LOCAL SURFACE WATER MANAGEMENT PLAN

CITY OF COON RAPIDS, MN

FINAL: September 2018

WSB Project No. 01431-600

Title Page

Certification

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1. EXECUTIVE SUMMARY

1.1. Local Surface Water Management Plan Purposes

This Local Surface Water Management Plan (Surface Water Management Plan, LSWMP, SWMP, City plan, the plan) will serve as a comprehensive planning document to guide the City of Coon Rapids in conserving, protecting, and managing its surface water resources. This plan has been created to meet the requirements detailed in Minnesota Statutes 103B and Minnesota Rules 8410, administered by the Minnesota Board of Water and Soil Resources. This plan is also consistent with the goals and policies of the Metropolitan Council's *Water Resources Management Policy Plan*, and the watershed district having jurisdiction within the City: Coon Creek Watershed District. This plan may be periodically amended to remain current with local practices and policies. The purposes of the water management programs are to:

- Protect, preserve, and use natural surface and groundwater storage and retention systems;
- Minimize public capital expenditures needed to correct flooding and water quality problems;
- Identify and plan for means to effectively protect and improve surface and groundwater quality;
- Establish more uniform local policies and official controls and strive for regional uniformity in surface and groundwater management;
- Prevent erosion of soil into surface water systems;
- Identify the unique connection between surface water and groundwater and look for opportunities to promote groundwater recharge, where beneficial;
- Protect and enhance fish and wildlife habitat and water recreational facilities; and
- Secure the other benefits associated with the proper management of surface and groundwater.

The Coon Rapids Local Surface Water Management Plan addresses these purposes.

1.2. Executive Summary

The Coon Rapids Local Surface Water Management Plan is organized as follows:

- ***Section 1 Executive Summary*** provides background information and summarizes the plan contents.
- ***Section 2 Land and Water Resource Inventory*** details the physical setting including the history, natural resources, and land uses within the City.
- ***Section 3 Agency Cooperation*** outlines other governmental controls and programs that affect stormwater management.
- ***Section 4 Assessment of Problems and Corrective Actions*** presents the City's water management related problems and issues.
- ***Section 5 Goals and Policies*** outlines the City's goals and policies pertaining to water management.
- ***Section 6 Implementation Program*** presents the implementation program for the City of Coon Rapids, which includes defining responsibilities, prioritizing, and listing

the program elements.

- ***Section 7 Financial Considerations*** outlines the continued administration of this plan with respect to plan updates and amendments.

- ***Section 8 Amendment Procedures*** discusses the procedures to be followed if this plan is amended.

- ***Section 9 Glossary*** provides a list of commonly used terms from the plan.

- ***Appendices*** are included in the back of the plan. These documents are included because they provide supporting information to the main body of the plan, are useful information, and/or are required to be included in this plan update. Direct website links to relevant reports or documents are provided throughout the report as appropriate.

    - Appendix A – Figures
    - Appendix B – Relevant City Ordinances
    - Appendix C – MS4 Documents
    - Appendix D – Wetland Management Plan
    - Appendix E – Engineering Design Standards for Stormwater Management
    - Appendix F – Pond Aesthetic Treatment Reference Documents
    - Appendix G – Water Resource Related Agreements
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1.2.1. Summary of Water Resource Related Problems and Corrective Actions

Three of the City's top water resource related priorities are mitigating and preventing flooding, maintaining City assets and aging infrastructure, and addressing water quality requirements. Several waterbodies within the City have been listed as impaired waters and have Total Maximum Daily Loads (TMDLs) associated with them. The City will implement Best Management Practices (BMPs), as feasible, to address the TMDLs. There are localized flooding concerns throughout the City, which will be addressed by priority and if applicable, with street reconstruction projects. As flooding concerns are raised, the City will investigate and address issues. The City will look for project partnership opportunities with CCWD and other agencies as available.

To help prioritize projects related to water quality, flooding, and aging infrastructure maintenance, the City will continue to develop their CIP and will use the Implementation Table in **Section 6** of this Plan. Additional information on the City's water resource related problems and corrective actions can be found in **Section 4**.

1.3. Personnel Contacts

To implement this plan, a coordinated water resource management approach must be used. This approach utilizes the services of personnel within the City and surrounding communities, as well as personnel associated within Coon Creek Watershed District (CCWD) and Anoka Conservation District (ACD).

The primary implementation responsibility will lie with the appropriate staff members at the City. Assistance from the surrounding municipalities, CCWD, and ACD will also be expected. Outlined below is the contact information of personnel having responsibilities for overseeing or implementing various aspects of this Local Surface Water Management Plan.

City of Coon Rapids
Tim Himmer, Director of Public Works
Mark Hansen, Assistant City Engineer
11155 Robinson Drive NW
Coon Rapids, MN 55433
(763) 767-6479

Coon Creek Watershed District
Tim Kelly, District Administrator
12301 Central Avenue NE, Suite 100
Blaine, MN 55434
(763) 755-0975

Anoka Conservation District
Jamie Schurbon, Watershed Projects Manager
1318 McKay Drive NE, Suite 300
Ham Lake, MN 55304
(763) 434-2030

Minnesota Department of Natural Resources
Jason Spiegel, North Metro Area Hydrologist
Ecological and Water Resources
1200 Warner Road
St. Paul, MN 55106
(651) 259-5822
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2. LAND AND WATER RESOURCE INVENTORY

2.1. Location and History

The City of Coon Rapids is located along the Mississippi River in the northern portion of the Twin Cities metropolitan area, primarily within southern Anoka County as shown on **Figure 1, Appendix A**. The City has a total area of approximately 23.3 square miles. There are several major transportation corridors within Coon Rapids – State Highway 47, State Highway 610, and U.S. Highway 10.

Coon Rapids is considered a developed community by the Metropolitan Council. Development that is expected to occur is at a steady growth rate and the seventh largest within the Twin Cities metropolitan area. **Table 2.1** shows the current and projected population through 2040.

Table 2.1 Coon Rapids Population

Year	Population	Households
2010	61,476	23,532
2016	62,726	24,235
2020	64,800	25,500
2030	68,400	27,500
2040	72,100	29,300

Sources: Metropolitan Council Population/Household Estimates

2.2. Physical Setting

2.2.1. Topography and Geology

The topography of the City can be described as gently rolling, with steeper areas near the Mississippi River. Storm water runoff from the City of Coon Rapids is generally directed from the northeast to the southwest into the Mississippi River.

The 2004 SWMP lists the City as being part of three regulating watersheds: Coon Creek Watershed District (CCWD), Lower Rum River Watershed Management Organization (Lower Rum WMO), and Six Cities Watershed Management Organization (Six Cities WMO). The Six Cities WMO was disbanded in 2011 and CCWD assumed watershed management responsibilities for parts of areas within Blaine, Coon Rapids, Fridley, and Spring Lake Park. CCWD also took over responsibility for the areas of Coon Rapids formally shown to be in the Lower Rum River WMO in 2013. As of today, the entire City is within the Coon Creek Watershed District. **Figure 2, Appendix A** shows the extent of the watershed districts. Specific drainage patterns are discussed in **Section 2.3.3**. As can be observed from the subwatershed delineation map, the City of Coon Rapids is divided into many small watersheds. The subwatershed delineations were created using City topographic mapping, storm sewer as-builts, aerial photos, and field investigations.

The Anoka Sand Plain Regional Hydrogeologic Assessment indicates that the geomorphology of the City is comprised of postglacial deposits that consist of peat and organic-rich sediment and Grantsburg Sublobe Deposits, which consist of very fine to medium sand and minor silt. The Anoka Sand Plain has an overall very high geologic sensitivity for surface water to reach the uppermost aquifer level. Additional information on the Anoka Sand Plain Regional Hydrogeologic Assessment can be found in the University of Minnesota digital library.

According to the Bedrock Geologic Map and Bedrock Topographic Map of the Seven-County

Twin Cities Metropolitan Area (Minnesota Geologic Survey 1986), the initial bedrock formations include St. Lawrence and Franconia formations, as well as Jordan sandstone, and the bedrock can vary from 600 to 700 feet above sea level.

Additional geological information can be found in the *Anoka County Geologic Atlas* located on the Minnesota DNR website.

2.2.2. Soils

The Soil Conservation Service (SCS) published the *Soil Survey of Anoka County Minnesota* in 1980. The *Soil Survey* provides mapping and physical properties for soil types found in Coon Rapids. The *Soil Survey* was added to the Soil Survey Geographic (SSURGO) Database in 2005, providing digital access to the information.

The City of Coon Rapids is entirely within the Anoka Sand Plain. Soils within this area generally have high infiltration rates and are a benefit for stormwater management. However, quick infiltration rates allow for unrestricted water movement through the soils without removing contaminants. This can create an increased susceptibility to ground water contamination. The hydrologic soil classification map is shown in **Figure 3, Appendix A**. The four soil classifications are defined as follows per the Minnesota Stormwater Manual:

> **Group A –** These soils have high infiltration rates even when thoroughly wetted. The infiltration rates range from 0.8 to 1.63 inches per hour. These soils consist chiefly of deep, well drained to excessively drained sands and gravel. Group A soils have a high rate of water transmission, therefore resulting in a low runoff potential.
>
> **Group B –** These soils have moderate infiltration rates ranging from 0.3 to 0.45 inches per hour when thoroughly wetted. Group B soils consist of deep moderately well to well drained soils with moderately fine to moderately coarse textures.
>
> **Group C –** These soils have slow infiltration rates ranging from 0.06 to 0.2 inches per hour when thoroughly wetted. Group C have moderately fine to fine texture.
>
> **Group D –** These soils have very slow infiltration rates ranging from 0 to 0.06 inches per hour when thoroughly wetted. Group D soils are typically clay soils with high swelling potential, soils with high permanent water table, soils with a clay layer at or near the surface, or shallow soils over nearly impervious material.

Roughly one-half of the City consists of Hubbard-Nymore association. This association is mainly a nearly level to gently sloping outwash plain that is dissected by drainageways and pitted by large depressions. This association contains mostly Group A soils.

The remainder of the City consists of Zimmerman-Isanti-Lino association. These soils are nearly level to undulating, excessively drained, somewhat poorly drained, and very poorly drained soils that are dominated by fine sands throughout. This association contains a mixture of Group A and B soils.

2.2.3. Climate and Precipitation

The climate within the Twin Cities Metropolitan Area is typical of a humid continental climate with moderate precipitation and wide daily temperature variations. Without the buffering influence of large bodies of water, cold winters and hot summers predominate. An area where climate change has been recorded in the Twin Cities is in rainfall intensities and rainfall depths. The Metropolitan Area has seen more intense rainfalls the last two decades and even the average rainfalls are shown to be more intense.

The total average annual precipitation in the Metropolitan Area is approximately 30.6 inches recorded over a 30-year period from 1981-2010. The total average annual snowfall is approximately 54.4 inches. Additional climatological information for the area can be obtained from the Minnesota State Climatology Office website..

Rainfall frequency estimates are used as design tools in water resource projects. Rainfall frequencies are summarized in *Technical Paper No. 40, Rainfall Frequency Atlas of the United States*, published by the U.S. Weather Bureau in 1961. This document was updated in 2013. Atlas 14 is the new document used as reference for rainfall frequencies. It has been adopted by the City and CCWD in their respective stormwater management rules. The annual probability percentage is the chance of each rainfall event occurring in a given year. **Table 2.2** lists rainfall frequencies for Coon Rapids.

Table 2.2 Atlas 14 Rainfall Depths and Frequency

Recurrence Interval (yrs)	24-hr Rainfall Depth (in)	Annual Probability
1	2.5	99%
2	2.9	50%
5	3.6	20%
10	4.3	10%
25	5.3	4%
50	6.2	2%
100	7.2	1%

The City of Coon Rapids uses the 10-year storm event for storm sewer design and the 100-year storm event for storage/ponding requirements and evaluating freeboard.

Additional precipitation information for the area can be obtained from the National Oceanic and Atmospheric Administration (NOAA) website.

2.2.4. Land Use

The City's existing land use practices include residential, commercial, industrial, and private and public open spaces. The majority of the City is single family residential with areas of commercial development along Coon Rapids Boulevard, Highway 10, and to the northwest of the City along Main Street and Riverdale Boulevard. **Figure 4, Appendix A** shows the existing land use for Coon Rapids. Existing land use data was analyzed from the Metropolitan Council Generalized Land Use dataset published in 2016.

Most of the residences and businesses are served by public water and sewer systems. The City still has some Individual Sewage Treatment Systems (ISTS), although these numbers are dwindling. These are anticipated to be abandoned and converted to City services within the next ten years, as feasible. The City's Wellhead Protection Plan (WHPP) describes the approach to handling existing ISTS in more detail. The WHPP can be found in **Appendix J**.

The City's proposed land use plan is currently being updated with the 2040 Comprehensive Plan. This is expected to be complete by the end of 2018. The Land Use Plan is central to the Comprehensive Plan. It guides how specific properties might develop. **Figure 5, Appendix A** shows the guided Land Use Plan for the current Comprehensive Plan Update, which projects land use to the year 2040 and becomes the basis of important local and regional planning decisions made by the City and outside agencies such as Metropolitan Council. According to state law, development proposals must conform to the land use plan or an amendment to the land use plan must be sought.

Land use data is an important factor for estimating surface water runoff. The hard or impervious

surface areas associated with each land use greatly affect the amount of runoff generated from an area. Future land use projections indicate areas that may be available for water resource enhancement and where improvements should be a priority. Significant changes in land use can increase runoff due to added impervious surfaces. However, changes in land use also allow for the construction of stormwater BMPs.

2.3. Water Resources Data

2.3.1. Wetlands

In 2005, the City completed a Wetland Management Plan that assessed approximately 260 water bodies using the Minnesota Routine Assessment Method (MnRAM). The Coon Creek Watershed District now serves as the Local Government Unit (LGU) for the Wetland Conservation Act (WCA) within the City. Regardless of the LGU, Minnesota's statutory wetland protection standards mean uniform wetland protection throughout the City. Wetlands and lakes under DNR jurisdiction have an added level of protection.

Wetlands provide several valuable functions. They are a critical part of the natural storm drainage system, help maintain water quality, reduce flooding and erosion, provide food and habitat for wildlife, and provide open spaces and natural landscapes for residents. Thus, wetlands are important physical, educational, ecological, aesthetic, recreational, and economic assets to the City. **Figure 6, Appendix A** presents the National Wetland Inventory (NWI) for Coon Rapids. The NWI map provides guidance on where wetlands occur in the City, though the NWI wetland boundaries cannot replace wetland delineations for determining legal wetland boundaries.

Coon Rapids seeks to use its wetlands as part of a natural stormwater drainage system while preserving the function and values of these wetlands. Using wetlands as part of the storm drainage system improves water quality, reduces flooding and erosion, and, in some cases, involves the restoration of previously drained wetland basins.

This involves balancing function and values against the City's need for economical implementation of its flood control system. Increases in water level, water level fluctuations or inundation times can change wetland characteristics. Though the WCA does not preclude these changes, the Minnesota Pollution Control Agency (MPCA) does not allow for inundation of wetlands or discharge to wetlands that cause an adverse impact. When considering wetland impacts, the watershed uses a function and values approach which means the type of wetland mitigation, not just the mitigation area, becomes important.

2.3.2. Major Water Bodies

There are several major water bodies that convey and store water within and through the City. These water bodies are the Mississippi River and associated wetlands, Coon Creek, Pleasure Creek, Springbrook Creek, Sand Creek, Crooked Lake, Cenaiko Lake, and McKay Lake. Most of these major water bodies are classified under the DNR Protected Waters. A DNR Protected Water is defined as those lakes, wetlands, and watercourses over which the DNR Division of Waters has regulatory jurisdiction. Protected Waters are designated based on the following, as defined in Minnesota Statute 103G.005, Subdivision 15:

- Water basins assigned a shoreline management classification by the commissioner, under sections 103F.201 to 103F.221, except wetlands less than 80 acres in size that are classified as natural environment lakes;
- Waters of the state which have been finally determined to be public waters or navigable waters by a court of competent jurisdiction;
- Meandered lakes, excluding lakes that have been legally drained;

- Water basins previously designated by the commissioner for management for a specific purpose such as trout lakes and game lakes pursuant to applicable laws;
- Water basins designated as scientific and natural areas under Section 84.033;
- Water basins located within and totally surrounded by publicly owned lands;
- Water basins where the State of Minnesota or the federal government holds title to any of the beds or shores, unless the owner declares that the water is not necessary for the purposes of the public ownership;
- Water basins where there is publicly owned and controlled access that is intended to provide for public access to the water basin;
- Natural and altered watercourses with a total drainage area greater than 2 square miles in area;
- Natural and altered watercourses designated by the commissioner as trout streams; and
- Public waters wetlands, unless the statute expressly states otherwise.

Public Waters Wetlands are all types 3, 4, and 5 wetlands as defined in United States Fish and Wildlife Service (USFWS) Circular No. 39 (1971 edition), not included within the definition of public waters, that are ten or more acres in size in unincorporated areas or 2.5 acres or more in incorporated areas.

Figure 6, Appendix A shows the locations of these water bodies.

2.3.3. Drainage Systems

The primary conveyance for all drainage districts is an extensive system of ditches and pipe infrastructure. **Figure 7, Appendix A** shows the City's subwatershed drainage areas and ditch system. The runoff generated in the City is routed to numerous public ditch systems, which all ultimately discharge to the Mississippi River. These ditch systems are largely intact, although some have been replaced with storm sewer and interconnected chains of ponds. The storm sewer infrastructure and ponds are shown in **Figure 8, Appendix A**. CCWD serves as the public ditch authority in the City. The City also has an agreement with CCWD that the watershed district will inspect various City-owned ditches.

2.3.4. Hydrologic Modeling (Water Quantity)

The City's hydrologic/hydraulic system consists of the Mississippi River, Coon Creek, Sand Creek, Pleasure Creek, Springbrook Creek, as well as other lakes, ponds, wetlands, and storm sewer pipe systems. As part of the 2004 SWMP, a modeling effort was completed for the City. Results of this model can be requested from the City. The area was divided into 13 subwatershed areas and was modeled for the 2-year, 10-year, and 100-year rainfall events. The City's model was replaced by the current CCWD district-wide hydrologic model. CCWD recently created a district-wide XPSWMM model to better assess floodplain risks and BMP capacity/performance. This model incorporated Atlas 14 storm events and is available from the District. The CCWD model is the most current for Coon Rapids and includes stormwater discharge rates and storage volumes. Model results can be requested from CCWD. The City will consider completing an assessment of the adequacy of available storage using CCWD's model as a starting point.

2.3.5. Monitored Water Quality and Quantity Data

The City will continue to support monitoring of surface waters within its jurisdictional boundaries

and outside these boundaries for waters to which the City discharges. Data will be obtained through cooperation and coordination with other various agencies, including the Minnesota Pollution Control Agency, cities adjacent to Coon Rapids, the Metropolitan Council, the Minnesota Department of Natural Resources, Coon Creek Watershed District, Anoka Conservation District and Three Rivers Park District.

Figure 9, Appendix A shows monitoring stations located within the City. Other water quality information can be found from CCWD, Metropolitan Council, ACD and the MPCA on the following websites:

- Coon Creek Watershed District Water Quality Research & Monitoring webpage.
- Metropolitan Council monitoring information, including the Citizen-Assisted Monitoring Program (CAMP), can be found on the Water Quality Management webpage.
- Anoka Conservation District Monitoring webpage.
- Minnesota Pollution Control Agency's Citizen Lake Monitoring Program (CLMP) webpage.

In 2005, Coon Rapids created a P8 model for existing and future water quality within the City. The results of the P8 water quality modeling effort can be requested from the City.

The City's 2005 P8 model has not been updated as part of this plan effort. To effectively monitor Best Management Practice (BMP) performance and water quality, the City of Coon Rapids has considered adopting the Stormwater Asset Management Program (SWAMP). This program uses construction as-builts, pond inventory, drainage areas, field inspections, and storm sewer maps to rank BMPs based on cost/benefit pollutant removal efficiency. Basins are prioritized based on a set of parameters and a schedule can be determined for maintenance needs. The program is continually updated to include new BMPs, updated stormwater infrastructure, or changed drainage areas. The City will be able to incorporate SWAMP to include the following:

- Scheduling, tracking, and storing MS4 infrastructure inspections
- Budgeting stormwater inspection and maintenance activities
- Tracking TSS and TP load reductions
- Prioritizing inspection and maintenance activities through a ranking system
- Providing information to the public on BMP maintenance priorities and schedules
- Demonstrating compliance for written procedure and treatment effectiveness requirements as part of the MS4 permit

The SWAMP will be done in coordination with the CCWD to remain consistent with their Total Maximum Daily Load (TMDL) and Watershed Restoration and Protection Strategies Report (WRAPS) studies and other water quality reports.

2.3.6. Impaired Waters

The MPCA is required to publish a list of impaired waters, these are lakes and streams in the state that are not meeting federal water quality standards. For each water body on the list, the MPCA is required to conduct a study to determine the allowable TMDL for each pollutant that exceeds the standards. Impaired waters in Coon Rapids, or those receiving discharge from Coon Rapids, are summarized in Table 2.3 below.

Table 2.3 – 2018 303(d) Listed Impaired Waters

Impaired Water	Affected Use	Pollutant	Year Added	TMDL Status
Crooked Lake (02-0084-00)	Aquatic Consumption	Mercury in Fish Tissue	2008	Complete
Coon Creek (07010206-530)	Aquatic Life, Aquatic Recreation	Invertebrate Index of Biotic Integrity, E. coli	2006, 2014	Complete
Sand Creek (07010206-558)	Aquatic Life, Aquatic Recreation	Invertebrate Index of Biotic Integrity, E. coli	2006, 2016	Complete
Springbrook Creek (County Ditch 17) (07010206-557)	Aquatic Life, Aquatic Recreation	Invertebrate Index of Biotic Integrity, E. coli	2006, 2014	Complete
Pleasure Creek (07010206-594)	Aquatic Life, Aquatic Recreation	Invertebrate Index of Biotic Integrity, E. coli	2006, 2014	Complete
Mississippi River (07010206-805)	Aquatic Consumption, Aquatic Recreation, Aquatic Life	Mercury in Fish Tissue, E. coli, Excess Nutrients	2002, 2006, 2016	Mercury: Complete E. coli and Nutrients: Underway

The City does not currently have any required phosphorus load reductions for lakes from approved TMDL studies. The 2007 Mercury TMDL is a statewide effort to reduce mercury for fish consumption. In 2016, the Coon Creek Watershed TMDL and WRAPS reports were approved. These reports designate categorical load reductions for Coon Creek, Sand Creek, Pleasure Creek, and Springbrook Creek based on specific flow zones. Sand Creek, Pleasure Creek, and Springbrook Creek were also listed in the Twin Cities Metro Area Chloride TMDL as High Risk Streams having at least one chloride concentration value within 10% of exceeding the water quality standard. These streams are a top priority for chloride reduction efforts for the City and CCWD.

The City will be required to update this surface water management plan to incorporate the findings of any additional approved TMDL study and will also be required to amend their MS4 permit and Storm Water Pollution Prevention Plan. This must be done within 18 months of the approved TMDL date.

2.3.7. Groundwater

The City of Coon Rapids, along with the Minnesota Department of Health (MDH) and Anoka County Environmental Services, developed a Wellhead Protection Plan (WHPP) that delineates drinking water supply management areas and wellhead protection areas. The City has adopted Part 1 of the WHPP, with Part 2 being completed by the spring of 2018. **Figure 10, Appendix A** shows the drinking water supply management areas (DWSMA) for the City, a few of which are generally described below. The DWSMA vulnerability is determined using geologic, soils and groundwater chemistry information. Additional information on the DWSMA vulnerability can be found in the WHPP in **Appendix J**.

Within the City, groundwater wells serve the City and private water needs. Each of these wells has a ground water appropriation permit from the DNR. **Figure 10, Appendix A** also shows the locations of the DNR permitted ground water appropriation sites within the City. Specific information related to each of these permits can be found on the DNR Water Use Permits webpage.

The City's WHPP describes the locations of these wells and how the vulnerability areas were delineated.

The City will be required to incorporate the requirements of the WHPP into their Stormwater Pollution Prevention Program (SWPPP) for areas located within vulnerable source water protection areas (NPDES MS4 General Permit). Vulnerable Source Water Protection areas are those areas susceptible to contamination of the water supply from activities at the land surface and are based on the following three components: geologic sensitivity, well construction maintenance and use, and water chemistry and isotopic composition.

For areas of vulnerability, the City will incorporate the guidance developed by the MDH on evaluating proposed stormwater infiltration projects in vulnerable source water protection areas. The City will also incorporate the guidance located within the Minnesota Stormwater Manual on designing infiltration BMPs while protecting groundwater and the wellhead protection standards set by CCWD. The full CCWD rules and infiltration requirements for groundwater protection can be found in **Appendix I.** The groundwater protection requirements will be of a particular concern in areas where infiltration is being considered in soils suitable for rapid infiltration adjacent to municipal and private wells.

Figure 11, Appendix A shows the surface water/groundwater interaction as analyzed by regional screening performed by the Met Council in their report, Evaluation of Groundwater and Surface-Water Interaction: Guidance for Resource Assessment. The Council intends on completing this process again in the future as new information becomes available.

2.3.8. Public Areas for Water Based Recreation and Access

There are a number of water bodies that provide both active recreation, such as fishing and boating, and passive recreation, such as walking. These recreational resources are outlined below:

Mississippi River: The Mississippi River provides boating, fishing, and hiking opportunities within the City. The Mississippi River is also a State Canoe Route operated by the DNR Division of Trails and Waterways.

Crooked Lake: A fishing pier and beach area are located at Crooked Lake. The beach has been closed since the early 1980s and will likely not reopen in the near future. Crooked Lake Park is to be reconstructed in 2018.

Coon Creek: Coon Creek runs through Lions Coon Creek Park, Erlandson Park, Robinson Park, Al Flynn Park, and Coon Rapids Dam Regional Park. The creek is encompassed by an expansive regional trail system with many local trail and accesses as well.

Coon Rapids Dam Regional Park: The Coon Rapids Dam Regional Park is located at the old dam site on the Mississippi River and is owned and maintained by Three Rivers Park District. The facility contains a boat and canoe launch, trails along the river, environmental education programs, and dam walkway and overlook. The Mississippi River is also a State Canoe Route operated by the DNR Division of Trails and Waterways.

Bunker Hills Regional Park: Bunker Hills Regional Park is located in northeastern Coon Rapids and provides a variety of passive recreational opportunities such as hiking and nature observation. Bunker Hills also has a City-owned golf course that will be adding drought-tolerant species to reduce irrigation needs.

Additional information regarding recreational opportunities within the City is available in the Parks, Open Space, and Trail System Plan found on the City's website. **Figure 12, Appendix A** shows the current City and regional trails along with the public and private ditches and park areas.

2.4. Natural Resources Data

2.4.1. Fish and Wildlife Habitat

Coon Rapids provides habitat for a variety of small mammals, reptiles, birds, amphibians, and insects. Maintenance of habitat for wildlife species is important in maintaining ecological stability in Coon Rapids' natural areas. The wetland inventory found in the City's Wetland Management Plan assesses a number of wetland functions such as floral diversity, wildlife habitat, and fisheries habitat for each wetland.

The DNR Natural Heritage database indicates there is a variety of unique fish and wildlife habitat within the City, much of which is located in Bunker Hills Regional Park, Coon Rapids Dam Regional Park, and along the Mississippi River, which is within the area designated as the Mississippi River Critical Area Corridor.

Additionally, Crooked Lake and Cenaiko Lake have been stocked with fish by the DNR with Cenaiko Lake being used as a trout fishery. The Crooked Lake Management Plan provides additional information about its lake management strategies. Pleasure Creek has a Rough Forage classification and the Mississippi River contains a variety of fish species.

The United States Geological Survey completed a study entitled "Water Quality, Physical Habitat, and Fish-Community Composition in Streams in the Twin Cities Metropolitan Area, Minnesota 1997-98." This study looked at 13 streams in the Twin Cities area, including Coon Creek and Sand Creek within the City of Coon Rapids. This study found that total instream habitat was greatest in five of the streams, including Coon Creek. Fish species richness was the fourth highest in Coon Creek. Sand Creek ranked lower in species richness. The results of this study determined that fish-community composition appeared to be affected by percent of impervious cover in the watershed, water chemistry, water temperature, geomorphology, substrate, instream habitat, and migration barriers.

2.4.2. Mississippi River Corridor Critical Area

The Minnesota State Legislature enacted the Critical Areas Act in 1973 and an executive order (79-19) was signed in 1976 declaring the Mississippi River Corridor Critical Area (MRCCA).

The executive order states the following purposes for the Critical Area designation:

- To protect and preserve a unique and valuable state and regional resource for the benefit of the health, safety and welfare of the citizens for the state, region, and nation;
- To prevent and mitigate irreversible damage to this state, regional and national resource;
- To preserve and enhance its natural, aesthetic, cultural, and historical value for the public use;
- To protect and preserve the river as an essential element in the national, state and regional transportation, sewer and water and recreational systems; and
- To protect and preserve the biological and ecological functions of the corridor.

In 1976, four corridor districts were established, corresponding to the following different types of land use along the Mississippi River: rural open space district, urban developed district, urban open space district, and urban diversified district. Each district has its own set of guidelines. The Critical Area Act requires that each city having jurisdiction over land within the Critical Area develop a Critical Area Plan. Executive Order 79-19 includes the rules and guidelines that each city must incorporate in its Critical Area Plan.

The City of Coon Rapids has developed a Mississippi River Corridor Area Overlay District as part of City ordinances. A copy of this ordinance can be found in **Appendix B**. Additional information can be found on the DNR website.

The City of Coon Rapids' MRCCA Rulemaking Districts are shown in **Figure 13**. This data was developed by the DNR.

2.4.3. MLCCS

The Minnesota Land Cover Classification System, or MLCCS, categorizes urban and built up areas in terms of land cover rather than land use. MLCCS serves as a tool for City staff to integrate natural area preservation into land planning, land use, and zoning decisions. The City is dominated primarily by developed area with herbaceous areas as the next highest land classification. The remaining areas are planted/cultivated land and forested areas north of the City and along the Mississippi River and various creeks. **Figure 14, Appendix A** shows MLCCS coverage for Coon Rapids.

2.4.4. Unique Features and Scenic Areas

The City of Coon Rapids has many natural areas, water bodies, and regional parks. These are generally near Coon Rapids' open space and park land. Some of these areas contain rare and endangered species and special habitats. The DNR has jurisdiction over these areas. Based on state statute, any work within these areas is required to meet DNR permit requirements

Bunker Hills Regional Park located in the northeast corner of the City is designated as a DNR conservation corridor and shows areas of outstanding biodiversity significance. The conservation corridors represent areas designated by the DNR to be protected and to provide restoration of key natural habitats. These corridors are to be used by local agencies to prioritize areas for conservation.

The area along the Mississippi River is also designated as a conservation corridor by the DNR. A large section is designated as having poor biodiversity significance. **Figure 15, Appendix A** provides the locations of rare and biological features and conservation corridors within Coon Rapids. This data was published in the Minnesota County Biological Survey by the DNR.

The City has no wild and scenic rivers as defined by the State.

2.5. Floodplain Management

FEMA completed the map modernization process for its Flood Insurance Study (FIS) and Flood Insurance Rate Maps (FIRMs) to identify flood risk within Anoka County in 2015. Any Letter of Map Amendment (LOMA) and Letter of Map Revision (LOMR) can be located on the mapping function of FEMA's website.

The City of Coon Rapids has developed Floodplain Management Regulations. A copy of these regulations can be found in **Appendix B**. These regulations generally prohibit uses or activities within the floodplain that include structures or fill or that obstruct flood flows or cause increased flood elevations.

CCWD recently completed an update to their district-wide floodplain model to incorporate Atlas 14 rainfall data. The CCWD model identifies certain properties within the 100-year floodplain that are inconsistent with FEMA's flood maps. **Figure 16, Appendix A** illustrates the FEMA flood zones for the City of Coon Rapids and lists these areas of concern are impacted by CCWD's model and not FEMA.

2.6. Water Resources Related Agreements

This section summarizes those water resources related agreements the City of Coon Rapids has established with other entities. The City of Coon Rapids also had numerous agreements with private property owners for BMP maintenance. Agreements can be found in **Appendix G** of this SWMP or can be requested from the City.

2.6.1. Agreement with the City of Blaine to Accept Pleasure Creek Drainage Study

The agreement describes the acceptance for the Pleasure Creek Drainage Study.

2.6.2. Joint Powers Agreement with the City of Anoka

The agreement is in regard to combining efforts towards construction of storm drainage facilities for the cities of Anoka and Coon Rapids.

2.6.3. City of Anoka Stormwater Drainage System Agreement

The agreement describes the combination of efforts towards construction of stormwater drainage facilities in Section 5, Township 31, Range 24 in Anoka County.

2.6.4. Agreement with Coon Creek Watershed District to Inspect and Assess Select Ditches

The agreement describes work performed by CCWD on behalf of the City to inspect and assess ditches lateral to Public Ditches and considered to be private drainage ditches. The City is responsible for maintaining creeks, which includes bank stabilization, culvert replacement, and deadfall removal within the City boundaries.

2.6.5. Agreements for Rain Garden Maintenance

CCWD and ACD have agreements with homeowners to maintain rain gardens that are installed in City right-of-way. Rain gardens or BMPs installed by the City as part of a public project are not required to have an operation and maintenance agreement with the watershed. The watershed requires operation and maintenance agreements on any privately maintained BMP.

2.6.6. Joint Powers Agreement with Coon Creek Watershed District for the Lower Sand Creek Corridor Restoration Project

The project involves stabilizing 4200 linear feet of actively eroding streambank to help reduce erosion, and enhancing the habitat in and adjacent to the channel along a ½-mile stretch of Sand Creek near its confluence with Coon Creek near Lions Park.

2.6.7. Agreements with the Minnesota Department of Transportation

- Authorized Joint Powers Agreement with MnDOT for acquisition of real estate for storm drainage purposes for Project 79-25 and MnDOT Project SP 0-217-TH610-333, April 1990.
- Approved Joint Powers Agreement with MnDOT for acquisition of Pleasure Creek Detention Pond, September 1985.
- Authorized Joint Powers Agreement with MnDOT for Foleywoods Trunk Storm Sewer, December 1985.

- Approved Cooperative Construction Agreement with MnDOT for Pleasure Creek Storm Water Detention Pond, May 1985.

2.6.8. Private Maintenance Agreements

The City has entered into multiple agreements with private property owners for pond and/or BMP maintenance. CCWD requires private maintenance agreements for any non-public stormwater infrastructure project.

3. AGENCY COOPERATION

There are a number of local, State, and Federal agencies that have rules and regulations related to local water management. The City recognizes the roles of these other agencies and will cooperate, coordinate, and when possible partner with these agencies. This section describes the City's current surface water management program and practices and identifies the agencies and organizations having roles in the City's management of these resources. **Table 3.1** summarizes the City's and other agencies' respective regulatory controls related to water resources management and protection.

Current regulations and policies that govern surface water management within Coon Rapids include the engineering design standards document, which has incorporated MIDS, and previous surface water management plans. **Table 3.1** summarizes the City's regulatory controls regarding surface water.

Table 3.1 – Regulatory Control

Official Control	Responsibility	Mechanism
Stormwater Management including MIDS standards and CCWD wellhead standards	City, CCWD	City Ordinance 8-1200 Surface Water Management, City adoption of MIDS, Engineering Design Standards for Stormwater Management
Erosion and Sediment Control	City, CCWD, MPCA	City Ordinance 11-1207.1 (9) Erosion and 8-1200 Surface Water Management
Shoreland	City, CCWD, DNR	City Ordinance 11-1100 Environmental District Regulations
Floodplain	City, CCWD, DNR, FEMA, USACE	City Ordinance 11-1101 Floodplain Management
Wetlands	CCWD as LGU, DNR, USACE, BWSR	Public Waters Rules (MnDNR). Section 404 of the Clean Water Act (USACE). WCA. City Ordinance 11-1102 Wetland Management
Illicit Discharge	City, CCWD	City Ordinance 13-1400 Illicit Discharges and Connections to the Stormwater System
Wellhead and Source Water Protection	City, MDH, MPCA, DNR, CCWD, EPA	Coon Rapids Wellhead Protection Plan; Minnesota Rules Chapters 4720, 4725, and 1031.101; Federal Safe Drinking Water Act
Grading and Drainage – required for work involving more than 50 cubic yards of material or land disturbance greater than 5,000 square feet	City Grading Permit, CCWD	City Ordinance 8-1200 Surface Water Management
**Acronyms are defined in the sections below*		

Additional City ordinances relevant to surface water management include:

- 11-1001 Mississippi River Corridor Critical Area Overlay District
- 13-500 On-Site Sewage Treatment System Regulations

3.1. Support Agencies

This plan is in conformance with, but does not restate, all other agency rules that are applicable to water resource management. The following agencies deal with or regulate water resources throughout the City.

- Anoka County
- Anoka Conservation District (ACD)
- Coon Creek Watershed District (CCWD)
- Minnesota Department of Health (MDH)
- Minnesota Pollution Control Agency (MPCA)
- Board of Water and Soil Resources (BWSR) and the Wetland Conservation Act (WCA)
- Minnesota Department of Natural Resources (DNR)
- US Army Corps of Engineers (USACE)
- Minnesota Department of Agriculture
- US Fish and Wildlife Service
- Minnesota Environmental Quality Board
- Metropolitan Council
- Minnesota Department of Transportation (MnDOT)
- U.S. Environmental Protection Agency (EPA)
- Federal Emergency Management Agency (FEMA)
- Natural Resources Conservation Service (NRCS)
- U.S. Geological Survey (USGS)

While these other agencies' rules, policies, and guidelines are not all restated in this Plan, they are applicable to projects, programs, and planning within the City. The MPCA Minnesota Stormwater Manual, which is a document intended to be frequently updated, is also incorporated by reference into this LSWMP and can be found at on the MPCA website.

3.2. NPDES Permitting Process

The MPCA has designated the City of Coon Rapids as an NPDES Phase II MS4 community (MN Rules Chapter 7090). Coon Rapids' application for permit coverage was extended in 2013 (**Appendix C**). The permit outlines Coon Rapids' Stormwater Pollution Prevention Plan (SWPPP) to address six minimum control measures:

- Public education
- Construction site runoff control
- Public involvement

- Post-construction runoff control
- Illicit discharge detection and elimination
- Pollution prevention in municipal operations

The City's SWPPP contains several best management practices within each of the listed control measures. Some of these best management practices include:

- Inspection of outfalls
- Street sweeping
- Inspection of post-construction BMPs
- Storm sewer system mapping
- Resident education

Many of the goals and policies discussed in this local surface water management plan are directly related to requirements listed in the NPDES program. As a result, the implementation section of this plan repeatedly references items listed in the City's SWPPP, which can be requested from the City.

3.3. Comparison of Regulatory Standards

Applicable developing and redeveloping property within Coon Rapids is subject to review and approval from CCWD. The CCWD has established rules governing stormwater management and protection of natural resources. Currently these rules vary in content between the City design standards.

3.3.1. City of Coon Rapids

In 2015, Coon Rapids developed their Engineering Design Standards for Stormwater Management. This document was written to meet the City's goals outlined in the SWPPP and outlines additional requirements that were adopted from the Minimal Impact Design Standards (MIDS). These Design Standards are consistent with CCWD's permitting rules. A copy of these design standards can be found in **Appendix E**.

3.3.2. Coon Creek Watershed District Rules

CCWD is in the process of updating their rules. CCWD Rules and Regulations were last updated in 2009 and their plan was last updated in 2013. The City is committed to working with CCWD and will continue to coordinate for review and permitting of the stormwater management aspect of developments. CCWD is also the LGU for WCA.

One of the significant changes to CCWD's Watershed Plan update was the adoption of Atlas 14, the update to TP 40, providing the most recent data on rainfall depths and frequencies. The City has also adopted the use of Atlas 14 rainfall data for stormwater management practices. A copy of CCWD Rules can be found in **Appendix I**.

CCWD and the City have continually collaborated together on programs and projects to achieve common goals outlined in Section 5 of this plan. Some of these goals include maintaining awareness of needs and opportunities between Coon Rapids and CCWD and implementing programs and projects that meet the needs of all partners, align financially, and are a part of the overall watershed planning effort. Continuing and improving coordination between land use planning at the City and watershed planning at CCWD will result in better projects to meet agency goals and a more efficient use of public funds. Coordination and collaboration between entities is key to constructing cost effective BMPs to manage water quality concerns and preserve the City's natural resources in the future.

3.3.3. Wetland Management

Since 2014, CCWD has been the LGU for the Wetland Conservation Act and will continue to administer WCA permits. WCA regulations generally focus on the prevention or mitigation of wetland impacts, while watershed standards focus on wetland buffers and stormwater impacts.

3.3.4. Wellhead and Source Water Management

Wellhead and source water management is regulated by numerous agencies. The list below provides an overview of agency regulations and responsibilities related to groundwater protection.

- U.S Environmental Protection Agency – Groundwater protection is authorized by Federal laws including the Safe Drinking Water Act. The focus is on general groundwater protection activities, but actual implementation of these programs is administered by the states in cooperation with local governments.

- Minnesota Department of Natural Resources – Responsible for permitting the sustainable use of Minnesota's water supplies such as preliminary well assessment approvals and water appropriations permits. The DNR also promotes a groundwater hydrology program to monitor groundwater/surface water interaction and groundwater availability.

- Minnesota Department of Health – Manages and maintains safe drinking water supply and administers the Wellhead Protection Program. The City of Coon Rapids recently completed an update to their Wellhead Protection Plan.

- Metropolitan Council – The Metropolitan Council has developed the Twin Cities Metropolitan Area Master Water Supply Plan to provide a framework for sustainable long-term water supply planning. They also have collaborated with numerous agencies to complete studies and projects to identify key water supply issues and have completed the Twin Cities Area Groundwater Flow Model.

- Coon Creek Watershed District – Implements regulations for development related to groundwater protection and recharge. The CCWD also collaborates with other agencies to help fund projects related to groundwater/surface water interaction.

- Coon Rapids – The City of Coon Rapids is required to comply with all rules and regulations established by these agencies. The City has developed a Wellhead Protection Plan and Water Supply Plan and will continue to implement regional/state partnerships in the investigation of surface/groundwater connections.

4. ASSESSMENT OF ISSUES

4.1. Stormwater Management System Assessment

Previous sections of this LSWMP provide background on the physical and regulatory forces shaping surface water management in Coon Rapids. This section describes problems and challenges of specific waters, neighborhoods, or programs identified by the City, CCWD and other groups. Minnesota Statutes and Rules and Metropolitan Council guidance documents require "issues and corrective actions" or "problems and corrective actions" as elements of LSWMPs. The assessment includes stormwater management issues, both current and future, identified by the City, CCWD, and other state and federal agencies. Coon Rapids emphasizes the surface water management challenges ahead and that these challenges will test the City's financial and technical resources. See **Figure 17, Appendix A** for the locations of the issues described in this section. The City's priorities for addressing issues, in order, are:

1. Mitigating and preventing flooding
2. Maintenance of City assets and addressing aging infrastructure
3. Implementing water quality BMPs to meet TMDL requirements
4. Meeting MS4 requirements
5. Water resource education

4.2. Water Quality

4.2.1. **Issue:** Crooked Lake was placed on the MPCA's impaired waters list in 2008 for high mercury concentrations in fish.

Corrective Action: The EPA has approved the statewide TMDL mercury study. The MPCA has since prepared a plan to reduce mercury releases by 2025. This plan describes specific strategies that the State will employ to achieve the goals of the TMDL. No additional action by the City is needed.

4.2.2. **Issue:** The Mississippi River was placed on the MPCA's impaired waters list in 2002 for high mercury concentration in fish. Since that time, it has also been listed as impaired for PCB in fish tissue, fecal coliform and excess nutrients.

Corrective Action: The EPA has approved the statewide TMDL mercury study and no additional action by the City is needed. A TMDL is underway to address the PCB in fish tissue, fecal coliform and excess nutrients impairments. Once these are complete, the City will update this LSWMP to incorporate any required implementation activities.

4.2.3. **Issue:** Several creeks within Coon Rapids do not meet federal water quality standards and are considered impaired for invertebrate index of biotic integrity and E. coli. Coon Rapids was assigned categorical wasteload allocations for TSS, TP, and E. coli for each creek listed below.

- Coon Creek
- Sand Creek
- Springbrook Creek (County Ditch 17)
- Pleasure Creek

Corrective Action: In 2016, the Coon Creek Watershed TMDL and WRAPS Report were approved by the EPA and MPCA to address impairments for these creeks. Coon Rapids was assigned a categorical wasteload allocation for each creek. The City will continue to

collaborate and partner with CCWD to implement the recommended strategies outlined in the WRAPS report. The City has also implemented a Goose Management Plan (**Appendix H**) to protect water quality and meet TMDL requirements. Specific strategies are listed in **Table 6.1** of this plan.

4.2.4. **Issue:** Water quality of Crooked Lake associated with its aquatic invasive species (AIS) such as Eurasian watermilfoil and curlyleaf pondweed.

Corrective Action: Since 1996, the Crooked Lake Area Association (CLAA) has used a combination of association funds and AIS prevention and management grant dollars to apply herbicide treatments. Analysis of the water quality information for Crooked Lake indicates that water quality has improved over the years. In 2016, the CLAA partnered with CCWD and the DNR to complete a treatment for milfoil management. This is a project that was successful in removing almost all of it. The CLAA will also complete treatment for curlyleaf pondweed in the spring of 2018. The CLAA will continue to perform spot treatments as needed and will look to control the species below nuisance level. CCWD will continue to provide the lead for the AIS plan and any educational outreach. The City has been and will continue to provide cost share dollars towards AIS management of Crooked Lake.

4.2.5. **Issue:** The City anticipates that there may be additional, future impaired waters listed that will affect the City.

Corrective Action: The City will work with CCWD, ACD, MPCA and others to develop and implement future TMDLs that affect the City.

4.2.6. **Issue:** In 2007, the City was required by the MPCA to complete a loading assessment and a nondegradation report. The report estimates change in TSS and TP from development since 1990 and also future loading with development that could occur by 2020. The City was then required to complete a mitigation plan to address the changes in TSS and TP through increased development.

Corrective Action: The report concluded that by utilizing current stormwater management policies of the City and CCWD, TP and TSS loads will remain less than that from the 1990 conditions. The report outlined the following tasks for the City to pursue to account for increased runoff volume due to development:

- Consider implementation of regional volume reduction BMPs such as using ponds for irrigation or constructing regional infiltration facilities.
- Monitor infiltration rates in ponds.

As TMDLs are developed, loading reductions will be prioritized through any wasteload allocations assigned. The City will continue to use this Nondegradation Report as a reference. The Nondegradation Report can be found in **Appendix K**.

4.2.7. **Issue:** The Twin Cities Metro Area (TCMA) Chloride TMDL approved in 2016 lists Pleasure Creek, Sand Creek, and Springbrook Creek as High Risk Streams having at least one chloride concentration value within 10% of exceeding the current water quality standard.

Corrective Action: The City will continue to implement chloride best management practices such as reducing salt use on roadways, education to adjacent properties about correct salt application, and improving policies designating salt usage. The City will coordinate with CCWD on the monitoring of chloride levels within the streams and will also collaborate with CCWD as they complete their watershed-wide chloride study in 2019. The City will look to incorporate any implementation items that are identified.

4.3. Flooding and Stormwater Rate Control

4.3.1. **Issue:** Discrepancies have been found between FEMA's flood mapping and the Coon Creek Watershed District floodplain elevations from their district-wide model.

Corrective Action: The City will partner with CCWD to address any discrepancies between floodplain elevations and will consider undertaking a restudy of the FEMA analysis for existing conditions. The City will implement regulations going forward to help prioritize potential flooding concerns based on the discrepancies. The City and CCWD will also provide education to affected property owners on the implications of the difference in floodplain elevations. **Figure 16, Appendix A** shows properties that have been affected by CCWD's 100-year floodplain elevations, but are not currently shown in the FEMA floodplain.

4.3.2. **Issue:** Wet basements have been noted adjacent to the wetland located north of Xeon Boulevard and west of Xeon Street due to high groundwater.

Corrective Action: The City will perform periodic maintenance of the existing outlet channel to keep it free from overgrowth and debris. The problem appears to be mainly associated with the lack of functioning sump pumps on private property.

4.3.3. **Issue**: Ponding in backyard areas of the Bridgewater neighborhood, near 116th Avenue and Cottonwood Street, occurs during heavy rainfall events. The low point in this area is below the outlet elevation of the existing storm sewer.

Corrective Action: In 2004, the City completed backyard grading near these properties. The City also excavated the pond located west of Cottonwood Street in 2014. A coordination effort will be completed between the City and CCWD to model the system to determine potential flooding inputs in the area. The City will continue to monitor this area for flooding. A Capital Improvement Project is anticipated for this area in 2018 to construct larger storm sewer pipe that will be sized to address the 100-year storm event.

4.3.4. **Issue**: Pond 22-74-01 south of Coon Rapids Boulevard between Egret Boulevard and Grouse Street periodically overflows. The outlet was shown to be undersized for high flow scenarios.

Corrective Action: The City will monitor this location, and any mitigation efforts will be performed in accordance with the City's Common Drainage Problem Policy. One option to consider is to partner with CCWD and/or the Anoka Park District to construct a bypass pipe to convey high flows to a low point east of the Coon Rapids Dam Regional Park parking lot. The City will partner with CCWD to perform ditch maintenance as needed to provide additional conveyance for stormwater and to prevent erosion. This is a medium priority project.

4.3.5. **Issue**: Flooding has been reported in the backyard of 1975 129th Lane. All backyards in this neighborhood flow to a localized low area near this property.

Corrective Action: The City will monitor this location, and any mitigation efforts will be performed in accordance with the City's Common Drainage Problem Policy. This is a low priority project.

4.3.6. **Issue**: Flooding occurs in the low point of the backyards of 1353 and 1363 109th Avenue.

Corrective Action: The City will monitor this location, and any mitigation efforts will be performed in accordance with the City's Common Drainage Problem Policy. This is a low priority project.

4.3.7. **Issue**: Residents of Aspencrest Townhomes have experienced basement flooding due to high groundwater.

Corrective Action: The City will monitor this location, and any mitigation efforts will be performed in accordance with the City's Common Drainage Problem Policy. Periodic ditch maintenance to prevent blockage through the main flow area may be one option to consider. This is a low priority project.

4.3.8. **Issue**: Flooding occurs in the backyards of the houses between Palm Street and Norway Street and between 99th Avenue and 100th Avenue.

Corrective Action: Mitigation efforts will be performed in accordance with the City's Common Drainage Problem Policy. The City will consider in 2018 the construction of backyard catch basins and associated pipe necessary to drain private property low areas.

4.3.9. **Issue**: Localized backyard flooding issues may arise throughout the City.

Corrective Action: When specific issues are identified, the City will investigate the causes and address the issues in accordance with the City's Common Drainage Problem Policy. The City will also work with CCWD on the review and investigation of corrective actions for future flooding problems. Preventing property damage from flooding and erosion is a common goal for the City and CCWD and future projects to address localized flooding will be opportunities for partnerships as the issues occur.

4.4. Maintenance Issues

4.4.1. **Issue:** Pond 9-24-01 near Ivywood Lane overflows and periodically causes easement area flooding. The backyard easement areas near Marshland Park also experience flooding.

Corrective Action: CCWD will review and provide inspection services for the Marshland Park area. The channel will be inspected and scheduled maintenance of drainageways and outlets will be completed as necessary. This is a low priority project.

4.4.2. **Issue**: The ditch between Sycamore Street and Unity Street and 121st Lane and 122nd Lane, and all the way west to the BNSF Railroad track is overgrown with vegetation and causes water to back up. Numerous localized low areas have developed in the ditch over the years, and a number of private encroachments into the drainage and utility easements are present.

Corrective Action: The City will monitor and clean the culvert outlets along this ditch system. The City will review if a culvert realignment at Unity Street can be performed at the time of street reconstruction in the area. The City will coordinate with adjacent residents to remove built up vegetation from the ditch easement areas. This is a medium priority project.

4.4.3. **Issue:** The ditch segment between 119th Avenue and Grouse Street periodically floods the rear year drainage and utility easements of several private property owners. The ditch itself is fed by shallow groundwater causing water to be present most of the year. During spring snow melt, water flowing in the ditch can back up higher on private property due to

inefficiencies associated with the dual pipe culvert crossing located at 119th Avenue.

Corrective Action: The City will monitor the ditch in accordance with the Common Drainage Problem Policy. The dual pipe culvert crossing below 119th Avenue will be re-aligned as part of future park upgrades at Lions Coon Creek Park. Pipe outlets will be inspected and cleaned as appropriate. The City will work with adjacent private property owners to minimize fence and other private encroachments into the drainage and utility easement.

4.4.4. **Issue:** Residents have expressed concerns over maintenance responsibilities for private stormwater facilities.

Corrective Action: The City has met with numerous associations to discuss aesthetic treatments and required maintenance activities. Aesthetic treatments for all stormwater ponds shall follow guidelines approved by the City Council and shall be considered a shared financial responsibility between the City and those requesting the treatment. City policy may periodically provide for algae treatments on stormwater ponds conducted for aesthetic purposes. The City does not consider aesthetic treatments to be a basis for improvement in water quality. Guidelines for cost sharing in pond treatments is as follows:

- **No discharge from public infrastructure outside of the development area:** 100% private cost based upon the pro-rata contribution of adjacent property owners, with the basis being no (or minimal) public benefit.
- **Off-site public discharge into the basin:** 25% - 75% City contribution based upon the pro-rata flow distribution within the subwatershed (runoff generated in versus outside the immediate development).
- **Ponds completely located within the public realm and regional basins:** 100% City cost, but only if a public water quality benefit (as prescribed by the City Council) can be attained.

Some of these association meetings are listed below.

- Tralee Terrace, Water's Edge, and Bridgewater Village. Multiple meetings were held in 2015, 2016, and 2017 to discuss the stormwater ponds on the southwest corner of Coon Rapids Boulevard Extension and Palm Street and between Redwood Street and Palm Street. For the pond near Coon Rapids Boulevard, stormwater is from a combination of both public and private areas. Generally, removal of vegetation or debris from culvert ends, and excavation for sediment removal within the pond itself, would be a shared responsibility between the City and the Tralee Terrace Condominium Association. For the pond near Redwood Street, stormwater coming into this pond is entirely from private areas. Removal of vegetation or debris from culvert ends, and excavation for sediment removal within the pond itself, would be a shared responsibility between the Bridgewater Village, Tralee Terrace Townhomes, and Water's Edge Townhome Associations. The City is responsible for keeping the pond outlet structure clean and free of debris.

- Weston Woods of Bunker Hills. A meeting was held in 2017 to discuss aesthetic treatments and minor maintenance of the pond located on the west side of Crane Street across from 126th Avenue. City staff provided an email follow up.

- Alexandra's Cove located north of Highway 10 and along Crooked Lake Boulevard NW. Meetings were held in 2014, 2015, and 2016. CCWD performed a separate association presentation on pond ownership in the area. City staff performed two association presentations in 2016 to discuss floodplain and pond maintenance.

- De Gardner's Pond. The stormwater pond discussed is located south of 121st Avenue, north of 119th Lane, east of Tronson Creek, and west of Yellowpine Street. The pond captures runoff from public streets, therefore, the City has noted that it is responsible for regular maintenance of the inlet pipes and any additional maintenance such as bank erosion, sediment removal, and inlet/outlet repairs. The City also provided information to the Association to reduce fertilizer applications and establish a 20-foot-wide natural buffer around the pond to help limit algae growth.

- Nature's Cove Townhomes. The stormwater pond is located on the north side of 121st Avenue and east of Bluebird Circle. The City and CCWD conducted a site meeting in 2015 where they discussed pond aesthetics and noted buffer and fertilizer BMPs.

- Weston Woods. The stormwater pond is located on the south side of 97th Avenue and west of Holly Circle. The City and CCWD conducted a site meeting in 2015 where they discussed pond aesthetics and noted buffer and fertilizer BMPs.

- Ashley Oaks. The City and CCWD met onsite to inspect the stormwater pond located just northwest of the Ashley Oaks Townhome development. The City provided maintenance recommendations to the Association such as installing a trash guard to help prevent the outlet from clogging, removing point source-directed rainwater from downspouts to limit erosion, and regrade slopes to limit further erosion. The City also provided cost estimates to the Association for future stormwater pond maintenance including erosion and vegetation removal, sediment delta removal, and pond dredging. This pond is considered privately owned and maintained.

The City will continue to meet with associations as this issue comes up to provide education on stormwater pond functions, vegetative buffers, and maintenance responsibilities. The City will also look into developing a standard maintenance agreement for all private BMPs that are constructed. The City will continue to encourage the installation of a 15 to 20-foot-wide natural buffer around stormwater ponds.

4.5. Flooding and Stormwater Rate Control Between the City and Adjoining Entities

4.5.1. **Issue**: Increased flow rates from Coon Rapids into Springbrook Nature Center have resulted in general erosion and poor water quality. Improving the water quality and reducing the rate at which water enters the Nature Center have been identified as a priority of the CCWD.

Corrective Action: The City has investigated opportunities to provide additional stormwater rate control within its border upstream of the Springbrook Nature Center. No opportunities to reasonably address the problem were identified. However, the City will continue to work with Fridley, Blaine, and CCWD to address this issue. This is a medium priority project.

4.5.2. **Issue:** Outflow from a wetland complex in the northwest corner of the City behind Walmart discharges to the City of Anoka and is currently backing up. Large deposits of silty sediment are a result of this backflow.

Corrective Action: The City is currently investigating outfall conditions and the normal water level of the basin and will continue to monitor and clean as necessary. The City will collaborate with CCWD and the City of Anoka if any project is identified to feasibly correct this issue.

4.6. Impacts of Stormwater Quality on Fish and Wildlife Resources

4.6.1. **Issue:** There is a need for vegetation management on Crooked Lake due to the increases in the number of aquatic invasive species over the years and the continued prevalence of Eurasian Milfoil and Curly-Leaf Pondweed. CCWD has identified aquatic invasive species as a main issue in their Comprehensive Watershed Plan due to its impacts on native habitats and species.

Corrective Action: The City of Coon Rapids, the CLAA, and CCWD collaborated to create the Crooked Lake Comprehensive Management Plan 2014-2018. The goal of this plan was to identify and evaluate lake health trends and to develop strategies for the protection and enhancement of Crooked Lake. Some management activities included an annual plant survey, water quality monitoring, annual chemical treatment, and groundwater monitoring. A copy of this plan can be found on CCWD's website.

The CLAA partnered with CCWD and the DNR in 2016 to implement a treatment on Crooked Lake for milfoil. This treatment was deemed successful and small spot treatments over the years should keep the milfoil below nuisance levels. An additional treatment is expected to occur in 2018 to remove curlyleaf pondweed. As part of the milfoil treatment plan, native plants were reintroduced to Crooked Lake to promote growth of non-invasive species to out-compete with the milfoil. Preliminary results indicate that the transplant was successful with over 70 percent survival rate.

The City will continue to collaborate with the CLAA and CCWD to address AIS in Crooked Lake through regular monitoring and will work with CCWD to proactively manage any future sign of AIS in other waterbodies throughout the City. The City and CCWD will also continue to coordinate education components including newsletter updates and signs on fishing docks.

4.7. Adequacy of Existing Regulations and Programs to Address Adverse Impacts on Local Water Resources

4.7.1. **Issue:** The City has adopted ordinances related to floodplain regulation, illicit discharge, surface water management, native vegetation planting, minimal impact design standards (MIDS), wetland management and erosion control. These ordinances need to be kept up to date as requirements change. A copy of the ordinances can be found in **Appendix B**.

Corrective Action: The City will continually evaluate these ordinances and will update them as needed. The City will continue to enforce all ordinances as necessary. The City will also notify CCWD of water-related ordinances changes.

4.7.2. **Issue:** The City currently has limited funding sources available to complete projects related to water resources.

Corrective Action: Stormwater funds and special assessment funding are not adequate to implement the studies, programs, and capital improvements outlined in this plan. The City must apply for grants to fund the implementation of capital improvements identified in this management plan. The City will consider increasing the current stormwater utility rate to fund future implementation items. The City will also consider partnering with CCWD on watershed-wide projects.

4.8. Erosion and Sediment Control

4.8.1. **Issue**: High flows along Tronson Creek have resulted in periodic side slope erosion and silt deposition. Flooding has occasionally occurred in backyards on the south side of 1400 block of 120th Avenue. Tronson Creek is also consistently fed by shallow groundwater.

Corrective Action: The City will monitor this area, and any mitigation efforts will be performed in accordance with the City's Common Drainage Problem Policy. Individual property owners are responsible for upkeep and maintenance of drainage ditches on their property. This is a medium priority project.

4.8.2. **Issue**: The ditch east of Coon Creek Boulevard and north of 131st Avenue is flat and residents state that the ditch does not completely drain and that stagnant water is present. It has also been noted that sediment has accumulated in the ditch.

Corrective Action: The City will monitor this location, and any mitigation efforts will be performed in accordance with the City's Common Drainage Problem Policy. This is a medium priority project.

4.8.3. **Issue**: The Moore Park ditch, at the crossing of Magnolia Street south of 112th Avenue, is eroding.

Corrective Action: The City has previously installed geo-cell material along the ditch banks and bottom. The City, with the assistance of CCWD, will continue to monitor and inspect this ditch. Some geo-cell material has washed out over the years and has been removed by the City. Any continued mitigation efforts will be performed in accordance with the City's Common Drainage Problem Policy. This is a medium priority project.

4.8.4. **Issue**: Several private storm ponds in the Tralee Terrace area need vegetation and debris removal but are difficult to access and maintain.

- One pond at the southwest corner of Coon Rapids Boulevard and Palm Street – Because stormwater enters this pond from both public and private areas, it is the shared responsibility of the City and the Tralee Terrace Condominium Association to remove vegetation and debris from culvert ends and excavate sediment. Any desired algae treatments are the sole responsibility of the Tralee Terrace Condominium Association as these are for aesthetic purposes only and do not improve water quality.

- Two ponds between Redwood Street and Palm Street – Because stormwater entering these ponds is entirely from private areas, the City's only responsibility is to keep pond outlet structures clean and free of debris. Other maintenance activities are the shared responsibility of the Bridgewater Village, Tralee Terrace Townhome, and Water's Edge Townhome Associations.

Corrective Action: Establish access agreements with the applicable homeowners' associations. Implement an inspection and maintenance schedule for these ponds. Additional ponds throughout the City that are identified to have access issues will be identified by the City and options will be analyzed.

4.9. Impact of Land Use Practices and Development

4.9.1. **Issue:** The City of Coon Rapids is nearing full development. This can make it difficult for

the City to implement stormwater management BMPs to efficiently meet watershed water quality requirements on a site by site basis.

Corrective Action: In areas where project specific BMPs will not be feasible, the City will look into completing regional water quality improvement projects, such as water reuse BMPs, to help meet future stormwater management requirements. The City has also adopted the Minimal Impact Design Standards to create flexible treatment options for areas not suitable for site specific BMPs. The City shall collaborate with the CCWD and the Anoka Conservation District to help identify flexible treatment options, including regional water quality BMPs, to meet design standards.

4.10. Education Program

4.10.1. **Issue:** The City of Coon Rapids recognizes the need for local water education programs to increase public awareness of local water management and improve the quality of stormwater runoff.

Corrective Action: The City will continue to provide educational content and opportunities to staff, residents, businesses, developers, and others. These efforts may include trainings, regular notices in the City's monthly newsletter, articles in the local paper, postings on the City website, and flyers in the utility bill. The City will coordinate with CCWD and the ACD to improve the efficiency of educational efforts and reduce duplication. Educational topics may include, but are not limited to:

- Stormwater pond function and maintenance
- Wetland buffers
- Yard/pet waste management
- Illicit discharge to stormwater
- Utility easements related to location, purpose, encroachments/obstruction
- Controlling invasive species
- Sustainable groundwater and recharge
- Erosion and sediment control on small scale landscaping projects adjacent to impaired waters
- FEMA/CCWD model discrepancies
- Salt usage
- Benefits and care of native vegetation
- Wellhead protection and well sealing
- Know the Flow story boards

4.11. Identification of Potential Problems to Occur in the Next 20 Years

4.11.1. **Issue:** Inspecting and maintaining existing stormwater infrastructure throughout the City.

Corrective Action: The City of Coon Rapids is responsible for maintenance of its stormwater system in conformance with the MCPA's MS4 Program. This includes maintenance of pipes, outlets, constructed ponds, lakes, wetlands, ditches, swales, and other drainage ways. Proper maintenance will ensure that the stormwater system continues to provide the necessary flood control and water quality treatment. The City will look to develop and refine the inspection program to make better use of existing asset management technology. Refer to **Appendix B** for a copy of the City SWPPP. Other units of government are responsible for maintaining the stormwater systems under their control.

4.11.2. **Issue:** Increasing prevalence of polycyclic aromatic hydrocarbons (PAHs) in stormwater ponds from runoff of roadways and other surfaces. PAHs are considered toxic and presents challenges for disposal when pond dredging is needed.

Corrective Action: As stormwater ponds are inspected and maintained, the City will identify any ponds that are contaminated and follow protocol for disposal of dredged material. The City also bans the use of materials for paved surfaces that contain PAHs for future development and redevelopment.

4.11.3. **Issue:** Accumulation of debris and material on City streets.

Corrective Action: The City will continue to sweep debris and salt from streets twice annually and more frequently for those areas along lakes and streams. More information regarding street sweeping activities can be found in the SWPPP which is located in **Appendix B.**

4.11.4. **Issue:** Elevated levels of chloride concentrations have been found in stormwater ponds, surface water bodies, and groundwater throughout the Twin Cities Metro Area. At levels exceeding the water quality standards, chloride can be toxic to aquatic life and can make drinking water sources not economically feasible to treat.

Corrective Action: The City will continue to implement chloride best management practices such as reducing salt use on roadways, education to private business owners about correct salt application, and improve policies designating salt usage. The City will continue to track and implement ways to reduce road salt usage based on its MPCA Level 1 and 2 Smart Salt Certifications. The City will coordinate with CCWD on the monitoring of chloride levels in waterbodies throughout the City. The City will also collaborate with CCWD as they complete their watershed-wide chloride study in 2019 and will look to incorporate any implementation items that are identified.

4.11.5. **Issue:** Prioritizing inspection and maintenance of stormwater ponds as well as determining the performance of existing stormwater ponds throughout the City.

Corrective Action: The City of Coon Rapids will implement the Stormwater Asset Management Program (SWAMP) that identifies and prioritizes pond maintenance activities and BMP inspections. This program will need to be updated regularly to result in an updated prioritization of pond inspection and maintenance activities. In addition, the program will estimate the current treatment provided by each pond to determine if the desired amount of treatment is being achieved. This program will help meet the MS4 permit requirements related to the management of stormwater ponds.

4.12. Availability and Adequacy of Existing Technical Information to Manage Local Water Resources

4.12.1. **Issue:** Atlas 14 (updated precipitation probability information) was recently released by NOAA. Atlas 14 rainfall values for larger rain events are shown to have increased by as much as 30%. Changes this significant in precipitation can cause issues in the existing City stormwater system. CCWD has identified the changes in precipitation values to be a primary issue for the entire watershed as well.

Corrective Action: The City will collaborate with CCWD to continue to implement Atlas 14 in the review and approval of new or redevelopment projects. The City will coordinate with the CCWD, FEMA and the DNR on implementing Atlas 14 into its floodplain management regulations.

4.12.2. **Issue:** The City has mapped the majority of its storm sewer system. As new and redevelopment projects are completed, the storm sewer GIS database needs to continually be updated.

Corrective Action: The City will annually update its storm sewer GIS database to incorporate recent projects, BMPs, and associated storm sewer improvements.

5. GOALS AND POLICIES

5.1. Summary

The City of Coon Rapids has developed a number of goals and policies that conform to the overall purpose that is specified in Minnesota Statutes Section 103B.201. These goals and policies have been developed to complement CCWD, county, regional and State goals and policies and meet the City's interest in protecting and managing its valuable water and natural resources, recognizing the relationships between resource protection, land use management, development, redevelopment and fiscal responsibility. Specific standards related to Minimal Impact Design Standards (MIDS), Atlas 14, wetland management requirements, and infiltration standards are listed in the City's Engineering Design Standards for Stormwater Management document (**Appendix E**).

This section outlines the goals and policies specific to surface water management in Coon Rapids. Goals and policies are grouped by their relationship to the key issues listed below:

- Section 5.2 – Water Quantity
- Section 5.3 – Water Quality
- Section 5.4 – Wetland Management
- Section 5.5 – Erosion and Sediment Control
- Section 5.6 – Education and Public Participation
- Section 5.7 – Groundwater Protection
- Section 5.8 – Recreation, Fish, and Wildlife
- Section 5.9 – Maintenance and Inspection
- Section 5.10 – Public Ditch System
- Section 5.11 – Financial Management
- Section 5.12 – Mississippi River
- Section 5.13 – Collaboration with CCWD

5.2. Water Quantity

Goals

1. To limit public capital expenditures necessary to control excessive volumes and rates of runoff.
2. To control the rate of stormwater runoff from development to reduce downstream flooding and erosion.
3. To provide adequate storage and conveyance of runoff to protect the safety of the public and minimize property damage.
4. To implement the Common Drainage Problem Policy to address drainage issues reported by residents.
5. To identify and address inconsistencies between CCWD's floodplain model and FEMA's flood zones.

Policies

1. Development will follow the MIDS as outlined in the City's Engineering Design Standards.

2. The City prohibits filling activities within the 100-year floodplain that will cause an increase in flood elevations. Filling within the floodway is prohibited. Filling within the flood fringe is prohibited unless the filling meets FEMA, DNR, CCWD, and City Ordinance requirements.

3. At a minimum, existing flow rates must be maintained for new and redevelopment for the 1-year, 2-year, 10-year, 25-year and 100-year 24-hour Atlas 14 rainfall events.

4. Within Drainage Sensitive Uses Areas, rate control calculations must show that the post-development 100-year peak flow rate shall not exceed predevelopment 25-year peak flow rate (by subwatershed). A Drainage Sensitive Use Area is defined as all those land uses that depend on subsurface drainage (i.e., local draining of the soil profile) for their continuation. Drainage Sensitive Land in Coon Rapids includes areas around McKay Lake, Coon Creek southeast of Crooked Lake, and Public Ditch 54-4 north of Main Street. **Figure 18, Appendix A** shows these locations.

5. All hydrologic studies will be based on standard hydrologic criteria and ultimate or anticipated development of the entire tributary drainage area.

6. Drainage calculations for the 1-, 2-, 10-, 25-, and 100-year Atlas 14 critical events must be submitted and approved as part of any development applications prior to the issuance of applicable building or grading permits.

7. Soil infiltration rates used for BMP design shall be in conformance with the Minnesota Stormwater Manual and the City's Engineering Design Standards. Soil borings and/or post infiltration testing will be required to determine actual soil infiltration rates.

8. The design storm events shall be defined as having the following MSE 3 distributions:

Table 5-1: Design Storm Events

Event Frequency	Event Duration	Probability of Occurrence in Any Given Year	Rainfall Amount (inches)
1 – Year	24- Hour	99%	2.5
2 – Year	24- Hour	50%	2.9
5 – Year	24- Hour	20%	3.6
10 – Year	24- Hour	10%	4.3
100 – Year	24- Hour	1%	7.2
100 – Year	10-Day Runoff	1%	7.2 (inches of runoff)

9. The critical 1% chance event will be defined as the event that requires the greatest stormwater storage volume in a storage facility. These facilities include lakes, ponds, and their outlets.

10. Storm water facilities (i.e., ponds, pond outlet systems, and major conveyance systems) will be designed using a 100-year event.

11. All minor drainage systems and local storm water collection systems analyses and design will be based on the Rational Method for the 10-year event unless otherwise specified.

12. Detention facility design will include access for maintenance of the outlet structure and the facility in general. Adequate easements will also be required adjacent to ditches to prevent obstruction of flows.

13. The design of storm water facilities will consider and identify location(s) of overflow(s) that prevent property damage to adjacent properties from extreme water levels. A 2-foot freeboard is required above the HWL determined by the 100-year critical event.

14. Culvert crossings or storm sewer systems in County or State right-of-way may have a

design frequency that differs from the 10-year. Each agency shall be contacted to determine the appropriate design frequency.

15. The City will utilize natural ponding areas, such as wetlands and lakes, for the impoundment and treatment of surface water runoff based on waterbody type identified in the CCWD Rules in **Appendix I**. All surface water runoff must be pretreated prior to discharging into a waterbody.

16. The City intends to use both designated and non-designated areas on public property to store stormwater runoff. Non-designated areas include general depressions, areas lacking easements, low points, and streets where structures and/or property is not damaged and any inundation that occurs will only be temporary in nature to be limited to 48 hours.

17. Available dead storage volume of landlocked areas shall be established by estimating the water surface elevation resulting from back-to-back 100-year, 24-hour rainfalls and runoff.

18. Emergency overflows or outlets to drainage systems will be provided and clearly marked on site plans. Two feet of freeboard is required adjacent to any structures.

19. The City will encourage the development of enhanced infiltration practices wherever it is practical. The City will not maintain private infiltration areas. Maintenance of private infiltration areas will be the responsibility of the homeowner's association or landowner.

20. The City intends to assist in addressing problems associated with structural inundation caused to the extent outlined in **Section 4** through the implementation of the Common Drainage Problem Policy. The City will work with property owners to identify and implement economic solutions to minimize damage risks to existing structures in flood prone areas. The City's assistance can be through public improvements or technical advice for private flood proofing improvements as outlined in this plan.

21. Where the construction of a formal outlet is not practical for landlocked areas, the minimum building elevation shall be meet the requirements listed in Section 8.3 of the Engineering Design Standards found in **Appendix E**. Hydric soils shall be considered for all landlocked areas.

22. At least two feet of vertical separation is required from the low floor elevation above the 100-year high water elevation and the DNR Ordinary High Water level (if applicable). Drainage easements and outlots for ponds, lakes, wetlands, and streams shall encompass an area to two feet above the 100-year HWL. The City will consider requiring three feet of vertical separation from the 100-year HWL.

23. All development must conform to the CCWD standards in **Appendix I**. Applicable projects must provide documents for review and an approved permit. An approved permit is required for the following:

    a. Land disturbing activities of one acre or greater of cumulative impact
    b. Work adjacent to lakes or wetlands
    c. Activities upstream from land that is dependent upon removal of water from the soil profile for their continued use (Drainage Sensitive Land Uses)

24. The City will collaborate with CCWD to address inconsistencies in their floodplain model in comparison to FEMA's flood zones.

5.3. Water Quality

Goal

1. To maintain or improve the quality of water in lakes, streams, or rivers within or immediately downstream of the City.

Overall Policies

1. The City will require that new developments provide no net increase of total phosphorus (TP), total suspended sediments (TSS), or volume of runoff. Redevelopment projects will implement BMPs to provide a net reduction on TP, TSS, and volume of runoff in compliance with water quality and non-degradation guidelines set in the Engineering Design Standards and CCWD Rules.

2. The City will continue to implement its Goose Management Plan to prevent contamination of stormwater runoff prior to discharge into water bodies. This plan can be found in **Appendix H** of this SWMP.

3. The City will continue to implement a salt management plan by incorporating chloride BMPs listed in the TCMA Chloride Management Plan and provide staff training on salt usage and its impacts on water quality.

4. The City prefers regional stormwater treatment basins versus site-by-site treatment systems.

5. In the design and construction of new, or modifications to the existing stormwater conveyance systems, pretreatment of stormwater runoff must be provided prior to discharge.

6. The NURP design recommendations for the design of stormwater treatment basins are as follows:

    - A permanent pool (dead storage) volume below the principal spillway (normal outlet) which shall be greater than or equal to the runoff from a 2.5-inch storm over the entire contributing drainage area assuming full development.

    - A permanent pool average depth (basin volume/basin area) which shall be greater than four feet, with a maximum depth of < 10 feet.

    - An emergency overflow (emergency outlet) adequate to control the one percent frequency/critical duration rainfall event.

    - Basin side slopes above the normal water level should be no steeper than 3:1, and preferably flatter. A basin shelf with a minimum width of 10 feet and one foot deep below the normal water level is recommended to enhance wildlife habitat, reduce potential safety hazards, and improve access for long-term maintenance.

    - To prevent short-circuiting, the distance between major inlets and the normal outlet shall be maximized.

    - A flood pool (live storage) volume above the principal spillway shall be adequate so that the peak discharge rates from 2-year and 100-year, 24-hour events are no greater than pre-development basin watershed conditions.

- Retardance of peak discharges for the more frequent storms can be achieved through a principal spillway design which may include a perforated vertical riser, small orifice retention outlet, or compound weir.

7. In areas where NURP treatment basins are not feasible to construct and a variance from the CCWD and City has been acquired, the most updated MPCA NPDES ponding guidelines may be used.

8. For algae control on municipal storm ponds, the City will undertake the following:

   - Require BMPs from adjoining property owners as a prerequisite to treating their pond. This involves the property owners taking responsibility for improving the water quality of the pond by keeping yard and pet waste from entering the pond, limiting fertilizer and irrigation use, and maintaining a natural buffer around the pond.

   - Limits on annual spending for algae/storm pond chemical treatment will be established by the City. The process of performing aesthetic pond treatments was eliminated in 2015 due to the lack of water quality benefit and process for supporting data that such treatments were providing any lasting benefit to the ponds. The guidelines for algae treatments are outlined as follows:

     - **No discharge from public infrastructure outside of the development area:** 100% private cost based upon the pro-rata contribution of adjacent property owners, with the basis being no (or minimal) public benefit.
     - **Off-site public discharge into the basin:** 25% - 75% City contribution based upon the pro-rata flow distribution within the subwatershed (runoff generated in vs. outside the immediate development).
     - **Ponds completely located within the public realm and regional basins:** 100% City cost, but only if a public water quality benefit (as prescribed by the City Council) can be attained.

   - A vegetative buffer of at least 15 feet will be required around existing storm ponds.

   - The City will assist in educating residents about the function and purpose of stormwater ponds and buffers. The residents will be required to take the lead on this initiative through associations and/or adopt-a-pond program. This will assist in residents taking steps to reduce nutrient loadings into the pond.

9. Construction sites required to obtain NPDES Construction Permit coverage must be in compliance with the terms of that permit.

10. The City will sweep all the City streets at least twice annually and more frequently in sensitive areas. Sensitive areas include areas surrounding lakes and adjacent to rivers or creeks and areas in neighborhoods with no stormwater treatment. The City will collaborate with CCWD to create a map showing these priority areas.

11. The City will require skimmers in the construction of new pond outlets and will add skimmers to the existing system whenever feasible and practical.

12. Skimmer design shall provide for skimmers that extend a minimum of four inches below the water surface and minimize the velocities of water passing under the skimmer to less than 0.5 feet per second for a 1-year, 24-hour rainfall event.

13. The City will continue to work cooperatively with Anoka County to implement the Know Your Flow initiative to provide public information regarding the protection and

management of natural resources and coordination among agencies.

14. Natural buffers are required adjacent to wetlands and encouraged adjacent to 1st and 2nd order streams, lakes, and stormwater ponds for projects requiring stormwater management permits for new and redevelopment. These buffers will be promoted and encouraged for all existing properties adjacent to lakes, streams, ponds, and wetlands.

15. The City will coordinate and collaborate with various agencies to continue the water quality monitoring program including CCWD, ACD, Met Council, and the MPCA.

16. The City will eliminate known illegal connections to the City's stormwater conveyance system through the City's MS4 permit requirements and illicit discharge ordinance.

17. The City will work with neighboring municipalities and CCWD to require rate control and treatment prior to the discharge of storm water across municipal boundaries.

18. Future outlets to DNR Public Waters must first pass through a pretreatment BMP prior to discharging into the water body. Full NURP treatment will be required for those areas that discharge into certain streams, lakes, and/or wetlands as defined in CCWD's approval standards.

19. All on-site wastewater systems will be the responsibility of the owner. If an on-site wastewater system fails, the owner will be required to connect to the City's sanitary sewer system. The owner is also responsible for routine inspections.

20. A response plan to minimize the impact of hazardous spills on protected waters has been developed and will be implemented by the City as part of the MS4 permit requirements. Regular updates will be completed as part of MS4 permit renewals and as new information is gathered. Wellhead protection standards will be incorporated for specified areas located throughout the City.

21. Establish and enforce a proper pet waste disposal ordinance. Implementation could include the addition of pet waste clean-up stations within City-owned parks and trail corridors.

5.4. Wetland Management

Overall Goal

1. To coordinate and collaborate with CCWD to ensure conformance with the requirements of the Wetland Conservation Act (WCA) and no net loss of wetlands and their functions.

Overall Policies

1. The City discourages wetland disturbance. Wetlands must not be drained or filled, wholly or partially, unless replaced by restoring, enhancing, or creating wetland areas of an equal public value, as permitted by CCWD and WCA. Wetland sequencing will be strictly followed:

    - First priority is to avoid the impact
    - Where the impact cannot be avoided, then the impact must be minimized
    - Where the impact cannot be avoided, then the impact must be mitigated

2. The use of wetland banking opportunities will be pursued by the City in accordance with WCA and CCWD.

3. Coon Creek Watershed District is the LGU for wetlands within the City. The City will work cooperatively and coordinate as wetland projects arise.

5.5. Erosion and Sediment Control

Overall Goal

1. To prevent the discharge of sediment from construction sites, agricultural areas, and drainageways from entering the City's surface water resources and storm sewer system.

Overall Policies

1. The City requires the submission and approval of erosion control and grading plans prior to the issuance of any grading or building permits. The City will coordinate erosion control items with CCWD.

2. The City will require any development or redevelopment to comply with the erosion control and steep slope standards found in the City's Engineering Design Standards, which are included in **Appendix E.**

3. Coon Rapids will regulate new development, redevelopment, street reconstruction projects, and other land disturbing activities through its Stormwater Management and Erosion and Sediment Control Ordinance.

4. The City will periodically review its Erosion and Sediment Control ordinance and revise it as necessary.

5. Soil erosion shall be prevented through the installation of erosion control practices in accordance with MPCA's Best Management Practices Handbook.

6. All construction sites that are required to obtain a NPDES permit must comply with the erosion and sediment control conditions of that permit. Erosion and sediment control BMPs are to be installed before land disturbing activities begin and shall be maintained until the site is re-stabilized.

7. The City will coordinate with CCWD to prioritize and complete bank stabilization projects. Biologically-impaired reaches, such as in Sand Creek, Coon Creek, Springbrook Creek, and Pleasure Creek, are commonly caused by streambank erosion and overland runoff. Completing these types of projects will assist in addressing the impairments in these streams.

8. The City will provide staff the opportunity to complete staff training and certifications related to erosion control inspections and SWPPP procedures.

9. The City will repair erosion problems on City owned property and issue orders for private landowners to do the same when erosion problems transport sediment from the property in question.

5.6. Education and Public Participation

Overall Goal

1. To inform and educate the public concerning urban stormwater, wetlands, and water quality management and how to address to address these items.

Overall Policies

1. The City will continue to implement a public education program which utilizes the following media: city newsletters, community access cable TV, individual mailings, local grade school meetings, public works open house, Summer in the City series, and the City website.

2. The City will provide staff training and education related to the MS4 permit activities, BMP maintenance, and other stormwater-related topics.

3. Enact a public education and outreach program to satisfy the minimum control measures identified in the City's NPDES MS4 permit and to help implement TMDL goals.

4. The public education program will include close coordination with outside entities like CCWD, Anoka County, DNR, MPCA, translation services, and others.

5. The City will provide education to properties identified in **Figure 16, Appendix A** that are listed in CCWD's 100-year floodplain, but are not identified in the FEMA floodplain.

5.7. Groundwater Protection

Overall Goal

1. To promote recharge of groundwater by requiring infiltration where appropriate to mitigate for the increased impervious surfaces associated with development.

2. To protect drinking water and wells by restricting infiltration where underlying geologic formations might convey surface water directly into groundwater aquifers, such as DWSMAs as found in the Wellhead Protection Plan.

3. To promote consistent groundwater protection regulations between agencies including MPCA, DNR, CCWD, and MDH.

Overall Policies

1. The City will implement its approved wellhead protection plan.

2. Cooperate with state and regional agencies on groundwater monitoring, inventorying or permitting programs. These agencies could include the MPCA, MDH, DNR, and CCWD. The City's groundwater protection policies are intended to preserve groundwater levels and flow and protection of drinking water supplies.

3. The City will work towards groundwater protection through the implementation of floodplain and shoreland ordinances in conformance with State and County regulations and the infiltration standards set by the CCWD. These infiltration standards include regulated DWSMAs and Emergency Recovery Areas (ERAs).

4. The City will encourage the development of alternative stormwater management methods including vegetated swales and infiltration practices provided these methods do not pose an increased risk for groundwater contamination.

5. The City will cooperate with the Department of Health to ensure that all unsealed or improperly abandoned wells within the City are properly sealed. Technical requirements for the abandonment of these wells will be in conformance with the local and State

regulations.

6. The City will cooperate with the DNR as they monitor surface water/ groundwater interaction of the surficial aquifer as shown in the Anoka Sand Plain Regional Assessment. The DNR will communicate any lake level concerns and will provide collected information on the wells that have been authorized within the City.

7. The City will collaborate as necessary with various agencies to perform special studies related to groundwater protection and recharge. The City will also work with the agencies to fill gaps in assessments of groundwater data.

8. The City, with the help of local partners, will implement efforts to identify and evaluate the economic and technical feasibility of water supply approaches and best practices that increase water conservation, enhance groundwater recharge, and make the best use of groundwater, surface water, reclaimed wastewater, and stormwater.

5.8. Recreation, Fish, and Wildlife

Overall Goal

1. To protect recreational opportunities and fish and wildlife habitat for the benefit of its residents.

Overall Policies

1. The City will cooperate with the Minnesota Department of Natural Resources, the Corps of Engineers, the U.S. Environmental Protection Agency, the U.S. Fish and Wildlife Service, the Anoka County Parks, and other appropriate agencies in promoting public enjoyment and protecting fish, wildlife, and recreational resources in the City. The City's recreation and fish/wildlife policies focus on access, connectivity, preservation, and control of exotic and invasive species.

2. Restoration of the City's fish and wildlife resources will be undertaken as outlined in the City's Parks, Open Space, and Trail System Plan. Activities to restore and/or maintain the City's habitat resources include prescribed burning, weeding/brushing, seed harvesting and disbursement. A complete copy of this Plan is available from the City's Parks Department.

3. Activities related to recreation, parks, open space, and trails systems shall be consistent with the City's Parks, Open Space, and Trail System Plan.

4. The City will preserve wetlands that provide habitat for wildlife and spawning of fish.

5. The City will work to create wildlife corridors throughout the City, where feasible.

6. The City will create and encourage native buffers around lakes and wetlands to increase wildlife habitat whenever possible. The City currently has an ordinance in place to encourage the use of native vegetation when landscaping.

7. The City will continue to work with CCWD to implement their fish and wildlife policies.

8. The City will partner with CCWD and CLAA to implement items in the Crooked Lake Management Plan to manage aquatic invasive species.

9. The City will implement their goose management plan to reduce TP and E. coli loading to

lakes and streams.

10. The City will coordinate with local and state agencies to protect threatened and endangered plant and animal species.

5.9. Maintenance and Inspection

Overall Goal

1. To continue an active storm sewer system maintenance and inspection program through an asset management approach.

2. To address existing ponds and outlet structures lacking adequate easements for maintenance.

Overall Policies

1. The City will continue to implement an annual inspection and maintenance program as required by the City's NPDES MS4 permit. Infrastructure to be inspected includes outfalls, water quality BMPs, and stormwater ponds.

2. The City will require and enforce adequate access to ponding facilities including outlots and easements.

3. The City shall identify pond and outlet structure locations that present access issues to its maintenance staff and develop options to address. Options shall include, but not be limited to, easement identification/acquisition, additional grading or regrading, and review with adjacent infrastructure reconstruction, as well as private development or redevelopment projects.

4. The City will implement the Stormwater Asset Management Program (SWAMP) that identifies and prioritizes pond maintenance activities and BMP inspections. This program will need to be updated regularly to result in an updated prioritization of pond inspection and maintenance activities.

5. The City will continually perform inspections and maintenance on public roadways through reconstruction reviews and financial investments.

6. The City will implement the SWAMP to schedule and track MS4 inspections and prioritize maintenance activities in coordination with CCWD.

7. Operation and maintenance agreements shall be developed as part of all private BMPs if a watershed permit is triggered. If a watershed permit is not triggered, the City will require a maintenance plan that includes procedures for maintenance and funding be submitted prior to approval of private BMPs. City must also receive and approve a plantings/material plan prior to implementation.

8. The City will perform maintenance measures to assure proper function of the city-owned drainage systems as outlined in the MS4 permit requirements and City ordinances.

5.10. Ditch System

Overall Goal

1. To provide a mechanism for management of the private ditch system and coordinate with CCWD for management of the public ditch system.

Overall Policies

1. The City will continue to coordinate with CCWD to provide inspection, maintenance, and repair of all ditches in the City's jurisdiction. Ditches will be inspected to ensure unobstructed conveyance outlined in the Common Drainage Problem Policy.

2. The City will maintain the ditches in their jurisdiction in conformance with the City ordinances.

5.11. Financial Management

Overall Goal

1. To utilize available funding mechanisms to construct and maintain a sustainable stormwater management system.

Overall Policies

1. The City will utilize various funding sources including, but not limited to, CCWD cost sharing and grants, area charges, stormwater utility, and other grants to accomplish improvements listed in this plan and other surface water documents.

2. The City will pursue grants, donations, and in-kind contributions to help fund stormwater projects.

3. The City will educate residents on the financial responsibilities (City versus property owner) for certain drainage issues. These will be outlined in the City's Common Drainage Problem Policy.

4. The City will encourage the watershed district to finance intercommunity and regional issues and projects.

5. The City will financially partner with other agencies/groups to address water quality issues. These agencies could include, but are not limited to, the Crooked Lake Area Association, City of Andover, and City of Blaine.

5.12. Mississippi River

Overall Goal

1. To continue to protect and preserve the Mississippi River corridor, Mississippi River, and associated wetlands.

Overall Policies

1. Work cooperatively with Federal, State, and County agencies in the development of resource management and implementation plans affecting the Mississippi River.

2. The City shall apply the Mississippi River Corridor Critical Overlay policies.

3. The City will continue its partnership with USGS and neighboring cities to monitor the newly installed stream gauge. This will be used to monitor bank protection and emergency management planning.

5.13. Collaboration with CCWD

The City is committed to maintaining a working partnership with CCWD in the implementation of the City's goals and policies. The goals listed in this section are consistent with CCWD's goals summarized below:

1. To prevent property damage from flooding, erosion, or degraded water quality. (Consistent with Sections 5.2, 5.4, 5.5, 5.9, and 5.10)
2. To ensure balance between inflow, outflow and the storage of water and encourage a productive landscape. (Consistent with Sections 5.3 and 5.7)
3. To ensure that water is protected from contamination. (Consistent with Section 5.3, 5.4 and 5.5)
4. To efficiently serve many uses including the safety and enjoyment of the watershed's residents. (Consistent with Section 5.6)
5. To preserve and enhance wildlife. (Consistent with Section 5.4 and 5.8)
6. To be proactive in AIS management and minimize their impacts on native habitats and species. (Consistent with Section 5.8)
7. To implement changes in precipitation through the adoption of Atlas 14 rainfall values. (Consistent with Section 5.2)
8. To manage groundwater dependent ecosystems. (Consistent with Section 5.7)

6. IMPLEMENTATION PROGRAM

6.1. Overview

Coon Rapids has developed its implementation program to address issues identified earlier in this SWMP. This program reflects the needs and concerns of many stakeholders including the City Council, City Staff, citizens, and CCWD. The program also considers Coon Rapids' ability to fund these items through its general levy and stormwater utility. The implementation program consists of the following components:

- Capital Improvement Projects (CIP)
- Operation and Maintenance
- Official Controls
- Monitor and Study

Capital Improvements consist of "on-the-ground" projects intended to remedy issues identified as current problems and to continually provide storm system improvements, new/redevelopment, street reconstructions, parks projects, and more. The capital projects focus on TSS. E. coli and phosphorus reductions within the TMDL subwatersheds and any additional areas identified in the City's Non-Degradation Report. Projects within the TMDL subwatersheds are the highest priority for the City. Flood protection is also a high priority for CIPs.

Operation and Maintenance items consist primarily of the general maintenance of Coon Rapids' drainage system including ponds, storm sewer, creeks, and culverts. Operation and maintenance also includes activities related to NPDES MS4 Permit compliance such as BMP maintenance and inspections, annual meetings, SWPPP updates, and SWPPP implementation.

Official Controls include ordinance and policy revisions intended to achieve water quality and quantity benefits. Each proposed implementation item has a specific driver, which are identified in the tabulated implementation program in Section 6.2. Over time, codes must be updated to remain consistent with goals, policies and practices. City ordinances are revised as needed to stay current with the MS4 permit requirements and revisions to the watershed district rules.

Monitor and Study items consist primarily of projects designed to collect water resource data such as water quality monitoring projects, and projects to evaluate cost benefits for various stormwater treatments or planning opportunities. These types of projects also include relevant partnerships and collaborations with the City, specifically in terms of groundwater/surface water protection and recharge.

6.2. 10-Year Implementation Plan Priorities

Table 6.1 presents Coon Rapids' Implementation Program. More importantly, the Implementation Program aligns with the City's goals and policies presented in this SWMP. **Table 6.1** presents implementation items in each of the four functional areas of Capital Improvement Projects (CIP), Operation and Maintenance, Official Controls, and Monitor and Study. The implementation program incorporates Coon Rapids' SWPPP through direct reference of items that have a financial impact. The City will update the implementation program in conjunction with its annual MS4 public meeting. As the City's CIP is reevaluated, **Table 6.1** may be updated, which does not require an amendment to this SWMP.

TABLE 6.1

SURFACE WATER MANAGEMENT IMPLEMENTATION PLAN

No.	Project Description	10 Year Total Cost Estimate [1,3]	Possible Funding Sources [2]	Proposed Cost By Year[1]										Comments
				2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	
Capital Improvement Projects (CIP)														
1	Outlet channel maintenance - The City will perform routine maintenance of the existing outlet channel south of 119th Lane west of Xeon Street. The City will need to acquire permanent easements.	$100,000	Stormwater Utility Fund, CCWD, Grants, Special Assessments						$50,000		$25,000		$25,000	Issue 4.3.2 in Section 4
2	Lions Creek Park Improvement Project - The City will plan on constructing a culvert beneath 119th Ave NW to help alleviate drainage issues with homes along the adjacent wetland.	$150,000	Stormwater Utility Fund, CCWD, Grants, Special Assessments		$150,000									Issue 4.3.2 in Section 4
3	Bypass pipe construction - The City will consider partnering with CCWD and/or the Park District to construct a bypass pipe to convey high flows to a low point east of the Coon Rapids Dam Regional Park parking lot.	$200,000	Stormwater Utility Fund, CCWD, Grants, Special Assessments				$200,000							Issue 4.3.4 in Section 4
4	Lift station construction - Construct a small lift station to convey runoff from the wetland in the backyard of 129th Lane to prevent backyard flooding near homes.	$110,000	Stormwater Utility Fund, CCWD, Grants, Special Assessments									$110,000		Issue 4.3.5 in Section 4
5	Overflow swale construction - The low point adjacent to homes near 1353 and 1363 109th Avenue currently has no positive outlet. If flooding persists, the City will consider construction of an overflow swale from the low point.	$20,000	Stormwater Utility Fund, CCWD, Grants, Special Assessments					$20,000						Issue 4.3.6 in Section 4
6	Storm sewer sump pump and outlet - Construct a storm sewer sump pump and outlet to convey runoff to the drainage channel near the Aspencrest townhome property.	$120,000	Stormwater Utility Fund, CCWD, Grants, Special Assessments								$120,000			Issue 4.3.7 in Section 4
7	Connect to existing storm sewer through the construction of a new outlet to alleviate backyard flooding	$60,000	Stormwater Utility Fund, CCWD, Grants, Special Assessments	$60,000										Issue 4.3.8 in Section 4

No.	Project Description	10 Year Total Cost Estimate [1,3]	Possible Funding Sources [2]	Proposed Cost By Year[1]										Comments
				2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	
8	Ivywood Lane drainage ditch - This ditch will be regularly inspected. Periodic ditch and outlet maintenance will be performed as needed. Outlet maintenance could include regrading the adjacent ditch and constructing an emergency overflow. The emergency overflow would be constructed as part of the City's road improvement project for Crooked Lake Boulevard.	$130,000	Stormwater Utility Fund, CCWD, Grants, Special Assessments						$40,000				$90,000	Issue 4.4.1 in Section 4
9	Burlington Northern/Drake Street Ditch - Regrade the ditch channel from the large wetland complex and clear vegetation.	$70,000	Stormwater Utility Fund, CCWD, Grants, Special Assessments				$70,000							Issue 4.4.2 in Section 4
10	Stormwater ditch regrading - The City will clean the skimmer structure and regrade the ditch along Coon Creek Boulevard and 131st Avenue. Additionally, a buffer could be established to provide additional stormwater treatment and reduce the need for further maintenance.	$78,000	Stormwater Utility Fund, CCWD, Grants, Special Assessments			$78,000								Issue 4.8.2 in Section 4
11	Weston Woods Townhomes Ditch Repair - The City will remove the sediment deltas formed at the inlets to the pond and will look at options to repair the inlets and outlet. An emergency overflow to the pond will also be installed.	$20,000	Stormwater Utility Fund, CCWD, Grants, Special Assessments						$20,000					Issue 4.8.4 in Section 4
12	Stormwater Improvement Projects - Includes yearly sewer and stormwater improvement projects constructed in conjunction with City reconstruction projects and other roadway/redevelopment projects.	$400,000	Stormwater Utility Fund, CCWD, Grants, Special Assessments	$40,000	$40,000	$40,000	$40,000	$40,000	$40,000	$40,000	$40,000	$40,000	$40,000	
13	Vegetation Management on Crooked Lake - Work with CCWD and CLAA to implement items listed in the Crooked Lake Management Plan. Including aquatic invasive species in-lake treatments.	$35,000	Stormwater Utility Fund, CCWD, Grants, Special Assessments	$3,000	$3,000	$3,000	$3,000	$3,000	$4,000	$4,000	$4,000	$4,000	$4,000	
14	Neighborhood Curb Cut Raingardens - Single-family lots between 85th Ave NW and East River Road NW Frontage Road provide various locations for curb-cut rain gardens to treat stormwater pollutants from private property. The City could partner with ACD, CCWD and local homeowners to provide assistance in cost and installation.	$60,000	Local Homeowners, Stormwater Utility Fund, CCWD, ACD, Special Assessments			$15,000		$15,000		$15,000		$15,000		Issue 4.2.3 in Section 4; Project analysis from ACD Springbrook Creek Stormwater Retrofit Analysis

No.	Project Description	10 Year Total Cost Estimate [1,3]	Possible Funding Sources [2]	Proposed Cost By Year[1]										Comments
				2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	
15	Iron Enhanced Sand Filter Bench - Pond 42 located north of 85th Ave NW along 85th Lane NW has space to install an IESF bench along the southern shore to provide additional stormwater treatment for dissolved constituents. Partner with CCWD and ACD. Because this is a private pond, coordination will be necessary with the responsible association.	$150,500	Stormwater Utility Fund, CCWD, ACD, Special Assessments							$150,500				Issue 4.2.3 in Section 4; Project analysis from ACD Springbrook Creek Stormwater Retrofit Analysis
16	Hydrodynamic Device - A hydrodynamic device could be installed to accept runoff from stormwater catch basins draining East River Road NW and the single-family and multi-family properties surrounding it. Located on the intersection of East River Road NW and 85th Ave NW. Partner with CCWD and ACD.	$115,300	Stormwater Utility Fund, CCWD, ACD, Special Assessments										$115,300	Issue 4.2.3 in Section 4; Project analysis from ACD Springbrook Creek Stormwater Retrofit Analysis
17	Hydrodynamic Device - A hydrodynamic device could be installed along the 84th Ln. NW storm sewer line to accept runoff from single-family properties draining to catch basins on 84th Ln. NW. Partner with CCWD and ACD.	$115,300	Stormwater Utility Fund, CCWD, ACD, Special Assessments								$115,300			Issue 4.2.3 in Section 4; Project analysis from ACD Springbrook Creek Stormwater Retrofit Analysis
18	Hydrodynamic Device - A hydrodynamic device could be installed along the 83rd Ln. NW storm sewer line to accept runoff from single-family properties draining to catch basins on Larch St. NW and 83rd Ln. NW. The device should be installed as far down the 83 rd. Ln. NW storm sewer line as possible, maximizing the drainage area to the practice. Partner with CCWD and ACD.	$58,600	Stormwater Utility Fund, CCWD, ACD, Special Assessments						$58,600					Issue 4.2.3 in Section 4; Project analysis from ACD Springbrook Creek Stormwater Retrofit Analysis
19	BMP Modification Along East River Road NW - Existing wet retention pond 53 is undersized for the drainage area and could be expanded for additional storage. The pond property is also privately owned, likely requiring a stormwater easement or potential outright purchase of the property for any stormwater treatment improvements.	$126,000	Stormwater Utility Fund, CCWD, ACD, Special Assessments							$126,000				Issue 4.2.3 in Section 4; Project analysis from ACD Springbrook Creek Stormwater Retrofit Analysis
20	Neighborhood Curb Cut Raingardens - Positioning the rain gardens is areas currently being undertreated for water quality. The City could partner with CCWD, ACD and local homeowners to provide assistance in cost and installation.	$46,000	Local Homeowners, Stormwater Utility Fund, CCWD, ACD, Special Assessments				$23,000				$23,000			Issue 4.2.3 in Section 4; Project analysis from ACD Sand Creek Stormwater Retrofit Analysis

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No.	Project Description	10 Year Total Cost Estimate [1,3]	Possible Funding Sources [2]	Proposed Cost By Year[1]										Comments
				2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	
21	Neighborhood Curb Cut Raingardens - Subwatershed located along Highway 610 along 88th Ave NW. Positioning the rain gardens uphill from existing catch basins will capture and infiltrate stormwater runoff before it enters the storm system. The City could partner with CCWD, ACD and local homeowners to provide assistance in cost and installation.	$52,500	Local Homeowners, Stormwater Utility Fund, CCWD, ACD, Special Assessments						$26,250			$26,250		Issue 4.2.3 in Section 4; Project analysis from ACD Pleasure Creek Stormwater Retrofit Analysis
22	Streambank Stabilization - Provide support for bank stablization effotrs where active erosion is identified during routine ditch inspections by CCWD. Partnership opportunity between the City, CCWD, ACD and others as needed.	$130,000	Stormwater Utility Fund, CCWD, ACD, Special Assessments					$37,000		$37,000		$56,000		Issue 4.2.3 in Section 4
23	Egret Storm line Re-Direct- Currently the Autumn Knolls stormwater pond is adjacent to the main storm sewer line that directs stormwater runoff from the en tire Egret network to Coon Creek. Though some water from the main line may be treated by the pond, the position of the pipe an d pond outfall likely creates a short-circuit scenario. By re-directi ng the storm line to a different part of the pond and installing a p roper outlet, the entire Egret network could be forced through th e Autumn Knolls pond before being discharged to Coon Creek.	$55,000	Stormwater Utility Fund, CCWD, ACD, Special Assessments			$55,000								Issue 4.2.3 in Section 4; Project analysis from ACD Lower Coon Creek Stormwater Retrofit Analysis
24	Infiltration Weir - Located south of 108th Ave and Butternut St. An outlet pipe set low in the landscape combined with channeliz ation of discharge from the surrounding stormwater pipes has sh ort-circuited the infiltration area. A simple weir structure would i ncrease the outlet elevation and provide additional infiltration. Additional engineering is required to determine which approach i s most feasible and to ensure that impacts to neighboring proper ties are minimized.	$15,000	Stormwater Utility Fund, CCWD, ACD, Special Assessments	$15,000										Project analysis from ACD Lower Coon Creek Stormwater Retrofit Analysis Project ID: LCC-15 Infiltration Weir
25	Coon Rapids Dam Regional Park Pond - The pond to the west of Highway 610 within the Coon Rapids D am Regional Park provides a great opportunity to provide storm water treatment for the entire catchment. Tasks for construction include inlet/outlet structures, excavation and expansion of the existing pond, and site restoration	$275,500	Stormwater Utility Fund, CCWD, ACD, Special Assessments								$275,500			Project analysis from ACD Lower Coon Creek Stormwater Retrofit Analysis

No.	Project Description	10 Year Total Cost Estimate [1,3]	Possible Funding Sources [2]	Proposed Cost By Year[1]										Comments
				2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	
26	Goose management activities outlined in the City's Goose Management Plan	$10,000	Stormwater Utility Fund, Grants, Special Assessments	$1,000	$1,000	$1,000	$1,000	$1,000	$1,000	$1,000	$1,000	$1,000	$1,000	
27	Neighborhood Curb Cut Raingardens - Subwatershed located south of Egret Blvd NW. Positioning the rain gardens uphill from existing catch basins will capture and infiltrate stormwater runoff before it enters the storm system. The City could partner with CCWD, ACD and local homeowners to provide assistance in cost and installation.	$108,000	Local Homeowners, Stormwater Utility Fund, CCWD, ACD, Special Assessments		$27,000			$27,000			$27,000		$27,000	
Operation and Maintenance														
28	Miscellaneous annual repairs to storm sewer infrastructure	$200,000	Stormwater Utility Fund	$20,000	$20,000	$20,000	$20,000	$20,000	$20,000	$20,000	$20,000	$20,000	$20,000	
29	Easement acquisitions to create access to stormwater BMPs and address flooding/storage issues	$24,000	Stormwater Utility Fund			$8,000			$8,000			$8,000		
30	Provide chemical treatment to selected municipal storm pond, provided landowner cooperation is obtained	$10,000	Stormwater Utility Fund	$2,000		$2,000		$2,000		$2,000		$2,000		From 2004 Plan implementation table
31	Parking Lots & Street Cleaning - Sweep City maintained streets 2 times per year	$662,000	Stormwater Utility Fund	$66,200	$66,200	$66,200	$66,200	$66,200	$66,200	$66,200	$66,200	$66,200	$66,200	From SWPPP Implementation Table
32	Storm Sewer Inspection Program - Conduct one inspection of all City-owned ponds and outfalls prior to expiration date of the MS4 General Permit. Annually inspect 100% of structural pollution control devices.	$50,000	Stormwater Utility Fund	$5,000	$5,000	$5,000	$5,000	$5,000	$5,000	$5,000	$5,000	$5,000	$5,000	From SWPPP Implementation Table, Issue 4.11.1 in Section 4
33	Road Salt Application Review - The City will record the annual activities of the salt distribution program and adjust current practices as necessary.	$10,000	Stormwater Utility Fund	$1,000	$1,000	$1,000	$1,000	$1,000	$1,000	$1,000	$1,000	$1,000	$1,000	From SWPPP Implementation Table
34	Stormwater Training Program - Staff trainings to discuss the following topics: parking lot and street cleaning, storm drain systems cleaning, road salt materials management, fleet and building maintenance, park and open spaces and other stormwater-related topics. Includes MN Fall Maintenance Expo, MPWA Fall Conference, and miscellaneous safety trainings.	$15,000	Stormwater Utility Fund	$1,500	$1,500	$1,500	$1,500	$1,500	$1,500	$1,500	$1,500	$1,500	$1,500	From SWPPP Implementation Table

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No.	Project Description	10 Year Total Cost Estimate [1,3]	Possible Funding Sources [2]	Proposed Cost By Year[1]										Comments
				2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	
35	TMDL Review & Implementation - Coon Rapids will work cooperatively with the Minnesota Pollution Control Agency and other outside organizations to develop and implement all future TMDL implementation plan(s) for impaired waters designated under Section 303(d), receiving MS4 discharges from within or adjacent to the City. This includes performance tracking towards TMDL goals.	$25,000	Stormwater Utility Fund	$2,500	$2,500	$2,500	$2,500	$2,500	$2,500	$2,500	$2,500	$2,500	$2,500	From SWPPP Implementation Table
36	Education Program: Coon Rapids and CCWD will collaborate to raise awareness by providing information on stormwater pollution prevention, effects of illicit discharges, best management practices, stormwater pond maintenance, pet waste management and outside entity resources available to City residents and business owners.	$32,000	Stormwater Utility Fund	$3,200	$3,200	$3,200	$3,200	$3,200	$3,200	$3,200	$3,200	$3,200	$3,200	Issue 4.4.4, 4.10.1 in Section 4
37	Storm Sewer System Mapping - Annually update storm sewer map for new development including new outfalls, storm sewer, and BMPs.	$8,000	Stormwater Utility Fund	$800	$800	$800	$800	$800	$800	$800	$800	$800	$800	
38	Illicit Discharge Inspections - Using the areas that the City identified as high-priority outfalls and areas around high-risk establishments, the City will integrate those sites into its annual MS4 inspection activities. As needed, City staff will televise a section of the sewer system, collect grab samples or perform other effective testing procedures to find illicit connection identified in the system.	$25,000	Stormwater Utility Fund	$2,500	$2,500	$2,500	$2,500	$2,500	$2,500	$2,500	$2,500	$2,500	$2,500	
39	Regular Flood Monitoring - The City will continually monitor known issue areas related to flooding.	$5,000	Stormwater Utility Fund	$500	$500	$500	$500	$500	$500	$500	$500	$500	$500	Issue 4.3.3, 4.3.5, 4.3.6, 4.4.1
40	Routine Ditch Maintenance - The City will continually perform ditch maintenance to prevent blockage through the main flow areas.	$25,000	Stormwater Utility Fund		$5,000		$5,000		$5,000		$5,000		$5,000	Issue 4.3.7, 4.4.2, 4.4.3, 4.8.3
41	Aesthetic Pond Treatment - The City will perform aesthetic pond treatments on stormwater basins as needed on a water quality basis and as outlined in Section 5.3.8.	$9,000	Stormwater Utility Fund			$3,000			$3,000			$3,000		
42	Stormwater Management Asset Program (SWAMP) - The City will implement this program to monitor BMP performance and water quality, prioritize inspection and maintenance activities, track TSS and TP load reductions, and schedule and record MS4 inspections.	$62,500	Stormwater Utility Fund	$22,000	$4,500	$4,500	$4,500	$4,500	$4,500	$4,500	$4,500	$4,500	$4,500	

No.	Project Description	10 Year Total Cost Estimate [1,3]	Possible Funding Sources [2]	Proposed Cost By Year[1]										Comments
				2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	
43	Pond Surveys - The City will annually complete pond surveys to schedule and prioritize the necessary maintenance projects. This efforts will be assisted by the SWAMP application.	$100,000	Stormwater Utility Fund	$10,000	$10,000	$10,000	$10,000	$10,000	$10,000	$10,000	$10,000	$10,000	$10,000	
44	Annual Pond Cleanout - The City will perform yearly cleanout of ponds identified for maintenance with the SWAMP program.	$500,000	Stormwater Utility Fund	$50,000	$50,000	$50,000	$50,000	$50,000	$50,000	$50,000	$50,000	$50,000	$50,000	
Official Controls														
45	Ordinance updates - The City will continually evaluate their adopted ordinances related to floodplain regulation, illicit discharge, surface water management (MIDS), wetland management, and erosion control. Any necessary revisions will be made as regulations change.	$3,000	Stormwater Utility Fund	$300	$300	$300	$300	$300	$300	$300	$300	$300	$300	Issue 4.7.1 in Section 4
46	Standard Maintenance Agreement - The City will develop a standard maintenance agreement for all private BMPs that are constructed.	$2,000	Stormwater Utility Fund		$2,000									Issue 4.4.4 in Section 4
47	Goose Management Plan: The City will regularly evaluate their goose management plan and activities. Updates will occur as needed.	$5,000	Stormwater Utility Fund	$500	$500	$500	$500	$500	$500	$500	$500	$500	$500	
48	Wellhead Protection Standards - The City will regularly evaluate their current wellhead protection standards and plan to remain consistent with local and regional updates.	$5,000	Stormwater Utility Fund	$500	$500	$500	$500	$500	$500	$500	$500	$500	$500	
49	Native Vegetation - The City will look to encourage the use of native vegetation per Ordinance 2164 and will update language as necessary.	$5,000	Stormwater Utility Fund	$500	$500	$500	$500	$500	$500	$500	$500	$500	$500	
50	Develop and update a City policy to provide guidance on addressing localized backyard flooding issues.	$10,000	Stormwater Utility Fund	$1,000	$1,000	$1,000	$1,000	$1,000	$1,000	$1,000	$1,000	$1,000	$1,000	Issue 4.3.9 in Section 4

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No.	Project Description	10 Year Total Cost Estimate [1,3]	Possible Funding Sources [2]	Proposed Cost By Year[1]										Comments
				2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	
Monitor and Study														
51	Undertake FEMA restudy analysis with CCWD. The purpose of this study is to help alleviate any discrepancies between FEMA flood elevation and the flood elevation from CCWD's district wide model.	$35,000	Stormwater Utility Fund, CCWD			$35,000								Issue 4.3.1 in Section 4
52	Cooperate with CCWD to identify and prioritize sites of streambank erosion. Ongoing study.	$50,000	Stormwater Utility Fund, CCWD	$5,000	$5,000	$5,000	$5,000	$5,000	$5,000	$5,000	$5,000	$5,000	$5,000	
53	Evaluation of Potential Stormwater Infiltration Projects for Impacts within Source Water Protection Areas. Ongoing study.	$100,000	Stormwater Utility Fund, CCWD	$10,000	$10,000	$10,000	$10,000	$10,000	$10,000	$10,000	$10,000	$10,000	$10,000	
54	Study potential locations to install new and emerging technologies designed to reduce E. coli. These projects would be credited towards the E. coli TMDL for Coon Creek, Sand Creek, Pleasure Creek and Springbrook Creek. Ongoing study.	$90,000	Stormwater Utility Fund, CCWD, ACD				$30,000				$30,000		$30,000	Coon Creek WRAPS Report
55	Identify stormwater ponds that are contaminated with PAHs as they are inspected and maintained. The City will prioritize cleanup and disposal as needed and will partner with CCWD and other agencies if applicable. See items 49-51 for costs related to this project. Ongoing project.	$40,000	Stormwater Utility Fund, CCWD, ACD	$8,000		$8,000		$8,000		$8,000		$8,000		
	TOTAL	$4,918,200		$332,000	$413,500	$433,500	$557,500	$338,500	$441,350	$569,000	$851,300	$458,750	$522,800	

[1] Cost estimates are preliminary and subject to review and revision as engineer's reports are completed and more information becomes available. Table reflects 2017 costs and does not account for inflation. Costs generally include labor, equipment, materials, and all other costs necessary to complete each activity. Some of the costs outlined above may be included in other operational costs budgeted by the City.

[2] Funding for stormwater program activities projected to come from following sources - Surface Water Management Fund, Developers Agreements, Grant Funds, General Operating Fund, or Special Assessments.

[3] Staff time is not included in the cost shown.

7. FINANCIAL CONSIDERATIONS

Implementation of the proposed regulatory controls, programs, and improvements that are identified in this plan will have a financial impact on the City. To establish how significant this impact will be, a review of the means and ability of the City to fund these controls, programs, and improvements is necessary. Outlined below is a list of various sources of revenue that the City will consider in implementing the water resource management efforts outlined in this plan.

For 2018-2027, the capital improvement projects, operation and maintenance programs, and studies are estimated to cost about $5,154,111 (**Table 6.1**). Potential funding sources are listed below:

- City's Stormwater Utility Fund
- Cost sharing due to collaboration and partnerships with Coon Creek Watershed District
- Special assessments for local improvements made under the authority granted by Minnesota Statutes Chapter 429.
- Revenue generated by Watershed Management Special Tax Districts provided for under Minnesota Statutes Chapter 473.882.
- Watershed District Levies from cooperation and partnership on projects with CCWD
- Grant monies that may be secured from various local, regional, County, State, or Federal agencies. This would include MnDOT, MPCA, Metropolitan Council, DNR, and others.
- Tax abatement
- Developer funds
- ACD Partnerships
- Neighboring cities
- Crooked Lake Area Association (CLAA)
- Other sources could include tax increment financing, state aid, etc.

The City will use funds generated from its Stormwater Utility as the primary funding mechanism for its implementation program including maintenance, repairs, capital projects, and studies. The City will continue to review the stormwater utility fee annually and adjust based on the stormwater related needs of the City and other available funding mechanisms. The City will coordinate annually with CCWD on upcoming cost sharing opportunities to address TMDLs and other water quality projects within the City. The City will also explore additional revenue sources as they become available and from those options listed above to cover additional funding needs.

8. AMENDMENT PROCEDURES

8.1. Review and Adoption Process

Review and adoption of this Surface Water Management Plan will follow the procedure outlined in Minnesota Statutes 103B.235:

> After consideration but before adoption by the governing body, each local government unit shall submit its water management plan to the watershed management organization[s] for review for consistency with the watershed plan. The organization[s] shall have 60 days to complete its review.
>
> Concurrently with its submission of its local water management plan to the watershed management organization, each local government unit shall submit its water management plan to the Metropolitan Council for review and comment. The council shall have 45 days to review and comment upon the local plan. The council's 45-day review period shall run concurrently with the 60-day review period by the watershed management organization. The Metropolitan Council shall submit its comments to the watershed management organization and shall send a copy of its comments to the local government unit.
>
> After approval of the local plan by the watershed management organization[s], the local government unit shall adopt and implement its plan within 120 days, and shall amend its official controls accordingly within 180 days.

8.2. Plan Amendments and Future Updates

This Local Surface Water Management Plan will be incorporated into the City's 2040 Comprehensive Plan update in 2018. The Plan is intended to be in effect for ten years, at which time an updated plan will be required. Following review by CCWD and Met Council and the formal adoption process outlined above, the Coon Rapids SWMP will be current.

The City may revise/amend the plan in response to City-identified needs. Minor changes to the plan will not require a re-submittal for agency review. Minor changes to the Plan shall be defined as changes that do not modify the goals, policies, or commitments expressly defined in this plan by the City. Adjustment to subwatershed boundaries will be considered minor changes provided that the change will have no significant impact on the rate or quality in which stormwater runoff is discharged from the City boundaries.

Significant changes to the local plan shall be made known to the following parties:

1. City Manager, Director of Public Works, and Assistant City Engineer
2. Coon Creek Watershed District
3. Metropolitan Council
4. Public within the City through a public hearing process

Any major changes to the Plan will be sent to CCWD and Metropolitan Council simultaneously for review and approval. Major amendments shall include updates to the City's goals and policies and ordinance updates related to stormwater management. The City's process shall be consistent with Policy 4.7, Certification and Approval of Local Water Management Plans, of the CCWD Watershed Management Plan. The Plan will be updated as necessary in response to the update of CCWD's Watershed Management Plan or subsequent rules.

9. GLOSSARY

ACD – Anoka Conservation District

BMPs – Best Management Practices

BWSR – Board of Water and Soil Resources

CCWD – Coon Creek Watershed District

City – City of Coon Rapids

CIP – Capital Improvement Projects

CLAA – Crooked Lake Area Association

CWPMP – Comprehensive Wetland Protection and Management Plans

DNR –Department of Natural Resources

DWSMA – Drinking Water Supply Management Area

FEMA – Federal Emergency Management Agency

FIS – Flood Insurance Study

FIRM – Flood Insurance Rate Map

GIS – Geographic Information System

IDDE – Illicit Discharge Detection and Elimination

IESF – Iron-Enhanced Sand Filter

ISTS – Individual Sewage Treatment Systems

LiDAR – Light Detection and Ranging

LGU – Local Governing Unit

LOMR – Letter of Map Revision

LSWMP – Local Surface Water Management Plan (also called the plan, City plan and SWMP)

MCBS – Minnesota County Biological Survey

MDH – Minnesota Department of Health

MIDS – Minimal Impact Design Standards

MLCCS – Minnesota Land Cover Classification System

MDOT – Minnesota Department of Transportation

MnRAM – Minnesota Routine Assessment Method for Evaluating Wetland Functions

MPCA – Minnesota Pollution Control Agency

MRCCA – Mississippi River Corridor Critical Area

MS4 – Municipal Separate Storm Sewer System

NPDES – National Pollutant Discharge Elimination System

NOAA – National Oceanic and Atmospheric Administration

NRCS – National Resources Conservation Service

NRI – Natural Resources Inventory

NWI – National Wetland Inventory

NWS – National Weather Service

PAHs – Polycyclic Aromatic Hydrocarbons

PPB – Parts Per Billion

SCS – Soil Conservation Service

SNA – Scientific and Natural Area

SOP – Standard Operating Procedure

SWAMP – Stormwater Asset Management Program

SWPPP – Storm Water Pollution Prevention Plan

TMDL – Total Maximum Daily Load

TP – Total Phosphorus

TSS – Total Suspended Solids

USFWS – United States Fish and Wildlife Service

WCA – Wetland Conservation Act

WHPP – Wellhead Protection Plan

WMO – Watershed Management Organization

WRAPS – Watershed Restoration and Protection Strategies Report (

Appendix A – Figures

Figure 1: Location Map

Figure 2: Watershed Districts

Figure 3: Soils

Figure 4: Existing Land Use

Figure 5: Proposed Land Use

Figure 6: Wetlands and Lakes

Figure 7: Subwatershed Drainage Areas

Figure 8: Stormwater Infrastructure

Figure 9: Water Quality Monitoring

Figure 10: Groundwater Protection Areas

Figure 11: Surface Water and Groundwater Interaction

Figure 12: Trail System

Figure 13: MRCCA

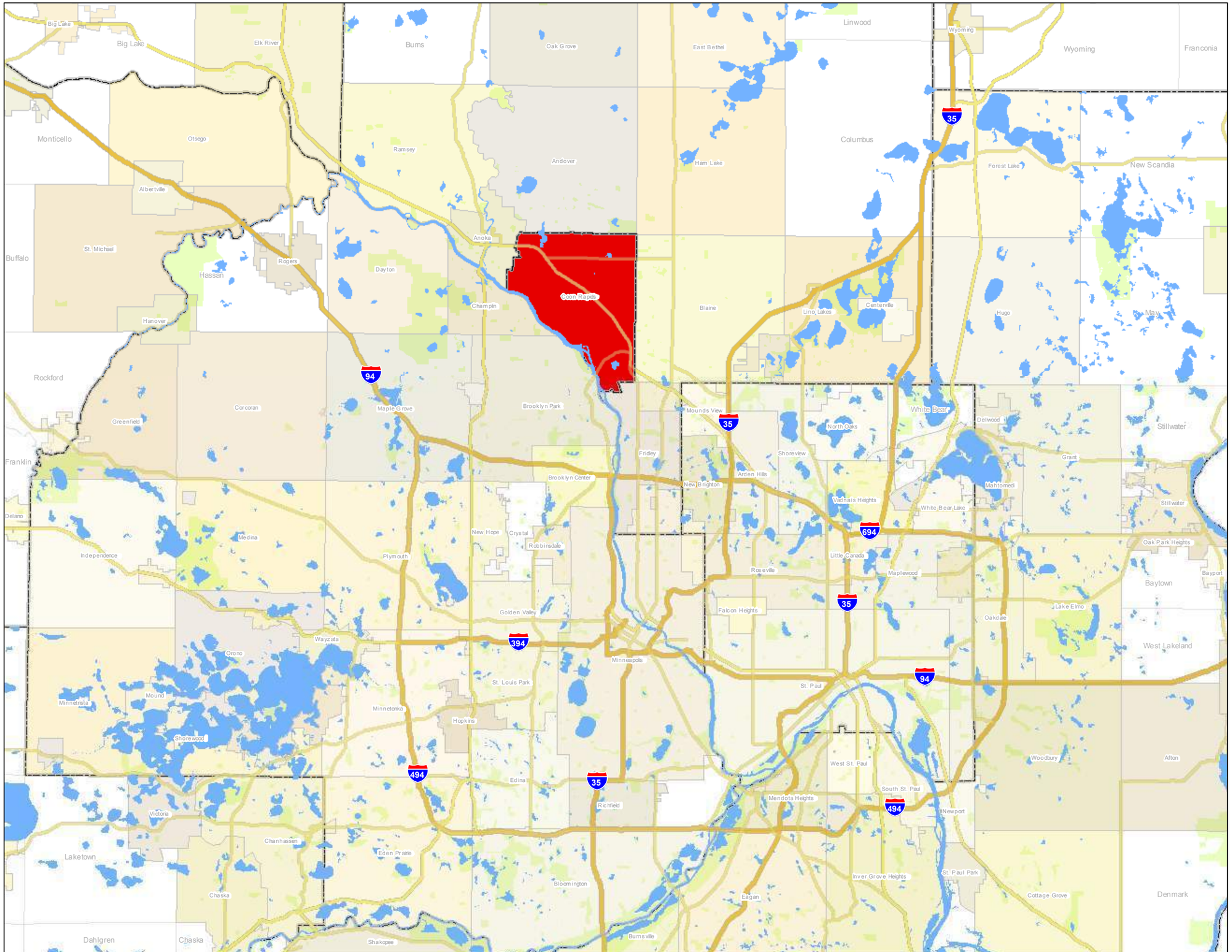
Figure 14: MLCCS

Figure 15: Natural Resources

Figure 16: FEMA Flood Zones

Figure 17: Issue Locations

Figure 18: Drainage Sensitive Land



COON RAPIDS
Minnesota

Figure 1 - Location Map

Coon Rapids Surface Water Management Plan

Legend

City Boundary

Waterbodies

N

0 4 Miles

1 inch = 4 miles

WSB

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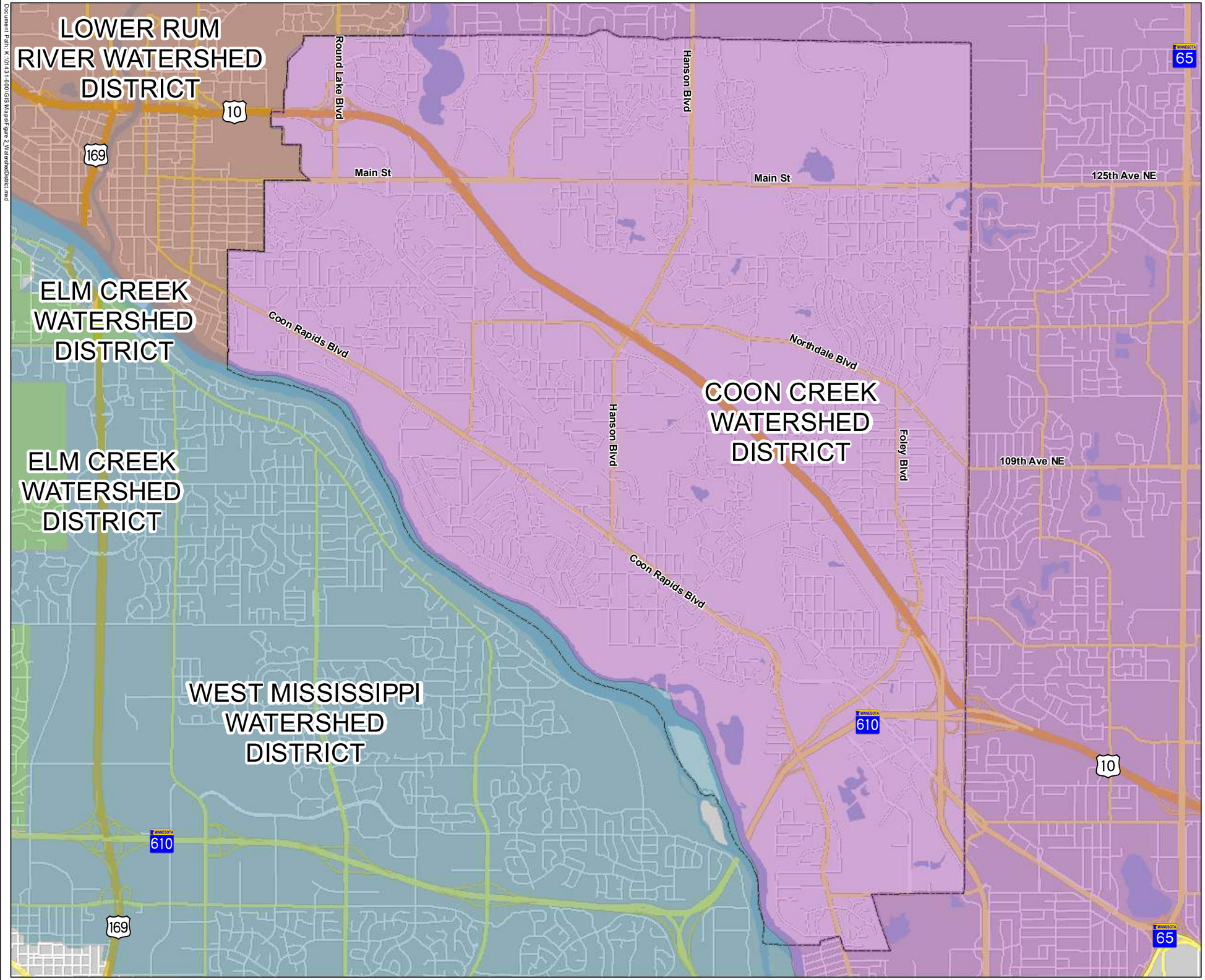
Date: 1/10/2018



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COON RAPIDS Minnesota

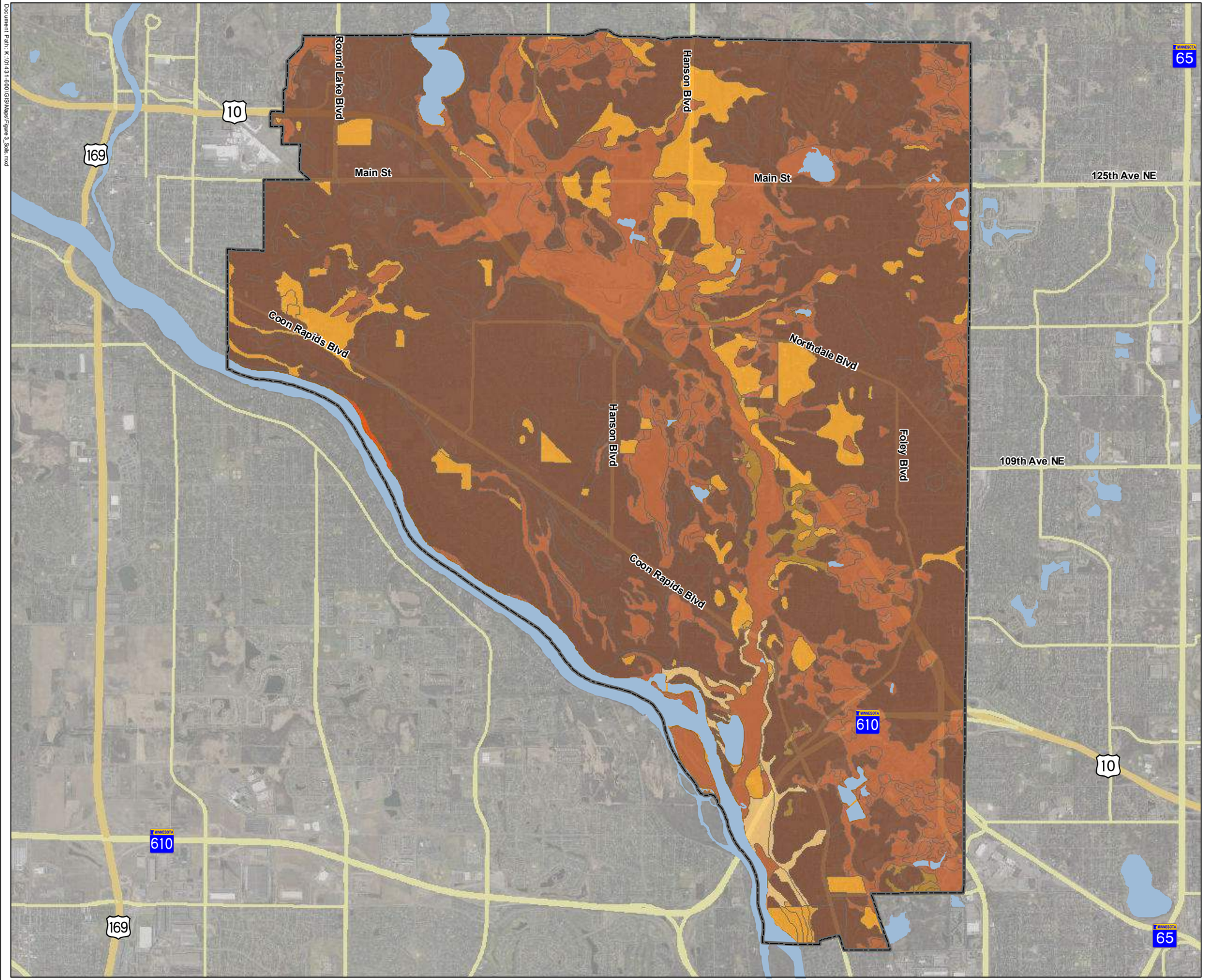
Figure 2 - Watershed District Boundaries

Coon Rapids Surface Water Management Plan

Legend

- Coon Creek
- Elm Creek
- Lower Rum River
- West Mississippi
- **CityBoundary**

WSB



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COON RAPIDS
Minnesota

Figure 3 - Soils

Coon Rapids Surface Water Management Plan

Legend

CityBoundary

SoilsClipped

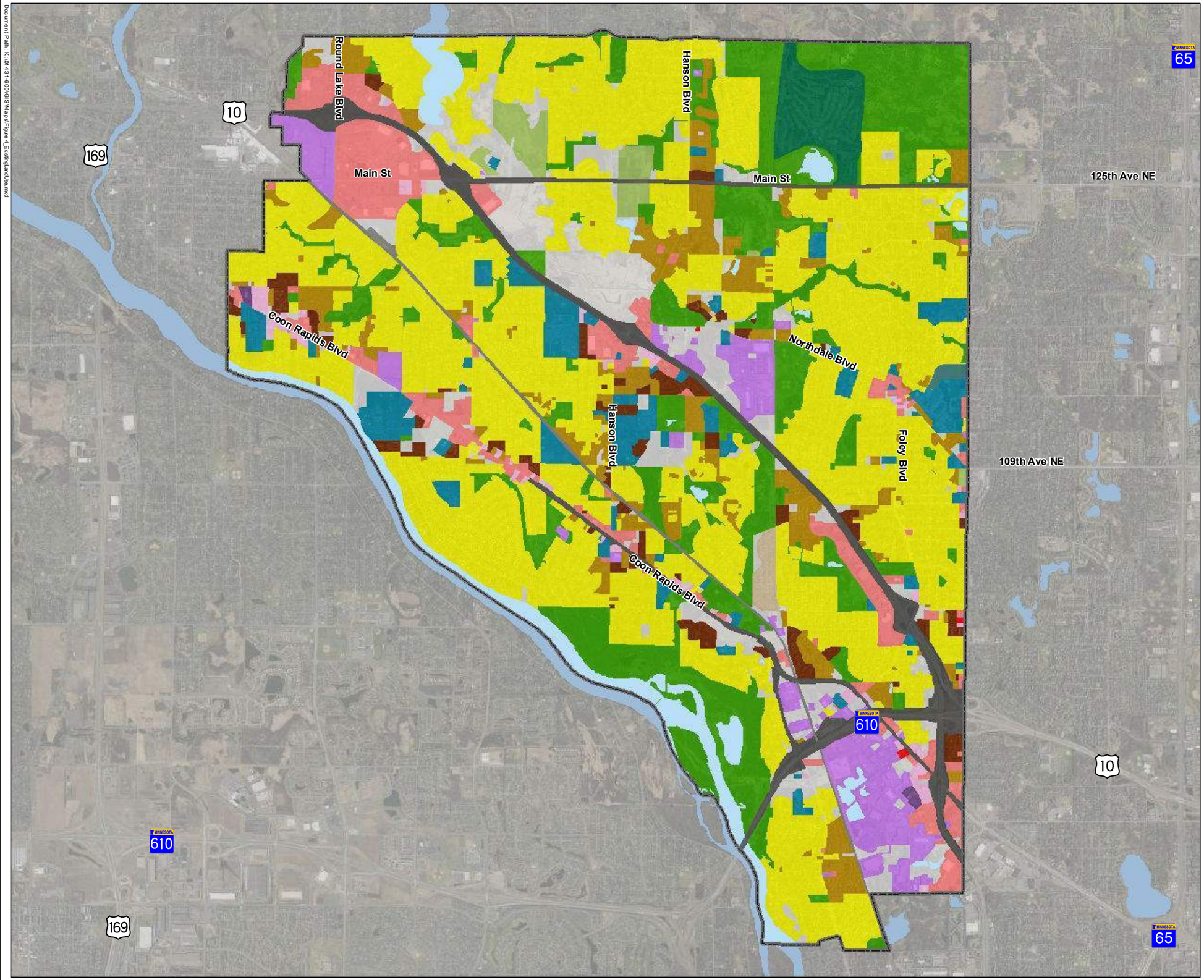
Hydrologic Soil Group

- Unknown/Urban Soils
- A
- A/D
- B
- B/D
- C

N

0 3,500 Feet

WSB



COON RAPIDS
Minnesota

Figure 4 - Existing Land Use

Coon Rapids Surface Water Management Plan

Legend

- Agricultural
- Golf Course
- Industrial and Utility
- Institutional
- Major Highway
- Major Railway
- Manufactured Housing Parks
- Mixed Use Commercial
- Mixed Use Industrial
- Mixed Use Residential
- Multifamily
- Office
- Open Water
- Park, Recreational, or Preserve
- Retail and Other Commercial
- Seasonal/Vaca...
- Single Family Attached
- Single Family Detached
- Undeveloped
- **CityBoundary**

N

0 3,500 Feet

WSB

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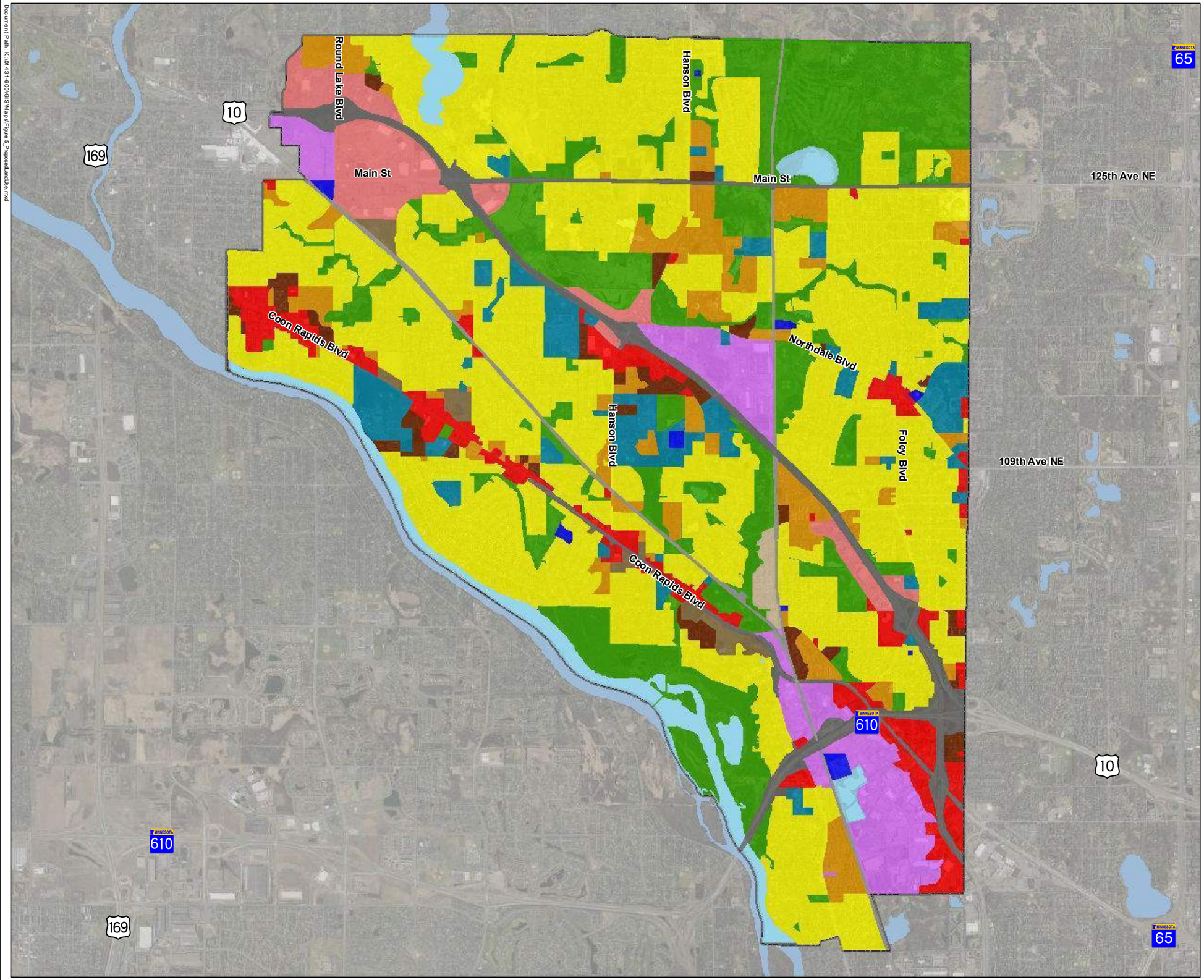

COON RAPIDS
Minnesota

Figure 5 - Proposed 2040 Land Use

Coon Rapids Surface Water Management Plan

Legend

- Industrial
- Institutional
- Major Highway
- Major Railway
- General Commercial
- Mixed Use Commercial
- Utility
- High Density Residential
- Moderate Density Residential
- Low Density Residential
- Residential Mixed Use
- Mobile Home Residential
- Open Water
- Park, Recreation or Preserve
- **CityBoundary**

N

0 3,500 Feet

WSB

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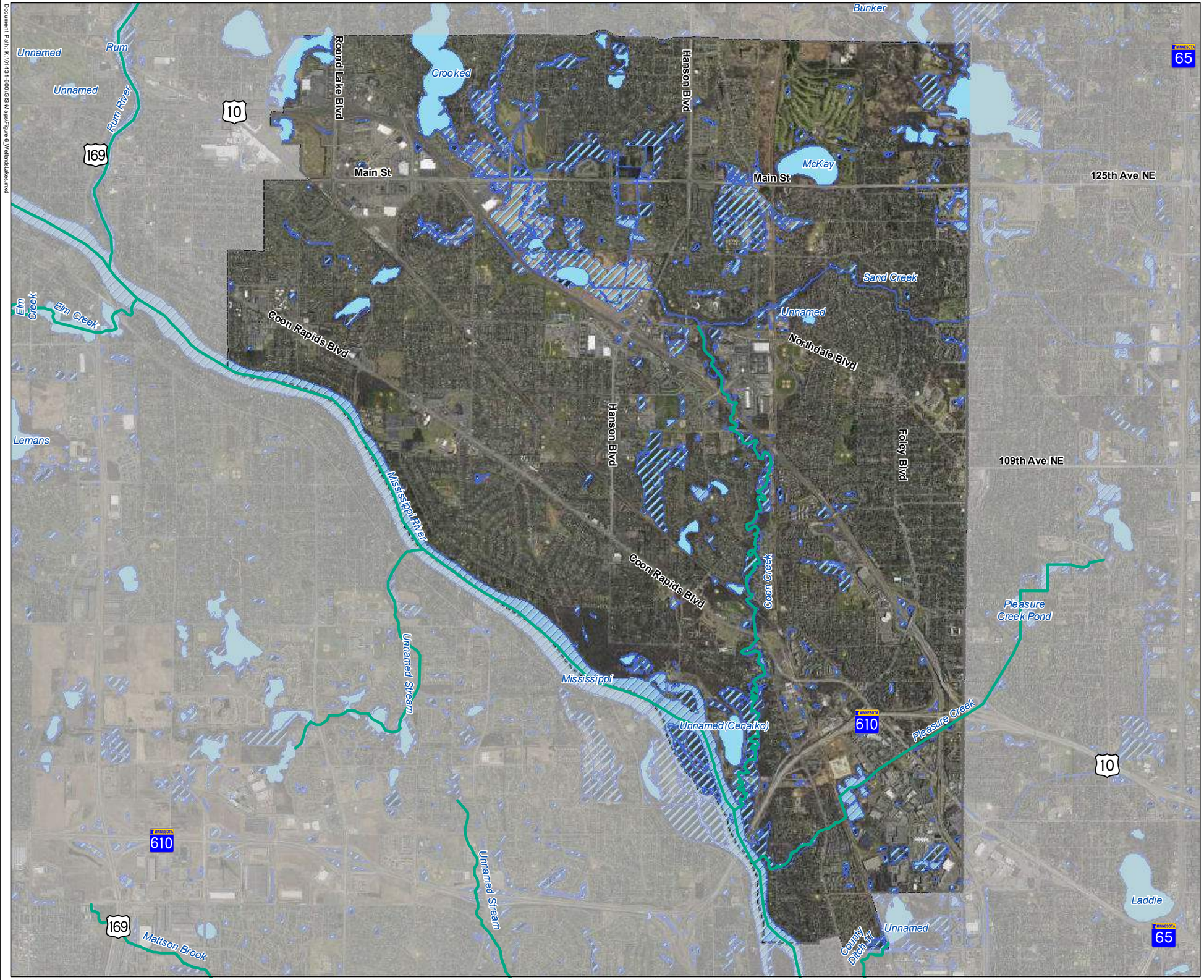

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COON RAPIDS
Minnesota

Figure 6 - Wetlands & Lakes

Coon Rapids Surface Water Management Plan

Legend

- DNR Protected Watercourse
- DNR Protected Waters
- National Wetland Inventory
- **City Boundary**

N

0 3,500 Feet

WSB

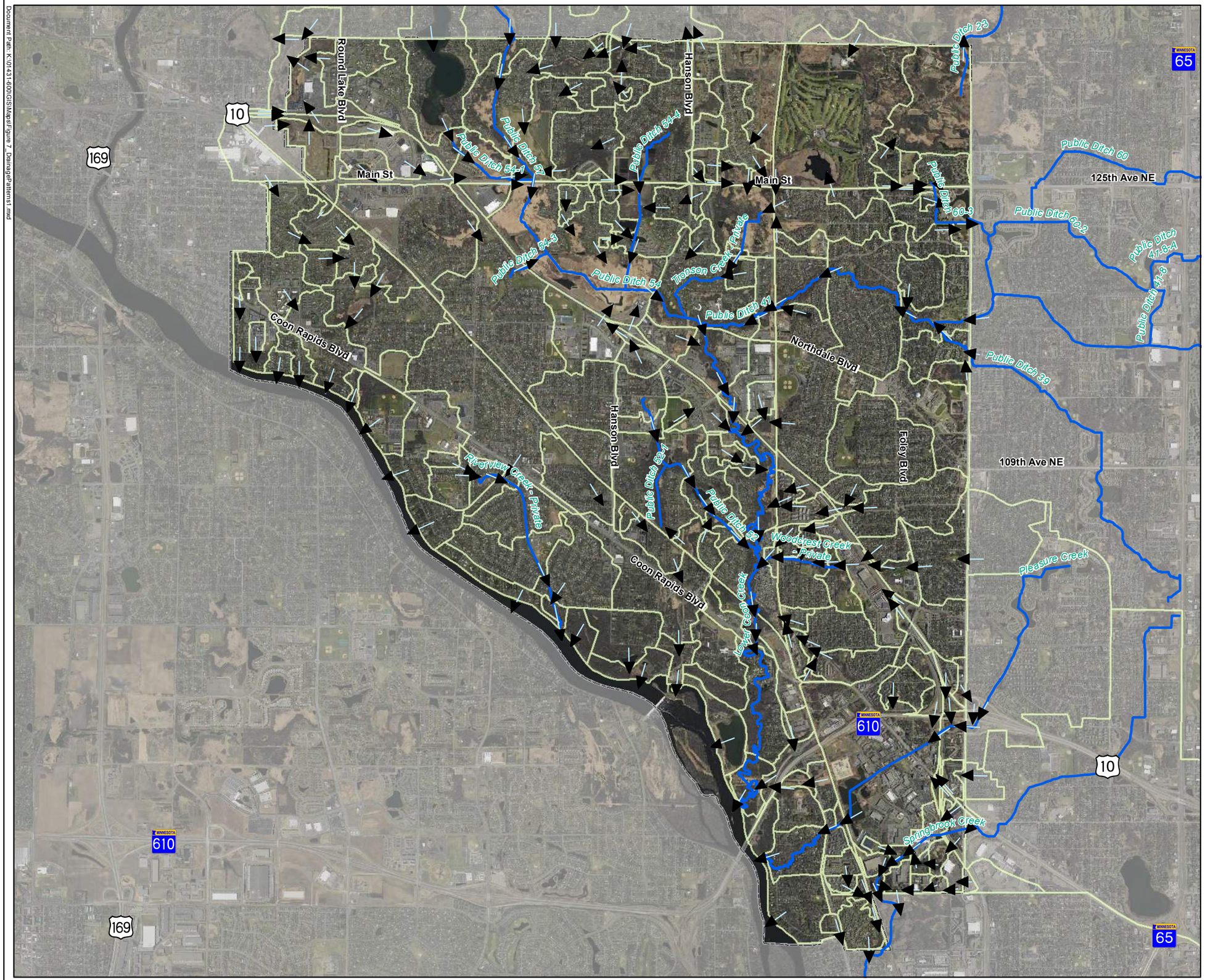

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Figure 7 - Subwatershed Drainage Areas

Coon Rapids Surface Water Management Plan

Legend

- Flow Direction
- CCWD Ditches
- Subwatershed Boundary
- **CityBoundary**

N

0 3,500 Feet

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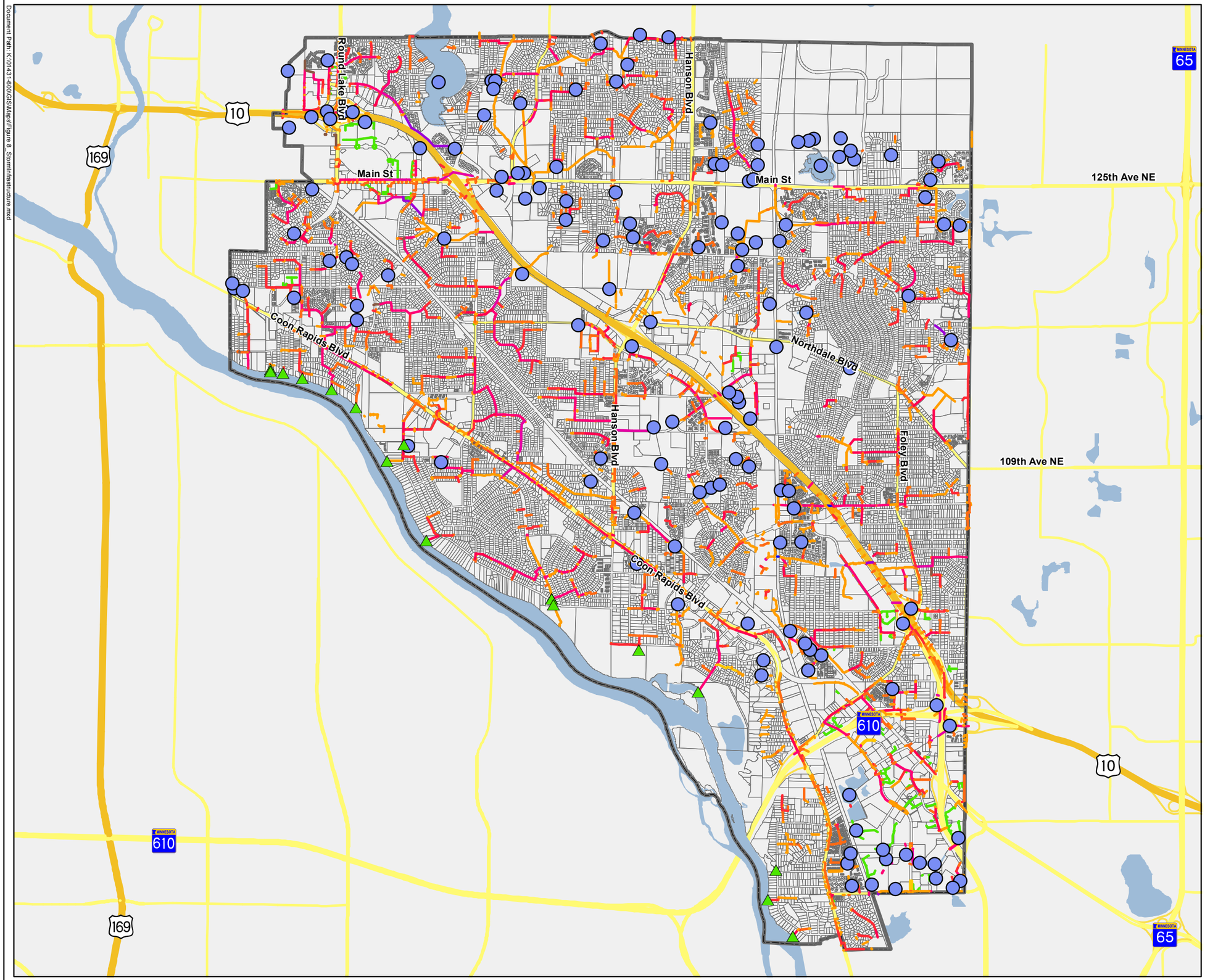


COON RAPIDS
Minnesota

Figure 8 - Stormwater Infrastructure

Coon Rapids Surface Water Management Plan

Legend

- Mississippi River Outfalls
- Stormwater Basins
- Storm Sewer Laterals
- Lakes
- CityBoundary

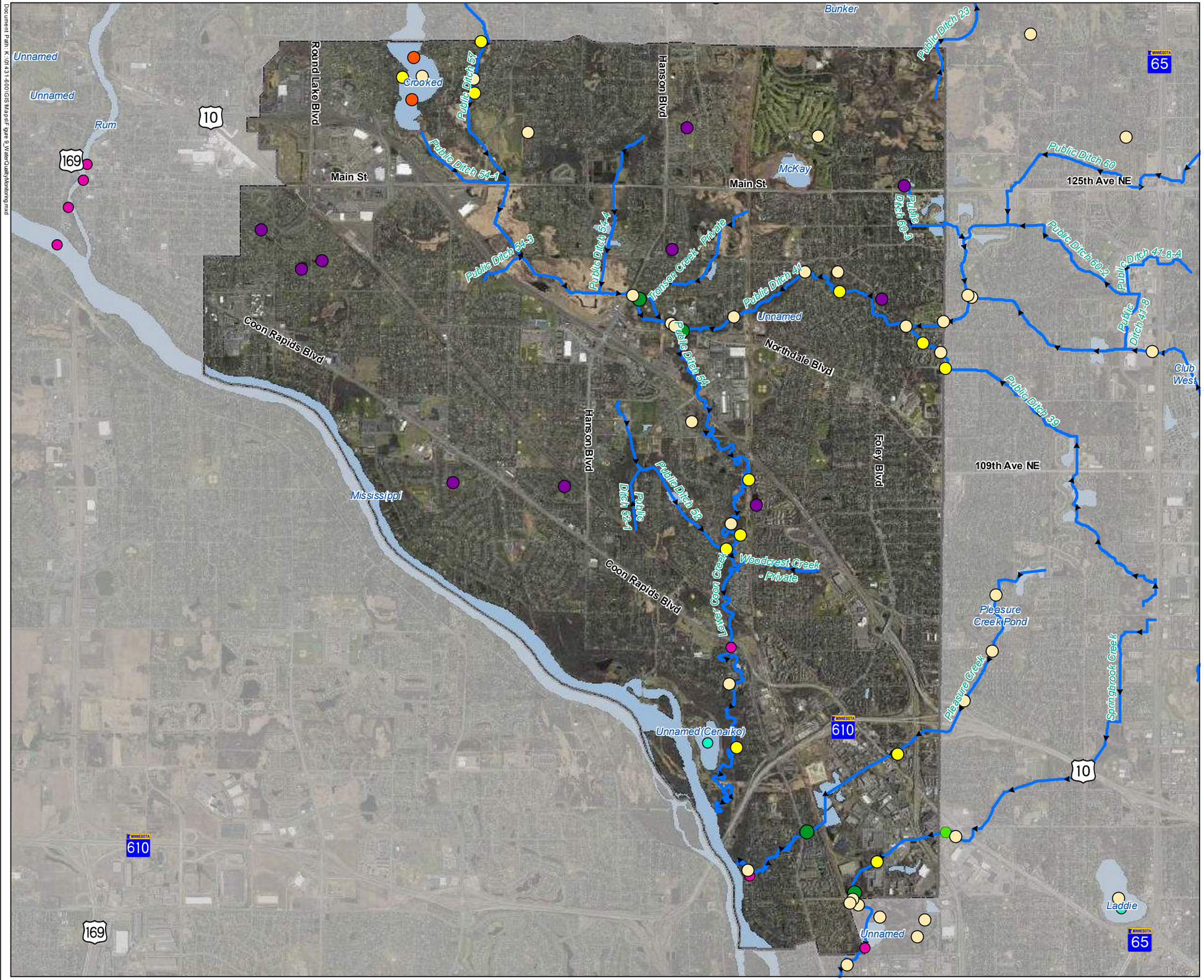
Storm Sewer Mains

- Unknown
- 6" - 8"
- 10" - 12"
- 15" - 18"
- 21" - 24"
- 27" - 33"
- 36" - 48"
- 54" - 66"
- 72" - 84"
- 96" - 108"

N

0 3,500 Feet

WSB



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COON RAPIDS
Minnesota

Figure 9 - Water Quality Monitoring

Coon Rapids Surface Water Management Plan

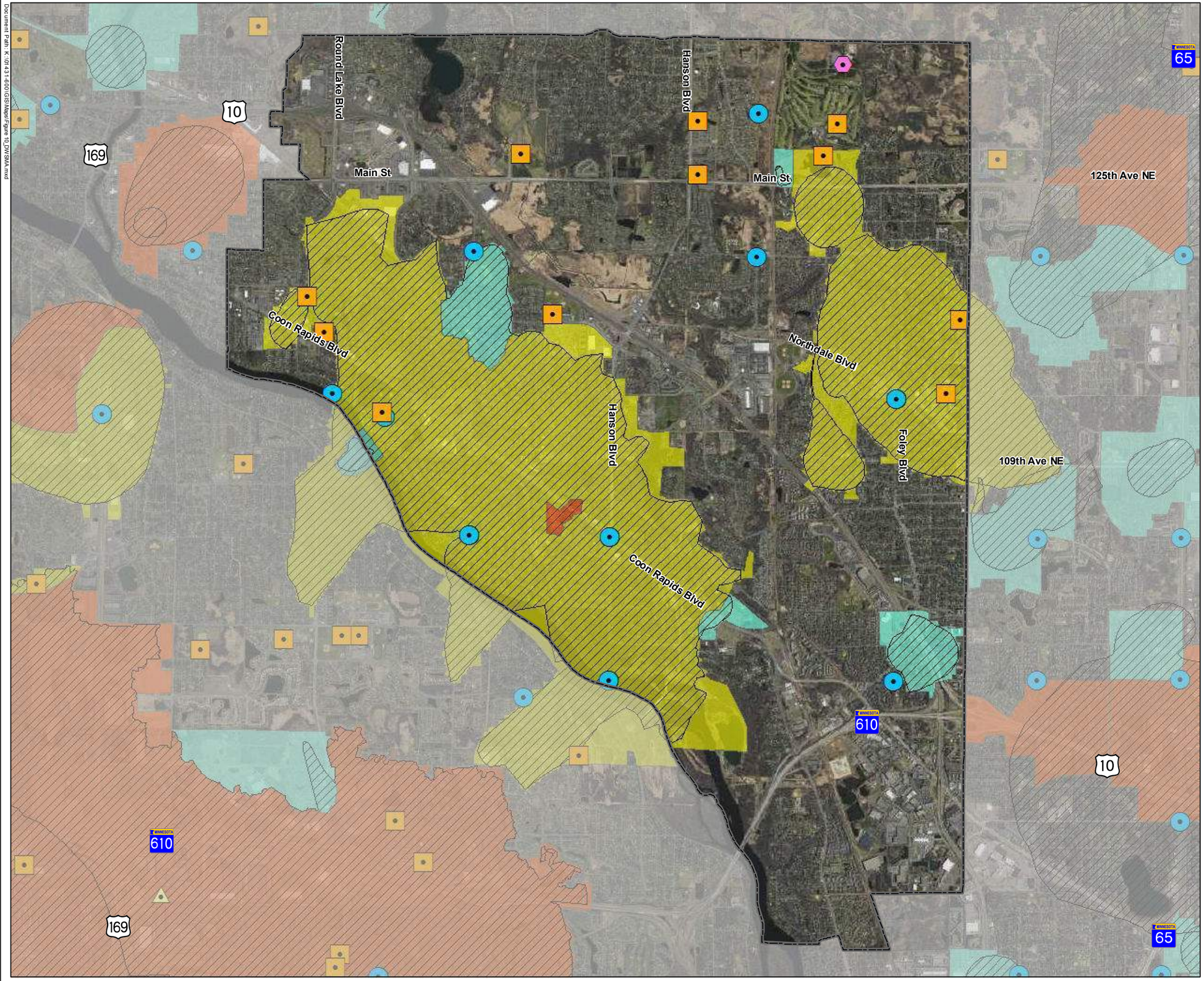
Legend

- ACD Monitoring Sites
- CCWD Monitoring Sites
- Met Council Stream Monitoring
- Met Council Lake Monitoring
- Biological, MPCA
- Infiltration Monitoring
- Lake Sampling
- Stream Monitoring
- CCWD Ditches
- City Boundary

N

0 3,500 Feet

WSB



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COON RAPIDS
Minnesota

Figure 10 - Groundwater Protection Areas

Coon Rapids Surface Water Management Plan

Legend

Wellhead Protection Areas

Water Appropriations

CATEGORY

- Major Crop Irrigation
- Non-Crop Irrigation
- Water Level Maintenance
- Waterworks

DWSMA Well Vulnerability

- Very High
- High
- Moderate
- Low
- Very Low

N

0 3,500 Feet

WSB

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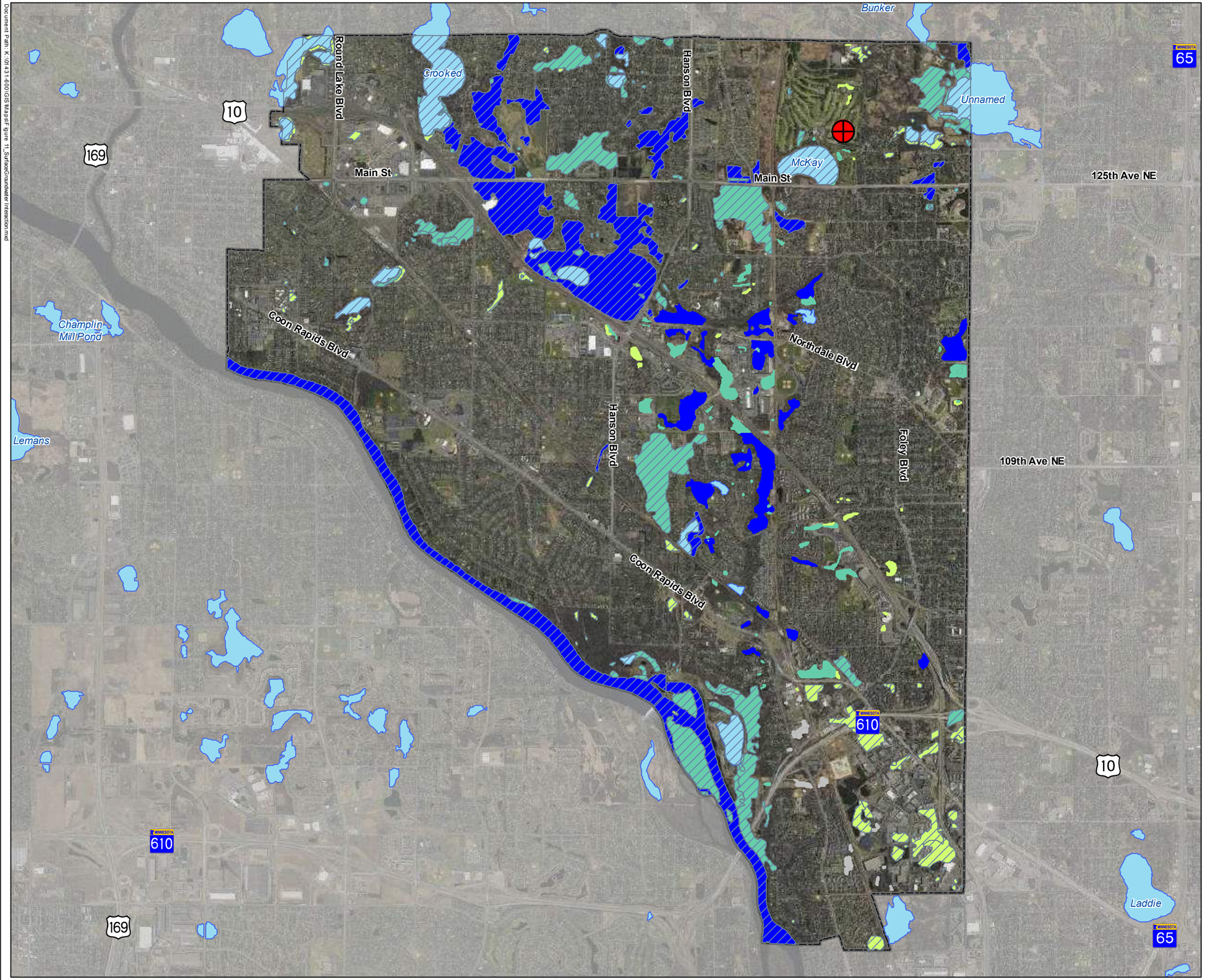


Figure 11 - Surface Water and Groundwater Interaction

Coon Rapids Surface Water Management Plan

Legend

- Groundwater Level Monitoring Well
- Vulnerable to Groundwater Contamination
- DNR Protected Waters

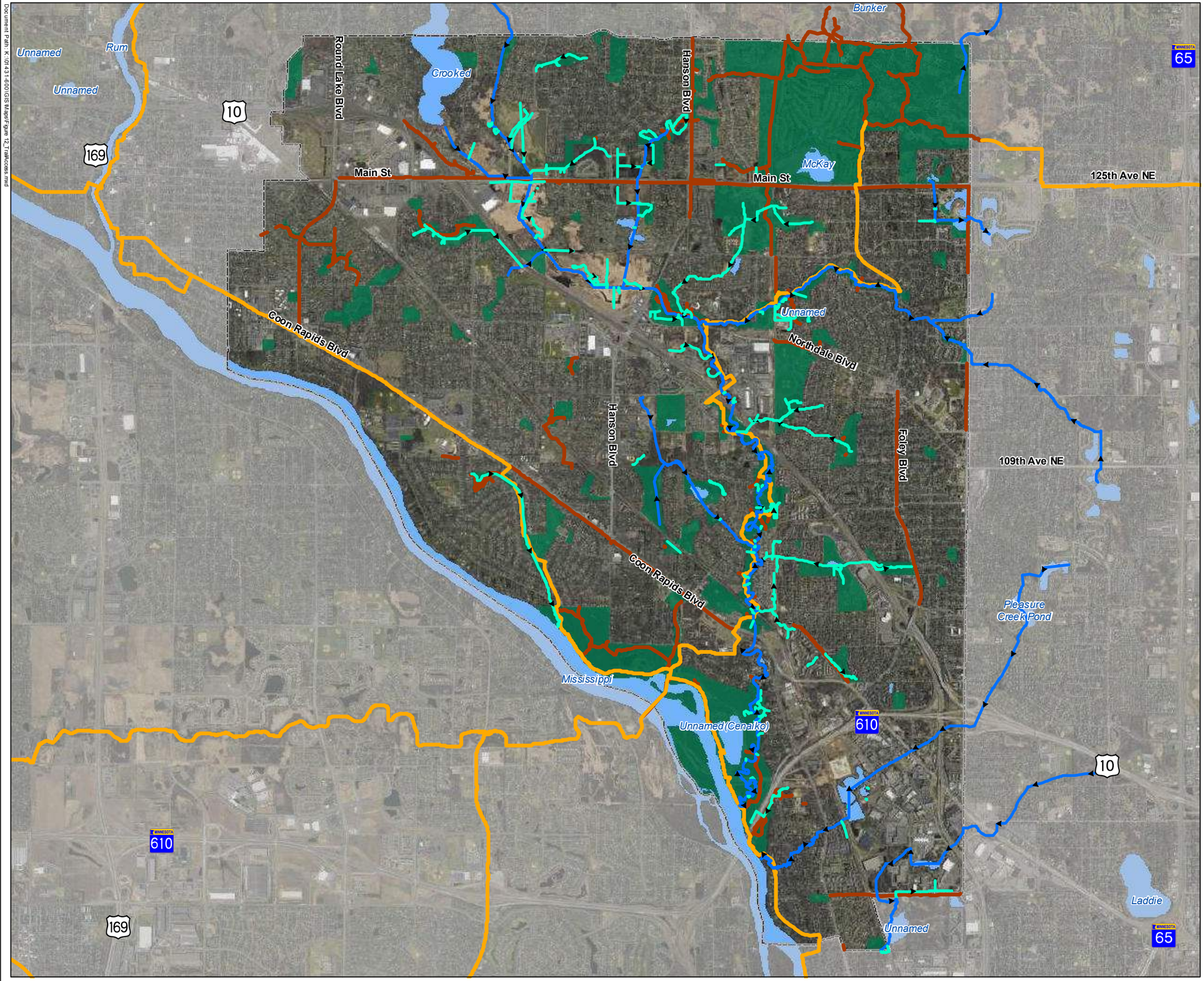
Surface Water Type

- Supported by upwelling groundwater
- Receives and discharges groundwater
- Recharges aquifers
- Disconnected from regional groundwater system

Source: Met Council Local Planning Handbook: Community Pages

N

0 3,500 Feet



COON RAPIDS
Minnesota

Figure 12 - Trail System

Coon Rapids Surface Water Management Plan

Legend

- Regional Trails
- City Trails
- City Parks/Preserves
- Private Ditch
- Public Ditch
- **CityBoundary**

N

0 3,500 Feet

WSB

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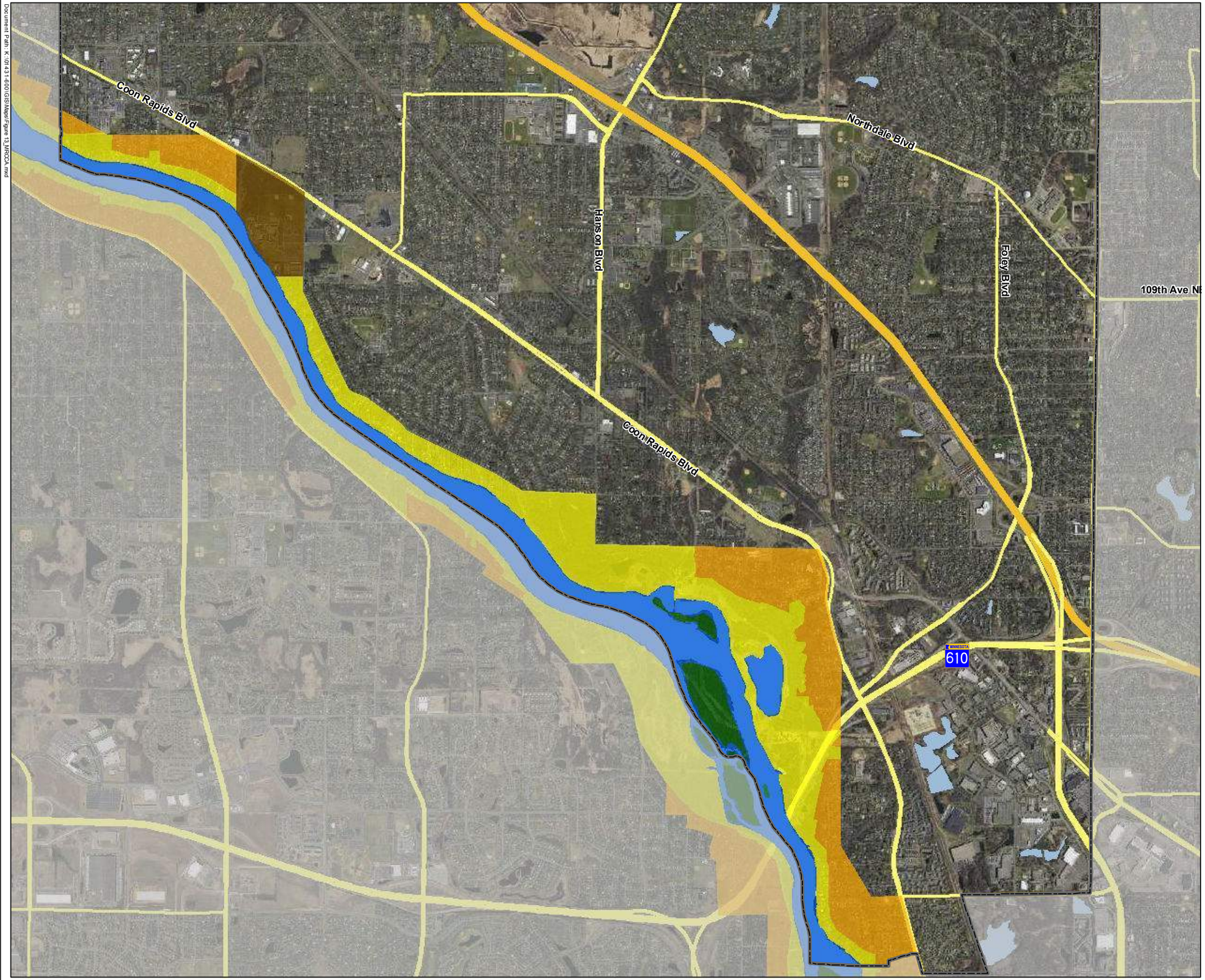

COON RAPIDS
Minnesota

Figure 13 - Mississippi River Corridor Critical Area (MRCCA)

Coon Rapids Surface Water Management Plan

Legend

DISTRICT

- CA-RN River Neighborhood
- CA-ROS Rural and Open Space
- CA-RTC River Towns & Crossings
- CA-SR Separated from River
- CA-UC Urban Core
- CA-UM Urban Mixed
- Water

N

0 3,500 Feet

WSB

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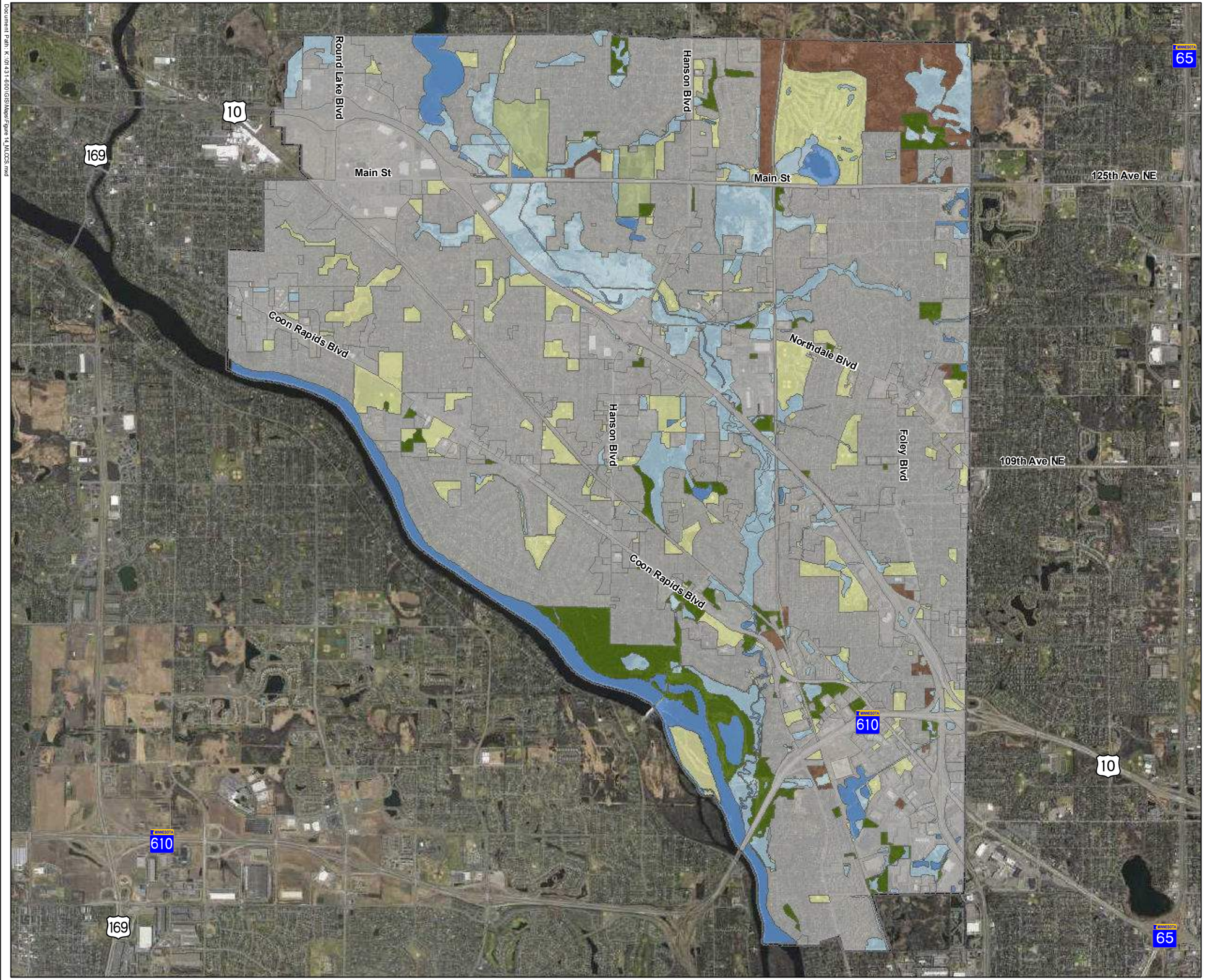

COON RAPIDS
Minnesota

Figure 14 - Minnesota Land Cover Classification System (MLCCS)

Coon Rapids Surface Water Management Plan

Legend

Class

- Developed Area
- Forest
- Herbaceous
- Planted/Cultivated
- Shrubland
- Water
- Wetlands

N

0 3,500 Feet

WSB

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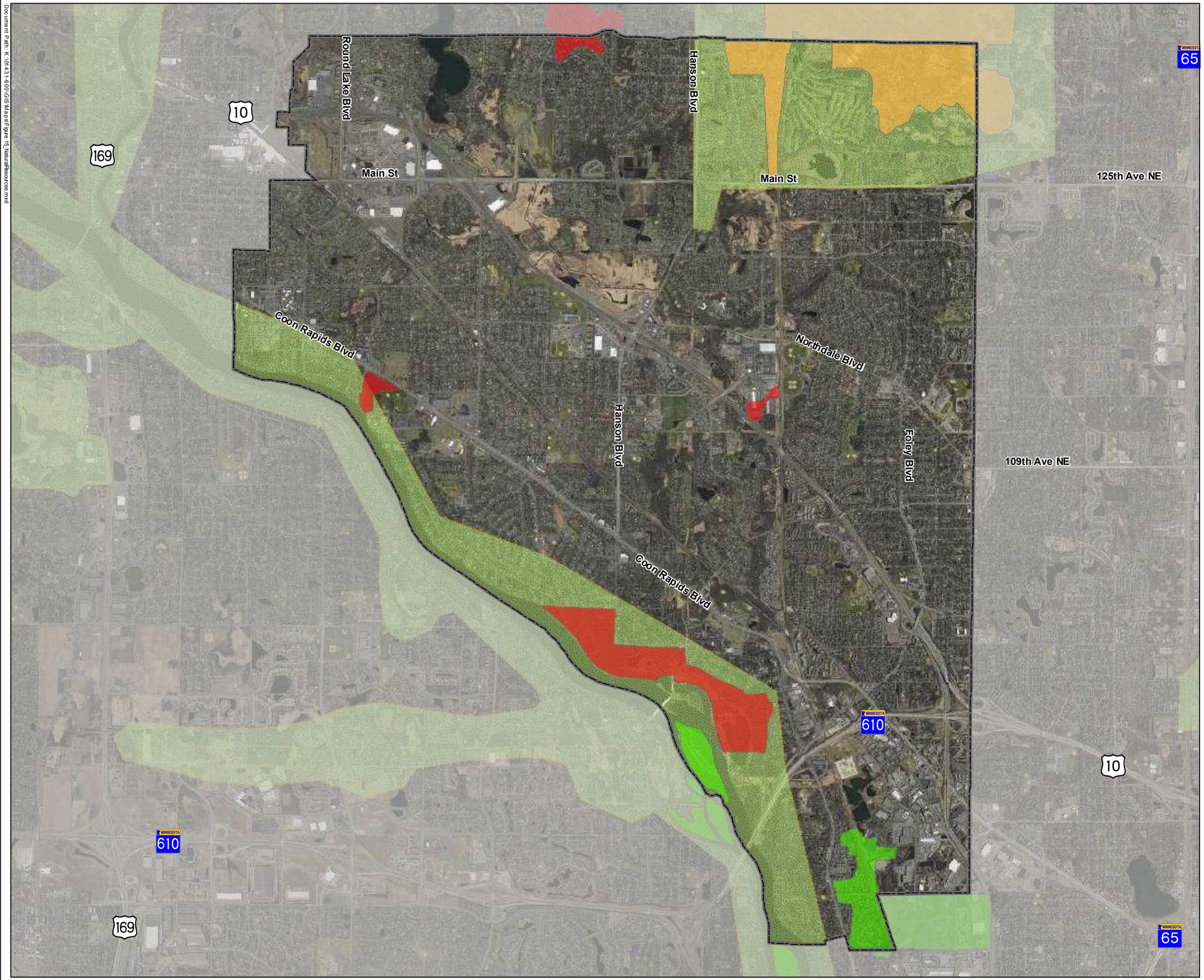

COON RAPIDS
Minnesota

Figure 15 - Natural Resources

Coon Rapids Surface Water Management Plan

Legend

Metro Conservation Corridors

Biodiverstiy Significance

Outstanding

High

Moderate

Below

N

0 3,500 Feet

WSB

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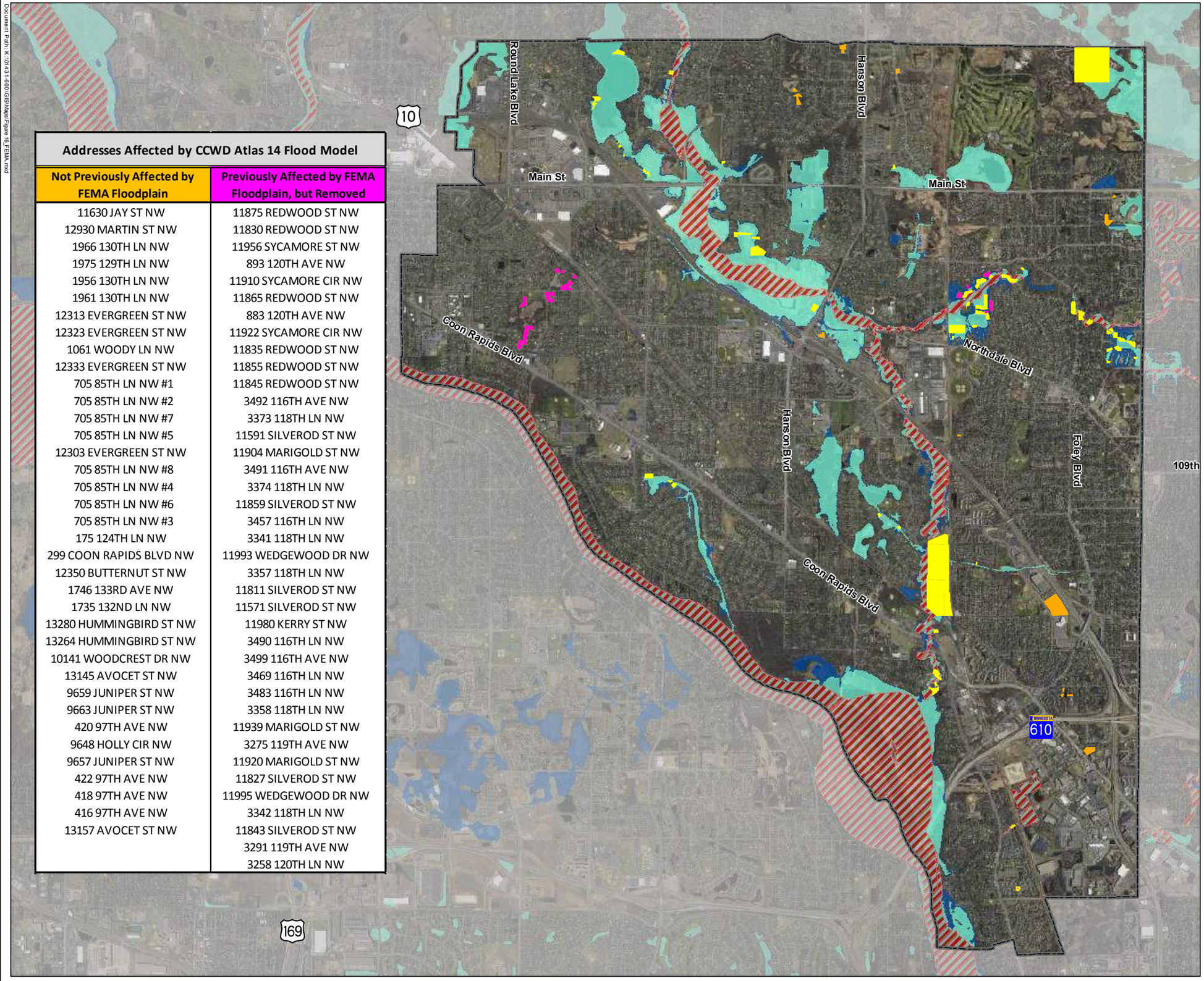


Addresses Affected by CCWD Atlas 14 Flood Model	
Not Previously Affected by FEMA Floodplain	**Previously Affected by FEMA Floodplain, but Removed**
11630 JAY ST NW	11875 REDWOOD ST NW
12930 MARTIN ST NW	11830 REDWOOD ST NW
1966 130TH LN NW	11956 SYCAMORE ST NW
1975 129TH LN NW	893 120TH AVE NW
1956 130TH LN NW	11910 SYCAMORE CIR NW
1961 130TH LN NW	11865 REDWOOD ST NW
12313 EVERGREEN ST NW	883 120TH AVE NW
12323 EVERGREEN ST NW	11922 SYCAMORE CIR NW
1061 WOODY LN NW	11835 REDWOOD ST NW
12333 EVERGREEN ST NW	11855 REDWOOD ST NW
705 85TH LN NW #1	11845 REDWOOD ST NW
705 85TH LN NW #2	3492 116TH AVE NW
705 85TH LN NW #7	3373 118TH LN NW
705 85TH LN NW #5	11591 SILVEROD ST NW
12303 EVERGREEN ST NW	11904 MARIGOLD ST NW
705 85TH LN NW #8	3491 116TH AVE NW
705 85TH LN NW #4	3374 118TH LN NW
705 85TH LN NW #6	11859 SILVEROD ST NW
705 85TH LN NW #3	3457 116TH LN NW
175 124TH LN NW	3341 118TH LN NW
299 COON RAPIDS BLVD NW	11993 WEDGEWOOD DR NW
12350 BUTTERNUT ST NW	3357 118TH LN NW
1746 133RD AVE NW	11811 SILVEROD ST NW
1735 132ND LN NW	11571 SILVEROD ST NW
13280 HUMMINGBIRD ST NW	11980 KERRY ST NW
13264 HUMMINGBIRD ST NW	3490 116TH LN NW
10141 WOODCREST DR NW	3499 116TH AVE NW
13145 AVOCET ST NW	3469 116TH LN NW
9659 JUNIPER ST NW	3483 116TH LN NW
9663 JUNIPER ST NW	3358 118TH LN NW
420 97TH AVE NW	11939 MARIGOLD ST NW
9648 HOLLY CIR NW	3275 119TH AVE NW
9657 JUNIPER ST NW	11920 MARIGOLD ST NW
422 97TH AVE NW	11827 SILVEROD ST NW
418 97TH AVE NW	11995 WEDGEWOOD DR NW
416 97TH AVE NW	3342 118TH LN NW
13157 AVOCET ST NW	11843 SILVEROD ST NW
	3291 119TH AVE NW
	3258 120TH LN NW

COON RAPIDS
Minnesota

Figure 16 - FEMA Flood Zones

Coon Rapids Surface Water Management Plan

Legend

Parcels Affected by CCWD's Atlas 14 Flood Model and Not Previously Affected by FEMA Floodplain

Parcels Affected by CCWD's Atlas 14 Model and Previously Affected by FEMA Floodplain

Parcels Impacted by the 100-year Floodplain from CCWD's Model & FEMA

FEMA Flood Zones

Floodway

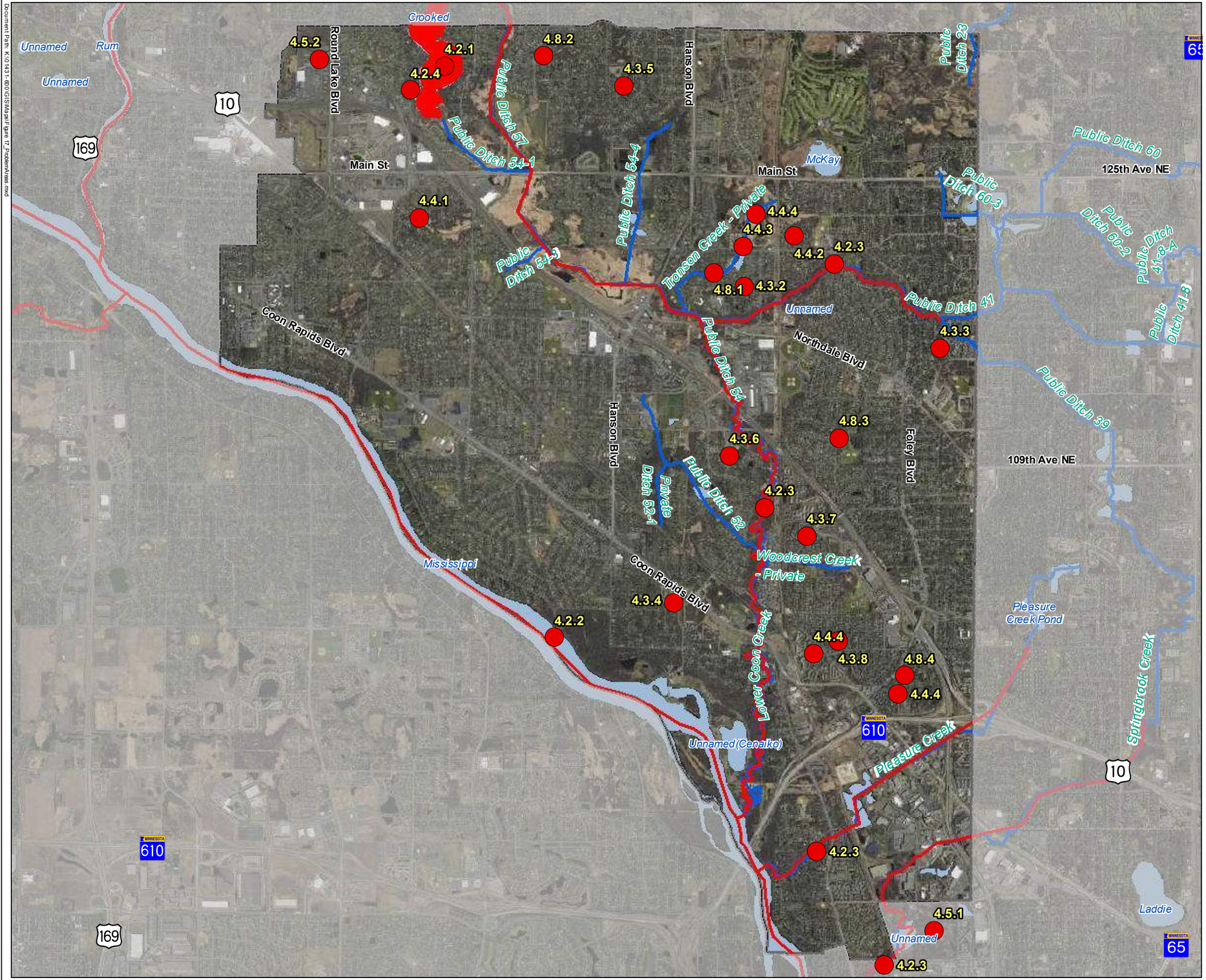
100 Year Floodplain

500 Year Floodplain

N

0 3,500 Feet

WSB



COON RAPIDS
Minnesota

Figure 17 - Issue Locations

Coon Rapids Surface Water Management Plan

Legend

- Problem Areas
- Impaired Streams
- Impaired Lakes
- CCWD Ditches

N

0 0.5 1 Miles

WSB

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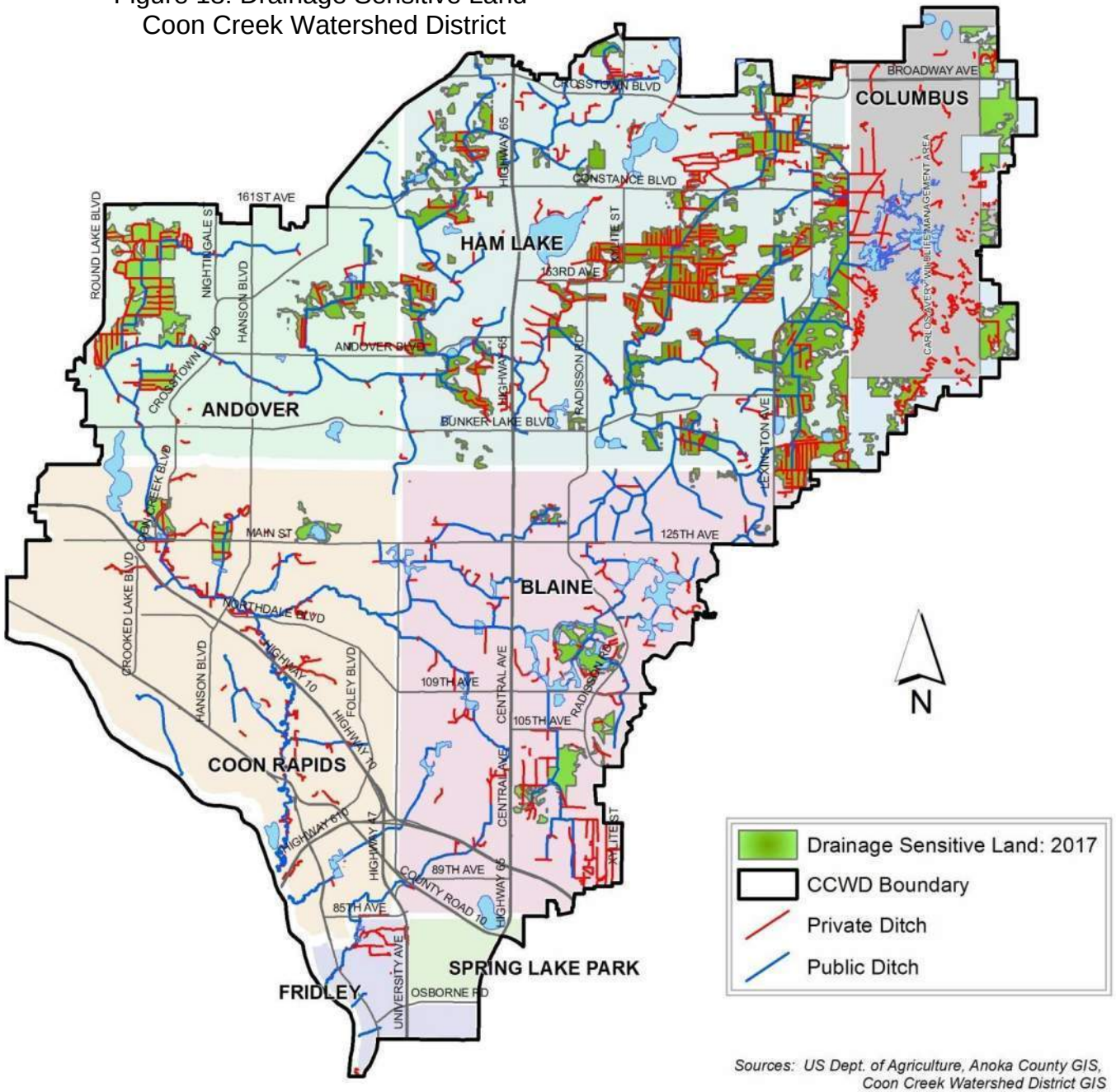
Figure 18: Drainage Sensitive Land
Coon Creek Watershed District



Sources: US Dept. of Agriculture, Anoka County GIS, Coon Creek Watershed District GIS

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Appendix B – Relevant City Ordinances

CHAPTER 8-1200 - SURFACE WATER MANAGEMENT

8-1201 - Findings and Purpose.

The City of Coon Rapids hereby finds that uncontrolled and inadequately planned use of wetlands, woodlands, natural habitat areas, areas subject to soil erosion, and areas containing restrictive soils adversely affects the public health, safety and general welfare by impacting water quality and contributing to other environmental problems, creating nuisances, impairing other beneficial uses of the environmental resources and hindering the ability of the City of Coon Rapids to provide adequate water, sewage, flood control, and other community services. In addition, extraordinary public expenditures may be required for the protection of persons and property in such areas and in areas which may be affected by unplanned land usage.

The purpose of this Chapter is to promote, preserve, and enhance the natural resources within the City of Coon Rapids and protect them from adverse effects occasioned by poorly sited development or incompatible activities by regulating land disturbing or development activities that would have an adverse and potentially irreversible impact on water quality and unique and fragile environmentally sensitive land; by minimizing conflicts and encouraging comparability between land disturbing and development activities and water quality and environmentally sensitive lands; and by requiring detailed review standards and procedures for land disturbing or development activities proposed for such areas, thereby achieving a balance between urban growth and development and protection of water quality and natural areas.

8-1202 - Statutory Authorization.

This Chapter is adopted pursuant to Minnesota Statutes Section 462.351 (1990). This Chapter is adopted pursuant to the authorization and policies contained in Minnesota Statutes Chapters 103B and 462; Minnesota Rules, Parts 6120.2500-6120.3900, Minnesota Rules Chapters 8410, 8420 and 70510.0210.

This Chapter is intended to meet the Minimal Impact Design Standards (MIDS) developed under Minnesota Statutes 2009, Section 115.03 subdivision 5c.

(Ord. No. 2130 , 3-17-15)

8-1203 - Definitions.

The following definitions of words, terms, and phrases apply in this Chapter of this Code. References hereinafter to "Section" are, unless otherwise specified, references to sections of this Chapter. Unless used in a context which indicates otherwise, defined terms remain defined terms whether or not capitalized.

(1) "Applicant" means any person who wishes to obtain a building permit, zoning, or subdivision approval.

(2) "City" means the City of Coon Rapids, Minnesota. City means its elected officials, officers, employees, and agents, or any commission, committee, or subdivision acting pursuant to lawfully delegated authority.

(3) "Control Measure" means a practice or combination of practices to control erosion and attendant pollution.

(4) "Detention Facility" means a permanent natural or man-made structure, including wetland, for the temporary storage of runoff which contains a permanent pool of water.

(5) "Flood Fringe" means the portion of the flood plain outside of the flood way.

(6) "Flood Plain" means the area adjoining a watercourse or water basin that has been or may be covered by a regional flood.

(7) "Flood Way" means the channel of the watercourse, the bed of water basins, and those portions of the adjoining flood plains that are reasonably required to carry and discharge flood water and provide water storage during a regional flood.

(8) "Hydric Soils" means soils that are saturated, flooded, or ponded long enough during the growing season to develop anaerobic conditions in the upper part.

(9) "Hydrophytic Vegetation" means microphytic plant life growing in water, soil, or on a substrate that is at least periodically deficient in oxygen as a result of excessive water content.

(10) "Land Disturbing or Development Activities" means any change of the land surface including removing vegetative cover, excavating, filling, grading, and the construction of any structure.

(11) "Person" means any individual, firm, corporation, partnership, franchisee, association, or governmental entity.

(12) "Public Waters" means waters of the state as defined in Minnesota Statutes, Section 103G.005, subd. 15.

(13) "Regional Flood" means a flood that is representative of large floods known to have occurred generally in the state and reasonably characteristic of what can be expected to occur on an average frequency in the magnitude of a 100-year recurrence interval.

(14) "Retention Facility" means a permanent natural or man-made structure that provides for the storage of storm water runoff by means of a permanent pool of water.

(15) "Sediment" means solid matter carried by water, sewage, or other liquids.

(16) "Structure" means anything manufactured, constructed, or erected which is normally attached to or positioned on land, including portable structures, earthen structures, roads, parking lots, and paved storage areas.

(17) "Wetlands" means lands transitional between terrestrial and aquatic systems where the water table is usually at or near the surface or the land is covered by shallow water. For purposes of this definition, wetlands must have the following three attributes:

(a) Have a predominance of hydric soils;

(b)

Are inundated or saturated by surface or ground water at a frequency and duration sufficient to support a prevalence of hydrophytic vegetation typically adapted for life in saturated soil conditions; and

(c) Under normal circumstances support a prevalence of such vegetation.

8-1204 - Applicability.

Every applicant for a building permit, subdivision approval, or a permit to allow land disturbing activities must submit a storm water management plan to the City's Community Development Department. No subdivision approval, or grading permit to allow land disturbing activities shall be issued until approval of the storm water management plan or a waiver of the approval requirement has been obtained in strict conformance with the provisions of this Chapter.

Every applicant for subdivision approval or a grading permit to allow wetland disturbing activities must submit a wetland assessment report to the City's Engineering Division. No subdivision approval or grading permit to allow wetland disturbing activities shall be issued until approval of the wetland replacement plan application or a certificate of exemption has been obtained in strict conformance with the provision of this Chapter and the Minnesota Wetland Conservation Act. This Chapter applies to all land, public or private, located within the City of Coon Rapids.

Every applicant for a building permit, subdivision approval, or a grading permit to allow land disturbing activities must adhere to erosion control measure standards and specifications contained in the MPCA publication "Protecting Water Quality in Urban Areas", the City's Engineering Design Guidelines or as approved by the City of Coon Rapids.

(Ord. No. 2130 , 3-17-15)

8-1205 - Exemptions.

The provisions of this Chapter do not apply to:

(1) Any part of a subdivision or a plat for the subdivision that has been approved by the City Council on or before the effective date of this Chapter;

(2) Any land disturbing activity for which plans have been approved by the watershed management organization within six months prior to the effective date of this Chapter;

(3) A lot for which a building permit has been approved on or before the effective date of this Chapter;

(4) Installation of fence, sign, telephone, and electric poles and other kinds of posts or poles; or

(5) Emergency work to protect life, limb, or property.

8-1206 - Waiver.

The City Council, upon recommendation of the Planning Commission, may waive any requirement of this Chapter upon making a finding that compliance with the requirement will involve an unnecessary hardship and the waiver of such requirements will not adversely affect the standards and requirements set forth in Section 8-1212. The City Council may require as a condition of the waiver, such dedication or construction, or agreement to dedicate or construct as may be necessary to adequately meet said standards and requirements.

8-1207 - Incorporation by Reference.

The following are incorporated into this Chapter by reference:

(1) The Minnesota Wetland Conservation Act is incorporated into this Chapter by reference.

(2) The National Pollutant Discharge Elimination System Permit, MN R100001 (NPDES general construction permit) issued by the Minnesota Pollution Control Agency, August 1, 2013, as amended. The NPDES general construction permit is incorporated into this Chapter by reference.

(3) The City's Engineering Design Guidelines. The guidelines shall serve as the official guide for storm water principles, methods, and practices for proposed development activities. The City's Engineering Design Guidelines is incorporated into this Chapter by reference.

(Ord. No. 2130 , 3-17-15)

8-1208 - Storm Water Management Plan Approval Procedures.

Unless otherwise exempted by this Chapter, a written application for storm water management plan approval, along with the proposed storm water management plan and maintenance agreement, shall be filed with the Community Development Department and shall include a statement indicating the grounds upon which the approval is requested, that the proposed use is permitted by right or as an exception in the underlying zoning district, and adequate evidence showing that the proposed use will conform to the standards set forth in this Chapter, as well as the requirements within the City's Engineering Design Guidelines; the Maintenance Agreement shall be prepared to meet the requirements of Section 8-1219 of this Chapter. Prior to applying for approval of a storm water management plan, an applicant may have the storm water management plans reviewed by the City's Community Development Department.

Five sets of clearly legible blue or black lined copies of all drawings and required information shall be submitted to the Community Development Department.

Storm water management and grading plan drawings shall be prepared to a scale appropriate to the site of the project and suitable for the review to be performed. At a minimum the scale shall be one inch equals 100 feet.

(Ord. No. 2130 , 3-17-15)

8-1209 - Storm Water Management Plan.

At a minimum, the Storm Water Management Plan shall meet the criteria as described in the City's Engineering Design Guidelines. The Storm Water Management Plan shall contain the following information:

(1) Plan Details;

(2) Topography;

(3) Elevation Information;

(4) Temporary Erosion Control Best Management Practices;

(5) Final Stabilization; and

(6) Tree Preservation.

(Ord. No. 2130 , 3-17-15)

8-1210 - Plan Review Procedure.

(1) Process. Storm water management plans for subdivisions or land disturbing activities meeting the requirements of Section 8-1209 shall be submitted by the Community Development Department to the Planning Commission for review in accordance with the standards of Section 8-1212. This review will be coordinated with review of the related subdivision, site plan or conditional use permit by the Commission. The Commission shall recommend approval, recommend approval with conditions, or recommend denial of the storm water management plan. Building permit storm water management plans shall be submitted to the City's Building Inspection Division for review and approval in accordance with the standards of Section 8-1212.

(2) Duration. Approval of a plan submitted under the provisions of this Chapter shall expire one year after the date of approval unless construction has commenced in accordance with the plan. However, if prior to the expiration of the approval, the applicant makes a written request to the Community Development Department for an extension of time to commence construction setting forth the reasons for the requested extension, the Community Development Department may grant one extension of not longer than 12 consecutive months. No subsequent extensions will be permitted regardless of the one extension granted. Receipt of any request for an extension shall be acknowledged by the Community Development Department within 15 days. The Community Development Department shall make a decision on the extension within 30 days of receipt. An applicant may appeal the decision to the City Council by filing a written request with the Director of the Community Development Department within ten days after receipt of the decision. The City Council will consider the appeal at its next regularly scheduled meeting which is held at least five days after the Director reviews the appeal request. Any plan may be revised in the same manner as originally approved.

(3)

Conditions. A storm water management plan may be approved subject to compliance with conditions reasonable and necessary to insure that the requirements contained in this Chapter are met. Such conditions may, among other matters, limit the size, kind or character of the proposed development, require the construction of structures, drainage facilities, storage basins, and other facilities, require replacement of vegetation, establish required monitoring procedures, stage the work over time, require alteration of the site design to insure buffering, and require the conveyance to the City of Coon Rapids or other public entity of certain lands or interests therein.

(4) Performance Security. As a condition of approval of any storm water management plan, the applicant shall submit an agreement to construct such required physical improvements, to dedicate property or easements, or to comply with such conditions as may have been agreed to. Such agreement shall be accompanied by a cash deposit or letter of credit to cover 150 percent of the estimated cost of complying with the agreement. The agreement and security shall guarantee completion and compliance with conditions within a specific time, which time may be extended in accordance with Section 8-1210(2).

The adequacy, conditions and acceptability of any agreement and security shall be determined by the City Council or any official of the City of Coon Rapids as may be designated by resolution of the City Council.

8-1211 - Fees.

All applications for storm water management plan approval shall be accompanied by a processing and approval fee. The processing and approval fee shall be established from time to time by resolution of the City Council.

8-1212 - Approval Requirements.

Every applicant for a building permit, subdivision approval, or permit to allow land disturbing activity shall submit an Erosion Control Plan and a Storm Water Management Plan to the City. The Erosion Control Plan and Storm Water Management Plan shall meet the submittal criteria for the plans of the City's Engineering Design Standards prior to starting construction.

(Ord. No. 2130 , 3-17-15)

8-1213 - Storm Water Management Criteria for Permanent Facilities.

(1) Unless determined by the City to be exempt or granted a waiver, all site designs shall establish storm water management facilities to control the peak flow rates and pollutants of storm water discharge associated with specified design storms and runoff volumes, as detailed in the City's Engineering Design Guidelines.

(2)

An applicant may also make an in-kind or monetary contribution to the development and maintenance of community storm water management facilities designed to serve multiple land disturbing and development activities undertaken by the City or one or more persons, including the applicant.

(3) The applicant shall give consideration to reducing the need for storm water management facilities by incorporating the use of natural topography and land cover such as wetlands, ponds, natural swales, and depressions as they exist before development to the degree that they can accommodate the additional flow of water without compromising the integrity or quality of the wetland or pond.

(4) The following storm water management practices shall be investigated in developing a storm water management plan in the following descending order of preference:

(a) Natural infiltration of precipitation on-site;

(b) Flow attenuation by use of open vegetated swales and natural depressions;

(c) Storm water retention facilities; and

(d) Storm water detention facilities.

(5) A combination of successive practices may be used to achieve the applicable minimum control requirements specified in subsection (4) above. Justification shall be provided by the applicant for the method selected.

(Ord. No. 2130 , 3-17-15)

8-1214 - Design Standards.

Permanent storm water facilities constructed in the City of Coon Rapids shall be designed according to the most current technology as reflected in the MPCA publications "Protecting Water Quality in Urban Areas," the "Minnesota Storm Water Manual," and the City's Engineering Design Guidelines.

(Ord. No. 2130 , 3-17-15)

8-1215 - Wetlands.

(1) Runoff shall not be discharged directly into wetlands without presettlement of the runoff.

(2) Wetlands must not be drained or filled, wholly or partially, unless replaced by restoring or creating wetland areas of at least equal public value. Replacement must be guided by provisions of the Wetland Conservation Act of 1991.

8-1216 - Steep Slopes.

No land disturbing or development activities shall be allowed on slopes of 18% or more.

8-1217 - Catch Basins.

Any newly installed and rehabilitated catch basins may be provided with a sump area for the collection of coarse-grained material. City staff shall review the design of catch basins on a case-by-case basis. An appropriate maintenance plan shall be developed and reviewed by City staff prior to construction. Such basins shall be cleaned when they are half filled with material.

(Ord. No. 2130 , 3-17-15)

8-1218 - Drain Leaders.

All newly constructed and reconstructed buildings will route drain leaders to pervious areas wherein the runoff can be allowed to infiltrate. The flow rate of water exiting the leaders shall be controlled so no erosion occurs in the pervious areas.

8-1219 - Storm Water Management Facilities Maintenance Plan and Agreement.

(1) All storm water management facilities shall be designed to minimize the need of maintenance, to provide access for maintenance purposes and to be structurally sound. The Responsible Party shall enter into a Maintenance Agreement with the City that documents all responsibilities for operation and maintenance of all permanent storm water management facilities. Such responsibility shall be documented in a maintenance plan and executed through a Maintenance Agreement. The Maintenance Agreement shall be executed and recorded against the parcel. The storm water Maintenance Agreement shall be in a form approved by the City and shall describe the inspection and maintenance obligations of this section and shall, at a minimum:

(a) Designate the Responsible Party who is permanently responsible for maintenance of the structural and nonstructural measures;

(b) Pass responsibilities for such maintenance to successors in title;

(c) Allow the City and its representatives the right-of-entry for the purposes of inspecting all permanent storm water management facilities;

(d) Allow the City the right to repair and maintain the facility, if necessary maintenance is not performed after proper and reasonable notice to the responsible party of the permanent storm water management facility;

(e) Include a maintenance plan that contains, but is not limited to the following:

(i) Identification of all structural permanent storm water facility;

(ii) A schedule for regular inspection, monitoring, and maintenance of each practice. Monitoring shall verify whether the practice is functioning as designed and may include, but is not limited to quality, temperature, and quantity of runoff;

(iii) Identification of the Responsible Party for conducting the inspection, monitoring and maintenance for each practice; and

(iv) Include a schedule and format for reporting compliance with the maintenance agreement to the City.

(f) The issuance of a permit constitutes a right-of-entry for the community or its contractor to enter upon the construction site. The applicant shall allow the community and their authorized representatives, upon presentation of credentials, to:

(i) Enter upon the permitted site for the purpose of obtaining information, examination of records, conducting investigations or surveys;

(ii) Bring such equipment upon the permitted development as is necessary to conduct such surveys and investigations;

(iii) Examine and copy any books, papers, records, or memoranda pertaining to activities or records required to be kept under the terms and conditions of the permit;

(iv) Inspect the storm water pollution control measures;

(v) Sample and monitor any items or activities pertaining to storm water pollution control measures; and

(vi) Correct deficiencies in storm water and erosion and sediment control measures.

(2) Inspection of Storm Water Management Facilities. Inspection programs shall be established on any reasonable basis, including but not limited to: routine inspections; random inspections; inspections based upon complaints or other notice of possible violations; inspection of drainage basins or areas identified as higher than typical sources of sediment or other contaminants or pollutants; inspections of businesses or industries of a type associated with higher than usual discharges of contaminants or pollutants or with discharges of a type which are more likely than the typical discharge to cause violations of state or federal water or sediment quality standards or the NPDES permit; and joint inspections with other agencies inspecting under environmental or safety laws. Inspections may include, but are not limited to, reviewing maintenance and repair records; sampling discharges, surface water, groundwater, and material or water in drainage control facilities; and evaluating the condition of drainage control facilities and other storm water management practices.

(a) When any new storm water management facility is installed on private property, or when any new connection is made between private property and a public drainage control system, sanitary sewer, or combined sewer; the property owner shall grant to the City the right to enter the property at reasonable times and in a reasonable manner for the purpose of inspection. This includes the right to enter a property when the City has a reasonable basis to believe that a violation of this title is occurring or has occurred, and to enter when necessary for abatement of a public nuisance or correction of a violation of this Chapter.

(b) The Director of Public Works, or designated representative, shall inspect all storm water management facilities during construction, during the first year of operation, and at least once every five years thereafter. The inspection records will be kept on file at the public works

department for a period of six years. It shall be the responsibility of the applicant to obtain any necessary easements or other property interests to allow access to the storm water management facilities for inspection and maintenance purposes.

(3) Records of Installation and Maintenance Activities. The Responsible Party shall make records of the installation and of all maintenance and repairs of the storm water management facilities, and shall retain the records for at least three years. These records shall be made available to the City during inspection of the storm water management facilities and at other reasonable times upon request.

(4) Failure to Maintain Practices. If a Responsible Party fails or refuses to meet the requirements of the Maintenance Agreement, the City, after reasonable notice, may correct a violation of the design standards or maintenance needs by performing all necessary work to place the storm water management facility in proper working condition. In the event that the storm water management facility becomes a danger to public safety or public health, the City shall notify the Responsible Party in writing. Upon receipt of that notice, the Responsible Party shall have 30 days to perform maintenance and repair of the facility in an approved manner. After proper notice, the City may specially assess the owner(s) of the storm water management facility for the cost of repair work and any penalties; and the cost of the work shall be assessed against the property and collected along with ordinary taxes by the county.

(Ord. No. 2130 , 3-17-15)

8-1220 - Models/Methodologies/Computations.

Hydrologic models and design methodologies used for the determination of runoff and analysis of storm water management structures shall be approved by the Public Works Director. Detention facilities shall be designed in accordance with NURP wet detention basin design criteria. Plans, specification, and computations for storm water management facilities submitted for review shall be sealed and signed by a registered professional engineer. All computations shall appear on the plans submitted for review, unless otherwise approved by the Director of Public Services.

(Ord. No. 2130 , 3-17-15)

8-1221 - Watershed Management Plans/Groundwater Management Plans.

Storm water management plans shall be consistent with adopted watershed management plans and groundwater management plans prepared in accordance with Minnesota Statutes Sections 103B.231 and 103B.255 respectively, and as approved by the Minnesota Board of Water and Soil Resources in accordance with state law.

8-1222 - Easements.

(1) If a storm water management plan involves direction of some or all runoff from the site, it shall be the responsibility of the applicant to obtain from adjacent property owners any necessary easements or other property interests concerning flowage of water.

(2) Easements are required for all landlocked ponding areas to the basin's 100-year storm high water level elevation.

(3) Easements are required for all outletted basins, swales, ditches, and overflow routes to the basin's 100-year storm high water level elevation.

(4) If the storm sewer is to be installed less than ten feet deep within private property, the easement shall be a minimum of 20 feet wide. If the storm sewer is ten feet or greater, the easement shall be twice as wide as the depth.

(5) Easements necessary for maintenance vehicle access are required for all of the above where not directly accessible from a public road.

8-1223 - Penalty.

(1) Notice of Violation. When the City determines that an activity is not being carried out in accordance with the requirements of this Chapter, it shall issue a written notice of violation to the owner of the property. The notice of violation shall contain:

(a) The name and address of the owner or Applicant;

(b) The address when available or a description of the land upon which the violation is occurring;

(c) A statement specifying the nature of the violation;

(d) A description of the remedial measures necessary to bring the development activity into compliance with this Chapter and a time schedule for the completion of such remedial action;

(e) A statement of the penalty or penalties that shall or may be assessed against the person to whom the notice of violation is directed; and

(f) A statement that the determination of violation may be appealed to the City by filing a written notice of appeal within 15 days of served notice of violation.

(2) Withholding Building Permit Inspections. The City may withhold building permit inspections if the person holding the site development permit does not respond to the notice of violation letter within the time period determined by the City and stated in the notice of violation.

(3) Stop Work Order. Persons receiving a stop work order will be required to halt all construction activities. This Stop Work Order will be in effect until the City confirms that the Land Disturbance Activity is in compliance and the violation has been satisfactorily addressed. Failure to address a notice of violation in a timely manner may result in civil, criminal, or monetary penalties in accordance with the enforcement measures authorized in this Chapter.

(4) Civil and Criminal Penalties.

(a)

In addition to or as an alternative to any Civil penalty provided herein or by law, any person who through an intentional act violates the provisions of this Chapter or who willfully fails to comply with the requirements of this Chapter, a notice of violation, or a stop work order shall be guilty of a misdemeanor and subject to prosecution. Such person shall be guilty of a separate offense for each day during which the intentional violation or willful noncompliance occurs or continues. A restitution award to the City for abatement or other remedial action taken by the City resulting from a violation or noncompliance may also include reasonable enforcement and prosecution costs, and it shall not limit a person's liability for damages in a civil action or proceeding for an amount greater than the restitution payment.

(b) When a criminal complaint is filed under this Chapter, the District Court may take any of the following actions if the prosecuting authority shows by a preponderance of the evidence that the action is necessary to prevent an ongoing violation or damage to storm water management facilities:

(i) Enter a restraining order or injunction;

(ii) Require execution of a satisfactory performance bond or place money in escrow; or

(iii) Take any other reasonable action to halt a violation or mitigate ongoing and future damages.

(c) Before granting the remedies provided for in this subsection, the District Court shall hold a hearing, after notice to directly affected persons, giving them a reasonable opportunity to respond. At the hearing the rules of evidence do not apply.

(5) Restoration of Lands. Any violator may be required to restore land to its undisturbed condition. In the event that restoration is not undertaken within a reasonable time after notice, the City may take necessary corrective action, the cost of which may, after notice and opportunity for hearing, be specially assessed against the property and collected along with the ordinary taxes by the county.

(Ord. No. 2130 , 3-17-15)

8-1224 - Appeals.

Any person aggrieved by the action of any official charged with the enforcement of this Chapter, as the result of the disapproval of a properly filed application for approval, issuance of a written notice of violation, or an alleged failure to properly enforce the ordinance in regard to a specific application, shall have the right to appeal the action to the City.

(1) The Applicant shall submit the appeal in writing and include supporting documentation.

(2) City staff shall make a decision on the appeal within 15 business days of receipt of a complete appeal application.

(3) The Applicant may appeal the decision of city staff to the city council. This appeal must be filed with the City within 30 days of City staff's decision.

(Ord. No. 2130 , 3-17-15)

8-1225 - Severability.

If any section, subsection, sentence, clause, phrase, or portion of this Chapter is for any reason held invalid or unconstitutional by any court or administrative agency of competent jurisdiction, such portion shall be deemed a separate, distinct, and independent provision and such holding shall not affect the validity of the remaining portions thereof. [Revised 12/05/00, Ordinance 1719]

(Ord. No. 2130 , 3-17-15)

11-1207 - Performance Standards.

11-1207.1 Environmental Standards.

(1) Nuisance Uses. No land, existing building, or proposed structure can be used or occupied in any manner creating dangerous, noxious, or otherwise objectionable conditions which could adversely affect the surrounding area.

(2) Radiation and Electrical Emissions. No activity can emit dangerous radioactivity beyond enclosed areas approved for such use. No equipment, other than domestic household appliances, can be utilized which creates electrical disturbances.

(3) Noise. Noise must be muffled or otherwise controlled so as not to become a nuisance. Noise levels are regulated by the standards of the Minnesota Pollution Control Agency.

(4) Odor. The emission of odorous matter is subject to the regulations established by the Minnesota Pollution Control Agency for Odor Control in Ambient Air.

(5) Vibrations. No vibration is permitted which is discernible without instruments on any adjoining property in a residential district. Within commercial and industrial districts, no vibration is be permitted which is discernible beyond the property line to the human sense of feeling for three minutes or more duration in any one hour.

(6) Smoke. The emission of visible smoke is subject to the Minnesota Pollution Control Agency's restrictions on the emission of visible air contaminants.

(7) Particulate Matter.

(a) Particulate matter includes fly ash, soot, and similar materials.

(b) Particulate matter emission from industrial processes, substances, products, or materials subject to becoming airborne must be in accordance with the Minnesota Pollution Control Agency's regulations.

(8) Toxic Matter. The ambient air quality standards of the Minnesota Pollution Control Agency are the guide to the release of airborne toxic materials within the City.

(9) Erosion. No erosion is permitted which will carry objectionable substances onto neighboring properties or into natural waterways. A property owner must not permit his property to be used or built on without applying all such reasonable measures as may be required to prevent wind or water erosion. The City Engineer may require reasonable measures of a property owner or developer to prevent wind or water erosion. The "Minnesota Storm Water Manual," published by the Minnesota Pollution Control Agency, is the guide for the planning, design, and layout of the conservation measures required. If required, a Nationwide Pollutant Discharge Elimination System (NPDES) Construction Storm Water General Permit must be obtained from the Minnesota Pollution Control Agency prior to commencing construction activities. The associated Storm Water Pollution Prevention Plan (SWPPP) should be submitted to the City for approval. Proof of NPDES permit

acquisition must be provided to the City prior to construction. The City Engineer may review any development plan to ensure that erosion and sedimentation must be effectively controlled. The following conditions must be placed on new developments where applicable:

(a) The development plan must be designed to minimize erosion potential.

(b) Landscaping, streets, storm sewers, and other drainage and erosion controls must be installed as early in the construction schedule as is practical.

(c) The area and duration of exposure of disturbed soils must be kept to a practical minimum, as determined by City staff but in no event can exposure of disturbed soils exceed 14 days.

(d) Whenever feasible, natural vegetation must be retained, protected, and supplemented.

(e) Where there is inadequate vegetation to protect erosion-prone areas during or after development, temporary or permanent vegetation and/or mulching must be established.

(f) Cut and fill slopes must not be steeper than four to one unless stabilized by a retaining wall or cribbing or approved by the City Engineer.

(g) Cut and fill must not endanger adjoining property.

(h) Fill must be placed and compacted so as to minimize sliding or erosion of the soil.

(i) Fill must not encroach on floodways, natural watercourses, or constructed channels.

(j) Grading must not be done in such a way so as to divert water onto the property of another landowner without the written consent of that landowner.

(k) Provisions must be made to prevent surface water from damaging the cut face of excavations or the sloping surfaces of fills.

(l) The use of temporary and permanent erosion control Best Management Practices including, but not limited to, rock construction entrances, silt fence, turf stabilization mats, and storm drain protection may be required.

(m) If sediment and debris is deposited on paved areas, street sweeping must be performed by and at the cost of the responsible party(ies) as determined by the City Engineer. Cleaning must be performed in a manner acceptable to the City Engineer. If this work is not performed by responsible party(ies), the City may perform street sweeping and bill the appropriate party(ies) for this work.

(n) The use of debris basins, sediment basins, silt traps, or similar measures may be required to trap sediment in runoff water until a disturbed area is stabilized.

(o) The use of ponds for temporary storm water storage is encouraged to reduce peak rainfall runoff and peak stream flows.

(10) Water Pollution. The discharge of raw sewage, industrial wastes, or other pollutants into waterways, lakes, or Municipal Separate Storm Sewer System (MS4) of the City is subject to the regulations of the Minnesota Pollution Control Agency.

(11)

Solid Waste. Sanitary landfills or other areas used for the accumulation of solid waste, including garbage, refuse, sludge, slag, fly ash, demolition debris, and other discarded solid materials, is be subject to the solid waste disposal regulations of the Minnesota Pollution Control Agency and Anoka County. In addition, use of all such areas must be approved by the City Council after receiving a recommendation from the Planning Commission. Reasonable measures may be required to ensure that the disposal site will not endanger the public health, safety, or welfare; create a public nuisance; result in scenic blight; adversely affect property values; reduce the usability of the site; or be incompatible with present and future surrounding land uses, including the posting of a bond in an amount determined by the Council to ensure satisfactory compliance.

(12) Glare. Lighting cannot be directed into a residential district from another property or obscure drivers' vision on public streets. No lighting fixture can create more than three footcandles of light intensity at the property line.

(13) Maintenance of Waterway Slopes. The owner or occupant of property on which is located a ditch, creek or man-made and/or natural waterway, that is part of the public drainage system and which was constructed or reconstructed on or after September 1, 1985, is responsible for the maintenance of all slopes of such ditch, creek or man-made and/or natural waterway located on their property. The owner or occupant will, at a minimum, maintain the lawn on such slopes and keep the slopes free of debris. This provision will not apply if the City has waived the requirements of Section 11-1506.

(14) Maintenance of Improvements. The owner or occupant of the premises must maintain the building and site in good condition, free from refuse and debris. All improvements must be repaired, replaced, or repainted as necessary. All diseased or dead plant materials must be promptly replaced with the same or equivalent materials.

[Revised 10/15/13 Ordinance 2109]

11-1207.2 Miscellaneous Performance Standards.

(1) Semitrailer and Container Storage. The City Council finds that the use of semi-trailers and ground level storage containers for the storage of goods and materials is unsightly, causes public safety concerns, circumvents the intent of the City Code regarding exterior storage, and is detrimental to surrounding property values. The reasonable control of the use of such semitrailer and containers is therefore necessary to protect the public health, safety, and general welfare.

(a) Except as provided below, it is illegal to park, store, or maintain, or permit to be parked, stored, or maintained on any property a semitrailer, a ground level storage container, or similar container.

(b) This subsection does not apply to:

(i) Semitrailers parked at or cued for an approved loading dock or, in the absence of a loading dock, which are being actively loaded or unloaded in Neighborhood, Community, Regional and General Commercial and Industrial Zoning Districts and at institutional uses in

11-1101 - Floodplain Management.

11-1101.1 Statutory Authorization and Purpose.

(1) Statutory Authorization. The legislature of the State of Minnesota has, in Minn. Stat. Ch. 103F and Ch. 462 delegated the responsibility to local government units to adopt regulations designed to minimize flood losses. Therefore, the City Council of Coon Rapids, Minnesota, does ordain as follows.

(2) Purpose.

(a) This Section regulates development in the flood hazard areas of Coon Rapids, Minnesota. These flood hazard areas are subject to periodic inundation, which may result in loss of life and property, health and safety hazards, disruption of commerce and governmental services, extraordinary public expenditures for flood protection and relief and impairment of the tax base. It is the purpose of this Section to promote the public health, safety, and general welfare by minimizing these losses and disruptions.

(b) National Flood Insurance Program Compliance. This Section is adopted to comply with the rules and regulations of the National Flood Insurance Program codified as 44 Code of Federal Regulations Parts 59—78, as amended, so as to maintain the community's eligibility in the National Flood Insurance Program.

(c) This Section is also intended to preserve the natural characteristics and functions of watercourses and floodplains in order to moderate flood and storm water impacts, improve water quality, reduce soil erosion, protect aquatic and riparian habitat, provide recreational opportunities, provide aesthetic benefits and enhance community and economic development.

11-1101.2 General Provisions.

(1) How to Use This Section. This Section adopts the floodplain maps applicable to Coon Rapids and includes three floodplain districts: Floodway, Flood Fringe, and General Floodplain.

(a) Where Floodway and Flood Fringe districts are delineated on the floodplain maps, the standards in Subsections 11-1101.4 or 11-1101.5 will apply, depending on the location of a property.

(b) Locations where Floodway and Flood Fringe districts are not delineated on the floodplain maps are considered to fall within the General Floodplain district. Within the General Floodplain district, the Floodway District standards in subsection 11-1101.4 apply unless the floodway boundary is determined, according to the process outlined in subsection 11-1101.6. Once the floodway boundary is determined, the Flood Fringe District standards in subsection 11-1101.5 may apply outside the floodway.

(2) Lands to Which Ordinance Applies.

(a) This Section applies to all lands within the jurisdiction of the City of Coon Rapids shown on the Official Zoning Map and/or the attachments to the map as being located within the boundaries of the Floodway, Flood Fringe, or General Floodplain Districts.

(b) The Floodway, Flood Fringe and General Floodplain Districts are overlay districts that are superimposed on all existing zoning districts. The standards imposed in the overlay districts are in addition to any other requirements in this Section. In case of a conflict, the more restrictive standards will apply.

(3) Incorporation of Maps by Reference. The Flood Insurance Rate Map panels enumerated below, all dated December 16, 2015 and all prepared by the Federal Emergency Management Agency together with all related materials, including the Flood Insurance Study for Anoka County, Minnesota, are hereby adopted by reference and declared to be a part of the Official Zoning Map and this Section. The following materials are on file in the City Engineer's office:

27003C0303E

27003C0304E

27003C0308E

27003C0309E

27003C0311E

27003C0312E

27003C0314E

27003C0316E

27003C0317E

27003C0318E

27003C0319E

27003C0381E

27003C0382E

(4) Regulatory Flood Protection Elevation. The regulatory flood protection elevation (RFPE) is an elevation no lower than two feet above the elevation of the regional flood plus any increases in flood elevation caused by encroachments on the floodplain that result from designation of a floodway.

(5) Interpretation. The boundaries of the zoning districts are determined by scaling distances on the Flood Insurance Rate Map.

(a) Where a conflict exists between the floodplain limits illustrated on the official zoning map and actual field conditions, the flood elevations shall be the governing factor. The Zoning Administrator must interpret the boundary location based on the ground elevations that

existed on the site on the date of the first National Flood Insurance Program map showing the area within the regulatory floodplain, and other available technical data.

(b) Persons contesting the location of the district boundaries will be given a reasonable opportunity to present their case to the Board of Adjustment and Appeals and to submit technical evidence.

(6) Abrogation and Greater Restrictions. It is not intended by this Section to repeal, abrogate, or impair any existing easements, covenants, or other private agreements. However, where this Section imposes greater restrictions, the provisions of this Section prevail. All other ordinances inconsistent with this Section are hereby repealed to the extent of the inconsistency only.

(7) Warning and Disclaimer of Liability. This Section does not imply that areas outside the floodplain districts or land uses permitted within such districts will be free from flooding or flood damages. This Section does not create liability on the part of the City of Coon Rapids or its officers or employees for any flood damages that result from reliance on this Section or any administrative decision lawfully made hereunder.

(8) Severability. If any section, clause, provision, or portion of this Section is adjudged unconstitutional or invalid by a court of law, the remainder of this Section shall not be affected and shall remain in full force.

(9) Definitions. Unless specifically defined below, words or phrases used in this Section must be interpreted according to common usage and so as to give this Section its most reasonable application. The following definitions apply only to Section 11-1101:

(a) "Accessory Use or Structure." A use or structure on the same lot with, and of a nature customarily incidental and subordinate to, the principal use or structure.

(b) "Base Flood Elevation." The elevation of the "regional flood." The term "base flood elevation" is used in the flood insurance survey.

(c) "Basement." any area of a structure, including crawl spaces, having its floor or base subgrade (below ground level) on all four sides, regardless of the depth of excavation below ground level.

(d) "Conditional Use." a specific type of structure or land use listed in the official control that may be allowed but only after an in-depth review procedure and with appropriate conditions or restrictions as provided in the official zoning controls or building codes and upon a finding that:

(i) Certain conditions as detailed in the zoning ordinance exist.

(ii) The structure and/or land use conform to the comprehensive land use plan if one exists and are compatible with the existing neighborhood.

(e) "Critical Facilities." Facilities necessary to a community's public health and safety, those that store or produce highly volatile, toxic or water-reactive materials, and those that house occupants that may be insufficiently mobile to avoid loss of life or injury. Examples of critical

facilities include hospitals, correctional facilities, schools, daycare facilities, nursing homes, fire and police stations, wastewater treatment facilities, public electric utilities, water plants, fuel storage facilities, and waste handling and storage facilities.

(f) "Development." Any manmade change to improved or unimproved real estate, including buildings or other structures, mining, dredging, filling, grading, paving, excavation or drilling operations, or storage of equipment or materials.

(g) "Farm Fence." A fence as defined by Minn. Stat. §344.02, Subd. 1(a)—(d). An open type fence of posts and wire is not considered to be a structure under this Section. Fences that have the potential to obstruct flood flows, such as chain link fences and rigid walls, are regulated as structures under this ordinance.

(h) "Flood." A temporary increase in the flow or stage of a stream or in the stage of a wetland or lake that results in the inundation of normally dry areas.

(i) "Flood Frequency." The frequency for which it is expected that a specific flood stage or discharge may be equaled or exceeded.

(j) "Flood Fringe." That portion of the floodplain outside of the floodway. Flood fringe is synonymous with the term "floodway fringe" used in the Flood Insurance Study for Anoka County, Minnesota.

(k) "Flood Prone Area." Any land susceptible to being inundated by water from any source (see "Flood").

(l) "Floodproofing." A combination of structural provisions, changes, or adjustments to properties and structures subject to flooding, primarily for the reduction or elimination of flood damages.

(m) "Lowest Floor." The lowest floor of the lowest enclosed area (including basement). An unfinished or flood resistant enclosure, used solely for parking of vehicles, building access, or storage in an area other than a basement area, is not considered a building's lowest floor.

(n) "Manufactured Home." A structure, transportable in one or more sections, which is built on a permanent chassis and is designed for use with or without a permanent foundation when attached to the required utilities. The term "manufactured home" does not include the term "recreational vehicle."

(o) "Obstruction." Any dam, wall, wharf, embankment, levee, dike, pile, abutment, projection, excavation, channel modification, culvert, building, wire, fence, stockpile, refuse, fill, structure, or matter in, along, across, or projecting into any channel, watercourse, or regulatory floodplain which may impede, retard, or change the direction of the flow of water, either in itself or by catching or collecting debris carried by such water.

(p) "One-Hundred-Year Floodplain." Lands inundated by the "Regional Flood" (see definition).

(q) "Principal Use or Structure." All uses or structures that are not accessory uses or structures.

(r)

"Reach." A hydraulic engineering term to describe a longitudinal segment of a stream or river influenced by a natural or man-made obstruction. In an urban area, the segment of a stream or river between two consecutive bridge crossings would most typically constitute a reach.

(s) "Recreational Vehicle." A vehicle that is built on a single chassis, is 400 square feet or less when measured at the largest horizontal projection, is designed to be self-propelled or permanently towable by a light duty truck, and is designed primarily not for use as a permanent dwelling but as temporary living quarters for recreational, camping, travel, or seasonal use. For the purposes of this Section, the term recreational vehicle is synonymous with the term "travel trailer/travel vehicle."

(t) "Regional Flood." A flood which is representative of large floods known to have occurred generally in Minnesota and reasonably characteristic of what can be expected to occur on an average frequency in the magnitude of the one-percent chance or 100-year recurrence interval. Regional flood is synonymous with the term "base flood" used in a flood insurance study.

(u) "Regulatory Flood Protection Elevation (RFPE)." An elevation not less than two feet above the elevation of the regional flood plus any increases in flood elevation caused by encroachments on the floodplain that result from designation of a floodway.

(v) "Repetitive Loss." Flood related damages sustained by a structure on two separate occasions during a ten year period for which the cost of repairs at the time of each such flood event on the average equals or exceeds 25 percent of the market value of the structure before the damage occurred.

(w) "Special Flood Hazard Area." A term used for flood insurance purposes synonymous with "One Hundred Year Floodplain."

(x) "Substantial Damage." Means damage of any origin sustained by a structure where the cost of restoring the structure to its before damaged condition would equal or exceed 50 percent of the market value of the structure before the damage occurred.

(y) "Substantial Improvement." Within any consecutive 365-day period, any reconstruction, rehabilitation (including normal maintenance and repair), repair after damage, addition, or other improvement of a structure, the cost of which equals or exceeds 50 percent of the market value of the structure before the "start of construction" of the improvement. This term includes structures that have incurred "substantial damage," regardless of the actual repair work performed. The term does not, however, include either:

(i) Any project for improvement of a structure to correct existing violations of state or local health, sanitary, or safety code specifications which have been identified by the local code enforcement official and which are the minimum necessary to assure safe living conditions.

(ii) Any alteration of a "historic structure," provided that the alteration will not preclude the structure's continued designation as a "historic structure." For the purpose of this Section, "historic structure" is as defined in 44 Code of Federal Regulations, Part 59.1.

11-1101.3 Establishment of Zoning Districts.

(1) Districts.

(a) Floodway District. The Floodway District includes those areas designated as floodway on the Flood Insurance Rate Map adopted in subsection 11-1101.2(3). For lakes, wetlands and other basins, the Floodway District includes those areas designated as Zone A and Zone AE without a floodway on the Flood Insurance Rate Map that are at or below the ordinary high water level as defined in Minn. Stat. §103G.005, subdivision 14.

(b) Flood Fringe District. The Flood Fringe District includes those areas designated as floodway fringe on the Flood Insurance Rate Map adopted in subsection 11-1101.2(3), as being within Zone AE but being located outside of the floodway. For lakes, wetlands and other basins (that do not have a floodway designated), the Flood Fringe District includes those areas designated as Zone AE on the Flood Insurance Rate Map panels adopted in subsection 11-1101.2(3) that are below the one-percent annual chance (100-year) flood elevation but above the ordinary high water level as defined in Minn. Stat. §103G.005, subd. 14.

(c) General Floodplain District. The General Floodplain District includes those areas designated as Zone A or Zone AE without a floodway on the Flood Insurance Rate Map adopted in subsection 11-1101.2(3), but not subject to the criteria in sections (a) and (b) above.

(2) Compliance. Within the floodplain districts established in this Section, the use of any land, the use, size, type and location of structures on lots, the installation and maintenance of transportation, utility, water supply and waste treatment facilities, and the subdivision of land must comply with the terms of this Section and other applicable regulations. All uses not listed as permitted uses or conditional uses in subsections 11-1101.4, 11-1101.5 and 11-1101.6, respectively, are prohibited. In addition, a caution is provided here that:

(a) New and replacement manufactured homes and certain recreational vehicles are subject to the general provisions of this Section and specifically subsection 11-1101.9.0.

(b) Modifications, additions, structural alterations, normal maintenance and repair, or repair after damage to existing nonconforming structures and nonconforming uses of structures or land are regulated by the general provisions of this Section and specifically subsection 11-1101.11.

(c) All structures must be constructed with electrical, heating, ventilation, plumbing, and air conditioning equipment and other service facilities that are designed and/or located so as to prevent water from entering or accumulating within the components during conditions of flooding.

(d) As-built elevations for elevated or floodproofed structures must be certified by ground surveys and flood-proofing techniques must be designed and certified by a registered professional engineer or architect as specified in the general provisions of this Section and specifically as stated in subsection 11-1101.10.

(e) Critical facilities, as defined in subsection 11-1101.2(9)(e), are prohibited in all floodplain districts.

1101.4 Floodway District (FW).

(1) Permitted Uses. The following uses, subject to the standards set forth in subsection 11-1101.4(2), are permitted uses if otherwise allowed in the underlying zoning district or any applicable overlay district:

(a) General farming, pasture, grazing, outdoor plant nurseries, horticulture, truck farming, forestry, sod farming, and wild crop harvesting.

(b) Industrial-commercial loading areas, parking areas, and airport landing strips.

(c) Open space uses, including but not limited to private and public golf courses, tennis courts, driving ranges, archery ranges, picnic grounds, boat launching ramps, swimming areas, parks, wildlife and nature preserves, game farms, fish hatcheries, shooting preserves, hunting and fishing areas, and single or multiple purpose recreational trails.

(d) Residential lawns, gardens, parking areas, and play areas.

(e) Railroads, streets, bridges, utility transmission lines and pipelines, provided that the Department of Natural Resources' Area Hydrologist is notified at least ten days prior to issuance of any permit, and that the standards in subsections 11-1101.4(4)(a), 11-1101.4(4)(c)(i) and 11-1101.4(4)(f) are met.

(2) Standards for Floodway Permitted Uses.

(a) The use must have a low flood damage potential.

(b) With the exception of the uses listed in subsection 11-1101.4(1)(e), the use must not obstruct flood flows or increase flood elevations and must not involve structures, fill, obstructions, excavations or storage of materials or equipment.

(c) Any facility that will be used by employees or the general public must be designed with a flood warning system that provides adequate time for evacuation if the area is inundated to a depth and velocity such that the depth (in feet) multiplied by the velocity (in feet per second) would exceed a product of four upon occurrence of the regional (1% chance) flood.

(3) Conditional Uses. The following uses may be allowed as conditional uses following the standards and procedures set forth in subsection 11-1101.10(4) and further subject to the standards set forth in subsection 11-1101.4(4), if otherwise allowed in the underlying zoning district or any applicable overlay district.

(a) Structures accessory to the uses listed in 11-1101.4(1) above and the uses listed in (b)—(g) below.

(b) Extraction and storage of sand, gravel, and other materials.

(c) Marinas, boat rentals, docks, piers, wharves, and water control structures.

(d) Storage yards for equipment, machinery, or materials.

(e) Placement of fill or construction of fences that obstruct flood flows. Farm fences, as defined in subsection 11-1101.2(9)(g), are permitted uses.

(f) Travel-ready recreational vehicles meeting the exception standards in subsection 11-1101.9(2).

(g)

Levees or dikes intended to protect agricultural crops for a frequency flood event equal to or less than the 10-year frequency flood event.

(4) Standards for Floodway Conditional Uses.

(a) All Uses. A conditional use must not cause any increase in the stage of the one-percent chance or regional flood or cause an increase in flood damages in the reach or reaches affected.

(b) Fill; Storage of Materials and Equipment:

(i) The storage or processing of materials that are, in time of flooding, flammable, explosive, or potentially injurious to human, animal, or plant life is prohibited.

(ii) Fill, dredge spoil, and other similar materials deposited or stored in the floodplain must be protected from erosion by vegetative cover, mulching, riprap or other acceptable method. Permanent sand and gravel operations and similar uses must be covered by a long-term site development plan.

(iii) Temporary placement of fill, other materials, or equipment which would cause an increase to the stage of the one-percent percent chance or regional flood may only be allowed if the City Council has approved a plan that assures removal of the materials from the floodway based upon the flood warning time available.

(c) Accessory Structures.

(i) Accessory structures must not be designed for human habitation.

(ii) Accessory structures, if permitted, must be constructed and placed on the building site so as to offer the minimum obstruction to the flow of flood waters:

(aa) Whenever possible, structures must be constructed with the longitudinal axis parallel to the direction of flood flow; and

(bb) So far as practicable, structures must be placed approximately on the same flood flow lines as those of adjoining structures.

(iii) Accessory structures must be elevated on fill or structurally dry floodproofed in accordance with the FP-1 or FP-2 floodproofing classifications in the State Building Code. All floodproofed accessory structures must meet the following additional standards:

(aa) The structure must be adequately anchored to prevent flotation, collapse or lateral movement and designed to equalize hydrostatic flood forces on exterior walls; and

(bb) Any mechanical and utility equipment in the structure must be elevated to or above the regulatory flood protection elevation or properly floodproofed.

(iv) As an alternative, an accessory structure may be internally/wet floodproofed to the FP-3 or FP-4 floodproofing classifications in the State Building Code, provided the accessory structure constitutes a minimal investment and does not exceed 576 square feet in size. A detached garage may only be used for parking of vehicles and limited storage. All structures must meet the following standards:

(aa)

To allow for the equalization of hydrostatic pressure, there must be a minimum of two "automatic" openings in the outside walls of the structure, with a total net area of not less than one square inch for every square foot of enclosed area subject to flooding; and

(bb) There must be openings on at least two sides of the structure and the bottom of all openings must be no higher than one foot above the lowest adjacent grade to the structure. Using human intervention to open a garage door prior to flooding will not satisfy this requirement for automatic openings.

(d) Structural works for flood control that will change the course, current or cross section of protected wetlands or public waters are subject to the provisions of Minn. Stat. §103G.245.

(e) A levee, dike or floodwall constructed in the floodway must not cause an increase to the one-percent chance or regional flood. The technical analysis must assume equal conveyance or storage loss on both sides of a stream.

(f) Floodway developments must not adversely affect the hydraulic capacity of the channel and adjoining floodplain of any tributary watercourse or drainage system.

11-1101.5 Flood Fringe District (FF).

(1) Permitted Uses. Permitted uses are those uses of land or structures allowed in the underlying zoning district(s) that comply with the standards in subsection 11-1101.5(2). If no pre-existing, underlying zoning districts exist, then any residential or nonresidential structure or use of a structure or land is a permitted use provided it does not constitute a public nuisance.

(2) Standards for Flood Fringe Permitted Uses.

(a) All structures, including accessory structures, must be elevated on fill so that the lowest floor, as defined, is at or above the regulatory flood protection elevation. The finished fill elevation for structures must be no lower than one foot below the regulatory flood protection elevation and the fill must extend at the same elevation at least 15 feet beyond the outside limits of the structure.

(i) All service utilities, including ductwork, must be elevated or watertight to prevent infiltration of floodwaters.

(ii) As an alternative to elevation on fill, an accessory structure that constitutes a minimal investment and that does not exceed 576 square feet in size may be internally floodproofed in accordance with subsection 11-1101.4(4)(c).

(b) The cumulative placement of fill or similar material on a parcel must not exceed 1,000 cubic yards, unless the fill is specifically intended to elevate a structure in accordance with subsection 11-1101.5(2)(a), or if allowed as a conditional use under subsection 11-1101.5(3)(c) below.

(c) The storage of any materials or equipment must be elevated on fill to the regulatory flood protection elevation.

(d) The storage or processing of materials that are, in time of flooding, flammable, explosive, or potentially injurious to human, animal, or plant life is prohibited.

(e) Areas filled must be mitigated by creating compensating volume storage at a one to one ratio such that there would be no net effect on the 100-year flood level.

(i) Fill must be properly compacted and the slopes must be properly protected by the use of riprap, vegetative cover or other acceptable method.

(f) All new principal structures must have vehicular access at or above an elevation not more than two feet below the regulatory flood protection elevation, or must have a flood warning /emergency evacuation plan acceptable to the City Council.

(g) Accessory uses such as yards, railroad tracks, and parking lots may be at an elevation lower than the regulatory flood protection elevation. However, any facilities used by employees or the general public must be designed with a flood warning system that provides adequate time for evacuation if the area is inundated to a depth and velocity such that the depth (in feet) multiplied by the velocity (in feet per second) would exceed a product of four upon occurrence of the regional (one-percent chance) flood.

(h) Interference with normal manufacturing/industrial plant operations must be minimized, especially along streams having protracted flood durations. In considering permit applications, due consideration must be given to the needs of industries with operations that require a floodplain location.

(i) Flood fringe developments must not adversely affect the hydraulic capacity of the channel and adjoining floodplain of any tributary watercourse or drainage system.

(j) Manufactured homes and recreational vehicles must meet the standards of Section 9 of this Section.

(3) Conditional Uses. The following uses and activities may be allowed as conditional uses, if allowed in the underlying zoning district(s) or any applicable overlay district, following the procedures in subsection 11-1101.10(4). Conditional uses must meet the standards in subsections 11-1101.5(2)(d) through 11-1101.5(2)(j) and subsection 11-1101.5(4).

(a) Any structure that is not elevated on fill or floodproofed in accordance with subsection 11-1101.5(2)(a).

(b) Storage of any material or equipment below the regulatory flood protection elevation.

(c) The cumulative placement of more than 1,000 cubic yards of fill when the fill is not being used to elevate a structure in accordance with subsection 11-1101.5(2)(a).

(4) Standards for Flood Fringe Conditional Uses.

(a) The standards listed in subsections 11-1101.5(2)(d) through 11-1101.5(2)(j) apply to all conditional uses.

(b) Basements, as defined by subsection 11-1101.2(9)(c), are subject to the following:

(i)

Residential basement construction is not allowed below the regulatory flood protection elevation.

(ii) Non-residential basements may be allowed below the regulatory flood protection elevation provided the basement is structurally dry floodproofed in accordance with subsection 11-1101.5(4)(d).

(c) All areas of nonresidential structures, including basements, to be placed below the regulatory flood protection elevation must be floodproofed in accordance with the structurally dry floodproofing classifications in the State Building Code. Structurally dry floodproofing must meet the FP-1 or FP-2 floodproofing classification in the State Building Code, which requires making the structure watertight with the walls substantially impermeable to the passage of water and with structural components capable of resisting hydrostatic and hydrodynamic loads and the effects of buoyancy. Structures wet floodproofed to the FP-3 or FP-4 classification are not permitted.

(d) The placement of more than 1,000 cubic yards of fill or other similar material on a parcel (other than for the purpose of elevating a structure to the regulatory flood protection elevation) must comply with an approved erosion/sedimentation control plan.

(i) The plan must clearly specify methods to be used to stabilize the fill on site for a flood event at a minimum of the regional (one-percent chance) flood event.

(ii) The plan must be prepared and certified by a registered professional engineer or other qualified individual acceptable to the City Council.

(iii) The plan may incorporate alternative procedures for removal of the material from the floodplain if adequate flood warning time exists.

(e) Storage of materials and equipment below the regulatory flood protection elevation must comply with an approved emergency plan providing for removal of such materials within the time available after a flood warning.

(f) Alternative elevation methods other than the use of fill may be utilized to elevate a structure's lowest floor above the regulatory flood protection elevation. These alternative methods may include the use of stilts, pilings, parallel walls, etc., or above-grade, enclosed areas such as crawl spaces or tuck under garages. The base or floor of an enclosed area shall be considered above-grade and not a structure's basement or lowest floor if: 1) the enclosed area is above-grade on at least one side of the structure; 2) it is designed to internally flood and is constructed with flood resistant materials; and 3) it is used solely for parking of vehicles, building access or storage. The above-noted alternative elevation methods are subject to the following additional standards:

(i) Design and Certification—The structure's design and as-built condition must be certified by a registered professional engineer or architect as being in compliance with the general design standards of the State Building Code and, specifically, that all electrical, heating,

ventilation, plumbing and air conditioning equipment and other service facilities must be at or above the regulatory flood protection elevation or be designed to prevent flood water from entering or accumulating within these components during times of flooding.

(ii) Specific Standards for Above-grade, Enclosed Areas—Above-grade, fully enclosed areas such as crawl spaces or tuck under garages must be designed to internally flood and the design plans must stipulate:

(aa) The minimum area of openings in the walls where internal flooding is to be used as a floodproofing technique. There shall be a minimum of two openings on at least two sides of the structure and the bottom of all openings shall be no higher than one foot above grade. The automatic openings shall have a minimum net area of not less than one square inch for every square foot of enclosed area subject to flooding unless a registered professional engineer or architect certifies that a smaller net area would suffice. The automatic openings may be equipped with screens, louvers, valves, or other coverings or devices provided that they permit the automatic entry and exit of flood waters without any form of human intervention; and

(bb) That the enclosed area will be designed of flood resistant materials in accordance with the FP-3 or FP-4 classifications in the State Building Code and shall be used solely for building access, parking of vehicles or storage.

11-1101.6 General Floodplain District (GF).

(1) Permitted Uses.

(a) The uses listed in subsection 11-1101.4(1), Floodway District Permitted Uses, are permitted uses.

(b) All other uses are subject to the floodway/flood fringe evaluation criteria specified in subsection 11-1101.6(2) below. Subsection 11-1101.4 applies if the proposed use is determined to be in the Floodway District. Section 11-1101.5 applies if the proposed use is determined to be in the Flood Fringe District.

(2) Procedures for Floodway and Flood Fringe Determinations.

(a) Upon receipt of an application for a permit or other approval within the General Floodplain District, the Director must obtain, review and reasonably utilize any regional flood elevation and floodway data available from a federal, state, or other source.

(b) If regional flood elevation and floodway data are not readily available, the applicant must furnish additional information, as needed, to determine the regulatory flood protection elevation and whether the proposed use would fall within the Floodway or Flood Fringe District. Information must be consistent with accepted hydrological and hydraulic engineering standards and the standards in subsection 11-1101.6(2)(c) below.

(c) The determination of floodway and flood fringe must include the following components, as applicable:

(i) Estimate the peak discharge of the regional (one-percent chance) flood.

(ii) Calculate the water surface profile of the regional flood based upon a hydraulic analysis of the stream channel and overbank areas.

(iii) Compute the floodway necessary to convey or store the regional flood without increasing flood stages more than one-half foot. A lesser stage increase than one-half foot is required if, as a result of the stage increase, increased flood damages would result. An equal degree of encroachment on both sides of the stream within the reach must be assumed in computing floodway boundaries.

(d) The Director will review the submitted information and assess the technical evaluation and the recommended Floodway and/or Flood Fringe District boundary. The assessment must include the cumulative effects of previous floodway encroachments. The Director may seek technical assistance from a designated engineer or other expert person or agency, including the Department of Natural Resources. Based on this assessment, the Director may approve or deny the application.

(e) Once the Floodway and Flood Fringe District boundaries have been determined, the Director must process the permit application consistent with the applicable provisions of subsections 11-1101.4 and 11-1101.5.

11-1101.7 Land and Development Standards.

(1) In General. Recognizing that flood prone areas may exist outside of the designated floodplain districts, the requirements of this Section apply to all land within the City of Coon Rapids.

(2) Subdivisions. No land may be subdivided which is unsuitable for reasons of flooding or inadequate drainage, water supply or sewage treatment facilities. Manufactured home parks and recreational vehicle parks or campgrounds are considered subdivisions under this Section.

(a) All lots within the floodplain districts must be able to contain a building site outside of the Floodway District at or above the regulatory flood protection elevation.

(b) All subdivisions must have road access both to the subdivision and to the individual building sites no lower than two feet below the regulatory flood protection elevation, unless a flood warning emergency plan for the safe evacuation of all vehicles and people during the regional (one-percent chance) flood has been approved by the City Council. The plan must be prepared by a registered engineer or other qualified individual, and must demonstrate that adequate time and personnel exist to carry out the evacuation.

(c) For all subdivisions in the floodplain, the Floodway and Flood Fringe District boundaries, the regulatory flood protection elevation and the required elevation of all access roads must be clearly labeled on all required subdivision drawings and platting documents.

(d) In the General Floodplain District, applicants must provide the information required in subsection 11-1101.6(2) to determine the regional flood elevation, the Floodway and Flood Fringe District boundaries and the regulatory flood protection elevation for the subdivision site.

(e) If a subdivision proposal or other proposed new development is in a flood prone area, any such proposal must be reviewed to assure that:

(i) All such proposals are consistent with the need to minimize flood damage within the flood prone area,

(ii) All public utilities and facilities, such as sewer, gas, electrical, and water systems are located and constructed to minimize or eliminate flood damage, and

(iii) Adequate drainage is provided to reduce exposure of flood hazard.

(3) Building Sites. If a proposed building site is in a flood prone area, all new construction and substantial improvements (including the placement of manufactured homes) must be:

(a) Designed (or modified) and adequately anchored to prevent floatation, collapse, or lateral movement of the structure resulting from hydrodynamic and hydrostatic loads, including the effects of buoyancy;

(b) Constructed with materials and utility equipment resistant to flood damage;

(c) Constructed by methods and practices that minimize flood damage; and

(d) Constructed with electrical, heating, ventilation, plumbing, and air conditioning equipment and other service facilities that are designed and/or located so as to prevent water from entering or accumulating within the components during conditions of flooding.

11-1101.8 Public Utilities, Railroads, Roads, and Bridges.

(1) Public Utilities. All public utilities and facilities such as gas, electrical, sewer, and water supply systems to be located in the floodplain must be floodproofed in accordance with the State Building Code or elevated to the regulatory flood protection elevation.

(2) Public Transportation Facilities. Railroad tracks, roads, and bridges to be located within the floodplain must comply with subsections 11-1101.4 and 11-1101.5. These transportation facilities must be elevated to the regulatory flood protection elevation where failure or interruption of these facilities would result in danger to the public health or safety or where such facilities are essential to the orderly functioning of the area. Minor or auxiliary roads or railroads may be constructed at a lower elevation where failure or interruption of transportation services would not endanger the public health or safety.

(3) On-site Water Supply and Sewage Treatment Systems. Where public utilities are not provided: 1) On-site water supply systems must be designed to minimize or eliminate infiltration of flood waters into the systems; and 2) New or replacement on-site sewage treatment systems must be designed to minimize or eliminate infiltration of flood waters into the systems and discharges from the systems into flood waters and they must not be subject to impairment or contamination during times of flooding. Any sewage treatment system designed in accordance with the state's current statewide standards for on-site sewage treatment systems is considered to be in compliance with this Section.

11-1101.9 Manufactured Homes, Manufactured Homes Parks, and Recreational Vehicles.

(1) Manufactured Homes. New manufactured home parks and expansions to existing manufactured home parks are prohibited in any floodplain district. For existing manufactured home parks or lots of record, the following requirements apply:

(a) Placement or replacement of manufactured home units is prohibited in the Floodway District.

(b) If allowed in the Flood Fringe District, placement or replacement of manufactured home units is subject to the requirements of subsection 11-1101.5 and the following standards.

(i) New and replacement manufactured homes must be elevated in compliance with subsection 11-1101.5 and must be securely anchored to an adequately anchored foundation system that resists flotation, collapse and lateral movement. Methods of anchoring may include, but are not limited to, use of over-the-top or frame ties to ground anchors. This requirement is in addition to applicable state or local anchoring requirements for resisting wind forces.

(ii) New or replacement manufactured homes in existing manufactured home parks must meet the vehicular access requirements for subdivisions in subsection 11-1101.7(2)(b).

(2) Recreational Vehicles. New recreational vehicle parks or campgrounds and expansions to existing recreational vehicle parks or campgrounds are prohibited in any floodplain district. Placement of recreational vehicles in existing recreational vehicle parks or campgrounds in the floodplain must meet the exemption criteria below or be treated as new structures meeting the requirements of this Section.

(a) Recreational vehicles are exempt from the provisions of this Section if they are placed in any of the following areas and meet the criteria listed in subsection 11-1101.9(2)(b):

(i) Individual lots or parcels of record.

(ii) Existing commercial recreational vehicle parks or campgrounds.

(iii) Existing condominium-type associations.

(b) Criteria for Exempt Recreational Vehicles:

(i) The vehicle must have a current license required for highway use.

(ii) The vehicle must be highway ready, meaning on wheels or the internal jacking system, attached to the site only by quick disconnect type utilities commonly used in campgrounds and recreational vehicle parks.

(iii) No permanent structural type additions may be attached to the vehicle.

(iv) The vehicle and associated use must be permissible in any pre-existing, underlying zoning district.

(v) Accessory structures are not permitted within the Floodway District. Any accessory structure in the Flood Fringe District must be constructed of flood-resistant materials and be securely anchored, meeting the requirements applicable to manufactured homes in subsection 11-1101.9(2)(b).

(vi) An accessory structure must constitute a minimal investment.

(c) Recreational vehicles that are exempt in subsection 11-1101.9(2)(b) lose this exemption when development occurs on the site that exceeds a minimal investment for an accessory structure such as a garage or storage building. The recreational vehicle and all accessory structures will then be treated as new structures subject to the elevation and floodproofing requirements of subsection 11-1101.5. No development or improvement on the parcel or attachment to the recreational vehicle is allowed that would hinder the removal of the vehicle should flooding occur.

11-1101.10 Administration.

(1) Director. The Director must administer and enforce this Section.

(2) Permit Requirements.

(a) Permit Required. A permit must be obtained from the Director prior to conducting the following activities:

(i) The erection, addition, modification, rehabilitation, or alteration of any building, structure, or portion thereof Normal maintenance and repair also requires a permit if such work, separately or in conjunction with other planned work, constitutes a substantial improvement as defined in this Section.

(ii) The use or change of use of a building, structure, or land.

(iii) The construction of a dam, fence, or on-site septic system, although a permit is not required for a farm fence as defined in this Section.

(iv) The change or extension of a nonconforming use.

(v) The repair of a structure that has been damaged by flood, fire, tornado, or any other source.

(vi) The placement of fill, excavation of materials, or the storage of materials or equipment within the floodplain.

(vii) Relocation or alteration of a watercourse - including new or replacement culverts and bridges), unless a public waters work permit has been applied for.

(viii) Any other type of "development" as defined in this Section.

(b) Application for Permit. Permit applications must be submitted to the Director on forms provided by the Director. The permit application must include the following as applicable:

(i) A site plan showing all pertinent dimensions, existing or proposed buildings, structures, and significant natural features having an influence on the permit.

(ii) Location of fill or storage of materials in relation to the stream channel.

(iii) Copies of any required municipal, county, state or federal permits or approvals.

(iv) Other relevant information requested by the Director as necessary to properly evaluate the permit application.

(c)

Certificate of Zoning Compliance for a New, Altered, or Nonconforming Use. No building, land or structure may be occupied or used in any manner until a certificate of zoning compliance has been issued by the Director stating that the use of the building or land conforms to the requirements of this Section.

(d) Certification. The applicant is required to submit certification by a registered professional engineer, registered architect, or registered land surveyor that the finished fill and building elevations were accomplished in compliance with the provisions of this Section. Floodproofing measures must be certified by a registered professional engineer or registered architect.

(e) Record of First Floor Elevation. The Director must maintain a record of the elevation of the lowest floor (including basement) of all new structures and alterations or additions to existing structures in the floodplain. The Director must also maintain a record of the elevation to which structures and alterations or additions to structures are floodproofed.

(f) Notifications for Watercourse Alterations. Before authorizing any alteration or relocation of a river or stream, the Director must notify adjacent communities. If the applicant has applied for a permit to work in public waters pursuant to Minn. Stat. §103G.245, this will suffice as adequate notice. A copy of the notification must also be submitted to the Chicago Regional Office of the Federal Emergency Management Agency (FEMA).

(g) Notification to FEMA When Physical Changes Increase or Decrease Base Flood Elevations. As soon as is practicable, but not later than six months after the date such supporting information becomes available, the Director must notify the Chicago Regional Office of FEMA of the changes by submitting a copy of the relevant technical or scientific data.

(3) Variances.

(a) Variance Applications. An application for a variance to the provisions of this Section will be processed and reviewed in accordance with applicable state statutes and Section 11-304.9 of the City Code.

(b) Adherence to State Floodplain Management Standards. A variance must not allow a use that is not allowed in that district, permit a lower degree of flood protection than the regulatory flood protection elevation for the particular area, or permit standards lower than those required by state law.

(c) Additional Variance Criteria. The following additional variance criteria of the Federal Emergency Management Agency must be satisfied:

(i) Variances must not be issued by a community within any designated regulatory floodway if any increase in flood levels during the base flood discharge would result.

(ii) Variances may only be issued by a community upon (i) a showing of good and sufficient cause, (ii) a determination that failure to grant the variance would result in exceptional hardship to the applicant, and (iii) a determination that the granting of a variance will not

result in increased flood heights, additional threats to public safety, extraordinary public expense, create nuisances, cause fraud on or victimization of the public, or conflict with existing local laws or ordinances.

(iii) Variances may only be issued upon a determination that the variance is the minimum necessary, considering the flood hazard, to afford relief.

(d) Flood Insurance Notice. The Director must notify the applicant for a variance that: 1) The issuance of a variance to construct a structure below the base flood level will result in increased premium rates for flood insurance up to amounts as high as $25.00 for $100.00 of insurance coverage: and 2) Such construction below the base or regional flood level increases risks to life and property. Such notification must be maintained with a record of all variance actions.

(e) General Considerations. The community may consider the following factors in granting variances and imposing conditions on variances and conditional uses in floodplains:

(i) The potential danger to life and property due to increased flood heights or velocities caused by encroachments;

(ii) The danger that materials may be swept onto other lands or downstream to the injury of others;

(iii) The proposed water supply and sanitation systems, if any, and the ability of these systems to minimize the potential for disease, contamination and unsanitary conditions;

(iv) The susceptibility of any proposed use and its contents to flood damage and the effect of such damage on the individual owner;

(v) The importance of the services to be provided by the proposed use to the community;

(vi) The requirements of the facility for a waterfront location:

(vii) The availability of viable alternative locations for the proposed use that are not subject to flooding;

(viii) The compatibility of the proposed use with existing development and development anticipated in the foreseeable future;

(ix) The relationship of the proposed use to the Comprehensive Land Use Plan and flood plain management program for the area;

(x) The safety of access to the property in times of flood for ordinary and emergency vehicles;

(xi) The expected heights, velocity, duration, rate of rise and sediment transport of the flood waters expected at the site.

(f) Submittal of Hearing Notices to the Department of Natural Resources (DNR). The Director must submit hearing notices for proposed variances to the DNR sufficiently in advance to provide at least ten days' notice of the hearing. The notice may be sent by electronic mail or U.S. Mail to the respective DNR area hydrologist.

(g)

Submittal of Final Decisions to the DNR. A copy of all decisions granting variances must be forwarded to the DNR within ten days of such action. The notice may be sent by electronic mail or U.S. Mail to the respective DNR area hydrologist.

(h) Record-Keeping. The Director must maintain a record of all variance actions, including justification for their issuance, and must report such variances in an annual or biennial report to the Administrator of the National Flood Insurance Program, when requested by the Federal Emergency Management Agency.

(4) Conditional Uses.

(a) Administrative Review. An application for a conditional use permit under the provisions of this Section will be processed and reviewed in accordance with Section 11-304.3 of the City Code.

(b) Factors Used in Decision-Making. In passing upon conditional use applications, the City Council must consider all relevant factors specified in other sections of this Section, and those factors identified in subsection 11-1101.10(3)(e).

(c) Conditions Attached to Conditional Use Permits. The City Council may attach such conditions to the granting of conditional use permits as it deems necessary to fulfill the purposes of this Section. Such conditions may include, but are not limited to, the following:

(i) Modification of waste treatment and water supply facilities.

(ii) Limitations on period of use, occupancy, and operation.

(iii) Imposition of operational controls, sureties, and deed restrictions.

(iv) Requirements for construction of channel modifications, compensatory storage, dikes, levees, and other protective measures.

(v) Floodproofing measures, in accordance with the State Building Code and this Section. The applicant must submit a plan or document certified by a registered professional engineer or architect that the floodproofing measures are consistent with the regulatory flood protection elevation and associated flood factors for the particular area.

(d) Submittal of Hearing Notices to the Department of Natural Resources (DNR). The Director must submit hearing notices for proposed conditional uses to the DNR sufficiently in advance to provide at least ten days' notice of the hearing. The notice may be sent by electronic mail or U.S. Mail to the respective DNR area hydrologist.

(e) Submittal of Final Decisions to the DNR. A copy of all decisions granting conditional uses must be forwarded to the DNR within ten days of such action. The notice may be sent by electronic mail or U.S. Mail to the respective DNR area hydrologist.

11-1101.11 Nonconformities.

(1) Continuance of Nonconformities. A use, structure, or occupancy of land which was lawful before the passage or amendment of this Section but which is not in conformity with the provisions of this Section may be continued subject to the following conditions. Historic structures, as defined in subsection 11-1101.2(9)(y)(ii), are subject to the provisions of Sections 1011.11(1)(a)—1011.11(1)(f).

(a) A nonconforming use, structure, or occupancy must not be expanded, changed, enlarged, or altered in a way that increases its flood damage potential or degree of obstruction to flood flows except as provided in subsection 11-1101.11(1)(b) below. Expansion or enlargement of uses, structures or occupancies within the Floodway District is prohibited.

(b) Any addition or structural alteration to a nonconforming structure or nonconforming use that would result in increasing its flood damage potential must be protected to the regulatory flood protection elevation in accordance with any of the elevation on fill or floodproofing techniques (i.e., FP-1 thru FP-4 floodproofing classifications) allowable in the State Building Code, except as further restricted in subsection 11-1101.11(1)(a)-(c) and 11-1101.11(1)(g) below.

(c) If the cost of all previous and proposed alterations and additions exceeds 50 percent of the market value of any nonconforming structure, then the entire structure must meet the standards of subsection 11-1101.4 or 11-1101.5 for new structures depending upon whether the structure is in the Floodway or Flood Fringe District, respectively. The cost of all structural alterations and additions must include all costs such as construction materials and a reasonable cost placed on all manpower or labor.

(d) If any nonconforming use, or any use of a nonconforming structure, is discontinued for more than one year, any future use of the premises must conform to this Section. The Assessor must notify the Director in writing of instances of nonconformities that have been discontinued for a period of more than one year.

(e) If any nonconformity is substantially damaged, as defined in subsection 11-1101.2(9)(x), it may not be reconstructed except in conformity with the provisions of this Section. The applicable provisions for establishing new uses or new structures in subsection 11-1101.4 or 11-1101.5 will apply depending upon whether the use or structure is in the Floodway or Flood Fringe, respectively.

(f) If any nonconforming use or structure experiences a repetitive loss, as defined in subsection 11-1101.2.(9)(v) of this Section, it must not be reconstructed except in conformity with the provisions of this Section.

(g) Any substantial improvement, as defined in subsection 11-1101.2.(9)(y), to a nonconforming structure requires that the existing structure and any additions must meet the requirements of subsection 11-1101.4 or 11-1101.5 for new structures, depending upon whether the structure is in the Floodway or Flood Fringe District.

11-1101.12 Penalties and Enforcement.

(1) Violation Constitutes a Misdemeanor. Violation of the provisions of this Section or failure to comply with any of its requirements (including violations of conditions and safeguards established in connection with grants of variances or conditional uses) constitute a misdemeanor and will be punishable as defined by law.

(2)

Other Lawful Action. Nothing in this Section restricts the City from taking such other lawful action as is necessary to prevent or remedy any violation. If the responsible party does not appropriately respond to the Director within the specified period of time, each additional day that lapses will constitute an additional violation of this Section and will be prosecuted accordingly.

(3) Enforcement. In responding to a suspected ordinance violation, the Director and City Council may utilize the full array of enforcement actions available to it including but not limited to prosecution and fines, injunctions, after-the-fact permits, orders for corrective measures or a request to the National Flood Insurance Program for denial of flood insurance availability to the guilty party. The City must act in good faith to enforce these official controls and to correct ordinance violations to the extent possible so as not to jeopardize its eligibility in the National Flood Insurance Program.

(a) When a violation is either discovered by or brought to the attention of the Director, the Director shall immediately investigate the situation and document the nature and extent of the violation of the official control. As soon as it is reasonably possible, this information will be submitted to the appropriate State Department of Natural Resources and Federal Emergency Management Agency regional office along with the City's plan of action to correct the violation to the degree possible.

(b) The Director shall notify the suspected party of the requirements of this Chapter and all other official controls and the nature and extent of the suspected violation of these controls. If the structure and/or use is under construction or development, the Director may order the construction or development immediately halted until a proper permit or approval is granted by the City. If the construction or development is already completed, the Director may either: 1) issue an order identifying the corrective actions that must be made within a specified time period to bring the use or structure into compliance with the official controls; or 2) notify the responsible party to apply for an after the fact permit/development approval within a specified period of time not to exceed 30 days.

11-1101.13 Amendments.

(1) Floodplain Designation—Restrictions on Removal. The floodplain designation on the Official Zoning Map must not be removed from floodplain areas unless it can be shown that the designation is in error or that the area has been filled to or above the elevation of the regulatory flood protection elevation and is contiguous to lands outside the floodplain. Special exceptions to this rule may be permitted by the Commissioner of the Department of Natural Resources (DNR) if the Commissioner determines that, through other measures, lands are adequately protected for the intended use.

(2) Amendments Require DNR Approval. All amendments to this Section must be submitted to and approved by the Commissioner of the Department of Natural Resources (DNR) prior to adoption. The Commissioner must approve the amendment prior to community approval.

(3) Map Revisions Require Ordinance Amendments. The floodplain district regulations must be amended to incorporate any revisions by the Federal Emergency Management Agency to the floodplain maps adopted in subsection 11-1101.2(3).

(Ord. No. 2154 , 12-15-15)

Editor's note— Ord. No. 2154 , adopted Dec. 15, 2015, repealed the former § 11-1101 and enacted a new § 11-1101 as set out herein. The former § 11-1101 pertained to similar subject matter and derived from the original Code of 1982.

11-1001 - Mississippi River Corridor Critical Area Overlay District Boundaries

11-1001.1 Findings. The City of Coon Rapids finds that the Mississippi River Corridor is a unique and valuable local, state, regional, and national resource. The river is an essential element in local, regional, state, and national transportation, sewer and water, and recreational systems, and serves important biological and ecological functions. The prevention and mitigation of irreversible damage to this resource and the preservation and enhancement of its natural, aesthetic, cultural, and historic values is in furtherance of the health, safety, and general welfare of the City.

11-1001.2 Intent. The intent of this Chapter is to protect the health, safety, and public welfare through the adoption of controls that will:

(1) Promote orderly development of residential and recreational uses within the length of the Corridor located in the City.

(2) Conserve the natural and scenic beauty of the river Corridor.

(3) Conserve and develop the natural resources of the Corridor.

(4) Provide for the compatibility of different land uses and the most appropriate use of land throughout the Critical Area.

11-1001.3 Establishment of Mississippi River Corridor Critical Area Overlay District. A Mississippi River Corridor Critical Area Overlay District with its attendant regulations is hereby established as a part of the zoning ordinance of the City. This District shall overlay the zoning districts presently in existence, or as amended, so that any parcel of land lying in the Overlay District shall also lay in one or more of the underlying established zoning districts. Territory within the Overlay District shall be subject to the requirements established in this Section as well as restrictions and the requirements established by other applicable City Code regulations. Within the Overlay District, all uses shall be permitted in accordance with the regulations for the underlying zoning district or districts; provided, however, that such uses shall not be entitled to or have the appropriate development permit issued for, until they have first satisfied the additional requirements established in this Section.

11-1001.4 Land to Which Regulations Apply.

(1) This subsection applies to public and private lands within the Mississippi River Corridor Critical Area as set forth and legally described in the Metropolitan Council's "Recommendations for Critical Area Designation of the Mississippi River Corridor" (February 1975).

(2) The following regulations govern, but wherever there is a conflict between these regulations and other Title 11 Chapters and Sections, the more restrictive of the two shall apply.

11-1001.5 Permitted Uses. The "Urban Developed District" classification for the Coon Rapids Critical Area permits and encourages residential and recreational development.

(1) Residential uses permitted by the underlying zoning district.

(2) Recreational uses including public parks, trails, and easements.

11-1001.6 Accessory Uses.

(1) Accessory uses permitted and regulated by the underlying zoning district;

(2) Docks and boat houses; and

(3) Retaining walls as permitted by the State Department of Natural Resources and the Army Corps of Engineers.

11-1001.7 Conditional Uses. Permitted subject to regulations contained in the underlying zoning district; Section 11-1200—General District Standards; applicable county, state, and federal regulatory controls and policies, criteria contained in subsections 11-1001.8—District Standards, 11-1001.9—Natural Resource Management, and 11-1001.10—Guidelines for Review of Conditional Use Permit Applications.

(1) Transportation facilities;

(2) Utility distribution systems including water, sewer, electric (lines under 200 KV), and pipelines;

(3) Essential public services and public safety facilities; i.e., water towers, pumping stations, fire houses, and similar structures.

(4) Signs, except temporary and recreational or transportation related and regulated by 11-2100;

(5) Limited retail uses associated with recreational uses of the river corridor; and

(6) Conditional uses permitted by underlying zoning district.

11-1001.8 District Standards.

(1) Lot Size. Lot size shall be governed by the underlying zoning district.

(2) Structure Heights. Structure height shall be governed by the underlying zoning district.

(3) Structure Setback. In addition to setbacks detailed in the underlying zoning standards, the following shall apply:

(a) All new structures and facilities shall be placed no less than 40 feet from the top of the bluff line overlooking the Mississippi River;

(b) All new structures and facilities shall be placed no less than 100 feet from the Mississippi River's normal high water mark as defined by the United States Department of Housing and Urban Development's Coon Rapids Flood Insurance Study dated March 15, 1977. In areas subject to flooding (identified in the study), the City Floodplain Management Regulations, Section 11-1101 shall apply; and

(c) Exceptions to setback requirements may include public safety facilities, public bridges and approaches, minor public roadways serving water-related uses, public recreational facilities, scenic overlooks, regional and local trails, docks and boat launching facilities, approved river crossings of essential services, and distribution systems and historical sites designated in National and State Registers of Historical Places.

(4) Placement of Structures. No land with slopes, before alteration, in excess of 20 percent will be developed for use by any structure except for the construction of erosion control structures. Development on land with a slope, before alteration, in excess of 12 percent but less than 20 percent will be permitted, providing the applicant can ensure the project meets the following conditions:

(a) The foundation and underlying material of any structure, including roads, shall be adequate for the slope condition and soil type.

(b) The developer can demonstrate that development during and after construction can be accomplished without increasing erosion and there is a proper utilization of controls to reduce runoff to nondestructive levels.

(c) The proposed development presents no danger of falling rock, mud, uprooted trees, and other material to structures, recreational facilities, public lands, and public waters downhill.

(5) Line of Sight. Development of new expansion of existing structures shall be placed so that the development is consistent with the reasonable preservation of the view of the River Corridor from other properties on both sides of the river and by the public. The walling off of view of the River Corridor from other properties and public right-of-ways shall be minimized.

11-1001.9 Natural Resource Management.

(1) Grading and Filling. Grading and filling or otherwise changing the topography landward of the ordinary high water mark shall not be conducted without a permit. A permit may only be issued if the provisions of Section 11-1103, Mining and Land Reclamation, are complied with.

(2) Retaining Walls and Erosion Control Structures. Retaining walls and erosion control structures waterward of the normal high water mark are permitted structures if the applicable permits issued by the Army Corps of Engineers and the Minnesota Department of Natural Resources have been obtained.

(3) Vegetation Management.

(a) Clear cutting of trees on the slope or face of bluffs, within 40 feet of creeks and river banks, and within 40 feet landward of bluff lines shall not be permitted.

(b) The selective cutting of trees greater than four inches in diameter may be authorized by the Director when cutting in appropriately spaced and staged to maintain a continuous natural cover.

(c) Existing and planned vegetation shall be considered in structure siting and design. The development of new and reconstruction of existing structures shall be accomplished so as to minimize the need for tree removal.

(d) The applicant shall demonstrate that all grading which takes place will be conducted so as to preserve root zone aeration and stability of trees and provide an adequate watering area equal to at least one-half of each tree's crown cover.

(e) Exceptions to the above include the removal of diseased or damaged trees and vegetation removal required for the development of permitted uses.

(4) Standards for Surface Water Management and Erosion Control.

(a) Storm water runoff may be directed into public water bodies and drainage systems, provided that it is substantially free from silt, debris, and chemical pollutants, and only at rates that will not disturb vegetation or increase turbidity;

(b) Recontouring of areas within 300 feet landward of the bluff line will only be permitted if the developer can show that care will be taken to slow the rate of storm water runoff to levels that will not cause or exacerbate erosion problems; or

(c) Structures, trails, and roads shall be sited to minimize levels of pedestrian and vehicular traffic in areas where soil compaction and loss of vegetative cover can contribute to erosion problems.

11-1001.10 Guidelines for Review of Conditional use Permit Applications. The Planning Commission may grant a conditional use permit if the developer can show he has addressed the following concerns:

(1) New Construction Guidelines.

(a) Primary consideration will be given to facilities within or adjacent to existing right-of-ways and locations.

(b) Structures shall be as compatible as practical with the natural area with regard to height and width, materials used, and color.

(c) Facilities shall be located so as to avoid steep slopes.

(2) Scenic intrusions into streams, valleys, and open exposures of water.

(3) Creating tunnel vistas by, for example, building deflections into utility and transportation routes.

(4) Soils susceptible to erosion which would create sedimentation and pollution problems.

(5) Areas of unstable soils which would be subject to extensive slippage.

(6) Areas with high water tables, especially if construction requires excavation.

(7) Open space recreation areas, unless no other option, excluding the destruction of residences, is possible.

(8) Transmission Services.

(a) Primary consideration shall be given to underground placement in order to minimize aesthetic, environmental, and public safety impacts. When considering overhead placement, the proposer shall explain the economic, technological, or land characteristic factors that make underground placement feasible.

(b) If overhead placement is necessary, the crossing shall be hidden from view as much as practical.

(c) As noted above, consideration shall be given to placing services on existing right-of-ways. Joint ownership of easements to facilitate this goal is encouraged. Consideration should also be given to locating new river crossings on the North Crosstown Bridge.

(9) Transportation Facilities.

(a) Careful consideration should be given to the provision of scenic overlooks for motorists and safe pedestrian and/or bicycle pathways on new or rebuilt transportation facilities.

(b)

Where possible provide access to the riverfront in public ownership and allow reasonable public use of the land between the river and transportation facility. River crossings should be designed to permit the co-development of trail corridors both on and under the crossing.

(10) Right-of-way Maintenance.

(a) If possible, natural vegetation of value to fish or wildlife which does not pose a hazard to or restrict reasonable use of the utility shall be allowed to grow in the right-of-way.

(b) Where vegetation has been removed, new vegetation consisting of native grasses, herbs, shrubs, and low growing trees, shall be planted and maintained on the right-of-way.

(c) Chemical control of vegetation should be avoided when practical, but where such methods are necessary, chemicals used, and the manner of their use must be in accordance with rules, regulations, and other requirements of all State and Federal agencies with authority over the use.

11-1001.11 Definitions. For purposes of this Section, the following definitions of terms shall apply:

(1) Bluff. Those steep slopes lying between the normal high water mark and the River Corridor boundary having an angle of ascent, proceeding landward from the river, of more than 12 percent from the horizontal.

(2) Bluff Line. A line delineating the top of a slope connecting the points at which the slope becomes less than 12 percent. More than one bluff line may be encountered proceeding landward from the river.

(3) Clear Cutting. The indiscriminate cutting down of large numbers of trees in a given area.

(4) Critical Area. The area known as the Mississippi River Corridor Critical Area designated by the Governor in the Executive Order No. 130 dated November 1976.

(5) Development. The making of any material change in the use or appearance of any structure or land including, but not limited to, a reconstruction, alteration of the size, the land, alteration of a shore or bank of the river, stream, lake, or pond; a commencement of drilling (except to obtain soil samples), mining or excavation; demolition of a structure, clearing of land as an adjunct to construction; deposit of refuse, solid or liquid waste, or fill on a parcel of land; and the dividing of land into three or more parcels.

(6) Essential Services. Means underground or overhead gas, electrical, steam, or water distribution systems, including poles, wires, mains, drains, sewer pipes, conduits, cables, and other similar equipment and accessories in conjunction therewith.

(7) Public Safety Facilities. Hydrants, fire alarm boxes, streetlights, railway crossings signals, and similar accessories including buildings.

(8) Retaining Wall. A structure utilized to hold a slope in a position in which it would not naturally remain in.

(9) Terrace. A relatively level area bordered on one or more sides by retaining walls.

(10)

Utility Facility. Physical facilities of electric, telephone, telegraph, cable, television, water, sewer, solid waste, gas, and similar service operations.

(11) Wetlands. Low-lying areas which may be covered with shallow and sometimes intermittent water. They are frequently associated with a high water table. Wetlands are generally too wet for cultivation or development without artificial drainage. Swamps, bogs, marshes, potholes, wet meadows, and sloughs are wetlands.

CHAPTER 13-1400 - ILLICIT DISCHARGES AND CONNECTIONS TO THE STORMWATER SYSTEM

13-1401 - Purpose/Intent.

The purpose of this Chapter is to provide for the health, safety, and general welfare of the citizens of the City of Coon Rapids through the regulation of non-storm water discharges to the storm drainage system to the maximum extent practicable as required by federal and state law. This Chapter establishes methods for controlling the introduction of pollutants into the municipal separate storm sewer system (MS4) in order to comply with requirements of the National Pollutant Discharge Elimination System (NPDES) permit process. The objectives of this Chapter are:

(1) To regulate the contribution of pollutants to the MS4 by stormwater discharges by any user.

(2) To prohibit illicit connections and discharges to the MS4.

(3) To establish legal authority to carry out all inspection, surveillance and monitoring procedures necessary to ensure compliance with this Chapter.

13-1402 - Definitions.

For the purposes of this Chapter, the following will mean:

(1) "Authorized Enforcement Agency" is the City of Coon Rapids.

(2) "Best Management Practices (BMPs)" are schedules of activities, prohibitions of practices, general good house keeping practices, pollution prevention and educational practices, maintenance procedures, and other management practices to prevent or reduce the discharge of pollutants directly or indirectly to stormwater, receiving waters, or stormwater conveyance systems. BMPs also include treatment practices, operating procedures, and practices to control site runoff, spillage or leaks, sludge or water disposal, or drainage from raw materials storage.

(3) "Clean Water Act" is the federal Water Pollution Control Act (33 U.S.C. § 1251 et seq.), and any subsequent amendments thereto.

(4) "Construction Activity" is any activity subject to NPDES Construction Permits. These include construction projects resulting in land disturbance of one acre or more. Such activities include but are not limited to clearing and grubbing, grading, excavating, and demolition.

(5) "Hazardous Material" is any material, including any substance, waste, or combination thereof, which because of its quantity, concentration, or physical, chemical, or infectious characteristics may cause, or significantly contribute to, a substantial present or potential hazard to human health, safety, property, or the environment when improperly treated, stored, transported, disposed of, or otherwise managed.

(6) "Illegal Discharge" is any direct or indirect non-storm water discharge to the storm drain system, except as exempted in this Chapter.

(7) "Illicit Connections" is defined as any drain or conveyance, whether on the surface or subsurface, which allows an illegal discharge to enter the storm drain system including but not limited to any conveyances which allow any non-storm water discharge including sewage, process wastewater, and wash water to enter the storm drain system and any connections to the storm drain system from indoor drains and sinks, regardless of whether said drain or connection had been previously allowed, permitted, or approved by an authorized enforcement agency or, any drain or conveyance connected from a commercial or industrial land use to the storm drain system which has not been documented in plans, maps, or equivalent records and approved by an authorized enforcement agency.

(8) "Industrial Activity" is any activity subject to NPDES Industrial Permits as defined in 40 CFR, Section 122.26 (b)(14).

(9) "National Pollutant Discharge Elimination System (NPDES) Storm Water Discharge Permit" is a permit issued by MPCA that authorizes the discharge of pollutants to waters of the United States, whether the permit is applicable on an individual group, or general area-wide basis.

(10) "Non-Storm Water Discharge" is any discharge to the storm drain system that is not composed entirely of storm water.

(11) "Person" is defined in other Sections as: Any one or more natural persons; a partnership, including a limited partnership; a corporation, including a foreign, domestic or non-profit corporation; a trust; a political subdivision of the state; or any other business organization.

(12) "Pollutant" is anything which causes or contributes to pollution. Pollutants may include, but are not limited to: paints, varnishes, and solvents; oil and other automotive fluids; non-hazardous liquid and solid wastes and yard wastes; refuse, rubbish, garbage, litter, or other discarded or abandoned objects, pesticides, herbicides, and fertilizers; hazardous substances and wastes and residues that result from constructing a building or structure; and noxious or offensive matter of any kind.

(13) "Premises" is any building, lot, parcel of land, or portion of land whether improved or unimproved including adjacent sidewalks and parking strips.

(14) "Storm Drain System" is the publicly-owned facilities by which storm water is collected and/or conveyed, including but not limited to any roads with drainage systems, municipal streets, gutters, curbs, inlets, piped storm drains, pumping facilities, retention and detention basins, natural and human-made or altered drainage channels, reservoirs, and other drainage structures.

(15) "Storm Water" is any surface flow, runoff, and drainage consisting entirely of water from any form of natural precipitation, and resulting from such precipitation.

(16) "Stormwater Pollution Prevention Plan" is a document which describes the Best Management Practices and activities to be implemented by a person or business to identify sources of pollution or contamination at a site and the actions to eliminate or reduce pollutant discharges to stormwater, stormwater conveyance systems, and/or receiving waters to the maximum extent practicable.

(17) "Wastewater" is any water or other liquid, other than uncontaminated storm water, discharged from a facility.

13-1403 - Applicability.

This Chapter shall apply to all water entering the storm drain system generated on any developed or undeveloped lands unless explicitly exempted by an authorized enforcement agency.

13-1404 - Responsibility for Administration.

The City of Coon Rapids shall administer, implement, and enforce the provisions of this Chapter. Any powers granted or duties imposed upon the City of Coon Rapids may be delegated in writing by the City Administrator to persons or entities acting in the beneficial interest of or in the employ of the City of Coon Rapids.

13-1405 - Severability.

The provisions of this Chapter are hereby declared to be severable. If any provision, clause, sentence, or paragraph of this Chapter or the application thereof to any person, establishment, or circumstances shall be held invalid, such invalidity shall not affect the other provisions or application of this Chapter.

13-1406 - Ultimate Responsibility.

The standards set forth herein and promulgated pursuant to this Chapter are minimum standards; therefore this Chapter does not intend or imply that compliance by any person will ensure that there will be no contamination, pollution, nor unauthorized discharge of pollutants.

13-1407 - Discharge Prohibitions.

(1) Prohibition of Illegal Discharges. No person shall discharge or cause to be discharged into the street, road, alley, catch basin, culvert, curb, gutter, inlet, ditch, water course, flood control channel, canal, storm drain, or municipal storm drain system any materials, including but not limited to leaves, dirt, landscape debris, trash, pollutants, or waters containing any pollutants that cause or contribute to a violation of applicable water quality standards, other than storm water. The commencement, conduct or continuance of any illegal discharge to the storm drain system is prohibited except as described as follows:

(a) The following discharges are exempt from discharge prohibitions established by this Chapter: water line flushing or other potable water sources, landscape irrigation or lawn watering, diverted stream flows, rising ground water, ground water infiltration to storm drains, uncontaminated pumped ground water, foundation or footing drains (not including active groundwater dewatering

systems), crawl space pumps, air conditioning condensation, springs, noncommercial washing of vehicles, natural riparian habitat or wetland flows, swimming pools (if de-chlorinated to less than 0.1 Parts Per Million), fire fighting activities, and any other water source not containing pollutants.

(b) Discharges specified in writing by the authorized enforcement agency as being necessary to protect public health and safety.

(c) Dye testing is an allowable discharge, but requires a verbal notification to the authorized enforcement agency prior to the time of the test.

(d) The prohibition shall not apply to any non-storm water discharge permitted under an NPDES permit, waiver, or waste discharge order issued to the discharger and administered under the authority of the Federal Environmental Protection Agency, provided that the discharger is in full compliance with all requirements of the permit, waiver, or order and other applicable laws and regulations, and provided that written approval has been granted for any discharge to the storm drain system.

(2) Prohibition of Illicit Connections.

(a) The construction, use, maintenance or continued existence of illicit connections to the storm drain system is prohibited.

(b) This prohibition expressly includes, without limitation, illicit connections made in the past, regardless of whether the connection was permissible under law or practices applicable or prevailing at the time of the connection.

(c) A person is considered to be in violation of this Chapter if the person connects a line conveying sewage to the MS4, or allows such a connection to continue.

13-1408 - Suspension of MS4 Access.

(1) Suspension due to Illicit Discharges in Emergency Situations. The City Council may, without prior notice, suspend MS4 discharge access to a person when such suspension is necessary to stop an actual or threatened discharge which presents or may present imminent and substantial danger to the environment, or to the health or welfare of persons, or to the MS4 or Waters of the United States. If the violator fails to comply with a suspension order issued in an emergency, the authorized enforcement agency may take such steps as deemed necessary to prevent or minimize damage to the MS4 or Waters of the United States, or to minimize danger to persons.

(2) Suspension due to the Detection of Illicit Discharge. Any person discharging to the MS4 in violation of this Chapter may have their MS4 access terminated if such termination would abate or reduce an illicit discharge. The authorized enforcement agency will notify a violator of the proposed termination of its MS4 access. The violator may petition the authorized enforcement agency for reconsideration and a hearing. A person commits an offense if the person reinstates MS4 access to premises terminated pursuant to this Section, without the prior approval of the authorized enforcement agency.

13-1409 - Industrial or Construction Activity Discharges.

Any person subject to an industrial or construction activity NPDES storm water discharge permit shall comply with all provisions of such permit. Proof of compliance with said permit shall be noticed in writing to the City Manager 60 days prior to the conditional approval of discharges to the MS4.

13-1410 - Monitoring of Discharges.

(1) Applicability. This section applies to all facilities that have storm water discharges associated with industrial activity, including construction activity.

(2) Access to Facilities.

(a) The authorized enforcement agency or its designee shall be permitted to enter and inspect facilities subject to regulation under this Chapter as often as may be necessary to determine compliance with this Chapter. If a discharger has security measures in force which require proper identification and clearance before entry into its premises, the discharger shall make the necessary arrangements to allow access to representatives of the authorized enforcement agency.

(b) Facility operators shall allow the authorized enforcement agency ready access to all parts of the premises for the purposes of inspection, sampling, examination and copying of records that must be kept under the conditions of an NPDES permit to discharge storm water, and the performance of any additional duties as defined by state and federal law.

(c) The authorized enforcement agency shall have the right to set up on any permitted facility such devices as are necessary in the opinion of the authorized enforcement agency to conduct monitoring and/or sampling of the facility's storm water discharge.

(d) The authorized enforcement agency has the right to require the discharger to install monitoring equipment as necessary. The facility's sampling and monitoring equipment shall be maintained at all times in a safe and proper operating condition by the discharger at its own expense. All devices used to measure stormwater flow and quality shall be calibrated to ensure their accuracy.

(e) Any temporary or permanent obstruction to safe and easy access to the facility to be inspected and/or sampled shall be promptly removed by the discharger at the written or oral request of the authorized enforcement agency and shall not be replaced. The costs of clearing such access shall be borne by the discharger.

(f) Unreasonable delays in allowing the authorized enforcement agency access to a permitted facility is a violation of a storm water discharge permit and of this Chapter. A person who is the operator of the facility with a NPDES permit to discharge storm water associated with industrial activity commits an offense if the person denies the authorized enforcement agency reasonable access to the permitted facility for the purpose of conducting any activity authorized or required by this Chapter.

(g) If the authorized enforcement agency has been refused access to any part of the premises from which stormwater is discharged, and the City is able to demonstrate probable cause to believe that there may be a violation of this Chapter, or that there is a need to inspect and/or sample as part of

a routine inspection and sampling program designed to verify compliance with this Chapter or any order issued hereunder, or to protect the overall public health, safety and welfare of the community, then the authorized enforcement agency may seek issuance of a search warrant from any court of competent jurisdiction.

13-1411 - Requirement to Prevent, Control, and Reduce Storm Water Pollutants by the use of Best Management Practices.

The City will adopt requirements identifying Best Management Practices (BMPs) of any activity, operation, or facility which may cause or contribute to pollution or contamination of storm water, the storm drain system, or waters of the U.S.

The owner or operator of a commercial or industrial establishment shall provide, at their own expense, reasonable protection from accidental discharge of prohibited materials or other wastes into the municipal storm drain system or watercourses through the use of these structural and non-structural BMPs. Further, any person responsible for a property or premise, which is, or may be, the source of an illicit discharge, may be required to implement, at said person's expense, additional structural and non-structural BMPs to prevent the further discharge of pollutants to the municipal separate storm sewer system. Compliance with all terms and conditions of a valid NPDES permit authorizing the discharge of storm water associated with industrial activity, to the extent practicable, shall be deemed compliant with the provisions of this section. These BMPs shall be part of a storm water pollution prevention plan (SWPPP) as necessary for compliance with requirements of the NPDES permit.

13-1412 - Watercourse Protection.

Every person owning property through which a watercourse passes, or such person's lessee, shall keep and maintain that part of the watercourse within the property free of trash, debris, excessive vegetation, and other obstacles that would pollute, contaminate, or significantly retard the flow of water through the watercourse. In addition, the owner or lessee shall maintain existing privately owned structures within or adjacent to a watercourse, so that such structures will not become a hazard to the use, function, or physical integrity of the watercourse.

13-1413 - Notification of Spills.

Notwithstanding other requirements of law, as soon as any person responsible for a facility or operation or responsible for emergency response for a facility or operation has information of any known or suspected release of materials which are resulting or may result in illegal discharges or pollutants discharging into storm water, the storm drain system, or water of the United States, said person shall take all necessary steps to ensure the discovery, containment, and cleanup of such release. In the event of such a release of hazardous materials said person shall immediately notify emergency response agencies of the occurrence via emergency dispatch services. In the event of a release of non-hazardous materials, said

person shall notify the authorized enforcement agency in person or by phone or facsimile no later than the next business day. Notifications in person or by phone shall be confirmed by written notice addressed and mailed to the City within three business days of the phone notice. If the discharge of prohibited materials emanates from a commercial or industrial establishment, the owner or operator of such establishment shall also retain an on-site written record of the discharge and the actions taken to prevent its recurrence. Such records shall be retained for at least three years.

13-1414 - Enforcement.

(1) Notice of Violation. Whenever the City finds that a person has violated a prohibition or failed to meet a requirement of this Chapter, the authorized enforcement agency may order compliance by written notice of violation to the responsible person. Such notice may require without limitation:

(a) The performance of monitoring, analysis, and reporting;

(b) The elimination of illicit connections or discharges;

(c) That violating discharges, practices, or operations shall cease and desist;

(d) The abatement or remediation of storm water pollution or contamination hazards and the restoration of any affected property;

(e) Payment of a fine to cover administrative and remediation costs; and

(f) The implementation of source control or treatment BMPs. If abatement of a violation and/or restoration of affected property is required, the notice shall set forth a deadline within which such remediation or restoration must be completed. Said notice shall further advise that, should the violator fail to remediate or restore within the established deadline, the work will be done by a designated governmental agency or a contractor and the expense thereof shall be charged to the violator.

(2) Enforcement Measures after Appeal. If the violation has not been corrected pursuant to the requirements set forth in the Notice of Violation, or, in the event of an appeal, within 15 days of the decision of the municipal authority upholding the decision of the authorized enforcement agency, then representatives of the authorized enforcement agency shall enter upon the subject private property and are authorized to take any and all measures necessary to abate the violation and/or restore the property. It shall be unlawful for any person, owner, agent or person in possession of any premises to refuse to allow the government agency or designated contractor to enter upon the premises for the purposes set forth above.

(3) Cost of Abatement of the Violation. Within 30 days after abatement of the violation, the owner of the property will be notified of the cost of abatement, including administrative costs. The property owner may file a written protest objecting to the amount of the assessment within 15 days. If the amount due is not paid within a timely manner as determined by the decision of the municipal authority, the

charges shall become a special assessment against the property and shall constitute a lien on the property for the amount of the assessment. Any person violating any of the provisions of this article shall become liable to the City by reason of such violation.

(4) Injunctive Relief. It shall be unlawful for any person to violate any provision or fail to comply with any of the requirements of this Chapter. If a person has violated and continues to violate the provisions of this Chapter, the authorized enforcement agency may petition for a preliminary or permanent injunction restraining the person from activities which would create further violations or compelling the person to perform abatement or remediation of the violation.

(5) Compensatory Action. In lieu of enforcement proceedings, penalties, and remedies authorized by this Chapter, the authorized enforcement agency may impose upon violator alternative compensatory actions, such as storm drain stenciling, attendance at compliance workshops, creek cleanup, etc.

(6) Violations Deemed a Public Nuisance. In addition to the enforcement processes and penalties provided, any condition caused or permitted to exist in violation of any of the provisions of this Chapter is a threat to public health, safety, and welfare, and is declared and deemed a nuisance, and may be summarily abated or restored at the violator's expense, and/or a civil action to abate, enjoin, or otherwise compel the cessation of such nuisance may be taken.

(7) Criminal Prosecution. Any person that has violated or continues to violate this Chapter shall be liable to criminal prosecution to the fullest extent of the law, and shall be subject to a criminal penalty of $1,000 dollars per violation per day and/or imprisonment for a period of time not to exceed 90 days. The authorized enforcement agency may recover all attorney's fees, court costs, and other expenses associated with enforcement of this Chapter, including sampling and monitoring expenses.

[Adopted 5/4/10, Ordinance 2034]

11-1102 - Wetland Management Regulations.

11-1102.1 Purpose. The purpose of these regulations is to achieve the policies described in the City's Wetland Management Plan relating to the protection and management of wetlands.

11-1102.2 Administration. The City Council hereby designates the Director of Public Services as the Administrator of these regulations. The City of Coon Rapids is the Local Government Unit (LGU) for the Wetland Conservation Act (WCA).

11-1102.3 Definitions. For the purpose of this Chapter the following definitions apply:

(1) Buffer. An upland area covered with natural vegetation (preferably native vegetation) that experienced little to no human impact such as mowing or fertilizer application.

(2) Best Management Practices (BMPs). Guidance and design criteria for storm water management facilities contained within the Minnesota Pollution Control Agency's publication entitled, "Protecting Water Quality in Urban Areas", dated March 2000 and as amended.

(3) City Wetland Management Plan Map. This map was developed as part of the Wetland Management Plan and shows the general locations of wetlands within the City. While an attempt was made to locate all wetlands within the City, omission of a wetland from this map does not exclude that wetland from this regulation.

(4) Minnesota Department of Natural Resources ("DNR") Protected Waters/Wetlands. Those water bodies that the Minnesota Department of Natural Resources has jurisdiction over up to the Ordinary High Water Level as noted on the DNR Protected Water and Wetland Inventory Map.

(5) Growing Season. The portion of the year when soil temperatures are above biologic zero in the upper part. In the Metro Area, the growing season is generally between April 21 and October 15.

(6) High Water Level (HWL). The 100-year water elevation of a water body determined by a hydrologic/hydraulic model.

(7) New Wetland Credit (NWC). Wetland replacement credit that can be used for any portion of wetland replacement as specified in the Wetland Conservation Act, as amended.

(8) Normal Water Level (NWL). The water elevation of the water body at the lowest controlling elevation as determined by an outlet structure, pump, etc. The Normal Water Level does not reflect the lowest elevation that may be attained naturally by infiltration, evaporation, or transpiration.

(9) Public Value Credit (PVC). The wetland replacement credit that can only be used for the portion of wetland replacement required above a 1:1 ratio.

(10) Sequencing. A five-step process outlined in the Wetland Conservation Act that evaluates the necessity of a project's impact on a wetland.

(11) Technical Evaluation Panel (TEP). A panel consisting of the Local Government Unit, the local Board of Water and Soil Resources board conservationist, a member of the Soil and Water Conservation District. This panel provides technical wetland support to the Local Government Unit.

(12)

Wetland. Lands transitional between terrestrial and aquatic systems where the water table is usually at or near the surface of the land is covered by shallow water. See also Minnesota Rules 8421.0110, subp. 53.

11-1102.4 Wetland Management.

(1) Boundaries. This regulation shall apply to those areas which are defined as jurisdictional wetland as per the *1987 Manual for Delineating and Identifying Jurisdictional Wetlands* . These areas are shown in general on the City's Wetland Management Plan map. This map also shows the management classifications for each wetland that pertain to this regulation. These areas shall be field identified by the applicant's trained wetland professional and reviewed for accuracy by the Administrator if work is proposed within or adjacent to the wetland. The presence or absence of a wetland on the City's Wetland Management Plan map does not represent a definitive determination as to whether a wetland covered by this regulation is present or not. It is the responsibility of the applicant to determine whether a wetland exists on a subject property.

(2) Application. The applicant shall submit the Minnesota Local/State/Federal Application Forms for Water/Wetland Projects to the Administrator for approval prior to any work that will impact wetlands. The Administrator shall follow the review timelines and notice requirements as outlined in the Wetland Conservation Act as set forth in Minnesota Rules Chapter 8420, as amended.

(3) Wetland Regulations. The Wetland Conservation Act, as amended, and the rules implementing the Wetland Conservation Act as set forth in Minnesota Rules Chapter 8420, as amended, are incorporated as part of these regulations and shall govern draining, filling, and dredging in wetlands. Where the City's Wetland Management Plan deviates from the Wetland Conservation Act, the Wetland Management Plan shall apply.

(4) Wetland Management. Wetlands within the City shall be managed as outlined below:

(a) Wetland Buffers. Average buffer zones with a minimum buffer width of 15 feet around existing wetlands will be required for all new or redevelopment as follows:

Preserve: 40 feet

Manage 1: 25 feet for wetlands less than two acres

35 feet for wetlands larger than two acres

Manage 2: 15 feet for wetlands less than two acres

25 feet for wetlands larger than two acres

Manage 3: 15 feet

Restore: 25 feet

Storm Ponds: 15 feet

These buffer zones will be platted as easements and marked with monumentation. Public trails or sidewalks that are a maximum of 10 feet in width can be included within the buffer provided the designated buffer width is maintained. Private access to a water body will be allowed provided that the dock or access is no more than 30 feet wide along the shoreline or one-half the width of the lot, whichever is less. Public water body access is not regulated by this ordinance. Storm water ponds are allowed within the buffer. A buffer commensurate with the width required for the wetland impacted is also required around newly created wetland mitigation sites. If the applicant believes that implementation of the buffer is a hardship, the applicant may apply for a variance in accordance with subsection 11-304.9.

(b) Storm Water Management. Storm water runoff directed to the wetlands will be required to be managed as follows and as outlined in the Comprehensive Storm Water Management Plan:

Preserve: Maintenance of existing bounce for a 10-year storm if feasible; Pretreatment for sediment and nutrients.

Manage 1: Limit bounce to existing plus 0.5 ft for 10-year storm if feasible. Pretreatment for sediment and nutrients.

Manage 2: Limit bounce to existing level plus 1.0 ft for 10-year storm if feasible. Pretreatment for sediment and nutrients.

Manage 3: No limit on bounce. Can be used for storm water management and treatment.

Restore: Limit bounce to existing level plus 1.0 ft for a 10- year storm if feasible. Pretreatment for sediment and nutrients.

Storm Ponds: Use for storm water management.

If the applicant believes that implementation of the buffer is a hardship, the applicant may apply for a variance in accordance with subsection 11-304.9.

(c) Wetland Sequencing. Sequencing for the different management classifications will be as follows:

Preserve: Impacts allowed only under extreme hardship. Sequencing must be in conformance with the WCA.

Manage 1: Sequencing in conformance with WCA.

Manage 2: Sequencing in conformance with WCA.

Manage 3: Significant sequencing flexibility provided.

Restore: Sequencing in conformance with WCA.

Storm Ponds: No sequencing required as storm ponds not within the jurisdiction of the WCA.

(d) Wetland Mitigation Requirements. Wetland mitigation for unavoidable impacts is required as described below. Actions eligible for wetland mitigation credit are outlined within the Wetland Conservation Act.

Preserve: Replacement at 3:1 ratio with 1.5 acres of NWC minimum and 1.5 acres of PVC maximum.

Manage 1: 2:1 with 1 acre of NWC minimum and 1 acre of PVC maximum.

Manage 2: 2:1 with 1 acre of NWC minimum and 1 acre of PVC maximum.

Manage 3: 2:1 with 1 acre of NWC minimum and 1 acre of PVC maximum.

Restore: 2:1 with 1 acre of NWC minimum and 1 acre of PVC maximum.

Storm Ponds: No mitigation required.

Mitigation for passive recreation projects such as trails, scenic overlooks, and benches will be at a 1:1 ratio with 0.5 acres of NWC minimum and 0.5 acres of PVC maximum for every acre of impacted wetland. The City will maintain an overall 2:1 ratio of mitigation in the City as outlined in the Wetland Management Plan.

11-1102.5 Exemptions. Those exemptions outlined in the Wetland Conservation Act as set forth in Minnesota Rules Chapter 8420.0420 are exempt from this Section.

11-1102.6 Performance Bond Required. If an Application includes wetland or buffer strip alteration, the Applicant must file with the Administrator prior to release of the final plat, or if there is no plat involved, prior to the first building permit for the subject property, a performance bond, cash escrow, or letter of credit, surety, or other guarantee acceptable to the Administrator and in an amount determined by the Administrator.

11-1102.7 Appeals and Enforcement.

(1) Enforcement. Enforcement of the Wetland Conservation Act shall be in accordance with Minnesota Rules 8420.0100.

(2) Appeals. The management classification of a wetland can be appealed by the landowner, project proposer, or other interested party. This appeal must be submitted to the Administrator in writing and include documentation supporting the reasons for placing a wetland into a different management category. This written appeal must be submitted to the Administrator prior to or along with the wetland impact permit application. A fee will be required for each wetland being appealed. The appeal will be reviewed by City Staff and the Technical Evaluation Panel. A decision will be made regarding the appeal within 60 days of receipt of the appropriate documentation. If the appeal is submitting outside of the growing season, the decision will be made 60 days after the start of the growing season.

8-111 - Deposit of Materials on City Streets Prohibited.

No person shall deposit or permit to be deposited on any public street in this City, leaves, grass, sand or similar materials, nor shall any person plow, shovel or blow or permit the plowing, shoveling or blowing of snow onto a public street in the City. Violation of this provision shall constitute a petty misdemeanor. This provision shall not apply to any person who is in the process of constructing or maintaining a yard or drive provided that the materials are immediately removed from the street.

Appendix C – MS4 Documents

Minnesota Pollution Control Agency
520 Lafayette Road North
St. Paul, MN 55155-4194

MS4 SWPPP Application for Reauthorization

for the NPDES/SDS General Small Municipal Separate Storm Sewer System (MS4) Permit MNR040000 reissued with an effective date of August 1, 2013

Stormwater Pollution Prevention Program (SWPPP) Document

Doc Type: Permit Application

Instructions: This application is for authorization to discharge stormwater associated with Municipal Separate Storm Sewer Systems (MS4s) under the National Pollutant Discharge Elimination System/State Disposal System (NPDES/SDS) Permit Program. **No fee** is required with the submittal of this application. Please refer to "Example" for detailed instructions found on the Minnesota Pollution Control Agency (MPCA) MS4 website at http://www.pca.state.mn.us/ms4.

Submittal: This *MS4 SWPPP Application for Reauthorization* form must be submitted electronically via e-mail to the MPCA at ms4permitprogram.pca@state.mn.us from the person that is duly authorized to certify this form. All questions with an asterisk (*) are required fields. All applications will be returned if required fields are not completed.

Questions: Contact Claudia Hochstein at 651-757-2881 or claudia.hochstein@state.mn.us, Dan Miller at 651-757-2246 or daniel.miller@state.mn.us, or call toll-free at 800-657-3864.

General Contact Information (*Required fields)

MS4 Owner (with ownership or operational responsibility, or control of the MS4)

*MS4 permittee name: Coon Rapids *County: Anoka
(city, county, municipality, government agency or other entity)

*Mailing address: 11155 Robinson Drive

*City: Coon Rapids *State: MN *Zip code: 55448

*Phone (including area code): 763-767-6494 *E-mail: thimmer@ci.coon-rapids.mn.us

MS4 General contact (with Stormwater Pollution Prevention Program [SWPPP] implementation responsibility)

*Last name: Himmer *First name: Tim
(department head, MS4 coordinator, consultant, etc.)

*Title: Public Works Director

*Mailing address: 11155 Robinson Drive

*City: Coon Rapids *State: MN *Zip code: 55448

*Phone (including area code): 763-767-6494 *E-mail: thimmer@ci.coon-rapids.mn.us

Preparer information (complete if SWPPP application is prepared by a party other than MS4 General contact)

Last name: Fristed First name: Travis
(department head, MS4 coordinator, consultant, etc.)

Title: Environmental Scientist/Technical Associate

Mailing address: 701 Xenia Avenue South, Suite 300

City: Minneapolis State: MN Zip code: 55416

Phone (including area code): 763-287-7169 E-mail: tfristed@wsbeng.com

Verification

1. I seek to continue discharging stormwater associated with a small MS4 after the effective date of this Permit, and shall submit this *MS4 SWPPP Application for Reauthorization* form, in accordance with the schedule in Appendix A, Table 1, with the SWPPP document completed in accordance with the Permit (Part II.D.). ☒ Yes
2. I have read and understand the NPDES/SDS MS4 General Permit and certify that we intend to comply with all requirements of the Permit. ☒ Yes

Certification (All fields are required)

☒ Yes - *I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted.*

I certify that based on my inquiry of the person, or persons, who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete.

I am aware that there are significant penalties for submitting false information, including the possibility of civil and criminal penalties.

This certification is required by Minn. Stat. §§ 7001.0070 and 7001.0540. The authorized person with overall, MS4 legal responsibility must certify the application (principal executive officer or a ranking elected official).

By typing my name in the following box, I certify the above statements to be true and correct, to the best of my knowledge, and that this information can be used for the purpose of processing my application.

Name: Tim Himmer
(This document has been electronically signed)

Title: Public Works Director Date (mm/dd/yyyy): 12/23/2013

Mailing address: 11155 Robinson Drive

City: Coon Rapids State: MN Zip code: 55448

Phone (including area code): 763-767-6494 E-mail: thimmer@ci.coon-rapids.mn.us

Note: *The application will not be processed without certification.*

Stormwater Pollution Prevention Program Document

I. Partnerships: (Part II.D.1)

A. List the **regulated small MS4(s)** with which you have established a partnership in order to satisfy one or more requirements of this Permit. Indicate which Minimum Control Measure (MCM) requirements or other program components that each partnership helps to accomplish (List all that apply). Check the box below if you currently have no established partnerships with other regulated MS4s. If you have more than five partnerships, hit the tab key after the last line to generate a new row.

☐ No partnerships with regulated small MS4s

Name and description of partnership	MCM/Other permit requirements involved
Coon Creek Watershed District: CCWD's public ed. Coordinator provides assistance in hosting stormwater educational outreach events (specific topics and events vary annually).	*MCM 2*
Anoka Soil & Water Conservation District: Prepares and hosts rain garden workshops on a project specific basis with City Street Reconstruction projects.	*MCM 2*

B. If you have additional information that you would like to communicate about your partnerships with other regulated small MS4(s), provide it in the space below, or include an attachment to the SWPPP Document, with the following file naming convention: *MS4NameHere_Partnerships.*

II. Description of Regulatory Mechanisms: (Part II.D.2)

Illicit discharges

A. Do you have a regulatory mechanism(s) that effectively prohibits non-stormwater discharges into your small MS4, except those non-stormwater discharges authorized under the Permit (Part III.D.3.b.)? ☒ Yes ☐ No

1. If **yes:**

   a. Check which *type* of regulatory mechanism(s) your organization has (check all that apply):

   ☒ Ordinance ☐ Contract language
   ☐ Policy/Standards ☐ Permits
   ☐ Rules
   ☐ Other, explain: _____

   b. Provide either a direct link to the mechanism selected above or attach it as an electronic document to this form; or if your regulatory mechanism is either an Ordinance or a Rule, you may provide a citation:

   Citation:

   City Code Chapter 13-1400 & Section 16.0 of Coon Creek Watershed District Rules

   Direct link: *http://www.ci.coon-rapids.mn.us/citycode/13-1400.pdf*

   http://www.cooncreekwd.org/index.asp?Type=B_BASIC&SEC={DD872F13-ABC2-49FE-B30F-60E415CC6AAF

   ☐ Check here if attaching an electronic copy of your regulatory mechanism, with the following file naming convention: *MS4NameHere_IDDEreg.*

2. If **no:**

   Describe the tasks and corresponding schedules that will be taken to assure that, within 12 months of the date permit coverage is extended, this permit requirement is met:

Construction site stormwater runoff control

A. Do you have a regulatory mechanism(s) that establishes requirements for erosion and sediment controls and waste controls? ☒ Yes ☐ No

1. If **yes:**

   a. Check which *type* of regulatory mechanism(s) your organization has (check all that apply):

      ☒ Ordinance ☐ Contract language
      ☐ Policy/Standards ☐ Permits
      ☐ Rules
      ☐ Other, explain: _____

   b. Provide either a direct link to the mechanism selected above or attach it as an electronic document to this form; or if your regulatory mechanism is either an Ordinance or a Rule, you may provide a citation:

      Citation:

      City codes 8-1200 & 11-1207 & Coon Creek Watershed District Rule 9.4

      Direct link:

      http://ci.coon-rapids.mn.us/citycode/08-1200.pdf

      http://ci.coon-rapids.mn.us/citycode/11-1200.pdf

      http://www.cooncreekwd.org/vertical/sites/%7B5C6B0F6F-9658-418B-9297-E0413AF79517%7D/uploads/%7BF7E4EABF-ACFC-426E-A3BB-7C633E2D5650%7D.PDF

      ☐ Check here if attaching an electronic copy of your regulatory mechanism, with the following file naming convention: *MS4NameHere_CSWreg.*

B. Is your regulatory mechanism at least as stringent as the MPCA general permit to Discharge Stormwater Associated with Construction Activity (as of the effective date of the MS4 Permit)? ☒Yes ☐ No

If you answered **yes** to the above question, proceed to C.

If you answered **no** to either of the above permit requirements listed in A. or B., describe the tasks and corresponding schedules that will be taken to assure that, within 12 months of the date permit coverage is extended, these permit requirements are met:

C. Answer **yes** or **no** to indicate whether your regulatory mechanism(s) requires owners and operators of construction activity to develop site plans that incorporate the following erosion and sediment controls and waste controls as described in the Permit (Part III.D.4.a.(1)-(8)), and as listed below:

1. Best Management Practices (BMPs) to minimize erosion. ☒ Yes ☐ No
2. BMPs to minimize the discharge of sediment and other pollutants. ☒ Yes ☐ No
3. BMPs for dewatering activities. ☒ Yes ☐ No
4. Site inspections and records of rainfall events ☒ Yes ☐ No
5. BMP maintenance ☒ Yes ☐ No
6. Management of solid and hazardous wastes on each project site. ☒ Yes ☐ No
7. Final stabilization upon the completion of construction activity, including the use of perennial vegetative cover on all exposed soils or other equivalent means. ☒ Yes ☐ No
8. Criteria for the use of temporary sediment basins. ☒ Yes ☐ No

If you answered **no** to any of the above permit requirements, describe the tasks and corresponding schedules that will be taken to assure that, within 12 months of the date permit coverage is extended, these permit requirements are met:

Post-construction stormwater management

A. Do you have a regulatory mechanism(s) to address post-construction stormwater management activities?
☒ Yes ☐ No

1. If **yes:**

   a. Check which *type* of regulatory mechanism(s) your organization has (check all that apply):

      ☒ Ordinance ☐ Contract language
      ☐ Policy/Standards ☐ Permits
      ☐ Rules
      ☐ Other, explain: _____

b. Provide either a direct link to the mechanism selected above or attach it as an electronic document to this form; or if your regulatory mechanism is either an Ordinance or a Rule, you may provide a citation:

Citation:

City Code Chapter 8-1200

Direct link:

http://www.ci.coon-rapids.mn.us/citycode/08-1200.pdf

☐ Check here if attaching an electronic copy of your regulatory mechanism, with the following file naming convention: *MS4NameHere_PostCSWreg.*

B. Answer **yes** or **no** below to indicate whether you have a regulatory mechanism(s) in place that meets the following requirements as described in the Permit (Part III.D.5.a.):

1. **Site plan review:** Requirements that owners and/or operators of construction activity submit site plans with post-construction stormwater management BMPs to the permittee for review and approval, prior to start of construction activity. ☒ Yes ☐ No

2. **Conditions for post construction stormwater management:** Requires the use of any combination of BMPs, with highest preference given to Green Infrastructure techniques and practices (e.g., infiltration, evapotranspiration, reuse/harvesting, conservation design, urban forestry, green roofs, etc.), necessary to meet the following conditions on the site of a construction activity to the Maximum Extent Practicable (MEP):

   a. For new development projects – no net increase from pre-project conditions (on an annual average basis) of: ☒ Yes ☐ No

      1) Stormwater discharge volume, unless precluded by the stormwater management limitations in the Permit (Part III.D.5.a(3)(a)).
      2) Stormwater discharges of Total Suspended Solids (TSS).
      3) Stormwater discharges of Total Phosphorus (TP).

   b. For redevelopment projects – a net reduction from pre-project conditions (on an annual average basis) of: ☒ Yes ☐ No

      1) Stormwater discharge volume, unless precluded by the stormwater management limitations in the Permit (Part III.D.5.a(3)(a)).
      2) Stormwater discharges of TSS.
      3) Stormwater discharges of TP.

3. **Stormwater management limitations and exceptions:**

   a. Limitations

      1) Prohibit the use of infiltration techniques to achieve the conditions for post-construction stormwater management in the Permit (Part III.D.5.a(2)) when the infiltration structural stormwater BMP will receive discharges from, or be constructed in areas: ☒ Yes ☐ No

         a) Where industrial facilities are not authorized to infiltrate industrial stormwater under an NPDES/SDS Industrial Stormwater Permit issued by the MPCA.
         b) Where vehicle fueling and maintenance occur.
         c) With less than three (3) feet of separation distance from the bottom of the infiltration system to the elevation of the seasonally saturated soils or the top of bedrock.
         d) Where high levels of contaminants in soil or groundwater will be mobilized by the infiltrating stormwater.

      2) Restrict the use of infiltration techniques to achieve the conditions for post-construction stormwater management in the Permit (Part III.D.5.a(2)), without higher engineering review, sufficient to provide a functioning treatment system and prevent adverse impacts to groundwater, when the infiltration device will be constructed in areas: ☒ Yes ☐ No

         a) With predominately Hydrologic Soil Group D (clay) soils.
         b) Within 1,000 feet up-gradient, or 100 feet down-gradient of active karst features.
         c) Within a Drinking Water Supply Management Area (DWSMA) as defined in Minn. R. 4720.5100, subp. 13.
         d) Where soil infiltration rates are more than 8.3 inches per hour.

      3) For linear projects where the lack of right-of-way precludes the installation of volume control practices that meet the conditions for post-construction stormwater management in the Permit (Part III.D.5.a(2)), the permittee's regulatory mechanism(s) may allow exceptions as described in the Permit (Part III.D.5.a(3)(b)). The permittee's regulatory mechanism(s) shall ensure that a reasonable attempt be made to obtain right-of-way during the project planning process. ☒ Yes ☐ No

4. **Mitigation provisions:** The permittee's regulatory mechanism(s) shall ensure that any stormwater discharges of TSS and/or TP not addressed on the site of the original construction activity are addressed through mitigation and, at a minimum, shall ensure the following requirements are met:
   a. Mitigation project areas are selected in the following order of preference: ☐ Yes ☒ No
      1) Locations that yield benefits to the same receiving water that receives runoff from the original construction activity.
      2) Locations within the same Minnesota Department of Natural Resource (DNR) catchment area as the original construction activity.
      3) Locations in the next adjacent DNR catchment area up-stream
      4) Locations anywhere within the permittee's jurisdiction.
   b. Mitigation projects must involve the creation of new structural stormwater BMPs or the retrofit of existing structural stormwater BMPs, or the use of a properly designed regional structural stormwater BMP. ☒ Yes ☐ No
   c. Routine maintenance of structural stormwater BMPs already required by this permit cannot be used to meet mitigation requirements of this part. ☐ Yes ☒ No
   d. Mitigation projects shall be completed within 24 months after the start of the original construction activity. ☐ Yes ☒ No
   e. The permittee shall determine, and document, who will be responsible for long-term maintenance on all mitigation projects of this part. ☒ Yes ☐ No
   f. If the permittee receives payment from the owner and/or operator of a construction activity for mitigation purposes in lieu of the owner or operator of that construction activity meeting the conditions for post-construction stormwater management in Part III.D.5.a(2), the permittee shall apply any such payment received to a public stormwater project, and all projects must be in compliance with Part III.D.5.a(4)(a)-(e). ☒ Yes ☐ No
5. **Long-term maintenance of structural stormwater BMPs:** The permittee's regulatory mechanism(s) shall provide for the establishment of legal mechanisms between the permittee and owners or operators responsible for the long-term maintenance of structural stormwater BMPs not owned or operated by the permittee, that have been implemented to meet the conditions for post-construction stormwater management in the Permit (Part III.D.5.a(2)). This only includes structural stormwater BMPs constructed after the effective date of this permit and that are directly connected to the permittee's MS4, and that are in the permittee's jurisdiction. The legal mechanism shall include provisions that, at a minimum:
   a. Allow the permittee to conduct inspections of structural stormwater BMPs not owned or operated by the permittee, perform necessary maintenance, and assess costs for those structural stormwater BMPs when the permittee determines that the owner and/or operator of that structural stormwater BMP has not conducted maintenance. ☒ Yes ☐ No
   b. Include conditions that are designed to preserve the permittee's right to ensure maintenance responsibility, for structural stormwater BMPs not owned or operated by the permittee, when those responsibilities are legally transferred to another party. ☒ Yes ☐ No
   c. Include conditions that are designed to protect/preserve structural stormwater BMPs and site features that are implemented to comply with the Permit (Part III.D.5.a(2)). If site configurations or structural stormwater BMPs change, causing decreased structural stormwater BMP effectiveness, new or improved structural stormwater BMPs must be implemented to ensure the conditions for post-construction stormwater management in the Permit (Part III.D.5.a(2)) continue to be met. ☒ Yes ☐ No

If you answered **no** to any of the above permit requirements, describe the tasks and corresponding schedules that will be taken to assure that, within twelve (12) months of the date permit coverage is extended, these permit requirements are met:

City Code 8-1200 and/or the Comprehensive Storm Water Management Plan (CSMP) will be revised to include exceptions for volume control practices on linear projects, and mitigation provisions c and d. Final ordinance and CSMP language will be formally adopted and implemented within 12 months from the date MS4 permit coverage is extended to the City.

III. Enforcement Response Procedures (ERPs): (Part II.D.3)

A. Do you have existing ERPs that satisfy the requirements of the Permit (Part III.B.)? ☐ Yes ☒ No

1. If **yes**, attach them to this form as an electronic document, with the following file naming convention: *MS4NameHere_ERPs.*
2. If **no**, describe the tasks and corresponding schedules that will be taken to assure that, with twelve (12) months of the date permit coverage is extended, these permit requirements are met:

B. Describe your ERPs:

Enforcement mechanisms for illicit discharges are defined in City Codes 13-1408 and 13-1414, penalties for Post-construction Stormwater Management in City code 8-1223, and City code 11-1203.14 describes the enforcement mechanisms that are available for construction site erosion and sediment control non-compliance, in addition to Notice of Violation, Forfeit of Security Bond Money, and Civil Penalties. Internal written enforcement response procedures are not defined, therefore the City will draft internal ERPs for MCMs 3, 4, and 5 in 2014, and finalize the ERPs or implementation within 12 months from the date MS4 permit coverage is extended to the City.

IV. Storm Sewer System Map and Inventory: (Part II.D.4.)

A. Describe how you manage your storm sewer system map and inventory:

The City's storm sewer is reviewed annually and revised to include new construction and reconstruction projects. The City's GIS database is used for inventory purposes, in combination with the City Works database to track inspection records and follow-up maintenance and repair orders. The inventory will be revised in 2014 to include new MS4 permit definitions for outfalls.

B. Answer **yes** or **no** to indicate whether your storm sewer system map addresses the following requirements from the Permit (Part III.C.1.a-d), as listed below:

1. The permittee's entire small MS4 as a goal, but at a minimum, all pipes 12 inches or greater in diameter, including stormwater flow direction in those pipes. ☒ Yes ☐ No
2. Outfalls, including a unique identification (ID) number assigned by the permittee, and an associated geographic coordinate. ☒ Yes ☐ No
3. Structural stormwater BMPs that are part of the permittee's small MS4. ☒ Yes ☐ No
4. All receiving waters. ☒ Yes ☐ No

If you answered **no** to any of the above permit requirements, describe the tasks and corresponding schedules that will be taken to assure that, within 12 months of the date permit coverage is extended, these permit requirements are met:

C. Answer **yes** or **no** to indicate whether you have completed the requirements of 2009 Minnesota Session Law, Ch. 172. Sec. 28: with the following inventories, according to the specifications of the Permit (Part III.C.2.a.-b.), including:

1. All ponds within the permittee's jurisdiction that are constructed and operated for purposes of water quality treatment, stormwater detention, and flood control, and that are used for the collection of stormwater via constructed conveyances. ☒ Yes ☐ No
2. All wetlands and lakes, within the permittee's jurisdiction, that collect stormwater via constructed conveyances. ☒ Yes ☐ No

D. Answer **yes** or **no** to indicate whether you have completed the following information for each feature inventoried.

1. A unique identification (ID) number assigned by the permittee. ☒ Yes ☐ No
2. A geographic coordinate. ☒ Yes ☐ No
3. Type of feature (e.g., pond, wetland, or lake). This may be determined by using best professional judgment. ☒ Yes ☐ No

If you have answered **yes** to all above requirements, and you have already submitted the Pond Inventory Form to the MPCA, then you do not need to resubmit the inventory form below.

If you answered **no** to any of the above permit requirements, describe the tasks and corresponding schedules that will be taken to assure that, within 12 months of the date permit coverage is extended, these permit requirements are met:

E. Answer **yes** or **no** to indicate if you are attaching your pond, wetland and lake inventory to the MPCA on the form provided on the MPCA website at: http://www.pca.state.mn.us/ms4 , according to the specifications of Permit (Part III.C.2.b.(1)-(3)). Attach with the following file naming convention: *MS4NameHere_inventory*. ☒ Yes ☐ No

If you answered **no,** the inventory form must be submitted to the MPCA MS4 Permit Program within 12 months of the date permit coverage is extended.

V. Minimum Control Measures (MCMs) (Part II.D.5)

A. MCM1: Public education and outreach

1. The Permit requires that, within 12 months of the date permit coverage is extended, existing permittees revise their education and outreach program that focuses on illicit discharge recognition and reporting, as well as other specifically selected stormwater-related issue(s) of high priority to the permittee during this permit term. Describe your **current** educational program, including **any high-priority topics included**:

   The City's stormwater educational program focuses on target audiences including local residents, businesses and developers to encourage adoption of best management practices that improve water quality and protection of natural resources. This is promoted through partnership with the Coon Creek Watershed District to effectively collaborate and promote education goals. The main vehicle for publicizing stormwater public education and outreach is through the use of the city's webpage. Additionally, the City uses printed brochures/guides, newsletters, neighborhood meetings, and the public access channel to advertise public service announcements for public education and outreach. The City plans to update the existing BMPs and implement public education information of two high priority topics (impaired waters/upcoming TMDLs, pet waste management, and illicit discharge recognition and reporting.

2. List the categories of BMPs that address your public education and outreach program, including the distribution of educational materials and a program implementation plan. Use the first table for categories of BMPs that you have established and the second table for categories of BMPs that you plan to implement over the course of the permit term.

   Include the measurable goals with appropriate timeframes that each BMP category will be implemented and completed. In addition, provide interim milestones and the frequency of action in which the permittee will implement and/or maintain the BMPs. Refer to the U.S. Environmental Protection Agency's (EPA) *Measurable Goals Guidance for Phase II Small MS4s* (http://www.epa.gov/npdes/pubs/measurablegoals.pdf).

   If you have more than five categories, hit the tab key after the last line to generate a new row.

Established BMP categories	Measurable goals and timeframes
City Newsletter	*The City will publish a minimum of two stormwater related articles in the City newsletter during each year of the MS4 permit cycle. City staff will annually review the appropriateness of the existing articles, and provide new articles for existing topics or high priority topics of interest (at the discretion of City staff) each calendar year of the MS4 permit cycle.*
Community Resource Guide	*One stormwater related article will be provided in the City's Community Resource Guide. City staff will annually record the number of guides distributed at City Hall to determine the effectiveness of this BMP during the MS4 permit cycle.*
City Stormwater Webpage	*Stormwater educational materials are provided on the City's webpage (*http://ci.coon-rapids.mn.us/publicworks/streets/stormwater.htm*) under the Stormwater Program section of the Streets Division webpage. City staff will post a minimum of one stormwater related article per year of the MS4 permit cycle. The content and appropriateness of all materials on the webpage will be reviewed a minimum of once per calendar year during the MS4 permit cycle.*

BMP categories to be implemented	Measurable goals and timeframes
Annual SWPPP Assessment & Annual Reporting	*City staff will conduct an annual SWPPP assessment in preparation of each annual report. Proposed SWPPP modifications are subject to Part II.G of the MS4 permit. The final annual report will be posted on the City's Stormwater webpage. City staff will submit the annual report to the MPCA prior to June 30th for the previous calendar year.*
Stormwater Webpage updates (high priority topics)	*http://ci.coon-rapids.mn.us/publicworks/streets/stormwater.htm* *will be updated with high priority topics, such as Illicit discharge recognition/reporting, pet waste management, and local impaired waters/TMDL updates in 2014. Periodic webpage updates will be completed throughout each year of the MS4 permit cycle.*

3. Provide the name or the position title of the individual(s) who is responsible for implementing and/or coordinating this MCM:

   Tim Himmer, Public Works Director

B. MCM2: Public participation and involvement

1. The Permit (Part III.D.2.a.) requires that, within 12 months of the date permit coverage is extended, existing permittees shall revise their current program, as necessary, and continue to implement a public participation/involvement program to solicit public input on the SWPPP. Describe your current program:

   The City's MCM 2 BMPs consist of the annual public meeting, the Coon Rapids Green expo, storm drain stenciling, neighborhood meetings, and the selective events with the Coon Creek Watershed District. Public comments received at each public meeting is recorded in meeting minutes. The City intends to post the updated SWPPP on the City's website after receiving MS4 permit coverage.

2. List the categories of BMPs that address your public participation/involvement program, including solicitation and documentation of public input on the SWPPP. Use the first table for categories of BMPs that you have established and the second table for categories of BMPs that you plan to implement over the course of the permit term.

   Include the measurable goals with appropriate timeframes that each BMP category will be implemented and completed. In addition, provide interim milestones and the frequency of action in which the permittee will implement and/or maintain the BMPs. Refer to the EPA's *Measurable Goals Guidance for Phase II Small MS4s* (http://www.epa.gov/npdes/pubs/measurablegoals.pdf). **If you have more than five categories**, hit the tab key after the last line to generate a new row.

Established BMP categories	Measurable goals and timeframes
Annual Public Meeting or Event	*Present the draft MS4 annual report to the City Council and/or one other City sponsored public event to solicit public input. Public input received (oral and written) will be recorded and evaluated by the City's MS4 General Contact. City responses (if relevant) will be made in writing to each commenter. Hold one meeting or event per calendar year (between January and June for the previous year) of the MS4 permit cycle.*
Coon Rapids Green Expo	*Attend and provide educational videos or other printed materials at the Annual Green Expo at City Hall. Record the number of educational materials that are distributed and all relevant SWPPP comments received. The City will continue this BMP throughout the MS4 permit cycle.*
Neighborhood Meetings	*City staff will provide printed brochures and poster displays at a minimum of one neighborhood meeting each year. City staff will record the number of brochures taken after each meeting for the annual report. The City will continue this BMP throughout the MS4 permit cycle.*
Student Volunteer Storm Drain Stenciling	*City staff will continue to coordinate storm drain stenciling events with volunteer student organizations, in partnership with the Coon Creek Watershed District. The City will continue this BMP throughout the MS4 permit cycle.*

BMP categories to be implemented	Measurable goals and timeframes
Online Availability of the Stormwater Pollution Prevention Plan (SWPPP) Program document	*The City will make the SWPPP and 2013 annual report available on the City's Stormwater webpage within 12 months from the date the MS4 permit coverage is extended to the City.*

3. Do you have a process for receiving and documenting citizen input? ☒ Yes ☐ No

   If you answered **no** to the above permit requirement, describe the tasks and corresponding schedules that will be taken to assure that, within 12 months of the date permit coverage is extended, this permit requirement is met:

4. Provide the name or the position title of the individual(s) who is responsible for implementing and/or coordinating this MCM:

   Tim Himmer, Public Works Director

C. MCM 3: Illicit discharge detection and elimination

1. The Permit (Part III.D.3.) requires that, within 12 months of the date permit coverage is extended, existing permittees revise their current program as necessary, and continue to implement and enforce a program to detect and eliminate illicit discharges into the small MS4. Describe your current program:

   The City's IDDE program consists of City Code 13-1400, public works activities, and fire department responsibilities. Emergency spill response and possible storm drain system contamination is coordinated by the Fire Department. Significant spills or discharges are contained, cleaned up, then reported to the State Duty Officer. West Central Chemical Response Inc. is contracted with the City to provide on-call spill response for specific materials as needed. Fire Department call-outs are documented in the 9-1-1 call system and follow-up record keeping completed by the Fire

Department. Public Works staff complete visual inspections for illicit discharges concurrently with scheduled stormsewer and pond inspections each year. Inspection records are retained by Public Works and maintained in the City Works database.

2. Does your Illicit Discharge Detection and Elimination Program meet the following requirements, as found in the Permit (Part III.D.3.c.-g.)?

   a. Incorporation of illicit discharge detection into all inspection and maintenance activities conducted under the Permit (Part III.D.6.e.-f.)Where feasible, illicit discharge inspections shall be conducted during dry-weather conditions (e.g., periods of 72 or more hours of no precipitation). ☒ Yes ☐ No

   b. Detecting and tracking the source of illicit discharges using visual inspections. The permittee may also include use of mobile cameras, collecting and analyzing water samples, and/or other detailed procedures that may be effective investigative tools. ☒ Yes ☐ No

   c. Training of all field staff, in accordance with the requirements of the Permit (Part III.D.6.g.(2)), in illicit discharge recognition (including conditions which could cause illicit discharges), and reporting illicit discharges for further investigation. ☒ Yes ☐ No

   d. Identification of priority areas likely to have illicit discharges, including at a minimum, evaluating land use associated with business/industrial activities, areas where illicit discharges have been identified in the past, and areas with storage of large quantities of significant materials that could result in an illicit discharge. ☒ Yes ☐ No

   e. Procedures for the timely response to known, suspected, and reported illicit discharges. ☒ Yes ☐ No

   f. Procedures for investigating, locating, and eliminating the source of illicit discharges. ☒ Yes ☐ No

   g. Procedures for responding to spills, including emergency response procedures to prevent spills from entering the small MS4. The procedures shall also include the immediate notification of the Minnesota Department of Public Safety Duty Officer, if the source of the illicit discharge is a spill or leak as defined in Minn. Stat. § 115.061. ☒ Yes ☐ No

   h. When the source of the illicit discharge is found, the permittee shall use the ERPs required by the Permit (Part III.B.) to eliminate the illicit discharge and require any needed corrective action(s). ☒ Yes ☐ No

   If you answered **no** to any of the above permit requirements, describe the tasks and corresponding schedules that will be taken to assure that, within 12 months of the date permit coverage is extended, these permit requirements are met:

   The City's IDDE program will be revised to include a map of high priority areas (based on current landuse, history of discharges, and active NPDES Industrial Stormwater permits) and refined written internal procedures for emergency and non-emergency response to reported spills, illicit discharges, and connections. Draft revisions will be completed in 2014 and implemented within 12 months from the date MS4 permit coverage is extended to the City.

3. List the categories of BMPs that address your illicit discharge, detection and elimination program. Use the first table for categories of BMPs that you have established and the second table for categories of BMPs that you plan to implement over the course of the permit term.

   Include the measurable goals with appropriate timeframes that each BMP category will be implemented and completed. In addition, provide interim milestones and the frequency of action in which the permittee will implement and/or maintain the BMPs. Refer to the EPA's *Measurable Goals Guidance for Phase II Small MS4s* (http://www.epa.gov/npdes/pubs/measurablegoals.pdf).

   If you have more than five categories, hit the tab key after the last line to generate a new row.

Established BMP categories	**Measurable goals and timeframes**
Illicit Discharge Public Education and Outreach	*The City will continue to use the media types identified in MCM 1 & 2 to distribute illicit discharge detection and elimination information to the public. Specific topics and frequency will vary throughout each year of the MS4 permit cycle.*
City code 13-1400	*The City will continue to enforce City Code 13-1400 for the duration of the MS4 permit cycle.*
IDDE Inspections	*The City will continue to annually conduct IDDE inspections concurrently with stormsewer, outfall, and ponds inspections per the IDDE inspection program.*

BMP categories to be implemented	***Measurable goals and timeframes***
IDDE Priority Inspection Map	*Develop IDDE inspection map in 2014. Utilize map for inspections within 12 months from the date MS4 permit coverage is extended.*
Employee Training	*The City will re-train Public Works staff on the procedures for conducting visual inspections of illicit discharges, including recognition and reporting of illicit discharges in 2014. Training will be scheduled within 12 months from the date MS4 permit coverage is extended.*

Written Procedures for Emergency/Non-Emergency Response	*Revise written internal procedures for emergency and non-emergency response to non-stormwater spills, discharges, and connections in 2014. Implement final written procedures within 12 months from the date MS4 permit coverage is extended.*

4. Do you have procedures for record-keeping within your Illicit Discharge Detection and Elimination (IDDE) program as specified within the Permit (Part III.D.3.h.)? ☐ Yes ☒ No

   If you answered **no**, indicate how you will develop procedures for record-keeping of your Illicit Discharge, Detection and Elimination Program, within 12 months of the date permit coverage is extended:

   The City's outfall and pond inspection form will be revised to include illicit discharge recognition & findings. Each inspection record is stored in the City Works database.

5. Provide the name or the position title of the individual(s) who is responsible for implementing and/or coordinating this MCM:

   Tim Himmer, Public Works Director

D. MCM 4: Construction site stormwater runoff control

1. The Permit (Part III.D.4) requires that, within 12 months of the date permit coverage is extended, existing permittees shall revise their current program, as necessary, and continue to implement and enforce a construction site stormwater runoff control program. Describe your current program:

   Construction Site erosion and sediment control plans for all sites are reviewed by the City Engineer, and require SWPPP compliance and permit coverage under the NPDES-CSW permit. Building department staff also assist in reviewing individual sites of less than one acre for compliance to the city's erosion control standards. Items needing attention are noted on the plans and given to the permittee to correct (as needed), prior to issuing building and grading permits. Construction site inspections are conducted weekly or bi-weekly by the City's Engineering consultant at the discretion of the City Engineer (based on current construction activity and scope of project). Inspection results are detailed in the inspection report, which is sent to the project owner and contractor within 48 hours of the inspection. Enforcement mechanisms include Notice of Violation, Forfeit of Security Bond Money, and Civil Penalties.

2. Does your program address the following BMPs for construction stormwater erosion and sediment control as required in the Permit (Part III.D.4.b.):
   a. Have you established written procedures for site plan reviews that you conduct prior to the start of construction activity? ☒ Yes ☐ No
   b. Does the site plan review procedure include notification to owners and operators proposing construction activity that they need to apply for and obtain coverage under the MPCA's general permit to *Discharge Stormwater Associated with Construction Activity No. MN R100001*? ☒ Yes ☐ No
   c. Does your program include written procedures for receipt and consideration of reports of noncompliance or other stormwater related information on construction activity submitted by the public to the permittee? ☐ Yes ☒ No
   d. Have you included written procedures for the following aspects of site inspections to determine compliance with your regulatory mechanism(s):
      1) Does your program include procedures for identifying priority sites for inspection? ☐ Yes ☒ No
      2) Does your program identify a frequency at which you will conduct construction site inspections? ☒ Yes ☐ No
      3) Does your program identify the names of individual(s) or position titles of those responsible for conducting construction site inspections? ☒ Yes ☐ No
      4) Does your program include a checklist or other written means to document construction site inspections when determining compliance? ☒ Yes ☐ No
   e. Does your program document and retain construction project name, location, total acreage to be disturbed, and owner/operator information? ☒ Yes ☐ No
   f. Does your program document stormwater-related comments and/or supporting information used to determine project approval or denial? ☒ Yes ☐ No
   g. Does your program retain construction site inspection checklists or other written materials used to document site inspections? ☒ Yes ☐ No

   If you answered **no** to any of the above permit requirements, describe the tasks and corresponding schedules that will be taken to assure that, within 12 months of the date permit coverage is extended, these permit requirements are met.

   The City intends to review the written existing procedures for site inspections, and revise (as needed) to include definitions for identifying priority sites and protocols for the receipt and consideration of non-compliance. Draft revisions will be completed in early 2014 and formally adopted for implementation within 12 months of the date MS4 permit coverage is extended to the City. City staff will also add contact information on the City website for the public to provide complaints regarding non-compliance of construction sites.

3. List the categories of BMPs that address your construction site stormwater runoff control program. Use the first table for categories of BMPs that you have established and the second table for categories of BMPs that you plan to implement over the course of the permit term.

   Include the measurable goals with appropriate timeframes that each BMP category will be implemented and completed. In addition, provide interim milestones and the frequency of action in which the permittee will implement and/or maintain the BMPs. Refer to the EPA's *Measurable Goals Guidance for Phase II Small MS4s* (http://www.epa.gov/npdes/pubs/measurablegoals.pdf). **If you have more than five categories**, hit the tab key after the last line to generate a new row.

Established BMP categories	**Measurable goals and timeframes**
Employee Training	*Engineering Department staff (a minimum of one staff member) will maintain valid certification in NPDES Construction Stormwater Permit related training per NPDES-CSW training requirements.*
City Erosion Control Permit	*Continue to implement as defined by City Code 8-1200 & 11-1207*

BMP categories to be implemented	**Measurable goals and timeframes**
Written Procedures	*The City develop written procedures for determining priority sites for inspection and receipt and consideration of reports of Construction Site noncompliance. Procedures will be drafted in 2014, and formally adopted within 12 months from the date permit coverage is extended to the City.*
Revise Building Dept. plan review checklist	*Revise the Building and Engineering Department's plan review checklist for single family dwellings to include specific erosion and sediment control standards.*

4. Provide the name or the position title of the individual(s) who is responsible for implementing and/or coordinating this MCM:

   Tim Himmer, Public Works Director

E. MCM 5: Post-construction stormwater management

1. The Permit (Part III.D.5.) requires that, within 12 months of the date permit coverage is extended, existing permittees shall revise their current program, as necessary, and continue to implement and enforce a post-construction stormwater management program. Describe your current program:

   Every applicant for a building permit, subdivision approval, or a permit to allow land disturbing activities must submit a storm water management plan.. No subdivision approval, or grading permit to allow land disturbing activities shall be issued until approval of the storm water management plan or a waiver of the approval requirement has been obtained in strict conformance with the provisions of chapter 8-1200.Building department staff reviews stormwater management plan associated with a building permit, while the city engineer reviews all other stormwater management plans. Post Construction Stormwater Management must conform to applicable Coon Creek Watershed District Rules and the City's 2004 Comprehensive Stormwater Management Plan.

2. Have you established written procedures for site plan reviews that you will conduct prior to the start of construction activity? ☒ Yes ☐ No

3. Answer **yes** or **no** to indicate whether you have the following listed procedures for documentation of post-construction stormwater management according to the specifications of Permit (Part III.D.5.c.):
   a. Any supporting documentation that you use to determine compliance with the Permit (Part III.D.5.a), including the project name, location, owner and operator of the construction activity, any checklists used for conducting site plan reviews, and any calculations used to determine compliance? ☒ Yes ☐ No
   b. All supporting documentation associated with mitigation projects that you authorize? ☒ Yes ☐ No
   c. Payments received and used in accordance with Permit (Part III.D.5.a.(4)(f))? ☒ Yes ☐ No
   d. All legal mechanisms drafted in accordance with the Permit (Part III.D.5.a.(5)), including date(s) of the agreement(s) and names of all responsible parties involved? ☒ Yes ☐ No

   If you answered **no** to any of the above permit requirements, describe the steps that will be taken to assure that, within 12 months of the date permit coverage is extended, these permit requirements are met.

4. List the categories of BMPs that address your post-construction stormwater management program. Use the first table for categories of BMPs that you have established and the second table for categories of BMPs that you plan to implement over the course of the permit term.

   Include the measurable goals with appropriate timeframes that each BMP category will be implemented and completed. In addition, provide interim milestones and the frequency of action in which the permittee will implement and/or maintain the BMPs. Refer to the EPA's *Measurable Goals Guidance for Phase II Small MS4s* (http://www.epa.gov/npdes/pubs/measurablegoals.pdf). **If you have more than five categories**, hit the tab key after the last line to generate a new row.

Established BMP categories	Measurable goals and timeframes
Regulatory Mechanism	*City staff will continue to process applications for building permits, subdivision approvals, and grading permit to the standards defined in City codes 8-1200 and 11-1207. Staff will continue to collaborate with the Coon Creek Watershed District on proposed projects to applicable CCWD rules. This BMP will continue through the end of the MS4 permit cycle (July 31, 2018).*

BMP categories to be implemented	Measurable goals and timeframes
Update City Code 8-1200 and/or the Comprehensive Storm Water Management Plan	*City Code 8-1200 and/or the Comprehensive Storm Water Management Plan (CSMP) will be revised to include the new MS4 permit requirements, as defined in II. Post- Construction Stormwater Management, 5. Final ordinance and CSMP language will be formally adopted and implemented within 12 months from the date MS4 permit coverage is extended to the City.*

5. Provide the name or the position title of the individual(s) who is responsible for implementing and/or coordinating this MCM:

   Tim Himmer, Public Works Director

F. MCM 6: Pollution prevention/good housekeeping for municipal operations

1. The Permit (Part III.D.6.) requires that, within 12 months of the date permit coverage is extended, existing permittees shall revise their current program, as necessary, and continue to implement an operations and maintenance program that prevents or reduces the discharge of pollutants from the permittee owned/operated facilities and operations to the small MS4. Describe your current program:

   The City's Public Works Department is primarily responsible for all MCM 6 activities. Current Public Works activities include inspections and maintenance of the storm sewer system, street sweeping, employee training. In 2014, the City intends to expand the employee training opportunities, refine all record keeping procedures of inspections and maintenance, and written procedures for IDDE.

2. Do you have a facilities inventory as outlined in the Permit (Part III.D.6.a.)? ☐ Yes ☒ No

3. If you answered **no** to the above permit requirement in question 2, describe the tasks and corresponding schedules that will be taken to assure that, within 12 months of the date permit coverage is extended, this permit requirement is met:

   City staff will conduct a facility inspection within 12 months of the date permit coverage is extended to the City.

4. List the categories of BMPs that address your pollution prevention/good housekeeping for municipal operations program. Use the first table for categories of BMPs that you have established and the second table for categories of BMPs that you plan to implement over the course of the permit term.

   Include the measurable goals with appropriate timeframes that each BMP category will be implemented and completed. In addition, provide interim milestones and the frequency of action in which the permittee will implement and/or maintain the BMPs. For an explanation of measurable goals, refer to the EPA's *Measurable Goals Guidance for Phase II Small MS4s* (http://www.epa.gov/npdes/pubs/measurablegoals.pdf).

   If you have more than five categories, hit the tab key after the last line to generate a new row.

Established BMP categories	Measurable goals and timeframes
Structural Stormwater BMP (SSBMP) Inspections	*Continue to inspect 100% of all SSBMP's each year of the MS4 permit cycle (July 31, 2018)*
Inspect MS4 Outfalls and Ponds	*Continue to inspect 20% of all MS4 outfalls each year, until 100% of all MS4 Outfalls and Ponds have been inspected within*

	the MS4 permit cycle (until July 31, 2018).
Salt Application Policy	*Annually calibrate equipment and maintain scale loader for monitoring deicing salt use. The City will continue this BMP annually through the end of the MS4 permit cycle (July 31, 2018).*
Street Sweeping	*The City will continue to conduct street sweeping operations of all public streets a minimum of twice annually (record the sweeping route and date per occurrence). Review and revise (as needed) street sweeping operations (including schedule, equipment, and disposal), stormwater quality priority areas, and routes annually through the end of the MS4 permit cycle (July 31, 2018).*
Review Inspection Reports	*Annually, review all pond, outfall, and Structural Stormwater BMP (SSBMP) inspection records to determine if maintenance, repair, or replacement is needed. Include a description of the findings and any maintenance, repair, or replacement as a result of the inspection findings. Evaluate each SSBMP's inspection frequency and adjust as needed per MS4 Permit Part III.D.6.e (1.). Evaluate and update inspection records annually through the end of the MS4 permit cycle (July 31, 2018).*
Employee Training	*Continue to host a minimum of one staff training event per year to discuss stormwater related topics. City staff will develop an annual training schedule, record the employee names, topics covered, and date of each event, annually through the end of the MS4 permit cycle (July 31, 2018).*

BMP categories to be implemented	**Measurable goals and timeframes**
Pond Sediment Excavation and Removal Projects	*The City will develop a reporting component for pond sediment removal projects within 12 months from the date MS4 permit coverage is extended to the City. Reporting will consist of documenting the date, pond ID, project limits/construction plans, volume of sediment removed, test results (if any), and disposal location. Begin reporting in 2015.*
Stockpiles, Storage and Material Handling Area Inspections	*Conduct quarterly written inspections of all stockpile, storage and material handling areas (per the 2014 facility inventory), through the end of the MS4 permit cycle (July 31, 2018).*
Update Public Works MS4 Program	*Update existing BMPs to coincide with new/revised MS4 permit requirements (refer to question #9).*

5. Does discharge from your MS4 affect a Source Water Protection Area (Permit Part III.D.6.c.)? ☒ Yes ☐ No

   a. If **no**, continue to 6.

   b. If **yes**, the Minnesota Department of Health (MDH) is in the process of mapping the following items. Maps are available at http://www.health.state.mn.us/divs/eh/water/swp/maps/index.htm. Is a map including the following items available for your MS4:

      1) Wells and source waters for drinking water supply management areas identified as vulnerable under Minn. R. 4720.5205, 4720.5210, and 4720.5330? ☒ Yes ☐ No

      2) Source water protection areas for surface intakes identified in the source water assessments conducted by or for the Minnesota Department of Health under the federal Safe Drinking Water Act, U.S.C. §§ 300j – 13? ☐ Yes ☒ No

   c. Have you developed and implemented BMPs to protect any of the above drinking water sources? ☒ Yes ☐ No

6. Have you developed procedures and a schedule for the purpose of determining the TSS and TP treatment effectiveness of all permittee owned/operated ponds constructed and used for the collection and treatment of stormwater, according to the Permit (Part III.D.6.d.)? ☒ Yes ☐ No

7. Do you have inspection procedures that meet the requirements of the Permit (Part III.D.6.e.(1)-(3)) for structural stormwater BMPs, ponds and outfalls, and stockpile, storage and material handling areas? ☐ Yes ☒ No

8. Have you developed and implemented a stormwater management training program commensurate with each employee's job duties that:

a. Addresses the importance of protecting water quality? ☒ Yes ☐ No

b. Covers the requirements of the permit relevant to the duties of the employee? ☐ Yes ☒ No

c. Includes a schedule that establishes initial training for new and/or seasonal employees and recurring training intervals for existing employees to address changes in procedures, practices, techniques, or requirements? ☐ Yes ☒ No

9. Do you keep documentation of inspections, maintenance, and training as required by the Permit (Part III.D.6.h.(1)-(5))? ☒ Yes ☐ No

If you answered **no** to any of the above permit requirements listed in **Questions 5 – 9**, then describe the tasks and corresponding schedules that will be taken to assure that, within 12 months of the date permit coverage is extended, these permit requirements are met:

The City will update written procedures for conducting inspections of illicit discharge detection, outfalls, ponds and structural stormwater BMPs, draft inspection and record keeping procedures for stock piles, storage, and material handling areas, a schedule and reporting method for employee training events, and record keeping procedures for pond excavation projects within 12 months of the date permit coverage is extended to the City.

10. Provide the name or the position title of the individual(s) who is responsible for implementing and/or coordinating this MCM:

Greg Cronin, Streets Division Supervisor

VI. Compliance Schedule for an Approved Total Maximum Daily Load (TMDL) with an Applicable Waste Load Allocation (WLA) (Part II.D.6.)

A. Do you have an approved TMDL with a Waste Load Allocation (WLA) prior to the effective date of the Permit? ☐ Yes ☒ No

1. If **no**, continue to section VII.
2. If **yes**, fill out and attach the MS4 Permit TMDL Attachment Spreadsheet with the following naming convention**:** *MS4NameHere_TMDL.*

   This form is found on the MPCA MS4 website: http://www.pca.state.mn.us/ms4.

VII. Alum or Ferric Chloride Phosphorus Treatment Systems (Part II.D.7.)

A. Do you own and/or operate any Alum or Ferric Chloride Phosphorus Treatment Systems which are regulated by this Permit (Part III.F.)? ☐ Yes ☒ No

1. If **no**, this section requires no further information.
2. If **yes**, you own and/or operate an Alum or Ferric Chloride Phosphorus Treatment System within your small MS4, then you must submit the Alum or Ferric Chloride Phosphorus Treatment Systems Form supplement to this document, with the following naming convention: *MS4NameHere_TreatmentSystem*.

   This form is found on the MPCA MS4 website: http://www.pca.state.mn.us/ms4.

VIII. Add any Additional Comments to Describe Your Program

Minnesota Pollution Control Agency
520 Lafayette Road North
St. Paul, MN 55155-4194

MS4 Pond, Wetland, and Lake Inventory Form

Municipal Separate Storm Sewer System (MS4) Program

Name of MS4 Permittee	Date form completed	Unique ID Number	Type of Feature (Pond, Wetland or Lake)	Feature Common Name (If Applicable)	Y Coordinate (Latitude) Decimal Degrees	X Coordinate (Longitude) Decimal Degrees
City of Coon Rapids	12/23/2013	1	POND		-93.34084882	45.20082606
City of Coon Rapids	12/23/2013	2	WETLAND		-93.35936996	45.20994838
City of Coon Rapids	12/23/2013	8	POND		-93.31740512	45.20779475
City of Coon Rapids	12/23/2013	9	POND		-93.32326158	45.20693529
City of Coon Rapids	12/23/2013	10	POND		-93.3196525	45.21169943
City of Coon Rapids	12/23/2013	13	POND		-93.27059851	45.19958293
City of Coon Rapids	12/23/2013	14	POND		-93.27180425	45.19764137
City of Coon Rapids	12/23/2013	15	POND		-93.28497845	45.20002452
City of Coon Rapids	12/23/2013	16	POND		-93.28285336	45.19980131
City of Coon Rapids	12/23/2013	17	POND		-93.27751367	45.20021741
City of Coon Rapids	12/23/2013	24	POND		-93.29816504	45.19756238
City of Coon Rapids	12/23/2013	25	POND		-93.29748473	45.1977347
City of Coon Rapids	12/23/2013	26	POND		-93.30311784	45.19933328
City of Coon Rapids	12/23/2013	27	POND		-93.30377219	45.20356992
City of Coon Rapids	12/23/2013	28	POND		-93.29689757	45.19896466
City of Coon Rapids	12/23/2013	32	WETLAND		-93.32606077	45.19899049
City of Coon Rapids	12/23/2013	36	POND		-93.36421687	45.19213551
City of Coon Rapids	12/23/2013	44	POND		-93.31747655	45.19635626
City of Coon Rapids	12/23/2013	46	POND		-93.31543994	45.19316838
City of Coon Rapids	12/23/2013	47	POND		-93.31498712	45.1918012
City of Coon Rapids	12/23/2013	50	POND		-93.29916035	45.19036901
City of Coon Rapids	12/23/2013	53	POND		-93.30547563	45.19077077
City of Coon Rapids	12/23/2013	56	POND		-93.2937393	45.19138739
City of Coon Rapids	12/23/2013	57	POND		-93.26758519	45.19297745
City of Coon Rapids	12/23/2013	58	POND		-93.26976678	45.19313067
City of Coon Rapids	12/23/2013	60	POND		-93.27498454	45.1857938
City of Coon Rapids	12/23/2013	61	POND		-93.26880703	45.1812529
City of Coon Rapids	12/23/2013	62	POND		-93.28980195	45.18405
City of Coon Rapids	12/23/2013	63	POND		-93.29974905	45.1888138
City of Coon Rapids	12/23/2013	70	POND		-93.35656297	45.18972163
City of Coon Rapids	12/23/2013	71	POND		-93.35898867	45.18932256
City of Coon Rapids	12/23/2013	81	WETLAND		-93.37290166	45.1864715
City of Coon Rapids	12/23/2013	82	WETLAND		-93.37310637	45.18699693
City of Coon Rapids	12/23/2013	84	WETLAND		-93.36413963	45.18552379

Name of MS4 Permittee	Date form completed	Unique ID Number	Type of Feature (Pond, Wetland or Lake)	Feature Common Name (If Applicable)	Y Coordinate (Latitude) Decimal Degrees	X Coordinate (Longitude) Decimal Degrees
City of Coon Rapids	12/23/2013	85	WETLAND		-93.35056513	45.18786052
City of Coon Rapids	12/23/2013	86	WETLAND		-93.35505319	45.18468171
City of Coon Rapids	12/23/2013	88	WETLAND		-93.35578941	45.18900444
City of Coon Rapids	12/23/2013	89	WETLAND		-93.34235344	45.1916196
City of Coon Rapids	12/23/2013	91	WETLAND		-93.31512803	45.18056464
City of Coon Rapids	12/23/2013	94	WETLAND		-93.29517384	45.18494571
City of Coon Rapids	12/23/2013	95	WETLAND		-93.283445	45.17834358
City of Coon Rapids	12/23/2013	96	WETLAND		-93.29412324	45.18051595
City of Coon Rapids	12/23/2013	97	POND		-93.2979362	45.1731603
City of Coon Rapids	12/23/2013	101	POND		-93.29815757	45.16823408
City of Coon Rapids	12/23/2013	102	POND		-93.29997413	45.16897673
City of Coon Rapids	12/23/2013	103	POND		-93.30151763	45.17218571
City of Coon Rapids	12/23/2013	104	POND		-93.30927918	45.17280629
City of Coon Rapids	12/23/2013	107	WETLAND		-93.31968513	45.16905813
City of Coon Rapids	12/23/2013	108	WETLAND		-93.32107751	45.16665545
City of Coon Rapids	12/23/2013	109	WETLAND		-93.31479445	45.16347609
City of Coon Rapids	12/23/2013	111	POND		-93.30366206	45.16608324
City of Coon Rapids	12/23/2013	113	WETLAND		-93.30236767	45.16638399
City of Coon Rapids	12/23/2013	115	POND		-93.29345913	45.16578748
City of Coon Rapids	12/23/2013	116	WETLAND		-93.29237135	45.16572871
City of Coon Rapids	12/23/2013	117	WETLAND		-93.29163538	45.16393272
City of Coon Rapids	12/23/2013	118	WETLAND		-93.29363196	45.16042142
City of Coon Rapids	12/23/2013	120	WETLAND		-93.30889902	45.16003379
City of Coon Rapids	12/23/2013	121	WETLAND		-93.31439027	45.15827252
City of Coon Rapids	12/23/2013	122	WETLAND		-93.30844698	45.15409782
City of Coon Rapids	12/23/2013	124	POND		-93.29215847	45.15131603
City of Coon Rapids	12/23/2013	125	POND		-93.2876189	45.14882192
City of Coon Rapids	12/23/2013	128	POND		-93.28953835	45.1472811
City of Coon Rapids	12/23/2013	321	POND		-93.29602614	45.14835029
City of Coon Rapids	12/23/2013	322	POND		-93.2962858	45.14681249
City of Coon Rapids	12/23/2013	323	POND		-93.2674428	45.12566726
City of Coon Rapids	12/23/2013	324	POND		-93.26851084	45.1250041
City of Coon Rapids	12/23/2013	328	POND		-93.26772779	45.13006326
City of Coon Rapids	12/23/2013	329	POND		-93.27530038	45.12835588
City of Coon Rapids	12/23/2013	330	POND		-93.27682035	45.12485554
City of Coon Rapids	12/23/2013	338	POND		-93.28352949	45.134528
City of Coon Rapids	12/23/2013	339	POND		-93.27730907	45.14541374
City of Coon Rapids	12/23/2013	344	WETLAND		-93.34284572	45.16868021
City of Coon Rapids	12/23/2013	680	WETLAND		-93.30587911	45.20556579
City of Coon Rapids	12/23/2013	681	POND		-93.30351751	45.21179718

Name of MS4 Permittee	Date form completed	Unique ID Number	Type of Feature (Pond, Wetland or Lake)	Feature Common Name (If Applicable)	Y Coordinate (Latitude) Decimal Degrees	X Coordinate (Longitude) Decimal Degrees
City of Coon Rapids	12/23/2013	682	POND		-93.30579132	45.21182274
City of Coon Rapids	12/23/2013	686	POND		-93.30611255	45.198619
City of Coon Rapids	12/23/2013	687	POND		-93.31403012	45.19165565
City of Coon Rapids	12/23/2013	688	POND		-93.30756362	45.18907847
City of Coon Rapids	12/23/2013	692	WETLAND		-93.27193402	45.17977237
City of Coon Rapids	12/23/2013	693	POND		-93.26768536	45.17486846
City of Coon Rapids	12/23/2013	696	POND		-93.28318591	45.16540969
City of Coon Rapids	12/23/2013	697	WETLAND		-93.26886863	45.16603469
City of Coon Rapids	12/23/2013	698	WETLAND		-93.26769643	45.16700551
City of Coon Rapids	12/23/2013	699	WETLAND		-93.28045269	45.15948046
City of Coon Rapids	12/23/2013	700	POND		-93.28546359	45.15815046
City of Coon Rapids	12/23/2013	701	WETLAND		-93.29983095	45.15569294
City of Coon Rapids	12/23/2013	706	WETLAND		-93.28486831	45.14662259
City of Coon Rapids	12/23/2013	707	WETLAND		-93.26931215	45.14732702
City of Coon Rapids	12/23/2013	710	WETLAND		-93.29106818	45.14062831
City of Coon Rapids	12/23/2013	711	POND		-93.29573593	45.14571043
City of Coon Rapids	12/23/2013	721	POND		-93.2812313	45.11854197
City of Coon Rapids	12/23/2013	1477	POND		-93.31741038	45.16372585
City of Coon Rapids	12/23/2013	2305	WETLAND		-93.28304902	45.18866981
City of Coon Rapids	12/23/2013	2709	POND		-93.32320237	45.19915549
City of Coon Rapids	12/23/2013	3114	POND		-93.33952584	45.19992919
City of Coon Rapids	12/23/2013	3125	POND		-93.26699352	45.19591893
City of Coon Rapids	12/23/2013	3126	POND		-93.2742964	45.19743168
City of Coon Rapids	12/23/2013	3525	WETLAND		-93.35522495	45.18319177
City of Coon Rapids	12/23/2013	3540	POND		-93.29490551	45.18195792
City of Coon Rapids	12/23/2013	3542	POND		-93.29657891	45.18156311
City of Coon Rapids	12/23/2013	4356	POND		-93.29050527	45.13567825
City of Coon Rapids	12/23/2013	4790	POND		-93.28701286	45.14856767
City of Coon Rapids	12/23/2013	4791	POND		-93.28973424	45.1498452
City of Coon Rapids	12/23/2013	4799	POND		-93.3175207	45.16267352
City of Coon Rapids	12/23/2013	4802	WETLAND		-93.31163521	45.1688644
City of Coon Rapids	12/23/2013	4805	POND		-93.304112	45.16067085
City of Coon Rapids	12/23/2013	4810	WETLAND		-93.28097896	45.1684434
City of Coon Rapids	12/23/2013	4825	WETLAND		-93.29676178	45.19777053
City of Coon Rapids	12/23/2013	4826	WETLAND		-93.29985724	45.19834655
City of Coon Rapids	12/23/2013	4833	WETLAND		-93.30875381	45.20293493
City of Coon Rapids	12/23/2013	4834	WETLAND		-93.32420896	45.20977838
City of Coon Rapids	12/23/2013	4835	WETLAND		-93.31983173	45.21229496
City of Coon Rapids	12/23/2013	4836	WETLAND		-93.31610687	45.20993324
City of Coon Rapids	12/23/2013	6048	WETLAND		-93.3128481	45.19450562

Name of MS4 Permittee	Date form completed	Unique ID Number	Type of Feature (Pond, Wetland or Lake)	Feature Common Name (If Applicable)	Y Coordinate (Latitude) Decimal Degrees	X Coordinate (Longitude) Decimal Degrees
City of Coon Rapids	12/23/2013	6051	WETLAND		-93.31734515	45.19680735
City of Coon Rapids	12/23/2013	6053	WETLAND		-93.31172275	45.18270842
City of Coon Rapids	12/23/2013	6055	WETLAND		-93.28965866	45.18561088
City of Coon Rapids	12/23/2013	6847	WETLAND		-93.2996884	45.19440607
City of Coon Rapids	12/23/2013	6848	WETLAND		-93.2925217	45.19323357
City of Coon Rapids	12/23/2013	6849	WETLAND		-93.30029472	45.18894144
City of Coon Rapids	12/23/2013	6860	WETLAND		-93.2741695	45.19677698
City of Coon Rapids	12/23/2013	6861	WETLAND		-93.26657362	45.17997275
City of Coon Rapids	12/23/2013	7269	WETLAND		-93.30372585	45.17393222
City of Coon Rapids	12/23/2013	7270	WETLAND		-93.30256109	45.173786
City of Coon Rapids	12/23/2013	7271	WETLAND		-93.30645633	45.17032594
City of Coon Rapids	12/23/2013	7278	WETLAND		-93.29328089	45.1723875
City of Coon Rapids	12/23/2013	7281	WETLAND		-93.31333957	45.174744
City of Coon Rapids	12/23/2013	7282	WETLAND		-93.31045557	45.1825971
City of Coon Rapids	12/23/2013	7283	WETLAND		-93.30810724	45.18138723
City of Coon Rapids	12/23/2013	7285	WETLAND		-93.3075437	45.17458165
City of Coon Rapids	12/23/2013	7286	WETLAND		-93.33672332	45.16694839
City of Coon Rapids	12/23/2013	7287	WETLAND		-93.32671545	45.15498286
City of Coon Rapids	12/23/2013	7292	WETLAND		-93.28941639	45.16199254
City of Coon Rapids	12/23/2013	7293	WETLAND		-93.29046412	45.16059606
City of Coon Rapids	12/23/2013	7295	WETLAND		-93.30044755	45.1615472
City of Coon Rapids	12/23/2013	7297	WETLAND		-93.30281425	45.16289517
City of Coon Rapids	12/23/2013	7299	WETLAND		-93.28938505	45.16562032
City of Coon Rapids	12/23/2013	7300	WETLAND		-93.28649966	45.16335691
City of Coon Rapids	12/23/2013	7301	WETLAND		-93.28490145	45.16403135
City of Coon Rapids	12/23/2013	7303	WETLAND		-93.28378433	45.15651155
City of Coon Rapids	12/23/2013	7304	WETLAND		-93.28258023	45.15834401
City of Coon Rapids	12/23/2013	7306	WETLAND		-93.28418844	45.1475868
City of Coon Rapids	12/23/2013	7309	WETLAND		-93.27387321	45.13916287
City of Coon Rapids	12/23/2013	7314	WETLAND		-93.29219414	45.15162161
City of Coon Rapids	12/23/2013	7319	WETLAND		-93.30705587	45.15327488
City of Coon Rapids	12/23/2013	7326	WETLAND		-93.27978469	45.12557235
City of Coon Rapids	12/23/2013	7327	WETLAND		-93.27985217	45.11908742
City of Coon Rapids	12/23/2013	4779	POND		-93.28284987	45.13290279
City of Coon Rapids	12/23/2013	30	WETLAND		-93.29685654	45.20132703
City of Coon Rapids	12/23/2013	4811	WETLAND		-93.28088506	45.16882315
City of Coon Rapids	12/23/2013	7290	WETLAND		-93.30734815	45.16795127
City of Coon Rapids	12/23/2013	112	POND	EPIPHANY POND	-93.30528199	45.16557713
City of Coon Rapids	12/23/2013	7726	POND		-93.29242694	45.18217568
City of Coon Rapids	12/23/2013	4851	WETLAND		-93.32241596	45.20052315

Name of MS4 Permittee	Date form completed	Unique ID Number	Type of Feature (Pond, Wetland or Lake)	Feature Common Name (If Applicable)	Y Coordinate (Latitude) Decimal Degrees	X Coordinate (Longitude) Decimal Degrees
City of Coon Rapids	12/23/2013	5238	WETLAND		-93.32788158	45.20929239
City of Coon Rapids	12/23/2013	4822	WETLAND		-93.29105889	45.19956737
City of Coon Rapids	12/23/2013	12	POND		-93.31582034	45.20952837
City of Coon Rapids	12/23/2013	18	POND		-93.28339539	45.20064486
City of Coon Rapids	12/23/2013	7294	WETLAND		-93.30287616	45.15650127
City of Coon Rapids	12/23/2013	81127	POND		-93.3036199	45.15687394
City of Coon Rapids	12/23/2013	43	POND		-93.32470643	45.19358013

Appendix D – Wetland Management Plan

City of Coon Rapids

Wetland Management Plan

Final

June 2004

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Section I – Executive Summary

Wetlands provide many benefits and as such are important resources to a City. Wetlands provide critical habitat for many types of birds, mammals, amphibians, reptiles, invertebrates, and plants. Wetlands can also act to improve water quality and provide water quantity control by storing water during storm events. Wetlands allow for groundwater interactions, whether it is recharge or discharge. Additionally, wetlands provide aesthetic value, nature observation areas, and areas for education and scientific research. Because of the importance of wetlands and the role wetlands play within a community, they must be considered during development review and city-wide planning in order to balance protection of the wetlands and development and growth in the City. Since the City of Coon Rapids is nearly fully developed, protecting and restoring the remaining wetlands and their functions is a high priority.

The City of Coon Rapids Wetland Management Plan (WMP) has been developed in conformance with Minnesota Rules 8420.0650 and meets the requirements of the Wetland Conservation Act (WCA). This WMP has been developed with assistance from the Technical Panel, City Staff, City Council, and public input. The WMP has been adopted by ordinance and is to be used in conjunction with the City of Coon Rapids Storm Water Management Plan.

The WMP provides a comprehensive approach for the protection and management of wetlands within the City and allows the City to have greater control over the rules governing decisions about these wetlands. The WMP provides greater flexibility and control over wetland management and protection, identifies regional wetland mitigation sites, identifies potential wetland restoration areas, and provides management strategies for different types of wetlands.

Section II contains an introduction to the WMP. It includes a description of existing resources, an overview of the Anoka Sand Plain Ecological System, a discussion of the development within the City, and outlines the intent of the Plan.

Section III discusses the regulatory framework for wetlands within the City. This section provides details of the role of the City as the Local Government Unit (LGU) for the WCA and provides a brief overview of other agency jurisdiction over wetlands. This section also outlines the wetland impact application process.

Section IV contains the methods used to assess the wetland functions and values and classify the wetlands within the City. A wetland function is defined as a physical, chemical, or biological process or attribute of a wetland. A wetland value is the extent to which a wetland function is perceived as beneficial to an individual, municipality, or other entity. Wetlands were assessed using the Minnesota Rapid Assessment Method (MnRAM) 2.0. This method incorporates objective and categorical information collected on wetlands to evaluate overall wetland health, vulnerability, and social value. No wetlands were delineated as part of this Plan. Absence of a wetland in the WMP does not indicate that a wetland does not exist.

Section V discusses the results of the functions and values assessment and the wetland management strategies for the wetlands. Wetlands were given scores for each function that was evaluated. Approximately 260 wetlands and storm ponds within the City of Coon Rapids were evaluated as part of this Plan. Wetland Types 1-7 are represented within the City. Detailed information about each wetland can be found in **Appendix A.** The wetland management classifications include Preserve, Manage I, Manage II, Utilize, Restore, and Storm Pond as outlined below:

> **Preserve (P):** Wetlands that were placed into the Preserve category generally provided the highest functions for vegetative diversity and wildlife habitat.
>
> **Manage 1 (M1):** Wetlands that were placed into the Manage 1 category generally provided high functions for vegetative diversity and wildlife habitat with some functions for water quality protection and flood attenuation.
>
> **Manage 2 (M2):** Wetlands that were placed into the Manage 2 category generally provided some functions for vegetative diversity and wildlife habitat with high functions for water quality protection and flood attenuation.
>
> **Manage 3 (M3):** Wetlands that were placed into the Manage 3 category generally provided the highest functions for water quality protection and flood attenuation.
>
> **Restore (R):** Restore wetlands generally received low scores for vegetation and habitat but due to their location, past disturbance, and/or hydrology are anticipated to be good candidates for restoration.
>
> **Storm Pond:** Water bodies that were created in upland areas for the purpose of treating and/or storing storm water runoff were designated as storm ponds. While these areas may have taken on wetland characteristics, they are not considered jurisdictional wetlands based on the Wetland Conservation Act.

These classifications allow the City to actively protect, restore, and manage wetlands, plan for future development and redevelopment, and identify programs and policies for wetland management. **Table V-1** contains more information about these management strategies.

Section VI contains an implementation program for this Plan. **Section VII** provides information on enforcement, appeals, and amendment procedures for this Plan and wetland assessments. **Section VIII** contains a glossary of terms used within this Plan.

A number of appendices are also included which provide supplemental information to the Plan.

Section II – Introduction

The City of Coon Rapids Wetland Management Plan (WMP) has been developed in conformance with Minnesota Rules 8420.0650 and meets or exceeds the requirements of the Wetland Conservation Act (WCA). This WMP has been developed with assistance from the Technical Panel, City Staff, City Council, and public input. The WMP has been adopted by ordinance and is to be used in conjunction with the City of Coon Rapids Storm Water Management Plan.

The WMP was created as part of the development of the Storm Water Management Plan and provides a comprehensive approach for the protection and management of wetlands within the City. The WMP provides greater flexibility and control over wetland management and protection, identifies potential wetland restoration areas, identifies regional wetland mitigation sites, and provides management strategies for different types of wetlands. The WMP designates wetland priorities and defines the City's long range goals for wetland management. The objectives of this plan are to:

- Identify, classify, and create an inventory of wetlands within the City
- Identify wetland functions and resources important to the City
- Identify potential wetland restoration sites
- Maintain wetland functions and values data for use by City, residents, and developers
- Manage wetland resources towards improvement of their functions and values and allow sequencing flexibility to be implemented when appropriate
- Develop a long-term wetland management strategy
- Focus limited resources in the most effective direction
- Determine the degree to which wetland avoidance must be practiced
- Provide technical information and baseline data regarding the functions and values of wetlands within the City
- Provide advance information for developers and the City about the quality of wetlands within the site
- Achieve no net loss in the quantity and quality of Coon Rapids' wetlands
- Provide identification of wetland priorities
- Provide public input into wetland management
- Serve as an educational tool

A. Background Information

The City of Coon Rapids' area is approximately 23 square miles in size and is located in southwestern Anoka County. The Mississippi River borders the City on the southwestern side of the city.

The Anoka Sand Plain

The City of Coon Rapids is located within the Anoka Sand Plain which provides unique conditions for wetlands. The Anoka Sand Plain is characterized by sandy soils which were formed from materials deposited by glaciers during the last glaciation period. These soils are highly permeable which accounts for the rapid groundwater recharge rate found throughout the Anoka Sand Plain. Because of this rapid recharge rate, the Anoka Sand Plain is considered geologically sensitive to pollutant contamination. Many of the wetland soils found in the Anoka Sand Plain are atypical due to the rapid infiltration rate of water that serves to leach out redox features normally found in wetland soils. Careful consideration of topography, hydrology, and vegetation must be taken when evaluating wetlands in the Anoka Sand Plain. The major soil association in Coon Rapids is the Hubbard-Nymore.

A large part of the Anoka Sand Plain is covered by a sand and gravel surficial aquifer. The majority of these surficial aquifers have an underlying bedrock aquifer typically consisting of dolomite, sandstone and shale. Most of the surficial groundwater in the Anoka Sand Plain ultimately flows to the Mississippi River. The water table is high in most wetlands located in the Anoka Sand Plain.

The Minnesota Department of Natural Resources (DNR) estimates that approximately 23% of land area in the Anoka Sand Plain is wetland based on National Wetlands Inventory data and satellite imagery from the 1990's. In Coon Rapids, there are fringe wetlands along Coon, Pleasure, and Sand Creeks, the Mississippi River. Lakes, ponds, and isolated wetlands also occur throughout the City. Approximately 260 wetlands were inventoried and are described in **Appendix A** of this WMP.

Many common and several rare wildlife species are found in the Anoka Sand Plain. Based on the County Biological Survey completed by the DNR, the following are some of the threatened and endangered species found within the various habitats in the Anoka Sand Plain:

- *Emydoidea blandingii* (Blanding's turtle)
- *Olor bucinnator* (Trumpeter swan)
- *Alasmidonta raveneliana* (Elktoe mussel)
- *Actinonaias ligamentina* (Mucket mussel)
- *Quadrula nodulata* (Wartyback mussel)
- *Pleurobema sintoxia* (Round pigtoe mussel)
- *Phalaropus tricolor* (Wilson's phalarope shorebird)

Blanding's turtle has been documented in wetland areas as well as several rare species of mussels in the Mississippi River. A detailed list of Minnesota's Endangered, Threatened, and Special Concern Species is available from the Natural Heritage and Nongame Research Program through the Minnesota DNR.

Existing Wetland Resources

There are approximately 260 wetlands within the City of Coon Rapids' limits. Wetlands and other natural resources of special interest within the City are outlined below:

Coon Creek: Coon Creek runs through Coon Rapids from the northwest through the center of the City and into the Mississippi River on the southwest boundary of the City. There are numerous wetlands located along the fringe of the Creek

Cenaiko Lake: Cenaiko Lake is a 29-acre man-made lake located adjacent to the Mississippi River in the southwest section of Coon Rapids in the Coon Rapids Dam Regional Park. Boats, canoes and other watercraft are prohibited on the lake. The lake is publicly owned and is one of only six lakes in the seven county metropolitan area that is stocked with brook and rainbow trout by the DNR. Ongoing research supported by DNR to control the presence of invasive Eurasian Water Milfoil is being conducted by the University of Minnesota on this lake. The research incorporates the use of an aquatic weevil (*Euryhchiopsis lecontei*) as a biological control agent.

Mississippi River Corridor Critical Area: The City of Coon Rapids has a Mississippi River Critical Overlay ordinance. This ordinance prevents and mitigates irreversible damage to the river corridor within the City limits. Please refer to the appendices of the City's Comprehensive Storm Water Management Plan for detailed information regarding this area. The entire southwest side of the City is bound by the Mississippi River.

McKay Lake: This lake is located in the northeast section of the City and is surrounded by a golf course.

Crooked Lake: Crooked Lake is located on the northwest side of the City and has a surface area of 130 acres. The northern tip of the lake lies within the City of Andover. It is used recreationally for boating and fishing.

Pleasure Creek: Pleasure Creek is located in the southeast corner of the City and directs water to the Mississippi River.

Sand Creek: Sand Creek is located on the eastern boundary of the City and directs water to the Mississippi River.

Wetlands 10-1, 9-5, 9-6, 9-7, and 9-4: This is a large wetland complex near the center of the City. This wetland has a large ditch (Coon Creek) bisecting it as well as containing DNR Wetlands 709W and 710W. A DNR Wildlife Management Area is also contained within a portion of this complex. While some parts of this complex have higher quality habitat than others, overall, the complex has been degraded by drainage and invasive species. The City plans to undertake

project to restore this wetland as well as improve the overall storm water management system in this area.

Fisheries Resources: The United States Geological Survey completed a study entitled "Water Quality, Physical Habitat, and Fish-Community Composition in Streams in the Twin Cities Metropolitan Area, Minnesota 1998-98". This study looked at 13 streams in the Twin Cities area, including Coon Creek and Sand Creek within the City of Coon Rapids. This study found that total instream habitat was greatest in 5 of the streams, including Coon Creek. Fish species richness was the fourth highest in Coon Creek. Sand Creek ranked lower in species richness. The results of this study determined that fish-community composition appeared to be affected by percent of impervious cover in the watershed, water chemistry, water temperature, geomorphology, substrate, instream habitat, and migration barriers.

B. Extent of Development

Based on the 2000 Census data, Coon Rapids is the fifth largest suburb in the Twin Cities Metropolitan area with a population of 61,607 and is nearly fully developed.

It is estimated that the City is currently 13.4% wetland. Historically, the area was 35% wetland prior to settlement. The development of Coon Rapids has resulted in a decrease in the number of pre-settlement wetlands and has caused degradation of many of the remaining wetlands. The intent of this plan is to provide management strategies for the City in order to minimize the impact to wetlands from redevelopment and new development, identify potential restoration sites and higher quality wetlands, and create an inventory of existing wetland resources.

C. Climatological Factors Influencing the Wetlands in City of Coon Rapids

The average annual precipitation in the area is 31.23 inches based on data from the State Climatology Office. Based on data from the State Climatology Office and Coon Creek Watershed District, there has been a general deficiency in precipitation since 1987. The estimated cumulative deficiency in precipitation from 1987 to 2001 is 7.37 inches below the norm. This trend has led to deficiencies in surface and subsurface water supplies and declines in wetland levels in the area. These drought conditions have been exacerbated by warmer than normal temperatures and an apparent increase in high intensity, short duration storm events (Source: Coon Creek Watershed District). This change in rainfall changes the hydrology of wetlands and other water resources. While this change in precipitation and climate are beyond the control of the City, the City will work with the local watershed agencies to document these changes.

D. Intent of Plan

The intent of the City's Wetland Management Plan is to provide a means for the City to protect and manage its wetlands and to identify potential wetland restoration sites. It is also the intent of this plan to identify wetlands in the City

where restorative practices will have the most beneficial impact on improving habitat and water quality, while simultaneously adding to the aesthetic value of the wetland.

The Minnesota Routine Assessment Method (MnRAM) 2.0 was used to identify wetland functions and values and to rank wetlands according to their functions and values. The protection and management strategies of wetlands within the City will be implemented based on the results of the MnRAM 2.0 functions and values assessment.

Section III – Wetland Regulations

The existing wetland regulatory framework in Minnesota involves a number of federal, state, and local agencies including the US Army Corps of Engineers, Department of Natural Resources, Watershed Districts, and the Local Government Units. This Wetland Management Plan has been developed to be in conformance with the Wetland Conservation Act (WCA); however, a brief discussion of the role of each wetland regulatory agency is included in this section.

A. US Army Corps of Engineers

The US Army Corps of Engineers (COE) regulates the discharge of dredged or fill materials to wetlands and other water bodies through Section 404 of the Clean Water Act provided there is a surface water connection to navigable waters. Any impact to navigable waters or wetlands that are connected to navigable waters, including filling, draining, or excavation, may require a permit from the COE. Wetland delineations are also subject to COE approval. Depending on the size and extent of the wetland impact, the Minnesota Pollution Control Agency may be involved in certifying the COE permit. For more information about the COE regulations, the area COE Project Manager can be contacted at (651) 290-5360 or information can be obtained from the COE website at www.mvp.usace.army.mil.

B. Department of Natural Resources

The Department of Natural Resources (DNR) has jurisdiction over Public Waters and Wetlands as depicted on the DNR Public Waters and Wetland maps. The DNR has jurisdiction over Public Water and Wetlands below the Ordinary High Water (OHW) elevation or below the top-of-bank for streams. The OHW is determined by the DNR. Any impact to a Public Water or Wetland may require a permit from the DNR. The DNR Area Hydrologist can be contacted for more information at (651) 772-7910 or information can be obtained from the DNR website at www.dnr.state.mn.us/waters/.

C. Pollution Control Agency

Minnesota Pollution Control Agency water quality standards applicable to wetland protection are contained in Minnesota Rules 7050. Water quality standards are applicable to all wetlands of the state and sequence mitigation requirements of Minn. Rule 7050.0186 apply to all wetland alterations that are permitted or certified by the MPCA as described below.

The NPDES/SDS permit program is a delegated federal permit issued under the responsibilities and authorities contained in Minnesota Statutes Chapter 115. Minnesota Rule 7050.0186 sequencing requirements to avoid, minimize, and mitigate wetland impacts are required to be satisfied in the issuance of MPCA/SDS permits, including issuance of the general Construction Storm Water NPDES permits. If a project includes a physical wetland alteration caused by draining, filling, excavation, or inundation of the wetland and that impact is not addressed in either the US Army Corps of Engineers 404 permit, the Department

of Natural Resources permit, or the Wetland Conservation Act permit, then mitigation compliance with MN Rule 7050.0186 must be demonstrated. For the purposes of the MPCA NPDES permit, *de minimis* determinations by another permitting agency that address the project impacts are recognized by the MPCA. However, a non-jurisdictional determination by another permitting agency does not address project impacts and therefore does require the project proposer to demonstrate that they meet the NPDES permit conditions and Minnesota Rule 7050.0186.

In the past, 7050.0186 requirements were often applied during the issuance of Section 401 Water Quality Certification which is part of the issuance process of the US Corps of Engineers 404 permit. The 401 Water Quality Certification program is an element of the Federal Clean Water Act and has been delegated to the MPCA. Under this program, the MPCA reviewed all federal permits including Clean Water Act Section 404 permit applications for compliance with state water quality standards primarily contained in Minnesota Rule 7050. The MPCA can approve, deny, or waive 401 certification. If denied, the federal permit, usually the US Corps of Engineers 404 permit, cannot be issued. The MPCA is currently not implementing the Section 401 program on a regular basis and nearly all certifications are being waived. This action does not eliminate, waive, or vary the applicant's responsibility of complying with all water quality standards and requirements contained in Minnesota Rules 7050. In addition, this waiver action does not waive MPCA's authority to take necessary actions, including enforcement actions, to ensure that the applicant and the project's construction, installation, and operation comply with water quality standards and all other applicable MPCA statutes and rules regarding water quality.

D. Local Government Unit – Wetland Conservation Act

The Wetland Conservation Act (WCA) is a State law that first passed in 1991 and has been subsequently amended (Minn. Laws CH 354, Minn. Statute 103G.222-2373 and other scattered sections). The Board of Water and Soil Resources (BWSR) publishes MN Rule 8420 in accordance with the Wetland Conservation Act laws. BWSR's role is to assist the Local Government Units (LGUs) in the implementation of WCA and to be a member of the Technical Evaluation Panel (TEP).

The intent of the WCA is to achieve a "no net loss" of wetlands in Minnesota. Therefore, the WCA prohibits filling, draining, and excavation of wetlands in some areas unless the activity is exempt or wetlands are replaced by restoration or creation of wetland of at least equal functions and values.

The WCA is administered by Local Government Units (LGUs). The City of Coon Rapids is the LGU for the WCA within the City's boundaries. The City can issue or deny permits depending on whether or not the project is in conformance with the WCA, the requirements of this Plan, and the requirements in the City's *Developer Guide to the Wetland Conservation Act* (Developer Guide). The WCA

exemptions are discussed in Minn. Rules 8420 and are included by reference to this Plan except where this Plan and the Developer Guide is more restrictive. The procedures for wetland impact application, sequencing, and replacement are outlined below.

1. Wetland Impact and Replacement Application

No person shall drain, excavate in the permanent or semipermanent flooded areas of Type 3, 4, or 5 wetlands (as described in **Section IV**)or fill a wetland, wholly or partially, or otherwise impact wetlands without first having a wetland replacement plan or other determination approved by the local government unit. An application for wetland impacts and replacement must be completed by the project proposer and submitted to the City. These applications are contained within **Appendix B.** If wetland impacts are unavoidable, a wetland mitigation plan must be included with the application as outlined within this Plan. An application fee may apply.

2. Wetland Delineation

For any site development activities within the City, the City requires the developer to submit a wetland delineation report that identifies the location and extent of any wetlands present on the site. Wetland boundaries must be determined using the methodologies of the United States Army Corps of Engineers Wetland Delineation Manual (January 1987). Wetland delineations are to be performed by a wetland professional who has been trained in wetland delineations. Delineations will be subject to verification by the City, the Technical Evaluation Panel (TEP), and/or the US Corps of Engineers. It is recommended that the developer has City Staff verify wetland delineations prior to plan development and/or application submittal.

3. Wetland Sequencing

Sequencing is a process in which the applicant demonstrates that the activity impacting a wetland complied with the following principles in descending order of priority:

- The applicant has avoided direct or indirect impacts to the wetland
- The applicant has minimized the impacts to the wetland
- The applicant has rectified wetland impact by repairing, rehabilitating, or restoring impacted wetlands
- The applicant has reduced or eliminated the wetland impact over time
- The applicant has replaced unavoidable wetland impacts

Sequencing must be provided as part of an application for wetlands categorized as Preserve, Restore, Manage I, and Manage II. The sequencing process is outlined in Minn. Rules 8420.0520 and summarized in **Table V-1** when more restrictive than the WCA. Sequencing for wetlands categorized as Utilize is much more flexbile with this plan and information is included in **Appendix C** and must be referenced in the

application if the developer chooses to use this sequencing discussion. Sequencing flexibility is explained in the *Developer's Guide*.

4. Wetland Replacement

Once sequencing has been completed in conformance with this Plan and the Wetland Conservation Act (WCA), and it has been determined that wetland impacts are unavoidable, the lost functions and values of the wetland must be replaced. Replacement of lost functions and values must be in conformance with **Section V** of this Plan and the WCA.

Wetland replacement should be located within the project site. If this is not feasible, replacement locations should be within the same subwatershed within the City. It is strongly encouraged that wetlands categorized as "Restore" within this Plan are used for wetland mitigation when feasible. The City will consider wetland mitigation that is outside the subwatershed on a case-by-case basis.

Wetland replacement may be completed in the form of New Wetland Credit (NWC) or through a combination of NWC and Public Value Credit (PVC) as provided in **Section V.** For a comprehensive description of NWC and PVC, see Minn. Rules 8420.0540 in the Wetland Conservation Act.

5. Replacement for Road Projects

Through the WCA, wetland impacts that occur due to road improvement projects that address safety issues and are not undertaken solely to accommodate additional traffic capacity by the City or County as the local road authority are eligible to be replaced by BWSR as outlined in Minn. Rules 8420.0540 Subp. 4 (5) (6) and Subp. 5. Impacts need to be avoided and minimized to the greatest extent feasible. Notification to BWSR of the intent to use BWSR mitigation is required through the application process and/or annual reporting by the City.

6. Wetland Replacement Monitoring

The City requires that monitoring of replacement wetlands be conducted for 5 years after their establishment. A monitoring report must be submitted to the City by **October 15th** of each year. Monitoring requirements are outlined in **Appendix D** and in the City's Developer Guide. Monitoring also includes actively managing the replacement site to ensure that vegetation is becoming established and invasive vegetation is being controlled, erosion problem areas are stabilized, hydrology criteria are being met, and any other activities to ensure the wetland replacement goals are met. The City requires a cash surety bond or irrevocable letter of credit to ensure construction and monitoring of the replacement area is carried out successfully. A portion of the bond will be

returned upon completion of construction, and the remainder after the five year monitoring period is complete.

D. Wetland Conservation Act Application Process and Timeline

When wetland filling or draining of any wetland, or excavation of the semi-permanently and permanently flooded areas of a Type 3, 4, or 5 wetland, or excavation greater than 6 feet for any wetland is anticipated as part of a project, an application must be completed by the project proposer and submitted to the City. These applications are contained within **Appendix B.**

If wetland impact is less than 10,000 sf, the City will send a summary of the project within 10 days of receipt of a complete application to the TEP, the DNR, the US Corps of Engineers, and anyone who has requested this type of information. If wetland impact is greater than 10,000 sf, the City will send a copy of the application and an invitation to submit comments within 10 days of receipt of the application to the TEP, Watershed Management Organization, the DNR, the US Corps of Engineers, and anyone who has requested such information. The TEP, Watershed District, DNR and other agencies shall have up to 30 calendar days to comment on the project.

Once the comment period has ended, the City will make a decision on the application within 60 days of receiving a complete application in accordance with Minn. Rules 8420.0230 Subp. 2 and mail a *Notice of Decision* and *Findings and Conclusions* to all who received a summary or copy of the permit application. The City's decision is then effective and the project can commence provided that replacement of the wetland impacts occurs before or concurrently with the wetland impact, provided all other permits from other agencies have been obtained, and the required 30-day appeal window has lapsed.

A project proposer can appeal the City's decision. This appeal must be made to the Board of Water and Soil Resources within 30 days after the date on which the *Notice of Decision* is mailed. Minn. Rules 8420.0250 can be consulted for further information on appeals. This Wetland Management Plan has been developed to be in conformance with the WCA. Any future changes in the WCA would supersede the requirements outlined in this Plan.

Section IV – Wetland Evaluation and Classification Methods

Approximately 260 wetlands were evaluated and classified within the City of Coon Rapids. The methods used to accomplish these tasks are described in this section.

A. Background Information

Aerial photography of the City was obtained to provide a base map for the Wetland Management Plan. Additional mapping from Metropolitan Mosquito Control, Anoka County, and the National Wetland Inventory were also reviewed. These sources were reviewed and compiled into one map in order to determine the potential locations of all wetlands within the City.

After potential wetland locations were identified in the office and by City Staff, these locations were field verified for their presence. The presence or absence of a wetland was determined using the criteria for wetland delineation as set forth in the 1987 Manual for Delineating and Identifying Jurisdictional Wetlands (US Corps of Engineers, 1987).

It is important to note that wetland edges were not delineated as part of the preparation of this Plan. A wetland delineation will need to be conducted as part of any potential impact or development activity near the wetland. In addition, the absence of a wetland from this Plan does not indicate that a wetland is not present on the site. Extreme efforts were taken to ensure that all wetlands within the City were evaluated as part of the development of this Plan; however, the unintentional omission of a particular wetland does not grant permission to impact that wetland before going through the proper regulatory process.

B. Wetland Types

Outlined below are the two different wetland typing systems that are used in Minnesota:

- Circular 39 adapted from *Wetlands of the United States*
- Cowardin System adopted from *Classification of Wetlands and Deepwater Habitats of the United States*

These systems are used to provide a general description of the type of wetland it is and its hydrologic regime.

<u>Circular 39</u>

The Circular 39 system was developed in 1956 by the US Fish and Wildlife Service. This system breaks wetlands into eight types based on hydrologic regime and/or vegetation type. This system is a simple, quick way to type wetlands. These types include the following:

Type 1: Seasonally flooded basin or floodplain
Type 2: Wet meadow

Type 3: Shallow marsh
Type 4: Deep marsh
Type 5: Shallow open water
Type 6: Shrub swamp
Type 7: Wooded swamp
Type 8: Bog

The Circular 39 system is used as part of the Wetland Conservation Act (WCA) regulations. A Circular 39 type has been assigned to the wetlands evaluated as part of this plan.

Cowardin System

The Cowardin System was developed in 1979 also by the US Fish and Wildlife Service. This system is more precise than the Circular 39 system. Cowardin describes wetlands using a tier system with each tier describing the wetland in more detail. The tier system is outlined as follows:

Tier 1 – Systems
Marine (not use in Minnesota)
Estuarine (not used in Minnesota)
Riverine
Lacustrine
Palustrine

Tier 2 – Subsystems
Riverine – tidal, lower perennial, upper perennial, or intermittent
Lacustrine – limnetic or littoral
Palustrine – no subsystems

Tier 3 – Classes
Rock
Unconsolidated bottom
Streambed
Aquatic bed
Emergent
Scrub-shrub
Forested
Open water
Moss-lichen

Finally, modifiers are added to the description to identify the type of water regime. These modifiers include the wetland being saturated, temporarily flooded, or other regime. Wetlands that are typed using Cowardin appear as letters such as PEMC, which is a Palustrine, Emergent, Seasonally flooded system. The National Wetland Inventory (NWI) uses this system. The wetlands in the Coon Rapids plan have also been typed using this system. However, this

was completed in a general way and exact Cowardin system typing was not completed as part of the Plan.

C. Wetland Function and Value Assessment

After background information about the location of a potential wetland was obtained and the wetland was field verified, a function and value assessment was completed for each wetland and a photograph of the wetland was taken for reference.

Functions and values of each wetland were evaluated using the Minnesota Routine Assessment Method Version 2.0. A wetland function is defined as a physical, chemical, or biological process or attribute of a wetland. A wetland value is the extent to which a wetland function is perceived as beneficial to an individual, municipality, or other entity. The assessment evaluated the values of the following functions:

- Vegetative Diversity / Integrity
- Fish and Wildlife Habitat
- Water Quality Protection
- Flood / Stormwater Attenuation
- Shoreline Protection
- Aesthetics, Recreation, and Education

A copy of the MnRAM Version 2.0 assessment method is included in **Appendix E.**

After the functions and values assessment was completed for the wetlands, the wetlands were placed into one of five management categories based on interpretation of the results. Water bodies that were created in upland areas to treat or store storm water were placed into the Storm Pond category. Many, but not all, storm ponds were evaluated with MnRAM. To place wetlands into management categories, the scores for each function were analyzed.

A category was also developed for wetlands that showed potential to be restored. Based on field review, these wetlands may have been impacted by agriculture or development in the past and/or had available space for future expansion/ restoration. These wetlands were placed into a category that would encourage restoration through identification of these areas.

The management categories and scoring criteria are described in more detail in **Table V-1** in **Section V.**

D. GIS Database for WMP

Information generated by the functions and values assessments was compiled into a GIS map and database. This database can be used by the City, developers, and the public for plan reviews, stormwater planning, and general information. This

database will be updated as necessary when new wetlands are created or wetlands are re-evaluated. The wetland classification map is included in **Appendix A.**

Section V – Wetland Assessment Results and Management Strategies

A. Wetland Inventory Results

Approximately 260 wetlands within the City were evaluated using MnRAM 2.0 contained in **Appendix E**. Wetlands were numbered based on which section they were located in and their location with approximate boundaries identified on a map.

While an attempt was made to evaluate all of the wetlands within the City, access to some wetlands was unavailable. The MnRAM 2.0 assessment will need to be undertaken at the property owner' expense if and when their land develops.

B. Wetland Management Categories and Strategies

Based on the MnRAM 2.0 wetland function and value assessment conducted during 2003, six different management categories were developed as follows:

Preserve (P): Wetlands that were placed into the Preserve category generally provided the highest functions for vegetative diversity and wildlife habitat. There are approximately 620 acres of P wetlands in the City.

Manage 1 (M1): Wetlands that were placed into the Manage 1 category generally provided high functions for vegetative diversity and wildlife habitat with some functions for water quality protection and flood attenuation. There are approximately 343 acres of M1 wetlands in the City.

Manage 2 (M2): Wetlands that were placed into the Manage 2 category generally provided some functions for vegetative diversity and wildlife habitat with high functions for water quality protection and flood attenuation. There are approximately 341 acres of M2 wetlands in the City.

Manage 3 (M3): Wetlands that were placed into the Manage 3 category generally provided the highest functions for water quality protection and flood attenuation. Many of these wetlands serve storm water storage and treatment functions. Portions of these wetlands may have been created from upland areas. If appropriate, exemption status for the previously upland portion of the wetland could be pursued by the applicant. There are approximately 145 acres of M3 wetlands in the City.

Restore (R): Restore wetlands generally received low scores for vegetation and habitat but due to their location, past disturbance, and/or hydrology are anticipated to be good candidates for restoration. The City will work to obtain easements or ownership on Restore wetlands for future restoration projects. There are approximately 534 acres of R wetlands in the City.

Storm Pond: Water bodies that were created in upland areas for the purpose of treating and/or storing storm water runoff were put into the Storm Pond category.

These water bodies are not within the jurisdiction of the Wetland Conservation Act.

Each management category has a different management strategy based on the wetland functions and values. These management strategies are outlined below and summarized on **Table V-1. Table V-2** summarizes how wetlands were placed into different management strategies.

1. Wetland buffers

Buffers are an upland area adjacent to a wetland that are covered with vegetation that experiences little to no human impact such as mowing or fertilizing. Buffers are effective management tools for protecting wetland systems. Vegetated buffers provide cover and nesting habitat for wildlife, reduce erosion around the wetland, provide vegetative diversity, and reduce the amount of pollutants in overland overflow runoff prior to discharge to the wetland.

As part of this Wetland Management Plan, average buffer zones with a minimum buffer width of 15 feet around existing wetlands will be required for all new or redevelopment as follows:

Preserve: 40 feet

Manage 1: 25 feet for wetlands less than 2 acres
35 feet for wetlands larger than 2 acres

Manage 2: 15 feet for wetlands less than 2 acres
25 feet for wetlands larger than 2 acres

Manage 3: 15 feet

Restore: 25 feet

Storm Ponds: 15 feet

Buffer monumentation will be required at the edge of these buffer areas and the wetland and buffer will be within an easement. A buffer of any width will be encouraged around existing wetlands that are not experiencing development or redevelopment. Additionally, the City will maintain these buffer widths within City-owned property. Storm water ponds will be allowed within the designated buffer. If a City project is requested by the landowner to do improvements on an adjacent wetland or storm pond, the buffer requirements outlined above will be required to be maintained by the landowner. Additionally, an easement around the water body and buffer will be required if none exists at the time of work.

A buffer commensurate with the width required for the wetland impacted is also required around newly created wetland mitigation sites. As outlined within the Minnesota Rules 8420.0541, Subp. 6, a 25-foot buffer can be used for Public Value Credit (PVC), may not exceed 100 percent of the replacement wetland area and may only be used as PVC credits for replacement above a 1:1 ratio.

The City will consider variances to these standards if hardship or extenuating circumstances are presented by the applicant.

2. Storm Water management

Wetlands have the ability to provide storm water treatment and decrease the risks of downstream flooding. The nutrients and sediment present in stormwater runoff can have a detrimental impact on some wetlands. However, other wetlands are not as sensitive to storm water impacts and may provide an overall benefit to the community by providing storm water treatment functions. To address storm water management, the following wetland management strategies have been developed as part of this Plan:

Preserve: Pretreatment of sediment and nutrients will be required. The existing bounce from a 10-year storm event will be maintained, if feasible.

Manage 1: Pretreatment of sediment and nutrients will be required. The bounce within the wetland will be limited to the existing level plus 0.5 feet for a 10-year storm event, if feasible.

Manage 2: Pretreatment of sediment and nutrients will be required. The bounce within the wetland will be limited to the existing level plus 1 foot for a 10-year storm event, if feasible.

Manage 3: These wetlands can be used for storm water management and treatment. There is no requirement on the bounce within these wetlands.

Restore: Pretreatment of sediment and nutrients will be required. The bounce within the wetland will be limited to the existing level plus 1 foot for a 10-year storm event, if feasible.

Storm Ponds: Use for storm water management.

Flexibility in these standards can be employed if necessary to address flood control projects or other emergency situations as deemed necessary by the City. **Appendix G** contains available information related to water levels for the 2-year, 10-year, and 100 year events for many of the wetlands.

3. Wetland Mitigation and Sequencing

The Wetland Conservation Act (WCA) guidelines serve as a baseline for the evaluation of impacts and associated wetland mitigation and replacement plans. This Wetland Management Plan outlines guidelines for the City Staff and Planning Commission, and ultimately, the City Council to use during review of projects impacting wetlands in each management category to ensure the protection of wetlands and conformance with State rules.

Preserve: Wetlands in this category shall receive the maximum amount of protection under this Plan. Avoidance is strongly recommended and impacts will be allowed only under extreme hardship. Replacement of the wetland's functions and values will be required at a 3:1 ratio with a minimum of 1.5 acres of new wetland credit (NWC) and maximum of 1.5 acres Public Value Credit (PVC). Sequencing is required as per Minnesota Rules 8420.0520 and the management strategy outlined for this category.

Manage 1: Mitigation of wetlands in this category will be at a 2:1 ratio with 1 acre of NWC minimum and 1 acre of PVC maximum for every acre impacted. Sequencing is required as per Minnesota Rules 8420.0520.

Manage 2: Mitigation of wetlands in this category will be at a 2:1 ratio with 1 acre of NWC minimum and 1 acre of PVC maximum for every acre impacted. Sequencing is required as per Minnesota Rules 8420.0520.

Manage 3: Mitigation of wetlands in this category will be at a 2:1 ratio with 1 acre of NWC minimum and 1 acre of PVC maximum for every acre impacted. Significant sequencing flexibility will be provided to these wetlands. Sequencing information for these wetlands is provided in **Appendix C**.

Restore: Mitigation of wetlands in this category will be at a 2:1 ratio with 1 acre of NWC minimum and 1 acre of PVC maximum for every acre impacted. Sequencing is required as per Minnesota Rules 8420.0520. Sequencing flexibility will be considered for a project if restoration of wetlands is being conducted as part of the project, provided the TEP concurs.

To promote the restoration of these wetlands, the City will provide incentives to developers to restore these wetlands or undertake restoration as a City project as feasible.

Additionally, the City will work to obtain easements or ownership of these wetlands for future restoration work.

Storm Ponds: Storm ponds are not under the jurisdiction of the WCA as they were constructed in upland areas. Therefore, no mitigation is required for impact to storm ponds.

Mitigation for Passive Recreation Projects: The City encourages the use of wetlands for passive recreation. Passive recreation includes walking trails, scenic overlooks, and benches. Mitigation for passive recreation projects that impact wetlands will be at a 1:1 ratio with 0.5 acres of NWC minimum and 0.5 acres of PVC maximum for every acre of impacted wetland.

4. Actions Eligible for Wetland Mitigation Credit

Actions eligible for wetland mitigation are outlined with Minnesota Rules 8420.0541.

In addition, the City wishes to provide incentives to developers to improve the functions and values of Restore, Manage 3, and Manage 2 wetlands. Toward that end, the City will encourage applicants to pursue obtaining wetland mitigation credit through Minnesota Rules 8420.0541, Subp. 4 – Exceptional Natural Resource Value Projects, if appropriate, or through other types of available credit.

It is anticipated that the credits obtained from any City wetland restoration or creation project will be placed into a wetland bank to be used for future projects or to be used to maintain an overall 2:1 mitigation ratio in the City.

5. Coon Creek Wetland Project

The City has developed a concept plan for the enhancement of the large wetland complexes west of Hanson Boulevard and north of TH10. This corresponds to Wetlands 10-1, 9-7, 9-6, 9-5, 9-4. This plan includes providing areas of differing wetland habitats by varying the water depths throughout the wetland complex. The City will work with the TEP to develop more detailed plans and obtain permits as part of the implementation of this Plan. The concept plan for this project is included in **Appendix H.**

6. Public Ditch Systems and Creek Maintenance

There are a variety of public ditch systems and creek systems throughout the City. Maintenance of these public ditches will continue to be through the ditch authority. Removal of deadfall, streambank stabilization, and other projects to maintain these public ditches will be allowed to be completed and will be regulated under applicable State laws.

Additionally, deadfall removal and streambank stabilization will be allowed along any creek, if needed.

7. Maintenance of an Overall 2:1 Mitigation Ratio

As required by the Wetland Conservation Act, an overall 2:1 mitigation ratio is required to be maintained in this area. The City's mitigation policies meet or exceed this requirement with the exception of the mitigation required for Passive Recreation projects, which require a 1:1 mitigation ratio. The City will maintain an overall 2:1 mitigation ratio through City restoration/mitigation projects, use of the City's wetland bank, and/or through the credit balance from mitigation projects resulting from impact to Preserve wetlands.

The City will review its overall achieved wetland mitigation ratio every 5 years to ensure a 2:1 ratio of wetland mitigation is met. The Technical Evaluation Panel will meet at a minimum every five years to review the implementation of this Plan.

C. Public Education

The goal of the City of Coon Rapids is to continue to educate its citizens about the importance of wetlands and wetland buffers, and to encourage voluntary stewardship of wetland resources through public education. Multi level education can be achieved through schools, community workshops, local newspapers, special interest groups, City sponsored workshops, the City's newsletter, information on the City's web-page, implementation of an Adopt-A-Wetland program workshops, and use of interpretive signage throughout the park and trail system in Coon Rapids. The WMP serves as a general resource tool for the City to reference when implementing wetland education programs.

D. New Wetlands and Wetlands not Assessed

New wetlands include wetlands created as part of a wetland mitigation/creation project that did not exist at the time this plan was adopted. Wetland areas not intentionally created such as those created by culvert blockage, beavers, etc. as outlined in Minn. Rules 8420.0122 shall not become part of this plan. City Staff will initially place newly created wetlands in the management category of the wetland that is being replaced or as otherwise determined by Staff. Newly created wetlands for mitigation are required to have a buffer commensurate with the width required for the wetland impacted.

City Staff will review the newly created wetlands at least 5 years after creation/restoration to determine if the wetland meets the functions and values of the management category of the wetland that it replaced. The annual wetland monitoring reports as required by the Wetland

Conservation Act will also be used in this evaluation. The City will determine if additional work is needed or if the management goal has been met or is attainable in the near future.

All known wetlands within the study area were evaluated with the exception of those areas where permission to access the site was not granted or the site could not be accessed due to safety issues. The absence of a wetland from this plan does not mean that a wetland is not present on the site. Extreme efforts were taken to ensure that all wetlands within the study site were evaluated as part of the development of this plan; however, the unintentional omission of a particular wetland does not grant permission to impact that wetland before going through the proper regulatory process. It is important to note that wetland edges were not delineated as part of this project. A wetland delineation will need to be performed as part of any potential impact of development or redevelopment activity near the wetlands.

If an existing wetland was not evaluated as part of this plan, the MnRAM 2.0 assessment contained within **Appendix E** will need to be completed by the applicant and submitted to the City for review and classification.

For any wetlands that the City was not permitted to access or were inadvertently omitted, an assessment will need to be undertaken by the property owner if and when their land develops. The assessment will be required to be conducted by a trained wetland professional. Based on this assessment, the City Staff will place the wetland into a management category.

Table V-1 summarizes the wetland management strategies for each management category.

Table V-1. Wetland Management Strategies

Classification	Buffer Requirement [a]	Storm Water Management [b]	Sequencing	Mitigation Requirements [c]	Management Strategy
Preserve	40 feet	Maintenance of existing bounce for a 10-year storm if feasible; Pretreatment for sediment and nutrients.	Impacts allowed only under extreme hardship. Sequencing must be in conformance with the WCA.	Replacement at 3:1 ratio with 1.5 acres of NWC minimum and 1.5 acres of PVC maximum.	Actively protect and preserve functions and values of wetlands to the maximum extent feasible. Avoid impacts and changes to hydrology to greatest extent feasible.
Manage I	25 ft for wetlands less than 2 acres; 35 ft for wetlands larger than 2 acres	Limit bounce to existing plus 0.5 ft for 10-year storm if feasible. Pretreatment for sediment and nutrients	Sequencing in conformance with WCA.	2:1 with 1 acre of NWC minimum and 1 acre of PVC maximum	Maintain existing functions and values.
Manage II	15 ft for wetlands less than 2 acres; 25 ft for wetland larger than 2 acres	Limit bounce to existing level plus 1.0 ft for 10-year storm if feasible. Pretreatment for sediment and nutrients.	Sequencing in conformance with WCA.	2:1 with 1 acre of NWC minimum and 1 acre of PVC maximum	Maintain existing functions and values. The City will work to provide incentives to developers who improve the functions and values of Manage 2 wetlands.
Manage III	15 feet	No limit on bounce. Can be used for storm water management and treatment	Significant sequencing flexibility will be provided to M3 wetlands. Sequencing information is outlined within this Plan in **Appendix C.**	2:1 with 1 acre of NWC minimum and 1 acre of PVC maximum	Use for stormwater management or provide incentives to developers who improve the functions and values of Manage 3 wetlands.
Restore	25 feet	Limit bounce to existing level plus 1.0 ft for a 10-year storm if feasible. Pretreatment for sediment and nutrients	Sequencing in conformance with WCA. Sequencing flexibility may be used on a project if wetland restoration is being conducted as part of the project.	2:1 with 1 acre of NWC minimum and 1 acre of PVC maximum	Undertake projects/ actions to restore wetland. To promote the restoration of these wetlands, the City will provide incentives to developers to restore these wetlands or undertake restoration as a City project as feasible. The City will work to obtain easements on Restore wetlands for future restoration projects.
Storm Ponds	15 feet	Use for storm water management	No sequencing required as storm ponds not within the jurisdiction of the WCA.	No mitigation required	Storm water management

a) Storm water ponds will be allowed within the wetland buffer. Buffer averaging is allowed, provided a minimum 15 foot buffer is maintained.
b) Flexibility in the storm water bounce standards can be employed if necessary to address flood control projects or other emergency situations as deemed necessary by the City.
c) Mitigation for Passive Recreation Projects will be at a 1:1 ratio with 0.5 acres of NWC minimum and 0.5 acres of PVC maximum for every acre of impacted wetland. Discussion on the maintenance of an overall 2:1 ratio in the City is provided in **Section V**.

Table V-2. City of Coon Rapids Wetland Classification System

Wetlands were placed into different wetland management strategies based on the results of the wetland functions and values assessment. Based on the functions and values assessment, each function for each wetland was ranked as **Exceptional (E), High (H), Medium (M), or Low (L)**. The table below summarizes how the rankings were used to place wetlands into different management strategies.

	Vegetative Diversity	***Maintenance of Hydrologic Regime***	***Flood Attenuation***	***Water Quality Protection***	***Wildlife***
Preserve	E, H	M, H	L	L	E, H
Manage 1	H, M	M	M, L	M, L	H, M
Manage 2	M, L	M	H, M	H, M	M, L
Manage 3	L	M, L	H	H	L
Restore	Based on field review and information from City				

Additional considerations:

- Shoreland protection
- Fishery habitat
- Aesthetics/education/recreation
- Land use
- DNR Public Waters/Wetlands
- Size of wetland
- Part of corridor

Section VI – Implementation Program

As part of this Wetland Management Plan, several programs and projects have been identified to protect wetlands as the City continues to experience development pressure. The following lists programs and/or projects that have been identified by this Plan.

A. Administer and enforce erosion and sediment control policies
The City shall continue to enforce its erosion and sedimentation control ordinance. This ordinance will be reviewed and updated as part of the implementation of the Storm Water Management Plan.

B. Adopt wetland buffer requirements
The wetland buffer requirements are outlined in **Section V** of this Plan. The purposes of these buffers are to protect wetlands, provide habitat for wildlife, and provide water quality protections.

C. Undertake wetland restoration within the City
As part of this Plan, some wetlands were placed into the Restore category. As funding becomes available, the City shall implement restoration projects for these wetlands and encourage developers to conduct restoration on these wetlands. Additionally, the City will work to obtain easements over wetlands in the Restore category for future restoration projects.

D. Implement Coon Creek Wetland Project
The City will work with the TEP to design and implement the Coon Creek Wetland Project. A concept plan is included in **Appendix H.**

E. Public education program
The goal of the City of Coon Rapids is to continue to educate its citizens about the importance of wetlands and wetland buffers, and to encourage voluntary stewardship of wetland resources through public education. Multi level education can be achieved through schools, community workshops, local newspapers, special interest groups, City sponsored workshops, the City's newsletter, information on the City's web-page, implementation of an Adopt-A-Wetland program and use of interpretive signage throughout the park and trail system in Coon Rapids. The WMP serves as a general resource tool for the City to reference when implementing wetland education programs.

F. Investigate and implement biological control program for invasive species
The City will implement Eurasian water milfoil and buckthorn removal programs as needed and as funding allows. Additionally, the City will investigate the feasibility of implementing a purple loosestrife control program through the DNR's biological control program.

G. Implement Wetland Management Plan

The City will adopt the Plan and its associated regulations by ordinance and continue to administer the WCA as outlined within this Plan and the Developer Guide to the WCA.

H. Conduct TEP Review

The Technical Evaluation Panel (TEP) will review the results and implementation of this Plan at a minimum every five years.

Section VII – Enforcement, amendments, and appeals

It is the intention of the City to have this Wetland Management Plan reviewed and approved by the Board of Water and Soil Resources (BWSR) and adopted through ordinance by the City. Once approved, no significant changes to this Plan can be made without the approval of BWSR. Significant changes to this Plan shall be made known to the following parties:

- The Mayor, City Council, and City Staff
- Planning Commission
- Watershed Management Organizations and Watershed Districts
- Board of Water and Soil Resources
- Technical Review Panel

Minor changes to the Plan including the addition of newly classified wetlands can be made by the City without outside review. Revision to the management strategies shall be considered a major change.

The management classification of a wetland within the Plan can be appealed by the landowner, project proposer, or other interested party. This appeal must be submitted in writing to the City and include documentation supporting the reasons for placing a wetland into a different management category. This written appeal must be submitted to the City prior to or along with the wetland impact permit application. A fee, as set by the City, will be required for each wetland being appealed. The appeal will be reviewed by City Staff and the Technical Evaluation Panel. A decision will be made regarding the appeal within 60 days of receipt of the appropriate documentation from the appellant if the appeal is submitted during the growing season. If the appeal is submitted outside of the growing season, a decision will be made within 60 days after the start of the growing season. The appellant will be notified in writing of the panel's decision. If not specifically stated in this Plan, the appeal process in Minnesota Rules 8420 will apply.

The City's decision regarding the wetland impact permit application can be appealed by a project proposer. This appeal must be made to BWSR within 30 days after the date on which the decision of the City is mailed to those required to receive notification of the decision. Minn. Rules 8420.0250 can be consulted for further information.

Enforcement will be in conformance with the City Code and Minnesota Rules 8420.

Section VIII – Glossary

Agricultural land	Land used for horticultural, row, close grown, pasture, and hayland crops and any associated farmyards, field roads, and drainage systems.
Anaerobic	A condition that exists when oxygen has been depleted in the local environment, such as a wetland soil.
Best Management Practices (BMPs)	State-approved and published practices that have been determined to be the most practical and effective means of controlling point and non-point pollutant levels for environmental quality goals.
Board of Water and Soil Resources (BWSR)	A state governmental agency that provides oversight to the Local Government Units for the Wetland Conservation Act.
Buffer	An upland area adjacent to a wetland that is covered with natural vegetation and experiences little to no human impact such as mowing or fertilizing. The buffer starts at the delineated wetland edge.
Buffer averaging	Buffer averaging is the practice of allowing a variable width buffer around a wetland where the average buffer width is equal to the buffer width required for the wetland management category.
Circular 39	A wetland classification method developed in 1956 by the US Fish and Wildlife Service that categorizes wetlands into eight types (i.e. Type 2).
COE	Corps of Engineers
Cowardin Method	A wetlands classification method developed in 1979 by the US Fish and Wildlife Service that categorizes wetlands using a tier system.
DNR	Department of Natural Resources
Erosion	Process by which land or structures are worn away by water, wind, or waves.
Function	A wetland function is a physical, chemical, or biological process or attribute of a wetland. It is what a wetland does.
Growing season	The portion of the year when soil temperatures are above biologic zero in the upper part. In the Metro Area, the growing season is generally between April 21 – October 15.
Hydrophytic vegetation	Macrophytic plant life growing in water, soil, or on a substrate that is at least periodically deficient in oxygen as a result of inundation or saturation by water.
Hydric Soils	A soil that is saturated, flooded or ponded long enough during the growing season to develop anaerobic conditions in the upper part.
Local Government Unit (LGU)	Local agency (i.e. city, town board, watershed management organization) that has the primary responsibility for administration of the Wetland Conservation Act (WCA).

MnRAM 2.0	Minnesota Routine Assessment Method. A method developed by the state agencies to assess wetland functions and values.
Monotypic vegetation	Only one plant species present within an area. Generally, these plant species are non-native and/or highly invasive.
MUSA	Metropolitan Urban Service Area
No net loss	No reduction in the area and value of a wetland compared to existing conditions.
Non-point source pollution	Pollution originating at a variety of non-localized sources, such as street runoff, septic systems, atmospheric deposition, or groundwater.
NWC	New Wetland Credit: Wetland replacement credit that can be used for any portion of wetland replacement.
OHW	Ordinary High Water level. The Department of Natural Resources (DNR) establishes this elevation for those Protected Waters and Wetlands that the DNR has jurisdiction over.
PVC	Public Value Credit: Wetland replacement credit that can only be used for the portion of wetland replacement required above a 1:1 ratio.
Sedimentation basin	A depression that utilizes gravity to trap sediment and debris.
Sequencing	A five-step process outlined in the WCA that evaluates the necessity of a project's impact in a wetland.
Technical Evaluation Panel (TEP)	A panel consisting of the LGU, the local Board of Water and Soil Resources (BWSR) board conservationist, a member of the Soil and Water Conservation District. This panel provides technical wetland support to the LGU.
Value	A wetland value is the extent to which a wetland function is perceived as beneficial to an individual, municipality, or other entity.
WCA	Wetland Conservation Act
Wetland	Transitional land between terrestrial and aquatic systems where the water table is usually at or near the surface or the land is covered by shallow water. Wetlands must have a predominance of hydric soils, be inundated or saturated with water at a frequency and duration sufficient to support a prevalence of hydrophytic vegetation typically adapted for life in saturated soil conditions, and under normal circumstances, supports a prevalence of hydrophytic vegetation.
Wetland Delineation	A field-defined line based on vegetation, hydrology, and soils that defines the jurisdictional edge of the wetland. Wetlands are delineated based on the methods outlined in the 1987 US Corps of Engineers Wetland Delineation

	Manual.
Wetland Banking Credits	Square footage or acreage of restored or created wetland or adjacent wetland buffer described by type and topographic setting that have been approved for deposit in the wetland bank.
Wetland Mitigation	The compensation or replacement of unavoidable wetland impacts through restoration or creation of wetlands.
WMP	Wetland Management Plan

Appendix A
Wetland Assessment Results

Abbreviation Key

Plant Communities: The plant communities evaluated as part of the MnRAM assessment for each wetland are listed by the following abbreviations in the table in **Appendix A.** These plant communities are based on "Wetland Plants and Plant Communities of Minnesota and Wisconsin", 2nd Edition (USACOE).

AT = Alder thicket
DM = Deep marsh
FF = Floodplain forest
HS = Hardwood swamp
SaM = Shallow marsh
SC = Shrub-carr
SeM = Sedge meadow
SFB = Seasonally flooded basin
SOW = Shallow open water
OB = Open bog
WM = Wet meadow

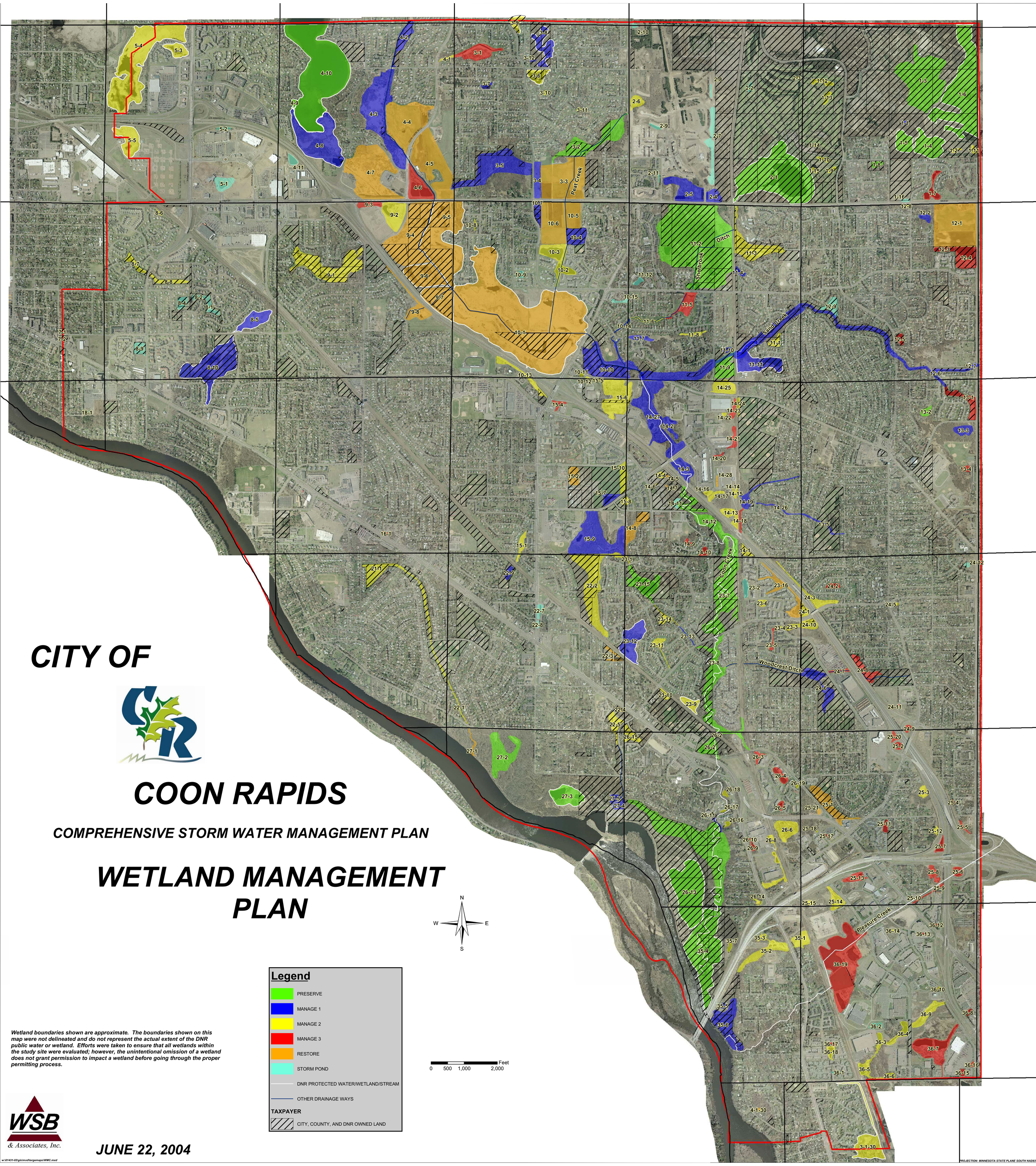
Function and Value: Each function is ranked as exceptional, high, medium, or low on the tables in **Appendix A** in conformance with MnRAM 2.0. These rankings are abbreviated as follows:

Exceptional: E
High: H
Medium: M
Low: L

CITY OF COON RAPIDS

COMPREHENSIVE STORM WATER MANAGEMENT PLAN

WETLAND MANAGEMENT PLAN



Legend

- PRESERVE
- MANAGE 1
- MANAGE 2
- MANAGE 3
- RESTORE
- STORM POND
- DNR PROTECTED WATER/WETLAND/STREAM
- OTHER DRAINAGE WAYS

TAXPAYER

- CITY, COUNTY, AND DNR OWNED LAND

Wetland boundaries shown are approximate. The boundaries shown on this map were not delineated and do not represent the actual extent of the DNR public water or wetland. Efforts were taken to ensure that all wetlands within the study site were evaluated; however, the unintentional omission of a wetland does not grant permission to impact a wetland before going through the proper permitting process.

WSB & Associates, Inc.

JUNE 22, 2004

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PROJECTION: MINNESOTA STATE PLANE SOUTH NAD83

City of Coon Rapids Wetland Management Plan

Wetland ID	Management Classification	Evaluation Date	Circular 39	Wetland Name	DNR PWI#	Potential Restoration Area	Potential Mitigation/ Expansion Area	VEGETATIVE DIVERSITY Plant Comm #1	Plant Comm #2	Plant Comm #3	Plant Comm #4	Plant Comm #5	Hydro Regime Maint	Flood Atten	Water Quality	Shore Prot	Wildlife Habitat	Fish Habitat	Aesth/ Ed/Rec	Plant Comm #1	Plant Comm #2	Plant Comm #3	Plant Comm #4	Plant Comm #5
1-1	M1	7/7/2003	3			N	N	L					H	M	M	NA	M	NA	H	SaM				
1-2	M2	7/1/2003	2			N	N	L	L				H	M	L	NA	M	NA	M	SaM	DM			
1-3	P	7/7/2003	6			N	N	E	E				E	M	H	NA	E	NA	H	SeM	SC			
1-4	P	7/1/2003	3		634P	N	N	E	E	M			E	M	H	NA	H	NA	H	SaM	SeM	SC		
1-5	P	7/1/2003	3		634P	N	N	E	E	H			E	H	H	NA	H	NA	H	SaM	SeM	SC		
1-6	P	7/1/2003	3		73P	Y	N	E	M	E			E	H	H	NA	E	NA	H	DM	SaM	OB		
1-7	M3	7/1/2003	4			N	N	M					M	M	L	NA	M	L	H	SOW				
1-8	P	6/30/2003	4			N	N	H	H				H	H	H	NA	E	L	H	SaM	HS			
1-9	M2	6/30/2003	5			N	N	L					M	M	M	NA	M	NA	H	SOW				
1-10	M2	6/30/2003	5			N	N	L					L	M	L	NA	M	NA	H	SOW				
1-11	M2	7/1/2003	2			N	N	L					H	M	M	NA	M	NA	M	SaM				
1-12	M2	7/7/2003	5			N	N	L					M	M	L	NA	M	NA	M	SOW				
1-13	M2	7/7/2003	5			N	N	L					M	M	L	NA	M	NA	M	SOW				
1-14	M2	6/30/2003	4			N	N	L					M	M	M	NA	M	NA	H	SOW				
1-15	M2	6/30/2003	5			N	N	L					M	L	M	NA	M	NA	H	SOW				
1-16	SP																							
2-1	P	6/30/2003	4	McKay Lake	83P	N	N	H	H				E	H	H	NA	H	NA	H	SaM	HS			
2-2	SP	7/30/2003																						
2-3	M2	7/7/2003	5			N	N	L					M	M	L	NA	M	NA	M	SOW				
2-4	M1	6/27/2003	2			N	N	M	M	H	H		H	H	H	NA	H	NA	H	SaM	SC	HS	SeM	
2-5	M1	6/27/2003	4			N	N	M	H	M			M	M	M	NA	H	NA	H	SaM	SC	HS		
2-6	M2	6/27/2003	2			N	N	L	L				H	H	M	NA	L	NA	M	WM	HS			
2-7	SP																							
2-8	SP																							
2-9	SP																							
2-10	SP																							
2-11	SP																							
2-12	M1	7/7/2003	4			N	N	H	H				M	M	M	NA	M	NA	M	DM	SaM			
3-1	M3	8/5/2003	6			N	N	L	L	L			M	M	H	NA	M	NA	M	WM	SC	HS		
3-2	P	7/16/2003	6			N	N	M	H				H	M	H	H	E	NA	H	SC	FF			
3-3	R	7/31/2003	2			Y	Y	M	L				L	L	L	L	L	NA	L	SaM	WM			
3-4	M1	7/31/2003	2			N	N	M	M				M	M	H	NA	H	NA	M	SC	WM			
3-5	M1	8/5/2003	7			N	N	L	L	H			H	H	H	NA	E	NA	H	WM	HS	FF		
3-6	M2	7/10/2003	4		625W	N	N	M	L	L			M	M	H	NA	M	NA	M	SOW	DM	SaM		
3-7	M1	7/16/2003	4			N	N	M					M	H	M	NA	M	NA	H	DM				
3-8	M1	7/10/2003	3		624W	N	N	M	M	M			H	H	H	NA	H	NA	H	DM	SaM	SC		
3-9	M2	7/10/2003	3		626W	N	N	L	L				H	H	H	NA	M	NA	M	DM	SaM			
3-10	M2	7/16/2003	3			N	N	M					H	M	M	NA	M	NA	L	SaM				
3-11	M2	7/16/2003	4			N	N	L	L				M	H	M	NA	M	NA	L	DM	SaM			

Wetland ID	Management Classification	Evaluation Date	Circular 39	Wetland Name	DNR PWI#	Potential Restoration Area	Potential Mitigation/ Expansion Area	VEGETATIVE DIVERSITY Plant Comm #1	Plant Comm #2	Plant Comm #3	Plant Comm #4	Plant Comm #5	Hydro Regime Maint	Flood Atten	Water Quality	Shore Prot	Wildlife Habitat	Fish Habitat	Aestlt/ Ed/Rec	Plant Comm #1	Plant Comm #2	Plant Comm #3	Plant Comm #4	Plant Comm #5
3-12	M1	7/10/2003	3			N	N	H	H				H	M	M	NA	M	NA	H	DM	SaM			
4-1	M2	7/16/2003	4			N	N	M	M				M	M	H	NA	M	NA	M	SaM	SC			
4-2	M1	8/11/2003	3			N	N	L	M	L			M	M	M	M	H	L	M	SaM	FF	WM		
4-3	M1	8/11/2003	3			N	N	L	L	M			M	M	M	M	E	L	H	SaM	WM	FF		
4-4	R	8/5/2003	2			Y	Y	L					L	M	L	NA	L	NA	L	WM				
4-5	R	8/5/2003	2			Y	Y	L					L	M	L	NA	L	NA	L	WM				
4-6	M3	8/5/2003	4			N	N	M					M	M	M	NA	L	L	L	SOW				
4-7	R	8/4/2003	3	Crooked Lake	84P	N	N	M	M	M	M		M	M	M	NA	E	L	H	WM	SaM	SC	HS	
4-8	M1	8/4/2003	3	Crooked Lake	84P	N	N	M	L	L			M	M	H	NA	E	L	H	SaM	WM	SC		
4-9	P	8/5/2003	5	Crooked Lake	84P	N	N	H	H				H	M	H	H	M	H	H	SOW	SC			
4-10	P	8/5/2003	5	Crooked Lake	84P	N	N	L					M	H	M	L	M	E	H	SOW				
4-11	SP	8/4/2003	5			N	N	L					M	H	M	NA	M	L	M	SOW				
5-1	SP	8/4/2003	5			N	N	L					L	H	L	NA	L	NA	M	SOW				
5-2	SP	8/4/2003	5			N	N	L					M	H	L	NA	L	L	L	SOW				
5-3	M2	8/4/2003	3		711W	N	N	L	L				M	H	H	NA	M	NA	M	SaM	SC			
5-4	M2	8/4/2003	3		629W	N	N	L	M				M	M	H	NA	H	NA	H	SaM	SC			
5-5	M2		0		631W																			
7-1	SP	8/8/2003	2			N	N	L					L	H	M	NA	L	NA	L	WM				
7-2	SP	8/8/2003	2			N	N	L					L	M	L	NA	L	NA	L	WM				
8-1	SP	8/8/2003	4			N	N	M	M				M	H	H	NA	M	L	H	DM	SaM			
8-2	SP	8/8/2003	4			N	N	M	M				M	H	H	NA	H	L	H	DM	SaM			
8-4	SP	8/8/2003	4			N	N	M	M				M	H	H	NA	M	NA	H	DM	SaM			
8-5	M1	8/8/2003	3		639W	N	N	L					M	H	M	NA	M	NA	M	SaM				
8-6	M2	8/6/2003	3			N	N	M					M	M	M	NA	M	NA	M	SaM				
8-7	M2	8/6/2003	3			N	N	M	M				M	M	H	NA	M	L	H	DM	SaM			
8-8	M2	8/6/2003	3			N	N	M					L	M	M	NA	M	NA	H	SaM				
8-9	SP	8/6/2003	3			N	N	L					M	H	H	NA	L	NA	L	SaM				
8-10	M1	8/8/2003	4		640W	N	N	L	L				M	H	H	NA	M	NA	H	DM	SaM			
9-1	M2	8/11/2003	3			N	N	M	M	L	M		M	H	H	NA	M	L	H	DM	SaM	WM	SC	
9-2	M2	8/5/2003	4			N	N	M	M	M			M	H	H	NA	M	NA	M	DM	SaM	SC		
9-3	M3	8/5/2003	2			N	N	L					L	M	L	NA	L	NA	L	WM				
9-4	R	8/13/2003	2			N	N	L	L				M	M	H	NA	M	NA	M	WM	SC			
9-5	R	8/13/2003	2		710W	N	N	L	L	L			M	M	H	NA	H	NA	M	SaM	WM	SC		
9-6	R	8/13/2003	3		710W	Y	N	M	M				M	M	H	NA	H	NA	H	SaM	WM			
9-7	R	8/13/2003	3		710W	N	N	M	M				M	M	M	NA	E	NA	H	SaM	SC			
9-8	R	8/11/2003	3			N	N	L	L	M			M	H	M	M	L	L	L	DM	SaM	SC		
10-1	R	7/31/2003	2		709W	Y	N	L	L	L			L	M	L	M	M	M	H	SaM	WM	SC		
10-2	M2	8/5/2003	5			N	N	L	M				M	H	H	NA	M	L	H	SOW	DM			
10-3	M2	7/31/2003	6			N	N	L	M	M			M	M	M	NA	M	L	M	SOW	SaM	SC		
10-4	M1	7/31/2003	7			N	N	M	M	M			M	M	H	M	E	L	M	SC	HS	WM		
10-5	R	7/31/2003	2			Y	Y	L					L	M	L	NA	L	NA	L	WM				

Wetland ID	Management Classification	Evaluation Date	Circular 39	Wetland Name	DNR PWI#	Potential Restoration Area	Potential Mitigation/ Expansion Area	VEGETATIVE DIVERSITY Plant Comm #1	Plant Comm #2	Plant Comm #3	Plant Comm #4	Plant Comm #5	Hydro Regime Maint	Flood Atten	Water Quality	Shore Prot	Wildlife Habitat	Fish Habitat	Aesth/ Ed/Rec	Plant Comm #1	Plant Comm #2	Plant Comm #3	Plant Comm #4	Plant Comm #5
10-6	R	7/31/2003	2			Y	Y	L					L	L	L	NA	L	NA	L	WM				
10-7	M1	7/31/2003	3			N	N	H	H	H			M	M	H	NA	M	NA	M	SaM	SeM	SC		
10-8	M2	8/14/2003	3			N	N	M					M	M	M	NA	M	NA	M	SaM				
10-9	SP	8/11/2003	5			N	N	L	M				M	M	M	NA	M	L	M	SOW	DM			
10-10	M1	7/30/2003	2			N	N	M	M				M	M	H	H	M	NA	E	SaM	FF			
10-11	M2	7/30/2003	4			N	N	L					H	H	M	NA	M	L	M	DM				
10-12	M2	8/12/2003	3			N	N	L					M	M	M	NA	L	NA	L	SaM				
10-13	M2	8/11/2003	3			N	N	L	L				M	M	M	NA	L	NA	L	DM	SaM			
10-14	M1	7/30/2003	3			N	N	M					M	M	H	H	H	L	M	SaM				
10-15	SP																							
11-1	M2	8/12/2003	2			N	N	L	M				M	M	H	NA	M	NA	M	WM	HS			
11-2	P	7/29/2003	3			N	N	M	H	E	M		H	M	H	NA	E	NA	H	SaM	WM	SC	HA	
11-3	M2	7/29/2003	3			N	N	L	M				H	M	H	NA	M	NA	M	SaM	SC			
11-4	M1	7/29/2003	4			N	N	H					H	M	H	NA	M	NA	M	DM				
11-5	M3	7/29/2003	5			N	N	M					M	M	M	NA	M	NA	M	DM				
11-6	M2	7/30/2003	3			N	N	M					M	M	H	H	M	NA	H	SaM				
11-7	M1	7/30/2003	3			N	N	M					H	M	M	NA	E	NA	H	SaM				
11-8	M2	7/30/2003	2			N	N	L					M	H	M	NA	M	NA	M	WM				
11-9	P	7/30/2003	2			N	N	M	H	H			H	M	H	NA	E	NA	H	SeM	SC	HS		
11-10	M1	7/31/2003	6			N	N	H	M				H	M	H	NA	M	NA	H	AT	WM			
11-11	M1	8/12/2003	3		638W	N	N	H	H	L	L		H	M	M	NA	H	L	H	DM	SaM	WM	SC	
11-12	SP																							
12-1	R	7/7/2003	3			Y	Y	L	L				L	M	L	NA	L	NA	L	SaM	WM			
12-2	M1	7/7/2003	4			N	N	H	H				M	M	M	NA	M	NA	M	DM	SaM			
12-3	M3	7/7/2003	5			N	N	M	M	M			M	M	M	NA	M	NA	H	SOW	DM	SaM		
12-4	M3	7/7/2003	5			N	N	H	H	H			M	M	H	H	E	M	H	SOW	DM	SaM		
12-5	M3	7/17/2003	5			N	N	L					M	H	L	L	L	L	M	SOW				
12-6	M1	7/17/2003	3	Sand Creek		Y	N	M	M	M			M	M	L	M	M	NA	M	SOW	DM	SaM		
12-7	M1	7/17/2003	4	Sand Creek Trib		N	N	M	M				M	H	L	NA	M	NA	M	DM	SaM			
12-8	M2	7/29/2003	1			N	N	L					M	M	M	NA	M	NA	L	WM				
12-9	SP	7/29/2003	1			N	N	H					H	H	H	NA	M	NA	H	WM				
13-1	M3	7/17/2003	4			N	N	M	M	M			M	M	H	NA	M	NA	M	SOW	DM	SaM		
13-2	P	7/17/2003	1			N	N	M	H				H	M	H	NA	H	NA	H	SeM	SC			
13-3	M1	7/17/2003	7			N	N	H					H	M	H	NA	E	NA	H	HS				
13-4	M3	7/17/2003	5			N	N	L	M				M	M	L	NA	H	NA	M	SOW	HS			
13-5	M1	8/12/2003	3			Y	N	M	M				M	M	M	M	M	NA	H	SaM	WM			
14-1	M2	8/13/2003	3			N	N	L	M	M	M		M	M	M	NA	M	L	M	SOW	SaM	SC	HS	
14-2	M1	8/12/2003	3	Coon Creek	Coon Creek	N	N	M					M	H	H	NA	M	NA	L	SaM				
14-3	M1	8/12/2003	3	Coon Creek	Coon Creek	N	N	M	M	M			H	H	H	M	M	L	M	DM	SaM	SC		
14-4	M2	8/12/2003	3			N	N	M	M	M			M	H	H	NA	M	NA	L	SaM	SeM	SC		
14-5	R	8/12/2003	3			Y	N	M	M				M	M	H	NA	M	L	L	SaM	SC			

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14-6	M2	8/12/2003	7			N	N	L	M				M	H	L	NA	M	NA	M	HS	SaM			
14-7	R	8/12/2003	1			N	Y	M					H	H	L	NA	M	NA	M	SFB				
14-8	R	8/7/2003	3			Y	N	M	M				M	H	M	NA	M	L	M	SaM	HS			
14-9	M3	8/13/2003	3			N	N	M	M				M	M	M	NA	M	L	M	SOW	SaM			
14-10	M3	8/13/2003	4			N	N	M	M				M	M	H	NA	M	L	M	SOW	SaM			
14-11	SP	8/12/2003	3			N	N	M	M	M			M	M	H	NA	M	L	M	SaM	SC	SOW		
14-12	P	8/13/2003	7	Coon Creek	Coon Creek	Y	N	M					M	M	H	H	M	H	H	FF				
14-13	M2	8/12/2003	2			N	N	M	M				H	M	M	NA	M	NA	M	SaM	SeM			
14-14	M2	8/12/2003	3			N	N	L					M	M	M	NA	L	NA	L	SaM				
14-15	M2	8/12/2003	3			N	N	M	M				M	M	M	H	L	L	L	SaM	SC			
14-16	M2	8/12/2003	3			N	N	L	M				M	M	L	L	M	L	M	SaM	FF			
14-17	M2	8/12/2003	3			N	N	M					M	H	H	NA	M	NA	L	SaM				
14-18	M3	8/12/2003	3			N	N	M					M	M	M	NA	L	NA	L	SaM				
14-19	M1	8/12/2003	1			N	N	M	H				M	M	H	M	H	L	H	SaM	FF			
14-20	M3	8/12/2003	3			Y	N	L					L	L	L	NA	L	NA	L	SaM				
14-21	M3	8/12/2003	2			N	N	L					M	H	M	NA	L	NA	L	WM				
14-22	M2	8/12/2003	3			N	N	M	M				H	H	M	NA	L	NA	L	SaM	SC			
14-23	M3	8/12/2003	2			N	N	L	M	M			H	H	M	NA	M	NA	L	SaM	SeM	SC		
14-24	M2	8/12/2003	3			N	N	M	M				M	M	H	NA	M	NA	M	SeM	SC			
14-25	M2	8/12/2003	1			N	N	L	L				M	H	H	NA	E	NA	H	WM	HS			
14-26	M1	8/12/2003	3			N	N	M	M				M	M	M	M	M	NA	M	SaM	WM			
14-27	M1	8/12/2003	3	Coon Creek	Coon Creek	N	N	M	M	H			H	H	H	H	E	L	H	SaM	SC	FF		
14-28	R			ADDED BY CITY																				
15-1	M2	8/12/2003	3			N	N	M	L				M	H	M	NA	L	NA	L	SaM	SFB			
15-2	R	8/7/2003	6			Y	Y	M	M	M			M	M	L	NA	E	L	L	SaM	SC	FF		
15-4	M3	8/12/2003	3			N	N	M	M				M	M	H	NA	L	L	L	SaM	SC			
15-5	M2	8/12/2003	3			N	N	M	M				M	H	H	NA	M	L	L	SaM	SC			
15-6	M2	8/12/2003	3			N	N	M	M				M	M	H	NA	M	L	L	SaM	SC			
15-7	M1	8/7/2003	3			N	N	M	M				M	M	L	NA	E	L	M	SOW	SaM			
15-8	M2	8/12/2003	1			Y	N	M					M	H	M	NA	L	NA	L	SFB				
15-9	M1	8/7/2003	6	Epiphany Creek		N	N	M	M				M	M	H	H	E	H	M	SC	FF			
15-10	M2	8/7/2003	3			N	N	M	M				M	M	M	NA	E	L	M	SaM	SFB			
16-1	M3	8/14/2003	1			N	N	L					M	H	L	NA	L	NA	L	SFB				
18-1	SP	9/17/2003	4			N	N	M					M	M	M	NA	L	L	L	SOW				
21-1	M2	8/14/2003	3			N	N	M	M				L	M	M	NA	L	L	L	SaM	SeM			
22-1	M2	8/14/2003	3			N	N	M	M				L	M	M	NA	L	L	M	SaM	SeM			
22-2	M2	8/7/2003	7			Y	N	L	M	M			M	M	M	NA	M	L	M	WM	SC	FF		
22-3	R	8/13/2003	3			Y	N	M	M				M	M	H	NA	M	L	M	SaM	SC	HS		
22-4	R	8/5/2003	7			Y	N	M					M	M	H	NA	M	NA	M	HS				
22-5	M2	8/5/2003	2			Y	N	L	L	L			M	M	H	NA	M	NA	M	WM	HS	SC		
22-7	SP	8/13/2003	1			N	N	L					M	M	L	NA	L	NA	L	SFB				

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22-8	SP	8/13/2003	3			N	N	M					M	M	M	NA	L	NA	L	SaM				
22-9	M1	8/14/2003	3			N	N	M	M				M	M	M	NA	M	L	M	SaM	HS			
23-1	M2	8/7/2003	7			N	N	M	M				M	M	H	M	M	M	M	SaM	FF			
23-2	SP	9/17/2002	3			N	N	M	M				M	M	H	NA	M	L	M	SaM	FF			
23-3	M2	7/29/2003	7			N	Y	L	L				M	H	H	NA	M	L	M	WM	HS			
23-4	M2	7/29/2003	7			N	N	M	L				M	M	H	M	M	L	M	SC	HS			
23-5	M3	7/29/2003	6			N	N	M	M	M			M	H	M	NA	M	L	M	SaM	SC	HS		
23-6	M2	8/1/2003	3			N	N	M	M	L			M	M	M	NA	M	L	M	SaM	SC	HS		
23-7	P	8/6/2003	3	Coon Creek	Coon Creek	N	N	M	M	M			M	M	M	H	H	H	H	SeM	SC	FF		
23-8	P	8/6/2003	7	Coon Creek	Coon Creek	N	N	M					M	M	H	H	M	H	H	FF				
23-9	M2	8/6/2003	3		646W	N	N	M	M	M	M		M	M	H	NA	M	L	M	SaM	SeM	SC	HS	
23-10	M2	8/6/2003	3			N	N	M	M				M	H	H	NA	M	NA	L	SaM	WM			
23-11	M2	8/7/2003	3			N	N	M	L	L			M	M	H	NA	M	L	M	SaM	WM	SC		
23-12	M1	8/7/2003	6		645W	N	N	M	M	M	M		M	H	M	NA	H	L	M	SOW	WM	SC	HS	
23-13	M1	8/7/2003	3			Y	N	M	M				M	M	M	M	M	H	M	SaM	SC			
23-14	M2	8/7/2003	2			N	N	M	M	M	M	L	M	M	H	M	M	M	M	SaM	WM	SC	FF	SFB
23-15	P	8/7/2003	4		643W	N	N	H	H	M	M		H	M	H	NA	H	H	H	SOW	DM	SC	HS	
23-16	R	8/1/2003	7			Y	N	L					M	M	M	NA	M	NA	M	HS				
24-1	M2	8/1/2003	2			Y	N	L	L				M	M	M	NA	M	NA	M	WM	HS			
24-2	M3	8/1/2003	5			N	N	M					M	M	M	NA	M	M	M	SOW				
24-3	M2	8/1/2003	2			N	N	M	M				M	M	M	NA	M	NA	M	SeM	HS			
24-4	SP		0																					
24-5	M2	8/1/2003	2			Y	N	L	L				M	M	M	NA	L	NA	L	WM	HS			
24-6	M1	7/29/2003	2			N	N	L	M	M			M	M	M	NA	M	L	M	SM	SC	HS		
24-7	M3	7/29/2003	3			N	N	M	M	M	L		M	M	M	NA	L	M	M	SaM	SC	HS	SOW	
24-8	M3	7/29/2003	6			N	N	M	M	L			M	M	M	NA	M	L	M	SaM	SC	HS		
24-9	M3	7/29/2003	3			N	N	L	L				M	M	L	NA	L	L	L	SOW	SM			
24-10	M2	7/29/2003	7			N	Y	M					M	M	H	NA	M	L	M	HS				
24-11	M3	7/29/2003	2			N	N	L	M				M	M	L	L	L	L	L	SM	SFB			
24-12	SP																							
25-1	R	7/31/2003	7			Y	N	M					M	H	M	NA	M	NA	M	HS				
25-2	M3	7/29/2003	3			N	N	L	L				M	M	L	NA	L	L	L	SOW	SaM			
25-3	M2	7/29/2003	2			N	N	L	L				M	M	M	NA	M	L	M	WM	HS			
25-4	M3	7/29/2003	3			N	N	L	L				M	M	L	NA	L	L	L	SaM	SC			
25-5	M3	7/29/2003	3			N	N	L	M				M	M	L	NA	L	NA	L	SM	WP			
25-6	M3		0	COULD NOT EVAL																				
25-7	M3	7/24/2003	5			N	N	L					M	M	L	NA	L	L	L	SOW				
25-8	M3	7/25/2003	7			N	N	L	L				M	H	H	NA	L	L	L	WM	FF			
25-9	M3	7/24/2003	2			N	N	L	L	L			M	M	H	M	L	L	L	SC	HS	SFB		
25-10	M3	7/24/2003	7			N	N	L	L				M	M	H	H	L	M	M	WM	FF			
25-11	M3	7/25/2003	4			N	N	L	M				M	M	M	NA	L	L	L	SOW	SaM			

Wetland ID	Management Classification	Evaluation Date	Circular 39	Wetland Name	DNR PWI#	Potential Restoration Area	Potential Mitigation/ Expansion Area	VEGETATIVE DIVERSITY Plant Comm #1	Plant Comm #2	Plant Comm #3	Plant Comm #4	Plant Comm #5	Hydro Regime Maint	Flood Atten	Water Quality	Shore Prot	Wildlife Habitat	Fish Habitat	Aesth/ Ed/Rec	Plant Comm #1	Plant Comm #2	Plant Comm #3	Plant Comm #4	Plant Comm #5
25-12	M2	7/25/2003	1			Y	N	L	L				M	H	M	NA	M	NA	M	WM	HS			
25-13	M3	7/23/2003	3			N	N	M	M				M	M	H	M	L	L	L	SaM	SC			
25-14	M2	7/23/2003	7			N	N	L	M				M	M	M	NA	L	L	L	WM	HS			
25-15	M2	8/4/2003	6			N	N	M					M	M	M	NA	H	NA	M	AT				
25-17	M3	7/31/2003	5			N	N	L	M				M	M	L	NA	L	L	M	SOW	SaM			
25-18	M2	7/31/2003	4			N	N	L	M				M	M	M	NA	M	L	M	SOW	SC			
25-19	M2	7/31/2003	5			N	N	M	M	M			M	M	M	NA	L	L	L	SOW	SaM	HS		
25-20	M3	7/29/2003	3			N	N	L					M	M	L	NA	L	L	L	SM				
25-21	R			ADDED BY CITY																				
26-1	M2	9/17/2003	6			N	N	M	M				M	M	M	NA	L	NA	L	FF	SC			
26-2	P	8/6/2003	5			N	N	L	M				M	M	H	M	M	L	M	SOW	FF			
26-3	M3	7/31/2003	3			N	N	M	M	M	M	M	M	M	H	NA	M	M	M	SOW	SaM	SC	HS	SeM
26-4	M3	7/31/2003	5			N	N	L	M				M	M	M	NA	M	L	M	SOW	HS			
26-5	M3	7/31/2003	7			N	N	L					M	M	L	NA	L	L	L	HS				
26-6	M2	7/31/2003	7			Y	N	L	M				M	H	M	NA	M	NA	M	WM	HS			
26-7	M2	8/4/2003	3			N	N	M	M	M			M	M	H	NA	M	L	M	SOW	SaM	HS		
26-8	M2	8/4/2003	3			N	N	M	M	M			M	M	H	NA	M	L	M	SaM	SeM	SOW		
26-9	M3	8/4/2003	5			N	N	M	M				M	M	L	NA	L	L	M	SOW	SaM			
26-10	M3	8/4/2003	5			N	N	L					M	M	L	NA	L	L	M	SOW				
26-11	M1	8/4/2003	7	Coon Creek	Coon Creek	N	N	M	L				M	M	H	H	M	H	M	FF	SFB			
26-12	P	7/11/2003	7	Coon Creek	Stream	N	N	H					E	M	H	NA	H	L	H	FF				
26-13	P	7/11/2003	5	Cenaiko Lake	654W	Y	Y	L	H				M	M	H	NA	E	E	H	SOW	WP			
26-14	M2	7/29/2003	2			Y	N	L	L				M	H	M	NA	M	NA	M	WM	HS			
26-15	M2	8/5/2003	7			Y	N	M	M	M			M	M	H	NA	M	NA	M	WM	HS	SC		
26-16	M2	8/4/2003	5			N	N	M					M	M	H	H	M	L	M	SOW				
26-17	M2	8/4/2003	5			N	N	L					M	M	H	M	M	M	M	SOW				
26-18	M2	8/5/2003	5			N	N	M	L				M	M	H	H	M	L	M	SOW	FF			
27-1	R	8/5/2003	5			Y	N	M					M	M	M	L	E	H	H	SOW				
27-2	P	8/5/2003	7			N	N	H	M				H	M	H	NA	E	L	E	SeM	HS			
27-3	P	8/5/2003	5		648P	N	N	M	M	M			M	M	H	NA	E	M	E	SOW	SC	HS		
27-4	M1	7/11/2003	3			N	N	M	M				M	M	H	NA	E	NA	E	SOW	SC			
27-5	M1	7/11/2003	5			N	N	L	M				H	M	M	NA	E	L	H	SOW	FF			
35-1	M2	8/4/2003	1			Y	N	L					M	M	M	NA	M	NA	M	WM				
35-2	M2	7/8/2003	7			N	N	M	L				M	M	M	NA	E	L	H	HS	SFB			
35-3	M2	7/8/2003	1			N	N	M					M	M	M	NA	M	NA	M	FF				
35-4	P	7/11/2003	7		654W	N	N	M	M	M	H		H	H	H	NA	E	E	E	SaM	WM	SC	FF	
35-5	M1	7/8/2003	3			N	N	M					M	M	H	NA	M	H	H	SaM				
35-6	M1	7/8/2003	3			N	N	H	M				M	M	H	E	M	L	H	SaM	FF			
35-7	M2	9/4/2003	3			N	N	M					M	M	H	NA	M	M	M	SaM				
36-1	SP	7/9/2003	4			N	N	M	M				M	M	H	NA	L	NA	L	SOW	SaM			
36-2	SP	7/10/2003	5			N	N	M	M				M	M	M	NA	M	NA	L	SOW	SaM			

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36-3	M2	7/10/2003	5	County Ditch		N	N	M					M	M	H	NA	M	L	L	SOW				
36-4	M2	7/9/2003	3	County Ditch		N	N	M	M				M	H	H	NA	M	M	M	SOW	SC			
36-5	M2	7/10/2003	5	County Ditch		N	N	M	M	M	M		M	M	H	NA	M	L	M	SOW	SaM	SeM	SFB	
36-6	M2	7/9/2003	4			N	N	M	M				M	M	H	NA	M	NA	M	SaM	HS			
36-7	M3	7/9/2003	3	COULD NOT EVAL		N	N	M	M				M	H	H	NA	M	L	M	SOW	WM			
36-8	M3		0																					
36-9	M2	7/23/2003	5	County Ditch		N	N	L	L	L	M		M	M	H	M	L	L	L	SOW	SaM	SC	WM	
36-10	M2	7/23/2003	5			N	N	M	M				M	H	M	NA	L	L	L	SaM	WM			
36-12	M3	7/25/2003	4			N	N	L					M	M	L	NA	L	L	L	SOW				
36-13	M3	7/24/2003	4			N	N	NA					M	M	L	NA	L	L	L	SOW				
36-14	M2	7/23/2003	1		Stream	N	N	M					M	M	M	M	L	M	L	FF				
36-15	M3	7/24/2003	5			N	N	M	L				M	M	H	NA	L	L	L	SOW	SaM			
36-16	M3	7/25/2003	4			N	N	M	M	M			M	M	H	NA	L	L	L	SaM	SOW	SC		
36-17	M3	7/9/2003	3			N	N	M	M				H	M	M	NA	L	L	M	SaM	HS			
36-18	M2	7/9/2003	3			N	N	M					M	M	M	NA	M	NA	M	SaM				
36-19	M3	7/23/2003	3	Pleasure Creek	Stream	N	N	M	M	M	M	M	M	H	H	H	M	H	M	SOW	SaM	WM	SC	FF
3-1-30	M2	7/8/2003	7		688P	N	N	L	M				M	M	H	NA	M	NA	M	SaM	HS			
4-1-30	R	8/4/2003	7			Y	N	L					M	H	H	NA	H	L	M	FF				

Appendix B
Wetland Impact Application

Minnesota Local/State/Federal Application Forms for Water/Wetland Projects

USE THIS APPLICATION FOR ANY PROJECT AFFECTING A LAKE, RIVER, STREAM OR WETLAND, INCLUDING:

Local Government Unit Approval Pursuant to Minnesota Wetlands Conservation Act (WCA)
Minnesota Department of Natural Resources (DNR) Permit to Work in Public Waters
Department of the Army Permit (33 CFR 325)

Note: The U.S. Army Corps of Engineers (**COE**) will forward application forms to the Minnesota Pollution Control Agency (**MPCA**) for processing if state water quality certification is required from the MPCA. You **do not** need to send this application to the MPCA.

This application packet includes :

Part I: The **BASIC APPLICATION** and the **COE APPLICATION** to be filled out by all applicants (see Instructions).

PART II: The **REPLACEMENT PLAN SUPPLEMENT** to be completed *only for* projects that impact wetlands and require a replacement plan for wetland mitigation. **If you're not sure** whether your project requires a replacement plan, call your Local Government Unit (LGU) or Soil and Water Conservation District (SWCD) office for guidance.

Do not proceed with your project until you have received all required approvals from your LGU, the DNR and the COE. If you wish to confirm the status of your application at any time, contact the agencies directly (see Instructions, page 2). **Proceeding with work before all required authorizations are obtained may result in fines or other penalties, and may include a requirement to restore the project site to original condition.**

If you have questions or need assistance with filling out these forms, contact your local SWCD office, your LGU, your Area DNR Waters office, or your COE field office (see Instructions, page 2).

If you believe that your project may be subject to watershed district, local zoning, or any other local regulations besides those of your LGU, contact those office(s) directly. **If you are a Federal Farm Program participant** and your project affects a wetland or water body on agricultural land, your eligibility for USDA benefits may be affected. Contact a Natural Resources Conservation Service office for further information.

A QUICK LOOK AT THE PROJECT APPLICATION PROCESS

Electronic files: Forms can be downloaded and filled out using Microsoft Word. Your input will be restricted to fill-in fields where users can enter text or check boxes. These areas appear gray on the screen, but not on the printed document.

Send copies of these completed application forms to your LGU, your Area DNR Waters office, and your COE regulatory office.

Any of the agencies may make initial contact with you to: a) inform you that it has no jurisdiction over your project; b) request additional information needed; or c) inform you of applicable fees.

When your application is considered complete and appropriate fees have been received (if requested) it will be distributed for appropriate review.

Following agencies' reviews, you will be informed if it has been approved, approved with changes or conditions, withdrawn, or denied.
For information about state laws, rules and regulations that direct this process go to the web site www.revisor.leg.state.mn.us. For information on U.S. Army Corps of Engineers regulations go to the web site www.mvp.usace.army.mil.

Instructions for Part I

HELP 1: Every applicant must fill out Section 1. The applicant is the person, agency, company, corporation, or other organization that owns, leases, or holds other legal rights to the land where the project is located. Indicate names of multiple applicants on a separate sheet.

HELP 1A: Fill out Section 1A only if you have designated an authorized agent. An authorized agent may be an attorney, builder, consultant, contractor, engineer, or any other person or organization designated by the applicant to represent him/her in this process. An agent is not required.

HELP 5: Purpose, description and dimensions of project: State briefly (in a sentence or two) what you propose to do and why it is needed. Also, describe whether your project will involve any of the following:

- Construction of structures, filling, draining, dewatering, removing, excavating or repair.
- Construction of an access path, bridge, culvert, dam, ditch, dock, driveway, riprap, road, sand blanket, shore protection, or tile line.
- Construction of any structures on fill, piles or a float-supported platform. If so, describe.
- Dredging or discharging (placing fill material) into a wetland or other water body (including the temporary placement of material). If so, explain the specific purpose of the placement of the material (such as erosion control) and indicate how it will be done (such as with a backhoe or dragline). If dredged material is to be discharged on an upland site, identify the location of the site.

Include an overhead view drawing showing the work to be undertaken and its relative location on the property. Show items such as property boundaries or lot dimensions; location and extent of shoreline, wetlands and water; location and dimensions and footprint of the proposed project, structure or activity (include length, width, elevation and other measurements as appropriate); points of reference such as existing homes, structures, docks or landscape features; indication of north; and location of spoil and disposal sites (if applicable). Hand drawn, computer generated or professionally prepared drawings are acceptable, as long as they contain all necessary information clearly, accurately, and in adequate detail. Please include specific dimensions whenever possible. You may also include photos, if you wish.

HELP 7: For information regarding adjacent landowners, contact the tax assessor where the project is to be developed.

HELP 8: If any part of the work has already been completed, describe the area already developed. Include a description of structures completed; any dredged or fill material already discharged (including type of material and volume in cubic yards); acres or square feet filled (if a wetland or other waterbody); and whether the work was done under an existing permit (if so identify the authorization, if possible).

HELP 9: Other permits, reviews or approval related to the project may include the following: conditional use permit; plat approval; zoning variance; National Pollutant Discharge Elimination System permit; state disposal system permit (includes dredged material disposal); watershed district/watershed management organization permit (stormwater, erosion, floodplain); environmental assessment worksheet/environmental impact statement; hazardous waste site; feedlot permit; groundwater appropriation permit; or county/township driveway/road permit. Are you aware of any archeological or cultural resource determinations or surveys completed concerning the project or replacement site by the State Historic Preservation Office (SHPO) or others? If yes, please explain on a separate sheet or attach a copy of any determinations or surveys.

Final Checklists (Part I)

- ☐ **Have you completed all of Part I** (Page 1), plus the Federal application (Page 2)?
- ☐ **Did you (and your agent, if applicable) sign Section 10** on page 1?
- ☐ **Have you signed the Application for the Department of the Army Permit** (Page 2) to seek Federal authorization of your project?
- ☐ **Have you included the necessary attachments for Part I?**

Attachments *must* include:

- ☐ Site Locator Map (Section 3)
- ☐ Type of Project (Section 4) (if additional space was needed)
- ☐ Overhead View of Project (Section 5 and HELP 5)
- ☐ Project Purpose, Description and Dimensions (Section 5) (if additional space was needed)

Attachments *may* also include:

- ☐ Applicant Contact Information (HELP 1) (if additional space was needed)
- ☐ Project Location (Section 3) (if additional space was needed)
- ☐ Project Alternatives (Section 6) (if additional space was needed)
- ☐ Photographs
- ☐ Adjoining Property Owners (Section 7) (if additional space was needed)
- ☐ Work Already Completed Section (Section 8) (if you answered YES)
- ☐ State Historic Preservation Office determination or survey

Submitting Your Application

Make three copies of the entire application and all attachments. Keep the original, and mail **a complete copy of your application to each of the local, state, and Federal entities listed below.** Be sure to include Part 1 and all attachments with each application.

LOCAL: Send to the appropriate Local Government Unit (LGU). If necessary, contact your county Soil and Water Conservation District (SWCD) office or visit the Board of Water and Soil Resources (BWSR) web site (www.bwsr.state.mn.us) to determine the appropriate LGU.

STATE: Send to your Area DNR Waters office, attention Area Hydrologist. If necessary, contact your county Soil and Water Conservation District (SWCD) office or visit the DNR website (www.dnr.state.mn.us) to locate the Area Hydrologist for your location, or contact a Regional DNR office:

NW Region:	**NE Region:**	**Central Region:**	**Southern Region:**
2115 Birchmont Beach Road N.E.	1201 East Highway 2	1200 Warner Road	261 Highway 15 South
Bemidji, MN 56601	Grand Rapids, MN 55744	St. Paul, MN 55106	New Ulm, MN 56073
Phone: 218-755-3873	Phone: 218-327-4416	Phone: 651-772-7910	Phone: 507 359-6053

FEDERAL: Send to the appropriate U.S. Army Corps of Engineers regulatory field office:

Brainerd:	**St. Paul:**	**La Crescent:**	**Two Harbors:**
U.S. COE, Regulatory Branch	U.S. COE, Regulatory Branch	U.S. COE, Regulatory Branch	U.S. COE, Regulatory Branch
10867 E. Gull Lake Drive N.W.	Army Corps of Engineers Centre	1114 South Oak Street	1554 Highway 2, Suite 2
Brainerd, MN 56401-9051	190 5th Street East	La Crescent, MN 55947-1338	Two Harbors, MN 55161
Phone: 218-829-8402	St. Paul, MN 55101-9051	Phone: 507-895-8059	Phone: 218-834-6630
	Phone: 651-290-5375		

WEB SITES: BWSR: www.bwsr.state.mn.us U.S. ACOE: www.mvp.usace.army.mil DNR: www.dnr.state.mn.us MPCA: www.pca.state.mn.us

Minnesota Local/State/Federal Application Form for Water/Wetland Projects

For Internal Use Only			
Application No.	Field Office Code	Date Initial Application Received	Date initial Application Deemed Complete

PART I: BASIC APPLICATION

"See HELP" directs you to important additional information and assistance in Instructions, Page 1.

1. LANDOWNER/APPLICANT CONTACT INFORMATION *(See Help 1)*

Name: Phone:

Complete mailing address:

1A. AUTHORIZED AGENT *(See Help 1A) (Only if applicable; an agent is not required)*

Name: Phone:

Complete mailing address:

2. NAME, TYPE AND SIZE OF PUBLIC WATERS or WETLANDS IMPACTED (Attach *Additional Project Area* sheets if needed)

Name or I.D. # of Waters Impacted (if applicable; if known):

(Check all that apply): ☐Lake ☐River ☐Wetland type ☐ 1 ☐ 1L ☐ 2 ☐ 3 ☐4 ☐ 5 ☐ 6 ☐ 7 ☐ 8

Indicate size of entire lake or wetland (check one): ☐ Less than 10 acres (indicate size:) ☐10 to 40 acres ☐ Greater than 40 acres

3. PROJECT LOCATION *(Information can be found on property tax statement, property title or title insurance):*

Project street address: Fire #: City (if applicable):

¼ Section: Section: Township #: Range #: County:

Lot #: Block: Subdivision: Watershed (name or #)

Attach a simple site locator map. If needed, include on the map written directions to the site from a known location or landmark, and provide distances from known locations. Label the sheet *SITE LOCATOR MAP.*

4. TYPE OF PROJECT: Describe the type of proposed work. Attach *TYPE OF PROJECT* sheet if needed.

. PROJECT PURPOSE, DESCRIPTION AND DIMENSIONS: Describe what you plan to do and why it is needed, how you plan to construct the project with dimensions (length, width, depth), area of impact, and when you propose to construct the project. **This is the most important part of your application. See HELP 5 before completing this section; see What To Include on Plans** (Instructions, page 1). Attach *PROJECT DESCRIPTION* sheet.

Footprint of project: acres or square feet drained, filled or excavated.

6. PROJECT ALTERNATIVES: What alternatives to this proposed project have you considered that would avoid or minimize impacts to wetlands or waters? List at least **TWO** additional alternatives to your project in Section 5 that avoid wetlands (one of which may be "no build" or "do nothing"), and explain why you chose to pursue the option described in this application over these alternatives. Attach *PROJECT ALTERNATIVES* sheet if needed.

7. ADJOINING PROPERTY OWNERS: For projects that impact more than 10,000 square feet of water or wetlands, list the complete mailing addresses of adjacent property owners on an attached separate sheet. (See **HELP 7**)

8. PORTION OF WORK COMPLETED: Is any portion of the work in wetland or water areas already completed? ☐ Yes ☐No. If yes, describe the completed work on a separate sheet of paper labeled **WORK ALREADY COMPLETED**. (See **HELP 8**)

9. STATUS OF OTHER APPROVALS: List any other permits, reviews or approvals related to this proposed project that are either **pending** or **have already been approved or denied on a separate attached sheet. See HELP 9.**

10. I am applying for state and local authorization to conduct the work described in this application. I am familiar with the information contained in this application. To the best of my knowledge and belief, all information in Part I is true, complete, and accurate. I possess the authority to undertake the work described, or I am acting as the duly authorized agent of the applicant.

_____	_____	_____	_____
Signature of applicant (Landowner)	*Date*	*Signature of agent (if applicable)*	*Date*

This block must be signed by the person who desires to undertake the proposed activity and has the necessary property rights to do so. If only the Agent has signed, please attach a separate sheet signed by the landowner, giving necessary authorization to the Agent.

APPLICATION FOR DEPARTMENT OF THE ARMY PERMIT (33 CFR 325) OMB APPROVAL NO. 0710-003 Expires Dec 31, 2004

The public burden for this collection of information is estimated to average 10 hours per response, although the majority of applications should require 5 hours or less. This includes the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Department of Defense, Washington Headquarters Service Directorate of Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202-4302; and to the Office of Management and Budget, Paperwork Reduction Project (0710-0003), Washington, DC 20503. Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to any penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number. Please DO NOT RETURN your form to either of these addresses. Completed applications must be submitted to the District engineer having jurisdiction over the location of the proposed activity.

PRIVACY ACT STATEMENT: Authorities: Rivers and Harbors Act, Section 10, 33 USC 403; Clean Water Act, Section 404, 33 USC 1344; Marine Protection, Research and Sanctuaries Act, 33 USC 1413, Section 103. Principal purpose: Information provided on this form will be used in evaluating the application for a permit. Routine uses: This information may be shared with the Department of Justice and other Federal, state, and local government agencies. Submission of requested information is voluntary; however, if information is not provided, the permit application cannot be evaluated nor can a permit be issued.

ITEMS 1 THROUGH 4 TO BE FILLED IN BY THE CORPS

1. APPLICATION NO.	2. FIELD OFFICE CODE	3. DATE RECEIVED	4. DATE APPLICATION COMPLETED

YOU *DO NOT* NEED TO COMPLETE ITEMS 6-10 and 12-25 in the SHADED AREAS.

All applicants must complete **non-shaded** items 5 and 26. If an agent is used, also complete items 8 and 11. This optional Federal form is valid for use *only* when included as part of this entire state application packet.

5. APPLICANT'S NAME	8. AUTHORIZED AGENT'S NAME AND TITLE (an agent is not required)
6. APPLICANT'S ADDRESS	9. AGENT'S ADDRESS
7. APPLICANT'S PHONE NO.	10. AGENT'S PHONE NO.

11. STATEMENT OF AUTHORIZATION (*if applicable; complete* only *if authorizing an agent)*

I hereby authorize _____ to act on my behalf as my agent in the processing of this application and to furnish, upon request, supplemental information in support of this permit application.

APPLICANT"S SIGNATURE: _____ DATE: _____

12. PROJECT NAME OR TITLE (see instructions)	
13. NAME OF WATERBODY, IF KNOWN (if applicable)	14. PROJECT STREET ADDRESS (if applicable)
15. LOCATION OF PROJECT	
16. OTHER LOCATION DESCRIPTIONS, IF KNOWN (see instructions)	
17. DIRECTIONS TO THE SITE	18. NATURE OF ACTIVITY
19. PROJECT PURPOSE	20. REASON(S) FOR DISCHARGE
21. TYPES OF MATERIAL BEING DISCHARGED AND THE AMOUNT OF EACH TYPE IN CUBIC YARDS	
22. SURFACE AREA IN ACRES OF WETLANDS OR OTHER WATERS FILLED	
23. IS ANY PORTION OF THE WORK ALREADY COMPLETE? YES _____ NO ____ IF YES, DESCRIBE COMPLETED WORK	
24. ADDRESSES OF ADJOINING PROPERTY OWNERS,	
25. LIST OF OTHER CERTIFICATIONS OR APPROVALS/DENIALS RECEIVED FROM OTHER FEDERAL, STATE OR LOCAL AGENCIES FOR WORK DESCRIBED IN THIS APPLICATION.	

26. Application is hereby made for a permit or permits to authorize the work described in this application. I certify that the information in this application is complete and accurate. I further certify that I possess the authority to undertake the work described herein or am acting as the duly authorized agent of the applicant.

_____ Signature of applicant _____ Date _____ Signature of agent (if any) _____ Date

The application must be signed by the person who desires to undertake the proposed activity (applicant), or it may be signed by a duly authorized agent if the statement in Block 11 has been filled out and signed. **18 U.S.C. Section 1001** provides that: Whoever, in any manner within the jurisdiction of any department or agency of the United States knowingly and willfully falsifies, conceals, or covers up with any trick, scheme, or disguises a material fact or makes any false, fictitious or fraudulent statements or representations or makes or uses any false writing or document knowing same to contain any false, fictitious or fraudulent statements or entry, shall be fined not more than $10,000 or imprisoned not more than five years or both.

ENG FORM 4345, Jul 97 EDITION OF FEB 94 IS OBSOLETE. (Proponent: CECW-OR)

Instructions For Part II

Complete those portions of Part II: Replacement Plan Supplement for which information is readily available (such as location, existing land use, size of impact area, etc.) A person certified in wetland delineation must determine items pertaining to specific wetland impacts (wetland type, ·edominant vegetation, watershed name, etc.) Contact the local soil and water conservation district (SWCD) office for further information on taining such items.

What to Include on Plans

Detailed overhead views of replacement site(s) (Part II), as well as profile view(s) of replacement site(s) (Part II), may be either hand drawn, computer generated or professionally prepared, as long as they contain all necessary information clearly, accurately, and in adequate detail. Please include specific dimensions whenever possible. You may also include photos, if you wish.

Overhead views of Part II replacement site(s) should include the following items that pertain to your project:

- Property boundaries and/or lot dimensions.
- Location and extent of shoreline, wetlands and water.
- Location and dimensions of proposed project, structure or activity. Include length, width, elevation and other measurements as appropriate.
- Points of reference (such as existing homes, structures, docks or landscape features).
- Location of inlet and outlet structures.
- Indication of north.
- Location of spoil and disposal sites (if applicable).
- Areas of wetland and upland plants established.

Profile views (side or cross-sectional views) should include the following items that pertain to your project:

- Location and dimensions of proposed project, structure or activity. Include elevation, depth, soil profile, side slope and other measurements as appropriate.
- Proposed water level elevation.

Final Checklists
Part II: Replacement Plan Supplement

☐ **Have you completed all of Part II** (pages 3-5)?
☐ **Did you (or your agent) sign Section 19** on page 5?
☐ **Have you included the necessary attachments for Part II?**

.ttachments *must* include:
☐ **If the project includes any wetland banking** (complete or partial), include Application for Withdrawal of Wetland Credits Form (Section 14)
☐ **If the project includes any project-specific replacements** (complete or partial), include:
- Description of Replacement Wetland(s) Construction (Section 15)
- Copy of vegetation management plan (Section 15)
- Scale drawing of overhead view or replacement wetland (Section 18)
- Scale drawing of profile view of replacement wetland (Section 18)

Attachments *may* also include:
☐ Additional description of Wetland Impact Charts (Section 11) (if additional space was needed)
☐ Additional Description of Replacement Wetlands charts (Section 17) (if additional space was needed)
☐ Additional soils information for created replacement wetland(s) (Section 18) (if available)

Note: To deposit surplus wetland credits in the State Wetland Bank, submit a Wetland Banking Application directly to your LGU (Section 16).

Preparing Your Application for Mailing

☐ **To apply for both state and Federal authorization, your application must include Part I** (Page 1), **the Federal application** (Page 2), **and attachments** as indicated on *Final Checklist for Part I* (Instructions, Page 2).
☐ **Your application must also include Part II** (Pages 3-5) and additional attachments as indicated on *Final Checklist for Part II* (above).
☐ **Make three copies of the entire application and all attachments.** Keep the original, and mail the three copies to the appropriate local, state, and Federal agencies (see Instructions for Part I for addresses).

PART II: REPLACEMENT PLAN SUPPLEMENT

For assistance in completing Part II, contact your Local Government Unit or a professional consultant

11. DESCRIPTION OF WETLAND IMPACTS: Complete the chart below: 1) Use one row of boxes for each wetland impact; 2) If your project has more than one wetland impact, reference your overhead view (part of Section 5) to this chart by identifying and labeling "first impact" and "second impactön ur overhead view; 3) If you are identifying only one wetland type within a given wetland impact area, use the first dotted line and leave the others blank; If you have chosen to identify more than one wetland type within a given wetland impact area, use the extra dotted lines to indicate each wetland type, and identify predominant vegetation and size of impacted area for each separate wetland type within that impact area; 5) If you do not have access to some of this information, call your LGU or SWCD office for assistance. *(Photocopy chart for more impacts, if needed.)*

DESCRIPTION OF WETLAND IMPACTS

Wetland impact *(as noted on overhead view)*	Watershed name or number *(if known)*	County, Section, Township, Range	Wetland type[1]	Predominant vegetation in impacted wetland area	Size of area impacted (in acres or square feet)	Existing land use in project area (check all that apply)
First impact						☐ Housing ☐ Commercial ☐ Industrial ☐ Parks/recreation areas ☐ Highways and associated rights-of-way ☐ Forested ☐ Farmsteads/agricultural ☐ Vacant lands ☐ Public and semi-public (schools/gov't facilities) ☐ Airports ☐ Extractive (gravel pits/quarries) ☐ Other:
Second impact						

[1]If you are identifying only one wetland type within a given wetland impact area, use the first dotted line and leave the others blank. If you have chosen to identify more than one wetland type within a given wetland impact area, use the extra dotted lines to indicate each separate wetland type, and identify predominant vegetation and size of impacted area for each separate wetland type with that impact area.

TOTALS **OF AREA(S) IMPACTED FOR EACH WETLAND TYPE ON CHART** (*indicate acres* ☐ *or square feet* ☐)

Type: 1: _____ 1L: _____ 2: _____ 3: _____ 4: _____ 5: _____ 6: _____ 7: _____ 8: _____ R: _____

12. SPECIAL CONSIDERATIONS: Are you aware of any special considerations that apply to either the impact site(s) or the replacement site(s)? ☐ Yes ☐ No (Examples: the presence of endangered species, special fish and wildlife resources, sensitive surface waters, or waste disposal site.) If YES, list and describe briefly.

13. SHORELAND IMPACT ZONE: Please identify each wetland impact site noted in Section 15 that is within 1000 feet of a lake or 300 feet of a river.

14. **HOW PROPOSED REPLACEMENT WILL BE ACCOMPLISHED:** Indicate how proposed replacement will be accomplished (check only one box below and continue as indicated):

☐ A. Wetland banking only
Complete *Application for Withdrawal of Wetland Credits Form* and include with your application. Copies of this form are available from your LGU, or download a copy from www.bwsr.state.mn.us
Skip to Section 19, page 6 (You do not need to complete Sections 15-18).

☐ B. Project-specific replacement only
Continue with Section 15 below.

☐ C. A Combination of wetland banking and project-specific replacement
Complete *Application for Withdrawal of Wetland Credits Form* and include with your application. Copies of this form are available from your LGU, or download a copy from www.bwsr.state.mn.us
Continue with Section 15 below.

15. **DESCRIPTION OF REPLACEMENT WETLAND(S) CONSTRUCTION** (Complete this section only if you marked Box B or Box C in Section 14 above):
Describe in detail how replacement wetland(s) will be constructed. If several methods will be used, describe each method. Details should include the following: 1) type of construction (such as excavated in upland, restored by tile break, restored by ditch block or revegetated); 2) type, size and specifications of outlet structures; 3) elevations relative to Mean Sea Level or established benchmarks or key features (such as sill, emergency overflow or structure height); 4) what best management practices will be implemented to prevent erosions or site degradation; 5) proposed timetable for starting and ending the project; and 6) a vegetation management plan. Write this description on a separate sheet of paper labeled *DESCRIPTION OF REPLACEMENT WETLAND CONSTRUCTION.*

16. **SURPLUS WETLAND CREDITS:** If using project-specific replacement (Box B or Box C in Section 14 above), will the replacement result in any surplus wetland credits that you wish to have deposited in the State Wetland Bank for future use? ☐ Yes ☐ No. If yes, **submit a Wetland Banking Application directly to your LGU.** Copies are available from your LGU, or download a copy from www.bwsr.state.mn.us

17. **DESCRIPTION OF REPLACEMENT WETLANDS:** Complete the chart below: 1) Use one row of boxes for each wetland replacement site; 2) If your project has more that one wetland replacement site, reference your overhead view (part of Section 5) to this chart by identifying and labeling "first replacement site" and "second replacement site" on your overhead view; 3) If you are identifying only one wetland type within a given replacement site, use the first dotted line(s) and leave the others blank; 4) If you have chosen to identify more than one wetland type in a given replacement site, use the extra dotted lines to indicate each separate wetland type, and identify type(s) of replacement credits and "restored or created" for each separate wetland type with that replacement site; 5) If you do not have access to some of the information, or if you do not know your replacement ratio, call your LGU or SWCD office for assistance. *Photocopy chart for more wetland replacements, if needed.)*

DESCRIPTION OF REPLACEMENT WETLANDS

Identify Wetland replacement site *(as noted on overhead view)*	Watershed name or number *(if known)*	County	Section, Township, Range	Wetland Type[1]	Type(s) of replacement credits *(in acres or square feet)*		Restored or created? Indicate R or C
					New Wetland Credits (NWC)	Public Value Credits (PVC)	
Name of First replacement site							
Name of Second replacement site							
					TOTAL NWC	TOTAL PVC	
					REQUIRED REPLACEMENT RATIO: *(If known)*		

[1]Circular 39 wetland types: Indicate1, 1L, 2, 3, 4, 5, 6, 7, 8, R, or U. If you are identifying only one wetland type within a given wetland impact area, use the first dotted line and leave the others blank. If you have chosen to identify more than one wetland type within a given wetland impact area, use the extra dotted lines to indicate each separate wetland type, and identify predominant vegetation and size of impacted area for each separate wetland type within that impact area.

18. ADDITIONAL INFORMATION REQUIRED FOR PROJECT-SPECIFIC REPLACEMENT (Required *only* if you marked Box B or Box C in Section 14): For projects involving at least some project-specific replacement, include the following additional information:

☐ Two drawings to scale of the replacement wetland. Include both overhead view and profile (side view or cross-sectional view). See *What to Include on Plans* (Instructions, Page 3) for a detailed description of what should be included in these drawings. Without drawings your application will be considered incomplete.

☐ For created replacement wetlands, include additional soils information (if available) that indicates the capability of the site to produce and maintain wetland characteristics.

Note 1: For replacement wetlands located on pipeline easements, you need to receive endorsement of your project from both the easement holder and the Minnesota Department of Public Safety's Office of Pipeline Safety. Before start of construction, the owner of any utilities must be notified. The landowner or contractor is responsible for giving this notice by calling "Gopher State One-Call" at 652-454-0002 (Twin Cities Metro Area) or 1-800-252-1166 (all other locations).

Note 2: For extensive or complex projects supplementary information may be requested at a later dated from one or more of the responding agencies. Such information may include (but not be limited to) the following: topographic map, water table map, soil borings, depth soundings, aerial photographs, environmental assessment and/or engineering reports.

19. SIGNED AFFIRMATION:

FOR PROJECTS INVOLVING REPLACEMENT BY WETLAND BANKING ONLY. To the best of my knowledge and belief, all information in Part II is true, complete and accurate; and I affirm that the wetland losses will be replaced via withdrawal from an account in the State Wetland Bank.

FOR PROJECTS INVOLVING EITHER PROJECT-SPECIFIC REPLACEMENT ONLY OR A COMBINATION OF WETLAND BANKING AND PROJECT-SPECIFIC REPLACEMENT:

Part A: The replacement wetland. I affirm that the replacement wetland was not:
Previously restored or created under a prior approved replacement plan or permit; AND
Drained or filled under an exemption during the previous 10 years; AND
Restored with financial assistance from public conservation programs; AND
Restored using private funds, other than landowner funds, unless the funds are paid back with interest to the individual or organization that funded the restoration; and the individual or organization notifies the local government unit in writing that the restored wetland may be considered for replacement.

Part B: Additional assurances (check all that apply):
☐ The wetland will be replaced before or concurrent with the actual draining or filling of a wetland.
☐ An irrevocable bank letter of credit, performance bond, or other acceptable security has been provided to guarantee successful completion of the wetland replacement.
☐ The wetland losses will be replaced via withdrawal from an account in the State Wetland Bank.

Part C. For projects involving any project-specific replacement: Within 30 days of either receiving approval of this application or beginning work on the project, I will record the Declaration of Restrictions and Covenants on the deed for the property on which the replacement wetland(s) will be located; and I will at the same time submit proof of such recording to the LGU.

To the best of my knowledge and belief, all information in Part II is true, complete and accurate; and I affirm all statements in Part A and C, as well as checked assurance(s) in Part B.

_____ _____
Signature or applicant or agent *Date*

FOR LGU USE ONLY

Replacement plan is (check one): ☐ Approved ☐ Approved with conditions (conditions attached) ☐ Denied

_____ _____
LGU official signature *Date*

LGU has receive evidence of title and proof of recording of Declaration of Restrictions and Covenants for Replacement Wetland:

_____ _____ _____
County where recorded *Date* *Document # assigned by recorder*

_____ _____
LGU official signature *Date*

Appendix C
Sequencing for Manage 3 Wetlands

Appendix C
Sequencing Flexibility for Manage 3 Wetlands

The Wetland Conservation Act (WCA) allows for flexibility in the sequencing process and as part of a Wetland Management Plan. Based on the MnRAM 2.0 assessment that was completed for each wetland, wetlands that received the highest percentage scores for water quality and flood attenuation and the lowest percentage scores for vegetation and habitat were placed into the Manage 3 category (see **Table V-2**). This appendix provides for significant sequencing flexibility for the wetlands in the Manage 3 category.

The wetlands placed in the Manage 3 management category received the lowest ratings for vegetation and habitat for the MnRAM 2.0 assessment as compared to all other wetlands within the City. These wetlands also received the high ratings for water quality and flood attenuation. This indicates that these wetlands act as a primary treatment facility for storm water and are acting to hold storm water and may prevent downstream flooding. Therefore, these wetlands provide those functions associated with a storm water pond.

These wetlands have been greatly impacted by disturbance such as grading, vegetation removal, storm water inputs, draining, etc. thereby reducing the vegetation, habitat, hydrology, and aesthetics functions of the wetland. Due to the low functioning of these wetlands for habitat and vegetation, it is anticipated that a replacement wetland could be designed to have overall higher functions and values. Therefore, if deemed feasible by the City, the wetlands within the Manage 3 category will be provided significant sequencing flexibility upon review of the project and replaced at a 2:1 ratio (1 acre New Wetland Credit and 1 acre Public Value Credit).

If impact to Manage 3 wetlands are proposed, the project proposer will be granted sequencing flexibility. Reference this section in the wetland replacement application should be made. It should be noted that the DNR and/or US Corps of Engineers may require separate sequencing discussions.

Appendix D
Wetland Monitoring Requirements

The attached wetland monitoring requirements have been copied from Minnesota Rules 8420 – Wetland Conservation Act Rules

Minnesota Rules, Table of Chapters

Table of contents for Chapter 8420

8420.0620 MONITORING ANNUAL REPORT.

Subpart 1. **Purpose.** The purpose of the annual report is to describe actual wetland restoration or creation activities completed during the past year, activities planned for the upcoming year, and the information in subpart 2. The applicant shall submit the annual report to the local government unit where the replacement wetland is located on a date determined by the local government unit until the applicant has fulfilled all of the requirements of the local government unit. The local government unit, at its discretion, may prepare the annual report for the applicant.

Subp. 2. **Report content.** The annual report shall include the following information and other site-specific information identified by the local government unit:

A. a description of the project location, size, current wetland type (Cowardin classification), and desired wetland type (goal);

B. a comparison of the as-built specifications versus the design specifications (first annual plan only) and a rationale for significant changes;

C. hydrology measurements: seasonal water level elevations or areal coverage measurements during the period April through October;

D. a map of plant communities within the boundaries of the replacement site, including hydrologic indicators observed; and

E. color photographs of the project area taken anytime during the growing season.

STAT AUTH: MS s 14.06; 103B.101; 103B.3355; 103G.2242

HIST: 18 SR 274; 22 SR 1877; 27 SR 135

Current as of 11/14/03

Appendix E
MnRAM 2.0

MINNESOTA ROUTINE ASSESSMENT METHOD (MnRAM) FOR EVALUATING WETLAND FUNCTIONS - Version 2.0

USER ADVISORIES:

Prerequisites

This primary purpose of this qualitative method is to provide an organized and consistent procedure to document observations and conclusions about wetland processes. It may be modified to fit special circumstances provided justification for the modifications is developed as part of the evaluation. This method requires training and experience in wetland science before it can be accurately applied. Professional judgement incorporated into the evaluation is intended to affect the outcome.

This method is intended for routine applications; for very complex or controversial sites a more elaborate method may be required. When possible (and especially for difficult or controversial sites) it is recommended that a diverse team of trained and experienced wetland professionals conduct the evaluation together. As with any method relying on professional judgement, the results will improve with training, practice and experience.

Several of the assessment items will be easier to complete with less field time if a preliminary office review of references such as the USGS topographic maps, stormwater management maps and plans, the county soil survey, NWI maps, aerial photography, and other off-site resources are checked to establish the history and setting of the wetland under evaluation. An evaluation for a small wetland (<10 acres) with normal circumstances in an area familiar to the evaluator(s) can be usually be completed in about 2 to 3 hours.

Size and Scale

If all other factors are the same, a wetland's total functional capacity is proportional to its size -- thus, size must be a consideration in the evaluation and any subsequent comparisons. Evaluations based on a unit size (e.g., per acre) may allow for a more direct comparison of wetlands of different sizes. However, there is importance in dispersion of wetlands as a wetland can only perform a function where it is located. Cumulatively then, smaller wetlands may provide functional benefits on a broader basis than larger wetlands. Thus, it is important to complete the evaluation with both landscape scale and site specific perspectives in mind.

Reference Standard Wetlands

A REFERENCE STANDARD WETLAND is a wetland judged to have the highest level of overall sustainable functional capacity for its type -- based on a classification system such as Circular 39, the Cowardin/National Wetland Inventory system or the Hydrogeomorphic system (HGM) -- within the Wetland Comparison Domain (see page 4 for definition). Reference Standard Wetlands will be the least disturbed/altered wetlands within the Wetland Comparison Domain. NOTE: In rare circumstances where the Wetland Comparison Domain is too small to include a high quality wetland, Reference Standard Wetlands may be identified in similar areas adjacent to the Wetland Comparison Domain. Functional evaluation of wetlands requires that Reference Standard Wetlands be designated prior to the evaluation to establish a common base of comparison. Ideally, Reference Standard Wetlands of each wetland type should be established in each Wetland Comparison Domain. However, for purposes of expediency, evaluations without Reference Standard Wetland sites may be conducted if the characteristics of Reference Standard Wetlands can be established and agreed to based on previous experience and familiarity with the wetlands in a particular Wetland Comparison Domain.

Functions vs. Values

A wetland function is a physical, chemical, or biological process or attribute of a wetland -- simply something a wetland does. For example, the process of retaining surface water is a commonly cited wetland function. A wetland value is the extent to which a wetland function is perceived as beneficial to an individual or society. Reduced flood damages to downstream properties is a value generally associated with the function of surface water retention.

While it's important to understand the distinction between functions and values, land use decisions involving wetlands typically involve consideration of both. Therefore, in the interest of practicality and to provide more useful information for making decisions about wetlands, this assessment method addresses a variety of wetland functions along with some of the related values. An attempt was made to separate the evaluations of functions and values, to provide the user a more clear understanding of how a proposed activity may affect a wetland's ability to perform a particular function, as compared to the function's relative importance (or value) resulting from its location on the landscape or socio-economic influences. This was not always possible, however. Some of the assessment parameters are difficult to assign as functions or values, and are thus combined in the same section. For instance, the assessment of water quality protection includes some purely functional aspects (geomorphological features of the wetland) and some value-related aspects (presence/absence of recreational waterbodies downstream). Other points to remember in conducting and applying the results of this assessment are:

- Wetland functions are closely linked to the long-term sustainability of the assessment wetland as a viable ecosystem.

- Generally, wetland functions can be measured more objectively than values, which are culturally derived. The wetland values included in this wetland assessment method are those that are more easily evaluated and generally thought to be positive.

- There are values associated with all of the assessed functions; some of them are just not explicitly evaluated by this method. In applying the results of this method, decision-makers must consider the relative value of each of the functions and the potential trade-offs involved. The results of this method are intended to provide objective information to aid the decision making process.

Wetland Ranking

A commonly asked question is: "If MnRAM does not use a numerical rank or rating system, who will decide which combination of functions is/are the most important? How can you compare wetlands?" The answer to the first question is the same as always -- people will decide. Functional assessment methods cannot make such decisions. By treating the various functions separately, MnRAM gives decision makers a more complete understanding of the tradeoffs associated with their land use decisions involving wetlands. The results are that MnRAM provides people with much better information for comparing wetlands than methods that somehow integrate all wetland functions into a single number. Such methods obfuscate, rather than illuminate the role that wetlands play in the landscape.

While a need for wetland functional analysis exists, it can lead to the perception of a wetland as a bundle of functions that can be teased apart and scattered around, rather than an integrated ecological system. There is also the risk that, having performed a functional assessment, we think we know all

there is to know about a particular wetland, when in fact our understanding may be limited.

Value judgements about which wetland functions are to be given the greatest emphasis are left to the entity conducting or sponsoring the assessment and are best applied in the context of a comprehensive wetland protection and management plan so that decisions about wetlands are made on a landscape, watershed or community basis before an action or proposal necessitates a judgement about use priorities on a case-by-case basis. *Rankings or ratings cannot be used to compare wetlands in different Wetland Comparison Domains.* Before assigning numerical rankings or qualitative ratings, it is necessary to establish Reference Standard Wetland sites for each wetland type in the Wetland Comparison Domain.

Definitions

Major watershed = 81 major watershed units as defined by the U.S. Geological Survey and listed in MN Rule Chapter 8420.0110.

Local watershed = subwatershed area within major watershed.

Immediate Watershed = direct surface drainage area into the wetland.

References

"Wisconsin Department of Natural Resources Rapid Assessment Methodology for Evaluating Functional Values" (David R. Seibert, November 1992).

"A Hydrogeomorphic Classification for Wetlands" (US Army Corps of Engineers, Report WRP-DE-4, Mark Brinson, August 1993).

"A Conceptual Framework for Assessing the Functions of Wetlands" (US Army Corps of Engineers, Report WRP-DE-3, Daniel Smith, August 1993).

"Wetland Plants and Plant Communities of MN and WI", 2nd Ed.; (USACOE - St. Paul District; Eggers & Reed).

"City of Plymouth Wetland Inventory and Ordinance Project"; developed by Peterson Environmental Consulting, Inc.

"City of Bloomington Wetland Inventory Project" as developed by Shelly Peterson and Scott Thureen, City of Bloomington, MN.

"Hydrology of Wisconsin Wetlands. Information Circular 40, U.S. Geological Survey"; Novitski, R.P., 1982.

Developed by Minnesota Interagency Wetlands Group

Board of Water & Soil Resources: John Jaschke, Barbara Ohman, Eric Mohring, Dan Eklund
Department of Natural Resources: Erv Berglund, Bruce Gerbig, Doug Norris, Bill Penning
Department of Transportation: Sarma Straumanis, Nick Tiedeken, Brad Kovach
Pollution Control Agency: Mark Gernes, Judy Helgen, Larry Zdon
U.S. Army Corps of Engineers: Steve Eggers, Tim Fell, Paul Richert
USDA-Natural Resources Conservation Service: Mark Oja, Sid Cornelius
U.S. Fish and Wildlife Service: Nick Rowse, Loyd Mitchell, Jack Arnold
St. Louis County Highway Department: Tom Tri

For more information or to receive a copy contact John Jaschke at the Minnesota Board of Water and Soil Resources at (651)296-3767.

Vegetative Diversity and Integrity

Step 1: Key out wetland plant community(-ities) within the evaluation area using the following key: ***Page 19 - 22 of "Wetland Plants and Plant Communities of MN and WI"; (USACOE - St. Paul District; Eggers and Reed).*** *Copies of the Second Edition (1997) can be purchased from the St. Paul District, U.S. Army Corps of Engineers, Army Corps of Engineers Centre, ATTN: Library/Sales Agent, 190 5th Street East, St. Paul, MN 55101-1638, phone: (612)290-5680.*

1A. Mature trees (dbh of 6 inches or more) are present and form closed stands (more than 17 trees per acre; more than a 50 percent canopy cover) on wet, lowland soils (usually floodplains and ancient lake basins) .

2A. Hardwood trees are dominant; usually alluvial, peaty/mucky, or poorly drained mineral soils.

3A. Silver maple, American elm, river birch, green ash, black willow and/or eastern cottonwood are dominant; growing on alluvial soils associated with riverine systems. ..... FLOODPLAIN FOREST

3B. Black ash, yellow birch, silver maple and/or red maple are dominant; northern white cedar may be subdominant; growing on poorly-drained mineral or peat/muck soils, often associated with ancient lake basins. ..... HARDWOOD SWAMP

2B. Coniferous trees are dominant; soils usually peaty.

4A. Tamarack and/or black spruce are dominant; growing on a continuous sphagnum moss mat and acid, peat soils. ..... CONIFEROUS BOG

4B. Northern white cedar and/or tamarack are dominant; continuous sphagnum moss mat absent; usually growing on neutral to alkaline peat/muck soils. ..... CONIFEROUS SWAMP

1B. Mature trees are absent or, if present, form open, sparse stands; other woody plants, if present, are shrubs or saplings and pole-size trees (dbh less than 6 inches) less than 20 feet high and growing on wet, lowland, or poorly-drained soils, or in ground-water eepage areas.

5A. Community dominated by woody shrubs.

6A. Low, woody shrubs usually less than 3 feet high; sphagnum moss mat layer may or may not be present.

7A. Shrubs are ericaceous and evergreen growing on a sphagnum moss mat layer; peat soils are acidic. ..... OPEN BOG

7B. Shrubs are deciduous, mostly shrubby cinquefoil, often growing on sloping sites with a spring-fed supply of internally flowing, calcareous waters; other calciphiles are also dominant; sphagnum moss mat layer absent; muck/poorly-drained mineral soils are alkaline. .....CALCAREOUS FEN

6B. Tall, woody deciduous shrubs usually greater than 3 feet high; sphagnum moss mat layer absent. ..... SHRUB SWAMPS

8A. Speckled alder is dominant; usually on acidic soils in and north of the vegetation tension zone. ..... ALDER THICKET

8B. Willows, red-osier dogwood, silky dogwood, meadowsweet and/or steeplebush are dominant on neutral to alkaline poorly-drained muck/mineral soils; found north and south of the vegetation tension zone. ..... SHRUB-CARR
NOTE: Buckthorns (*Rhamnus* spp.) may occur as dominant shrubs or small trees in disturbed shrub-carrs.

5B. Community dominated by herbaceous plants.

9A. Essentially closed communities, usually with more than 50 percent cover.

10A. Sphagnum moss mat on acid peat soils; leatherleaf, pitcher plants, certain sedges, and other herbaceous species tolerant of low utrient conditions may be present. ..... OPEN BOG

10B. Sphagnum moss mat absent; dominant vegetation consists of sedges (Cyperaceae), grasses (Gramineae), cattails, giant bur-reed,

arrowheads, forbs and/or calciphiles. Soils are usually neutral to alkaline poorly drained mineral soils and mucks.

11A. Over 50 percent of the cover dominance contributed by the sedge family, cattails, giant bur-reed, arrowheads, wild rice, and/or giant reed grass (*Phragmites*).

12A. Herbaceous emergent plants growing on saturated soils to areas covered by standing water up to 6 inches in depth throughout most of the growing season.

13A. Major cover dominance by the sedges (primarily genus *Carex*). ..... SEDGE MEADOW

13B. Major cover dominance by cattails, bulrushes, water plantain, *Phragmites*, arrowheads, and/or lake sedges. ..... SHALLOW MARSH

12B. Herbaceous submergent, floating and emergent plants growing in areas covered by standing water greater than 6 inches in depth throughout most of the growing season. ..... DEEP MARSH

11B. Over 50 percent of the cover dominance contributed by grasses (except wild rice and *Phragmites*), forbs and/or calciphiles.

14A. Spring-fed supply of internally flowing, calcareous waters, often sloping sites; calciphiles such as sterile sedge, wild timothy, Grass-of-Parnassus and lesser fringed gentian are dominant. ..... CALCAREOUS FEN

14B. Water source(s) variable; calciphiles not dominant.

15A. Soils saturated to inundated during the growing season; prairie grasses such as big bluestem, prairie cordgrass and/or Canada bluejoint grass are usually dominant, and various species of lowland prairie forbs are present. ..... WET TO WET-MESIC PRAIRIE

15B. Site rarely inundated, but soils are saturated for all or part of the growing season; dominated by forbs such as giant goldenrod and/or grasses such as redtop and reed canary grass. ..... FRESH (WET) MEADOW

9B. Essentially open communities, either flats or basins usually with less than 50 percent vegetative cover during the early portion of the growing season, or shallow open water with submergent, floating and/or floating-leaved aquatic vegetation.

16A. Areas of shallow, open water (< 6.6 feet in depth) dominated by submergent, floating and/or floating-leaved aquatic vegetation. ..... SHALLOW, OPEN WATER COMMUNITIES

16B. Shallow depressions or flats; standing water may be present for a few weeks each year, but are dry for much of the growing season; often cultivated or dominated by annuals such as smartweeds and wild millet. ..... SEASONALLY FLOODED BASIN

USER GUIDANCE -Maintenance of Characteristic Hydrologic Regime

The ability of a wetland to maintain a hydrologic regime characteristic of that expected for the wetland type represented is evaluated based upon wetland characteristics, land use within the wetland, and land use within the upland watershed contributing to the wetland.

Use the predominant rating of **high, medium,** or **low** for all factors to identify the wetland's functional level.

Wetlands with unaltered outlet conditions and mostly undisturbed conditions in the wetland and its local watershed would be rated as **exceptional** for this function.

Question Rationale

1. Outlet Characteristics. The ability of a wetland to maintain a hydrologic regime characteristic of the wetland type is somewhat dependent upon whether or not a natural outlet is present, and largely dependent upon whether or not an outlet has been constructed by humans. Constructed outlets can significantly affect the ability of a wetland to provide temporary and long-term water retention, and thus its ability to maintain its characteristic hydrologic regime.

Wetlands with no constructed outlet are functioning at the highest level possible for the type within the wetland comparison domain, and should be rated **high**. Wetlands with managed outlets that maintain the characteristic hydrologic regime should be rated **medium high** (e.g., restored wetlands with watersheds that have been altered). Constructed outlets above the temporary wetland zone are rated **medium high** if managed to mimic natural conditions. Constructed outlets, either surface or subsurface, below the top of the nporary wetland zone reduces the ability of the wetland to provide temporary and long-term water retention; if a constructed outlet is present below the top of the temporary wetland zone, but is such that the wetland is able to provide significant temporary and long-term water retention (i.e., the wetland is only partially drained), the rating should be **medium**. Constructed outlets, either surface or subsurface, which remove most or all temporary and long-term retention capabilities, significantly reduce the ability of the wetland to maintain its characteristic hydrologic regime; the rating should be **low**.

Constructed outlets that keep open water wetlands open water or keep saturated wetlands saturated are rated **medium**. If the constructed outlet changes the wetland to non-wetland or to deepwater habitat or from saturated conditions to open water or from open water to saturated then it is rated **low**.

2. Dominant upland land use. Upland land use within the watershed contributing to the wetland has a significant influence on the flow of runoff and sediments to the wetland, and thus the ability of the wetland to maintain its characteristic hydrologic regime. The more developed and intensively the watershed is used, the greater the delivery of runoff and sediments to the wetland is likely to be, and the more likely the ability of the wetland to maintain its characteristic hydrologic regime will be reduced.

3. Dominant wetland land use. The land use of the wetland itself affects the soils and vegetation within the wetland, and thus the relationships affecting ground-water discharge and recharge and evapotranspiration. The more developed and intensively the wetland is used, the more likely these relationships are to be impacted, and the more likely the ability of the wetland to maintain its characteristic hydrologic regime will be reduced.

4. Water/Vegetation Proportions and Interspersion. Flow-through wetlands with relatively low proportions of open water to vegetation and low interspersion of water and vegetation are more capable of altering floodflows. Vegetation slows floodwaters by creating frictional drag in proportion to stem density. Flow-through wetlands with dense stands of vegetation and with little open water are more capable of slowing flood water than open water alone.

USER GUIDANCE - Flood/Storm Water Attenuation

Flood/storm water detention is evaluated based upon wetland characteristics, adjacent land uses, and the wetland location within the watershed. When this method is being used in conjunction with the review of a specific project proposed to take place in the wetland, the focus should more specifically concentrate on determining wetland changes due project construction. Use a predominance of high, medium or low functional levels to identify **high, medium**, or **low** significance. **Exceptional** functional level is achieved if the wetland is managed to maximize stormwater retention in an area prone to or with the potential for flood damages.

Question Rationale

1. Outlet Characteristics. Wetlands with no outlet or an outlet above the temporary wetland zone (fringe) will store water for a longer period of time than wetlands with well-defined outlets. A natural outlet at or below the temporary wetland zone will store some water depending on antecedent climate conditions. Wetlands with excavated or enlarged outlets will store less water than would be expected of a particular wetland type or hydrogeomorphic setting.

2. Flood Damages. Wetlands providing floodwater attenuation in watersheds with known or future potential for flood damages take on a higher level of importance for storing flood/stormwater as compared to watersheds where flood damages are unlikely.

3. Land Cover of the Watershed. Greater volumes of runoff and quicker and higher flood peaks are produced in watersheds with significant amounts of impervious surfaces, bare soils, and little natural vegetation. A wetland located in a watershed with these characteristics has a greater potential benefit in storing or attenuating floodflows than a wetland subject to natural hydrologic conditions.

4. Watershed Soils. Greater runoff and higher flood peaks occur in watersheds having primarily impermeable soils. These types of oils impede infiltration of water and therefore produce increased runoff. Wetlands located downslope in watersheds supporting these onditions are more likely to provide flood attenuation.

5. Water/Vegetation Proportions and Interspersion. Wetlands with relatively low proportions of open water to vegetation and low

interspersion of water and vegetation are more capable of altering floodflows. Vegetation slows floodwaters by creating frictional drag in proportion to stem density. Wetlands with dense stands of vegetation and with little open water are more capable of slowing flood water than open water alone.

Sheet Flow. Sheet flow, rather than channel flow, offers greater frictional resistance. The potential for floodflow desynchronization is greater when water flows through the wetland as sheet flow.

7. Stormwater Management. Wetlands that are managed to maximize stormwater control -- for example, by manipulation or drawdown of the outlet, by receiving directed stormwater from developed areas, or by increasing the drainage area -- generally provide a higher functional level for flood/stormwater storage than do similar unmanaged wetlands.

8. Wetland Losses. Watersheds with high losses of wetlands generally experience greater flooding problems and potential than watersheds where most of the pre-settlement wetlands remain. Thus, the remaining wetlands in areas with high losses become potentially more important for floodwater attenuation.

9. Location in the Watershed. The location of the wetland in the watershed will determine the benefits it provides downstream. Wetlands higher in the watershed will benefit a broader downstream area while wetlands lower in the watershed may provide greater benefits to a specific area.

USER GUIDANCE - Water Quality Protection

Water quality protection is evaluated according to the wetland's primary water source, the potential impact of surrounding land uses, estimated storage capacity, vegetation and detritus density, position with respect to other surface waters and evidence of excess nutrient loading. The water quality function of wetlands include numerous chemical, biological and physical processes. When any of these processes are disrupted sufficiently to change the character of the wetland, the wetland water quality is diminished. Wetland water quality should be preserved when possible, and only when no other options are reasonable should a wetland be degraded in order to maintain other downstream waters.

Wetlands can significantly reduce impact from several pollutants through the natural processes of adsorption and entrapment. Background levels of nutrient assimilation by wetlands can reduce excessive plant growth in downstream lakes, rivers and wetlands. The nutrients of principal concern are phosphorus and nitrogen. Common sources of nutrients are urban storm water and runoff from cultivated fields and feedlots. Forested wetlands retain ammonia during seasonal flooding and wetland environments are effective at denitrification. Wetlands take up metals both by adsorption in the soils and by plant uptake via the roots. They also allow metabolism of oxygen demanding materials and can reduce fecal coliform populations. These pollutants are often buried by deposition of newer plant material, isolating them in the sediments. When the narrow channel of a stream widens into a wetland, stream velocity slows. This allows the sediments to drop out and settle in the wetland. However, excessive sediment deposition resulting from artificially conveyed waters discharged into wetlands or erosion from bare soils adjacent to wetlands can smother wetland benthic organisms which adversely impacts wetland functions. It should also be noted that it is possible for sediments to be resuspended causing increased turbidity in wetland waters which are typically very clear as sediment settling does not necessarily mean it is permanently stabilized.

The water quality function wetlands provide help ameliorate the physical, chemical and biological impacts of pollution in downstream waters. However, wetlands should not be used as "Band-Aid" to mask symptoms of a larger problem such as poor land use practices.

A wetland is rated as **exceptional** if it contributes significantly to the water quality protection of a recreational water or potable water supply source down gradient within the local watershed. A wetland is rated as **high** if it is in the local watershed of a water supply source, waterbody or watercourse and directly contributes to it's water quality. A wetland is rated as **medium** if it is in the local watershed of any other surface water and contributes indirectly or potentially to it's water quality. A wetland is rated as **low** if it performs minimal water quality functions (e.g. ditched flow-through systems that have minimal detention times).

USER GUIDANCE - Shoreline Protection

Shoreline protection is evaluated based on the wetland's proximity to lakes, streams or open water basins and whether the wetland is positioned to absorb erosive forces (i.e. wave action, land uses, unstable soils). Wetlands are rated as **exceptional** if they are

positioned adjacent to lakes, rivers or perennial streams such that they commonly absorb erosive energy. They are rated **high** if they are similarly positioned adjacent to intermittent streams or large open water wetland basins or if they provide interception of storm event overland flow to open water areas. They are rated **medium** if they are adjacent to open water areas but are not strategically positioned so as to warrant a higher rating. They are rated **low** only if they are located in a shoreline area but provide no obvious benefits to the open water area.

USER GUIDANCE --Wildlife Habitat: Maintenance of Characteristic Animal Communities

"Wildlife" refers to all animal species, including mammals, birds, reptiles, amphibians, and invertebrates that depend on or utilize wetland habitats within the reference domain. This method assumes that the quality of the wildlife habitat provided by a wetland is related primarily to the level of disturbance or degradation compared to an undisturbed or least disturbed reference standard wetland of the same type *within the wetland comparison domain*. ["Disturbance," as used here refers to human activities or human-induced conditions that tend to reduce natural diversity or disrupt natural processes. Management activities designed to mimic natural processes (e.g., burning, water level management) or to restore natural diversity (e.g., exotic species control) would not be considered "disturbances" in this context.] The functional level of the habitat can also be influenced by the size of the wetland and its position in the landscape relative to other wetlands and habitat types. The method assumes that all wildlife species are ecologically important and that low species diversity is not necessarily a sign of poor wildlife habitat. Some wetland types naturally support a lower diversity of wildlife species or numbers. The assessment of fish and wildlife habitat quality should account for the fact that some wetlands are used only seasonally or intermittently by certain species but are nonetheless important or even critical for those species.

Wetlands with **exceptional** wildlife habitat value are those that represent relatively undisturbed, pristine conditions, and/or are inhabited or frequented by unique or rare species, including those that are state or federally listed (see Appendix B) or species that are rare locally (Question 1). (Note that the presence of rare, endangered, or threatened species is also addressed under the "Special Features" section of this method.) Wetlands that provide critical habitat components *that are not generally available elsewhere*, even if the species dependent on them are not particularly rare (e.g. colonial waterbird nesting colonies, amphibian breeding sites) should generally be rated exceptional (Question 2). A wetland of a type that has been substantially eliminated within the reference domain would generally warrant an exceptional or high rating if it supports or contributes to the support of wildlife species that may not otherwise be present in the reference domain (Question 9).

A wetland should be rated as providing **high** quality wildlife habitat if it is relatively undisturbed and exhibits nearly the full range of flora and fauna that would be expected to be present in a wetland of that type and size within the wetland comparison domain (Question 4). Such wetlands would typically, though not necessarily, be surrounded by undeveloped uplands or be components of larger wetland complexes (Questions 6,7) and the hydrologic regime would generally be intact (Question 5) . Wetlands that provide important connections between other habitat areas may be rated high, even if the habitat quality of the wetland itself is low (Question 8). Similarly, it may be appropriate to assign a high functional rating to wetlands that comprise the only, or nearly only available wetland habitat in the comparison domain, even though the habitat quality of the wetland may be low (Question 10).

Wetlands should be rated as **medium** for wildlife habitat quality if they exhibit some evidence of disturbance or degradation, such as invasion by exotics, extensive monocultures typical of altered hydrologic regimes or degraded water quality, or largely surrounded by developed areas (Questions 4-7). Such wetlands would typically be missing many of the wildlife species that would normally be expected for that type of wetland, and population densities may be reduced. In some instances, a wetland may be so small (either naturally or as a result of previous filling/draining) that its use by wildlife is limited. However, even very small wetlands may provide important habitat for certain species, such as amphibians, which should be taken into account. Some wetlands that are significantly disturbed or degraded may be considered to have *at least* medium habitat quality if they provide seasonally important habitat components (Question 3). For example, temporary, saturated, or seasonally flooded wetlands that may be cultivated in most years often provide important habitat in the spring and fall for migrating waterfowl and shorebirds.

Low quality wetlands are those that have been so degraded by human activity that they are seldom, if ever used by wildlife. Examples include: i. wetlands that are so polluted that vegetation is absent, ii. extremely small, degraded, isolated wetland remnants, and iii. wetlands exhibiting extremely low vegetative diversity *compared to similar type wetlands within the wetland comparison domain* (Questions 4-7). This may include early stage or failed wetland restorations or creations. Note: Wetlands that have been partially drained such that the wetland type has been altered should be compared to a reference standard wetland of the type that is currently present.

USER GUIDANCE - Fishery Habitat

Generally, the value of a wetland for fish habitat is related to it's connection with deepwater habitats. A wetland should be ıted as having **high or exceptional** value for fish if it provides spawning/nursery habitat, or refuge for *native* fish species in adjacent lakes, rivers or streams. Some isolated deep marshes may intermittently support populations of sunfish and northern pike as a result of colonization during flood events. Such wetlands should be rated **high to moderate** for fish habitat. Permanently flooded isolated wetlands that support native populations of minnows should be rated as **moderate**. Wetlands with exclusive, high carp populations should be rated as **low** value for fish habitat because carp cause extreme degradation of the wetland. Isolated wetlands that are not permanently flooded do not generally support fish populations. It is important to note that most wetlands indirectly contribute to the maintenance of fish populations in lakes, streams and rivers as a result of their influence on water quality and hydrology.

USER GUIDANCE - Aesthetics/Recreation/Education/Cultural and Science

The aesthetics/recreation/education/cultural and science function and value of each wetland is evaluated based on the wetland's visibility, accessibility, evidence of recreational uses, evidence of human influences (e.g. noise and air pollution) and any known educational or cultural purposes.

Accessibility of the wetland is key to its aesthetic or educational appreciation. Thus, proximity to population centers may increase its perceived importance. However, proximity to population centers and locations in public areas may have associated noise and/or pollution factors that could degrade the aesthetic and educational functional level.

While dependent on accessibility, a wetland's functional level could be evaluated by the view it provides observers. Distinct contrast between the wetland and surrounding upland may increase its perceived importance. Also, diversity of wetland types or vegetation communities may increase its functional level as compared to monotypic open water or vegetation.

A wetland is rated as **exceptional** if it provides unique or rare educational, cultural or recreation functions or values (e.g. it is located in an outdoor learning area or park focused on wetland study or appreciation). A wetland is rated as **high** if it provides ny educational use or if it has public access and appreciation, or if it is an undisturbed wetland with visual diversity located in a ıatural setting. A wetland is rated as **medium** if it is relatively undisturbed with some diversity and is frequently viewed. A wetland is rated **low** if it has minimal visual diversity or recreational use.

USER GUIDANCE - Commercial Uses

The wetland is rated **exceptional** if it provides a commercial crop, product or agricultural commodity without hydrologic or vegetative modification. A **high** rating is assigned if the wetland produces a commercial crop, product or agricultural commodity with seasonal or temporary modifications. The rating is **medium** if the wetland is used frequently for non-commercial consumptable uses or if production of the commercial crop or product requires permanent or frequent hydrologic or vegetative modification to the wetland. The rating is **low** if the wetland is used for infrequent non-commercial consumptable uses. The rating is N/A if the wetland provides no commercial uses.

APPENDIX A

MINNESOTA'S LIST OF ENDANGERED, THREATENED, AND SPECIAL CONCERN SPECIES 7/1/96

FOR MORE INFORMATION, CONTACT:

Natural Heritage and Nongame Research Program
Section of Ecological Services, Minnesota Department of Natural Resources
500 Lafayette Rd., Box 25
St. Paul, MN 55155
Phone: 1-800-766-6000 (or 612-296-6157 in the metro area)
Fax: 612-296-1811

MAMMALS

Threatened

Spilogale putorius ..... eastern spotted skunk

Special Concern

Canis lupus ..... gray wolf (Fed. Status: T)
Cervus elaphus ..... elk
Cryptotis parva ..... least shrew
Felis concolor ..... mountain lion
Microtus ochrogaster ..... prairie vole
Microtus pinetorum ..... woodland vole
Mustela nivalis ..... least weasel
Myotis septentrionalis ..... northern myotis
Perognathus flavescens ..... plains pocket mouse
Phenacomys intermedius ..... heather vole
Pipistrellus subflavus ..... eastern pipistrelle
Sorex fumeus ..... smokey shrew
Synaptomys borealis ..... northern bog lemming
Thomomys talpoides ..... northern pocket gopher

BIRDS

Endangered

Ammodramus bairdii ..... Baird's sparrow
Ammodramus henslowii ..... Henslow's Sparrow
Anthus spragueii ..... Sprague's Pipit
Calcarius ornatus ..... chestnut-collared longspur
Charadrius melodus ..... piping plover (Fed. Status: T)
Rallus elegans ..... king rail
Speotyto cunicularia ..... burrowing owl

Threatened

Cygnus buccinator ..... trumpeter swan
Falco peregrinus ..... peregrine falcon (Fed. Status: E)
Lanius ludovicianus ..... loggerhead shrike
Phalaropus tricolor ..... Wilson's phalarope
Podiceps auritus ..... horned grebe
Sterna hirundo ..... common tern

Special Concern

Ammodramus nelsoni ..... Nelson's sharp-tailed sparrow
Asio flammeus ..... short-eared owl
Buteo lineatus ..... red-shouldered hawk
Coturnicops novehoracensis ..... yellow rail
Dendroica cerulea ..... cerulean warbler
Empidonax virescens ..... acadian flycatcher
Gallinula chloropus ..... common moorhen
Haliaeetus leucocephalus ..... bald eagle (Fed. Status: T)
Larus pipixcan ..... Franklin's gull
Limosa fedoa ..... marbled godwit
Pelecanus erythrorhynchos ..... American white pelican
Seiurus motacilla ..... Louisiana waterthrush
Sterna forsteri ..... Forster's tern
Tympanuchus cupido ..... greater prairie-chicken
Wilsonia citrina ..... hooded warbler

AMPHIBIANS AND REPTILES

Endangered

Acris crepitans ..... northern cricket frog
Sistrurus catenatus ..... massasauga

Threatened

Clemmys insculpta ..... wood turtle
Crotalus horridus ..... timber rattlesnake
Emydoidea blandingii ..... Blanding's turtle

Special Concern

Apalone mutica ..... smooth softshell
Chelydra serpentina ..... snapping turtle
Coluber constrictor ..... racer
Elaphe obsoleta ..... rat snake
Eumeces fasciatus ..... five-lined skink
Hemidactylium scutatum ..... four-toed salamander
Heterodon nasicus ..... western hognose snake
Pituophis catenifer ..... gopher snake
Tropidoclonion lineatum ..... lined snake

FISH

Threatened

Polyodon spathula ..... paddlefish

Special Concern

Acipenser fulvescens ..... lake sturgeon
Alosa chrysochloris ..... skipjack herring
Ammocrypta asprella ..... crystal darter
Aphredoderus sayanus ..... pirate perch
Coregonus kiyi ..... kiyi
Coregonus zenithicus ..... shortjaw cisco
Cycleptus elongatus ..... blue sucker
Erimystax x-punctata ..... gravel chub
Etheostoma microperca ..... least darter
Fundulus sciadicus ..... plains topminnow
Ichthyomyzon fossor ..... northern brook lamprey
Ichthyomyzon gagei ..... southern brook lamprey
Ictiobus niger ..... black buffalo
Morone mississippiensis ..... yellow bass
Notropis amnis ..... pallid shiner
Notropis anogenus ..... pugnose shiner
Notropis nubilus ..... Ozark minnow
Notropis topeka ..... Topeka shiner
Noturus exilis ..... slender madtom
Percina evides ..... gilt darter

MOLLUSKS

Endangered

Arcidens confragosus ..... rock pocketbook
Elliptio crassidens ..... elephant-ear
Fusconaia ebena ..... ebonyshell
Lampsilis higginsi ..... Higgins eye (Fed. Status: E)
Lampsilis teres ..... yellow sandshell
Novasuccinea n. sp. Minnesota B ..... Iowa pleistocene ambersnail
Plethobasus cyphyus ..... sheepnose
Quadrula fragosa ..... winged mapleleaf (Fed. Status: E)
Quadrula nodulata ..... wartyback
Vertigo hubrichti hubrichti ..... Midwest pleistocene vertigo

Threatened

Actinonaios ligamentina ..... mucket
Alasmidonta marginoto ..... elktoe
Cumberlandia monodonta ..... spectaclecase
Cyclonaias tuberculata ..... purple wartyback
Ellipsaria lineolata ..... butterfly
Epioblasmo triquetro ..... snuffbox
Megalonaias nervosa ..... washboard
Novasuccinea n. sp. Minnesota A ..... Minnesota pleistocene ambersnail
Pleurobema coccineum ..... round pigtoe
Quadrula metanevro ..... monkeyface
Simpsonaios ambigua ..... salamander mussel
Tritogonia verrucosa ..... pistolgrip
Venustoconcha ellipsiformis ..... ellipse
Vertigo hubrichti variabilis n. subsp. .. variable pleistocene vertigo
Vertigo meramecensis ..... bluff vertigo

Special Concern

Elliptio dilatata ..... spike
Losmigona compressa ..... creek heelsplitter
Lasmigona costata ..... fluted-shell
Ligumia recta ..... black sandshell
Obovaria olivoria ..... hickorynut

JUMPING SPIDERS

Special Concern

Habronottus texonus ..... a species of jumping spider
Morpisso grota ..... a species of jumping spider
Metophidippus orizonensis ..... a species of jumping spider
Poradamoetas fontana ..... a species of jumping spider
Phidippus apacheanus ..... a species of jumping spider
Phidippus pius ..... a species of jumping spider
Sassacus popenhoei ..... a species of jumping spider
Tutelino formicoria ..... a species of jumping spider

LEAFHOPPERS

Special Concern

Aflexio rubronura ..... red-tailed prairie leafhopper

DRAGONFLIES

Special Concern

Ophiogomphus anomalis ..... extra-striped snaketail
Ophiogomphus susbehcha ..... St. Croix snaketail

BUTTERFLIES AND MOTHS

Endangered

Erynnis persius ..... persius dusky wing
Hesperia comma assiniboia ..... assiniboia skipper
Hesperia uncas ..... uncas skipper
Lycaeides melissa samuelis ..... Karner blue (Fed. Status: E)
Oeneis uhleri varuna ..... Uhler's arctic

Threatened

Hesperia dacotae ..... dakota skipper
Hesperia ottoe ..... ottoe skipper
Oarismo garita ..... garita skipper

Special Concern

Atrytone orogos ..... arogos skipper
Erebia disa mancinus ..... disa alpine
Hesperia leonardus ..... leonardus skipper
Lycaeides idas nobokovi ..... Nabokov's blue
Oarisma powesheik ..... powesheik skipper
Pyrgus centaureae freijo ..... grizzled skipper
Schinia indiona ..... phlox moth
Speyerio idolia ..... regal fritillary

CADDISFLIES

Endangered

Chilostigmo itoscae ..... headwaters chilostigman

Special Concern

Agapetus tonus ..... a species of caddisfly
Asynarchus rossi ..... a species of caddisfly
Cerocleo brevis ..... a species of caddisfly
Ceracleo vertreesi ..... a species of caddisfly
Hydroptila metoeca ..... a species of caddisfly
Hydroptilo novicolo ..... a species of caddisfly
Hydroptilo tortoso ..... a species of caddisfly
Oxyethiro ecornuta ..... a species of caddisfly
Oxyethira itoscae ..... a species of caddisfly
Polycentropus milaco ..... a species of caddisfly
Protoptila talola ..... a species of caddisfly
Setodes guttatus ..... a species of caddisfly

TIGER BEETLES

Endangered

Cicindelo fulgida fulgido ..... a species of tiger beetle
Cicindela limbato nympho ..... a species of tiger beetle

Threatened

Cicindela denikei ..... a species of tiger beetle
Cicindela fulgida westbournei ..... a species of tiger beetle
Cicindelo lepido ..... a species of tiger beetle

Special concern

Cicindela hirticollis rhodensis ..... a species of tiger beetle
Cicindelo macro macro ..... a species of tiger beetle
Cicindelo potruela patruela ..... a species of tiger beetle
Cicindela splendido cyonocepholota ... a species of tiger beetle

VASCULAR PLANTS

Endangered

Agalinis auriculata	eared false foxglove
Agalinis gattingeri	round-stemmed false foxglove
Asclepias stenophylla	narrow-leaved milkweed
Astragalus alpinus	alpine milk-vetch
Bartonia virginica	Virginia bartonia
Botrychium gallicomontanum	frenchman's bluff moonwort
Botrychium oneidense	blunt-lobed grapefern
Botrychium pallidum	pale moonwort
Cacalia suaveolens	sweet-smelling Indian-plantain
Caltha natans	floating marsh-marigold
Carex formosa	handsome sedge
Carex pallescens	pale sedge
Carex plantaginea	plantain-leaved sedge
Castilleja septentrionalis	northern paintbrush
Cheilanthes lanosa	hairy lip-fern
Chrysosplenium iowense	Iowa golden saxifrage
Cristatella jamesii	James' polanisia
Dodecatheon meadia	prairie shooting star
Draba norvegica	Norwegian whitlow-grass
Eleocharis wolfii	Wolf's spike-rush
Empetrum eamesii	purple crowberry
Empetrum nigrum	black crowberry
Erythronium propullans	dwarf trout lily (Fed. Status: E)
Escobaria vivipara	ball cactus
Fimbristylis puberula var. *interior*	hairy fimbristylis
Glaux maritima	sea milkwort
Hydrastis canadensis	golden-seal
Iodanthus pinnatifidus	purple rocket
Isoetes melanopoda	blackfoot quillwort
Lechea tenuifolia	narrow-leaved pinweed
Lesquerella ludoviciana	bladder pod
Listera auriculata	auricled twayblade
Malaxis paludosa	bog adder's-mouth
Marsilea vestita	hairy water clover
Montia chamissoi	montia
Oryzopsis hymenoides	Indian ricegrass
Osmorhiza berteroi	Chilean sweet cicely
Oxytropis viscida	sticky locoweed
Paronychia fastigiata	forked chickweed
Partbenium integrifolium	wild quinine
Platanthera flava var. herbiola	tubercled rein-orchid
Platanthera praeclara	western prairie fringed orchid (Fed. Status: T)
Polemonium occidentale ssp. *lacustre*	western Jacob's-ladder
Polygala cruciata	cross-leaved milkwort
Polystichum braunii	Braun's holly fern
Potamogeton bicupulatus	snailseed pondweed
Potamogeton diversifolius	diverse-leaved pondweed
Psoralidium tenuiflora	slender-leaved scurf pea
Sagina nodosa ssp. borealis	knotty pearlwort
Saxifraga cernua	nodding saxifrage
Scleria triglomerata	tall nut-rush
Sedum integrifolium ssp. leedyi	Leedy's roseroot (Fed. Status: T)
Selaginella selaginoides	northern spikemoss
Senecio canus	gray ragwort
Talinum rugospermum	rough-seeded fameflower
Tofieldia pusilla	small false asphodel
Xyris torta	twisted yellow-eyed grass

Threatened

Achillea sibirica	Siberian yarrow
Allium cernuum	nodding wild onion
Allium schoenoprasum var. *sibiricum*	wild chives
Ammophila breviligulata	beachgrass
Arabis bolboellii var. retrofracta	Holboell's rockcress
Arnica longbophylla	long-leaved arnica
Arnoglossum plantagineum	tuberous Indian-plantain
Asclepias hirtella	prairie milkweed
Asclepias sullivantii	Sullivant's milkweed
Asplenium trichomanes	maidenhair spleenwort
Aster shortii	Short's aster
Aureolaria pedicularia	fernleaf false foxglove
Besseya bullii	kitten-tails
Botrychium lanceolatum	triangle moonwort
Botrychium lunaria	common moonwort
Botrychium rugulosum	St. Lawrence grapefern
Carex careyana	Carey's sedge
Carex conjuncta	jointed sedge
Carex davisii	Davis' sedge
Carex festucacea	fescue sedge
Carex garberi	Garber's sedge
Carex jamesii	James' sedge

Threatened (cont'd)

Carex katahdinensis	Katahdin sedge
Carex laevivaginata	smooth-sheathed sedge
Carex laxiculmis	spreading sedge
Carex sterilis	sterile sedge
Crassula aquatica	pigmyweed
Crataegus douglasii	black hawthorn
Cyperus acuminatus	short-pointed umbrella-sedge
Cypripedium arietinum	ram's-head lady's-slipper
Diplazium pycnocarpon	narrow-leaved spleenwort
Dryopteris marginalis	marginal shield-fern
Eleocharis nitida	neat spike-rush
Eleocharis olivacea	olivaceous spike-rush
Eleocharis rostellata	beaked spike-rush
Eupatorium sessilifolium	upland boneset
Floerkea proserpinacoides	false mermaid
Heteranthera limosa	mud plantain
Huperzia porophila	rock clubmoss
Lespedeza leptostachya	prairie bush clover (Fed. Status: T)
Melica nitens	three-flowered melic
Moehringia macrophylla	large-leaved sandwort
Napaea dioica	glade mallow
Nymphaea leibergii	small white waterlily
Paronychia canadensis	Canadian forked chickweed
Phegopteris hexagonoptera	broad beech-fern
Plantago elongata	slender plantain
Poa paludigena	bog bluegrass
Polystichum acrostichoides	Christmas fern
Rhynchospora capillacea	hair-like beak-rush
Rotala ramosior	tooth-cup
Rubus chamaemorus	cloudberry
Salicornia rubra	red saltwort
Saxifraga paniculata	encrusted saxifrage
Scleria verticillata	whorled nut-rush
Scutellaria ovata	ovate-leaved skullcap
Shinnersoseris rostrata	annual skeletonweed
Silene nivea	snowy campion
Subularia aquatica	awlwort
Sullivantia sullivantii	reniform sullivantia
Vaccinium uliginosum	alpine bilberry
Valeriana edulis var. ciliata	valerian
Viola lanceolata	lance-leaved violet
Viola nuttallii	yellow prairie violet
Woodsia glabella	smooth woodsia
Woodsia scopulina	Rocky Mountain woodsia

Special Concern

Adoxa moschatellina	moschatel
Agrostis geminata	twin bentgrass
Androsace septentrionalis ssp. puberulenta	northern androsace
Antennaria parvifolia	small-leaved pussytoes
Aristida purpurea var. longiseta	red three-awn
Aristida tuberculosa	sea-beach needlegrass
Asclepias amplexicaulis	clasping milkweed
Asplenium platyneuron	ebony spleenwort
Astragalus flexuosus	slender milk-vetch
Astragalus missouriensis	Missouri milk-vetch
Bacopa rotundifolia	water-hyssop
Baptisia alba	white wild indigo
Baptisia bracteata var. leucophaea	plains wild indigo
Botrychium campestre	prairie moonwort
Botrychium mormo	goblin fern
Botrychium minganense	Mingan moonwort
Botrychium simplex	least moonwort

Buchloe dactyloides ..... buffalo grass
Calamagrostis lacustris ..... marsh reedgrass
Calamagrostis montanensis ..... plains reedgrass
Calamagrostis purpurascens ..... purple reedgrass
Callitriche heterophylla ..... larger water-starwort
Carex annectens ..... yellow-fruited sedge
Carex crus-corvi ..... raven's foot sedge
Carex exilis ..... coastal sedge
Carex flava ..... yellow sedge
Carex hallii ..... Hall's sedge
Carex michauxiana ..... Michaux's sedge
Carex obtusata ..... blunt sedge
Carex praticola ..... prairie sedge
Carex scirpoidea ..... northern singlespike sedge
Carex supina var. *spaniocarpa* ..... weak arctic sedge
Carex typhina ..... cattail sedge
Carex woodii ..... Wood's sedge
Carex xerantica ..... dry sedge
Chamaesyce missurica ..... Missouri spurge
Cirsium hillii ..... Hill's thistle
Cladium mariscoides ..... twig-rush

Special Concern (continued)

Claytonia caroliniana ..... Carolina spring-beauty
Cymopterus acaulis ..... wild parsley
Cypripedium candidum ..... small white lady's-slipper
Dalea candida var. *oligophylla* ..... white prairie-clover
Decodon verticillatus ..... waterwillow
Deschampsia flexuosa ..... slender hairgrass
Desmanthus illinoensis ..... prairie mimosa
Desmodium cuspidatum var. *longifolium* ..... big tick-trefoil
Desmodium nudiflorum ..... stemless tick-trefoil
Diarrhena obovata ..... American beakgrain
Dicentra canadensis ..... squirrel-corn
Draba arabisans ..... rock whitlow-grass
Drosera anglica ..... English sundew
Drosera linearis ..... linear-leaved sundew
Dryopteris goldiana ..... Goldie's fern
Eleocharis parvula ..... dwarf spike-rush
Eleocharis quinqueflora ..... few-flowered spike-rush
Eryngium yuccifolium ..... rattlesnake-master
Euphrasia hudsoniana ..... Hudson Bay eyebright
Fimbristylis autumnalis ..... autumn fimbristylis
Gaillardia aristata ..... blanket-flower
Gentiana affinis ..... northern gentian
Gentianella amarella ssp. acuta ..... felwort
Hamamelis virginiana ..... witch-hazel
Helianthus nuttallii ssp. rydbergii ..... Nuttall's sunflower
Helictotrichon hookeri ..... oat-grass
Hudsonia tomentosa ..... beach-heather
Hydrocotyle americana ..... American water-pennywort
Jeffersonia diphylla ..... twinleaf
Juglans cinerea ..... butternut
Juncus marginatus ..... marginated rush
Juncus stygius var. americanus ..... bog rush
Juniperus horizontalis ..... creeping juniper
Leersia lenticularis ..... catchfly grass
Limosella aquatica ..... mudwort
Listera convallarioides ..... broad-lipped twayblade
Littorella uniflora ..... American shore-plantain
Luzula parviflora ssp. *melanocarpa* ..... small-flowered woodrush
Lysimachia quadrifolia ..... whorled loosestrife
Macbaeranthera pinnatifida ..... cutleaf ironplant
Malaxis monophyllos var. *brachypoda* ..... white adder's-mouth
Minuartia dawsonensis ..... rock sandwort
Muhlenbergia uniflora ..... one flowered muhly
Najas gracillima ..... slender naiad
Najas marina ..... sea naiad
Oenothera rhombipetala ..... rhombic-petaled evening primrose
Opuntia macrorhiza ..... plains prickly pear
Orobanche fasciculata ..... clustered broomrape
Orobanche ludoviciana ..... Louisiana broomrape
Orobanche uniflora ..... one-flowered broomrape
Osmorhiza depauperata ..... blunt-fruited sweet cicely
Panax quinquefolius ..... American ginseng
Pellaea atropurpurea ..... purple cliff-brake
Phacelia franklinii ..... Franklin's phacelia
Pinguicula vulgaris ..... butterwort
Platanthera clavellata ..... club-spur orchid
Poa wolfii ..... Wolf's bluegrass
Polygonum careyi ..... Carey's smartweed
Polygonum viviparum ..... alpine bistort
Polytaenia nuttallii ..... prairie-parsley
Potamogeton vaginatus ..... sheathed pondweed
Potamogeton vaseyi ..... Vasey's pondweed
Prenanthes crepidinea ..... nodding rattlesnake-root
Pyrola minor ..... small shinleaf
Ranunculus lapponicus ..... Lapland buttercup
Rhynchospora fusca ..... sooty-colored beak-rush
Rorippa sessiliflora ..... sessile-flowered cress
Rudbeckia triloba ..... three-leaved coneflower
Ruppia maritima ..... ditch-grass
Salix maccalliana ..... Maccall's willow
Salix pellita ..... satiny willow
Sanicula trifoliata ..... beaked snakeroot
Schedonnardus paniculatus ..... tumblegrass
Scirpus clintonii ..... Clinton's bulrush
Senecio indecorus ..... elegant groundsel
Silene drummondii ..... Drummond's campion
Solidago mollis ..... soft goldenrod
Solidago sciaphila ..... cliff goldenrod
Sparganium glomeratum ..... clustered bur-reed
Stellaria longipes ..... long-stalked chickweed
Symphoricarpos orbiculatus ..... coralberry
Tephrosia virginiana ..... goat's-rue
Torreyochloa pallida ..... Torrey's manna-grass
Trillium nivale ..... snow trillium
Trimorpha acris var. *asteroides* ..... bitter fleabane
Trimorpha lonchophylla ..... shortray fleabane

Special Concern (continued)

Triplasis purpurea ..... purple sand-grass
Tsuga canadensis ..... eastern hemlock
Utricularia purpurea ..... purple-flowered bladderwort
Utricularia resupinata ..... lavender bladderwort
Verbena simplex ..... narrow-leaved vervain
Vitis aestivalis ..... silverleaf grape
Waldsteinia fragarioides ..... barren strawberry
Woodsia alpina ..... alpine woodsia
Xyris montana ..... montane yellow-eyed grass

LICHENS

Endangered

Buellia nigra ..... a species of lichen
Caloplaca parvula ..... a species of lichen
Dermatocarpon moulinsii ..... a species of lichen
Leptogium apalachense ..... a species of lichen
Lobaria scrobiculata ..... a species of lichen
Parmelia stictica ..... a species of lichen
Pseudocyphellaria crocata ..... a species of lichen
Umbilicaria torrefacta ..... a species of lichen

Threatened

Cetraria oakesiana ..... a species of lichen
Coccocarpia palmicola ..... a species of lichen
Parmelia stuppea ..... a species of lichen

Special concern

Anaptychia setifera ..... a species of lichen
Cetraria aurescens ..... a species of lichen
Cladonia pseudorangiformis ..... a species of lichen
Lobaria quercizans ..... a species of lichen
Peltigera venosa ..... a species of lichen
Sticta fuliginosa ..... a species of lichen

MOSSES

Endangered

Schistostegia pennata ..... luminous moss

Special Concern

Bryoxiphium norvegicum ..... sword moss
Tomenthypnum falcifolium ..... a species of moss

FUNGI

Endangered

Fuscoboletinus weaverae ..... a species of fungus
Psathyrella cystidiosa ..... a species of fungus
Psathyrella rhodospora ..... a species of fungus

Special concern

Laccaria trullisata ..... a species of fungus
Lactarius fuliginellus ..... a species of fungus
Lysurus cruciatus ..... a species of fungus

MINNESOTA ROUTINE ASSESSMENT METHOD
FOR EVALUATING WETLAND FUNCTIONS (MnRAM) -
Version 2.0

GENERAL INFORMATION:

Project Number or Name: **Coon Rapids Wetland Plan**		Wetland Number:
Name of Wetland Owner (if necessary):		
Location: County: **Anoka** Section __ ; ¼ ¼ ¼ Township Range		
Major Watershed: **Mississippi River** Minor Watershed:		Local Government Unit: **Coon Rapids**
Evaluator(s):	Date(s) of Site Visit(s):	

SCOPE AND LIMITATIONS:

1. Description of **temporal factors** of this assessment due to seasonal considerations and/or existing hydrologic and climatologic conditions (e.g., after heavy rains, snow or ice cover, frozen soil, during drought period, during spring flood, during bird migration). Circle those that apply and list others (use back of page if necessary):

2. Description of the **Wetland Assessment Area:** the project site, the wetland, wetland portion or wetland complex being evaluated. (If the evaluation area consists of more than one wetland type it may be necessary to complete an assessment for more than one **Wetland Assessment Area.**) (Use back of page if necessary):

   Wetland #

3. Description of the **Wetland Comparison Domain:** the geographic area (e.g., the political boundary, major or local watershed boundary or ecoregion subsection) used for functional comparison. Briefly explain the reason(s) for the choice of the Wetland Comparison Domain. The Wetland Comparison Domain should generally be of a size so as to include some relatively undisturbed Reference Standard Wetlands. (Use back of page if necessary.):

   City of Coon Rapids

4. Describe the **purpose** of this assessment: i. regulatory/impact determination; ii. replacement/mitigation design; iii. restoration; iv. monitoring; v. inventory/planning/classification; vi. educational; vii.other

   #iv and #v

7/8/03

WETLAND CLASSIFICATION:

Regulatory Jurisdictions (if relevant): USACOE/404 ____ LGU/WCA __X__ DNR/PWI ____

NWI/Cowardin classification(s): Circular 39 Classification(s):

Wetland Type(s): (see "Wetland Plants and Plant Communities of MN and WI", 2nd Edition; USACOE - St. Paul District; Eggers and Reed)

shallow open water, deep marsh, shallow marsh, sedge meadow, wet meadow, wet to wet-mesic prairie, calcareous fen, open bog, coniferous bog, shrub-carr, alder thicket, hardwood swamp, coniferous swamp, floodplain forest, seasonally flooded basin *(circle those that apply)*

Estimated size(s) of entire wetland(s) in acres or square feet: **See GIS Database**

Based on the results of the attached functional assessment and best professional judgement, rate the significance of each of the functions for the subject wetland and check the appropriate box. **Complete the table as a summary after doing the functional assessment and consulting the user guidance.**

_____	FUNCTIONAL LEVEL					
FUNCTIONS (and Related Values)	N/A	Low	Medium	High	Exceptional	Comments
Vegetative Diversity/Integrity^ Plant Comm. #1						
Plant Comm. #2						
Plant Comm. #3						
Plant Comm. #4						
Maintenance of Hydrologic Regime						
Flood/Stormwater/Attenuation						
Water Quality Protection						
Shoreline Protection						
Wildlife Habitat						
Fishery Habitat						
Aesthetics/Recreation/Educ./Cultural						
Is this area a storm water pond? (Circle one)	Yes	No				

^ *if there are distinct plant communities rate each of them separately*

Projected conditions (if applicable): Not applicable

List any **Special/Unique Features** of the wetland as compared to others in the Wetland Comparison Domain:

Is this area a potential wetland restoration area?

SITE DESCRIPTION

I. HYDROLOGIC SETTING

Describe the hydrogeomorphology of the wetland (check those that apply):

___ Depressional
___ Riverine (within the river/stream banks)
___ Lacustrine Fringe (edge of deepwater areas)
___ Extensive Peatland
___ Slope
___ Floodplain
___ Other _____

B. The hydrology source is primarily: Ground water only / Surface water only / Both (Surface and Ground water) / Unknown
See Appendix B

Additional Observations/Descriptions:_____

C. Has the hydrology of (a.) the wetland, or (b.) the wetland's immediate watershed, been substantially altered by excavation, ditching, tiles, dams, culverts, pumping, diversion of surface flow, or changes to runoff within the immediate watershed (circle those that apply)?
a.) Yes ___ No___ If Yes; when and how?
b.) Yes ___ No___ If Yes; when and how?

D. Does the wetland have discernable inlets or outlets? ____ If Yes, describe each inlet and outlet.
inlets: _____
outlets: _____

E. Does the wetland have standing water? _____ If yes, maximum depth (if known)? _____
Approximately how much of the wetland is inundated? _____% Date of observation ___/ ___/____

F. What is the predominant hydroperiod (seasonal water level pattern) of the wetland(s)?

___ Permanently Inundated (surface water present all year in every year)
___ Intermittently Exposed (surface water present all year, except during severe droughts)
___ Semi-Permanently Inundated (surface water present throughout growing season in most years)
___ Seasonally Inundated (surface water present for extended periods in early growing season but absent by end of the growing season in most years)
___ Temporarily Inundated (surface water present for brief periods during the growing season, water table usually below soil surface)
___ Permanently Saturated (surface water seldom present but substrate permanently saturated except during severe drought)
___ Saturated (surface water seldom present but substrate saturated for extended periods during the growing season)
___ Artificially Inundated (surface water controlled or induced by pumps/dikes/dams, etc.)

G. List any waters or wetlands in close proximity to the wetland. Note approximate distance from the wetland and if there is a surface water connection to other surface waters or wetlands. **(Within visual distance)**

II. VEGETATION

A. Identify the type and amount of vegetation species present by dominant species in each stratum (can be >100%).

% cover	
%	floating leaved dominants:
%	submerged aquatic dominants:
%	herbaceous ground layer:
%	emergent dominants:
%	shrub dominants:
%	deciduous tree dominants:
%	coniferous tree dominants:
%	other (including altered conditions):

- Natural vegetation altered: _____ % of area

  list method of alteration_____ and frequency of occurrence _____

- Invasive/Exotic species: _____ % of area list species:

  This evaluation does not include reed canary grass.

III. SOILS

General Description of Soil(s) from Soil Survey and on Site:

	Adjacent UPLAND Area	WETLAND Area
Soil Survey Classification(s): Is the area an inclusion? Y N U		
Soil texture and drainage characteristics		
Soil disturbed? If yes, describe below.		
Field Observations:		

V. SURROUNDING LAND USES

A. What is the estimated area of the wetland's immediate watershed in acres (*optional*)? **See Storm Water Management Plan**

B. Describe the surrounding land uses in the table:

LAND-USE	Estimated % of Wetland's Immediate Watershed (Can be >100%)
Developed (Industrial/Commercial/Residential)	
Agricultural: cropland	
Agricultural: feedlots	
Agricultural: grazing	
Forested	
Grassed (without grazing)	
Recreation areas/parks	
Highways/Roads	
Mining (specify type)	
Water and wetlands	
Other (specify)	

VI. SITE SKETCH or Photograph

See digital photo in database

FUNCTIONAL ASSESSMENT

The following assessment requires the evaluator to examine site conditions and document that a particular wetland function or related value is present and to assess the capability of the wetland to perform those functions or related values. Positive answers to questions generally indicate the presence of factors important for a function or related value. The questions are only provided to guide and document the evaluation. After completing each section, the trained evaluator should consider the factors observed and use best professional judgement to rate their capability as compared to a Reference Standard Wetland in the same wetland comparison domain. The ratings should be recorded on the page 5 summary.

Special Features

1. Is the wetland part of, or directly adjacent to, an area of special natural resource interest? Check those that apply:

   ___a. Designated trout streams or trout lakes (see MNDNR Commissioners Order 2450 Part 6262.0400 subparts 3 and 5);
   ___b. State or Federal designated wild and scenic river (see MN Rule Ch. 7050);
   ___c. Calcareous fen (see MN Rule Ch. 7050)
   ___d. Scientific and natural area or rare natural community (see MN Rule Ch. 7050);
   ___e. A high priority wetland, environmentally sensitive area or environmental corridor identified in a local water management plan,
   ___f. Federally identified special area management plan, special wetland inventory study, or an advanced delineation and identification study;
   ___g. Public park, forest, trail or recreation area;
   ___h. State or Federal fish and wildlife refuges and fish and wildlife management areas;
   ___i. State or Federal designated wilderness area;
   ___j. An archeological or historic site as designated by the State Historic Preservation Office.
   ___k. Federal or state listed endangered, threatened or species of concern in or using the wetland or known adjacent lands. If yes, list the species of concern:
   ___l. A State Coastal Zone or Shoreland Management Plan area.
   ___m. A shoreland area identified in a zoning ordinance (generally within 1000 feet from a waterbasin and 300 feet from a watercourse).
   ___n. A floodplain area identified in a zoning ordinance or map.
   ___o. A wetland restored or preserved under a conservation easement.
   ___p. A wetland restored or created for mitigation purposes;
   ___q. A Wellhead Protection Area;
   ___r. A sensitive ground-water area;

Step 2: Consult the high, moderate and low quality descriptions for the appropriate plant community. Read the descriptions in that order before making a decision as to which is most applicable. Also, read the following description for "exceptional" quality plant communities applicable to all communities.

Exceptional Quality:
Plant communities undisturbed, or sufficiently recovered from past disturbances, such that they represent pre-European settlement conditions. Non-native plant species are absent or, if present, constitute a minor percent cover of the community. Rare, threatened and/or endangered species (consider both State and Federal listings) may be present. Unique features (e.g., patterned peatlands, virgin prairie, old growth forests) may also be present. Page numbers below refer to *"Wetland Plants and Plant Communities of MN and WI", 2nd Edition, (USACOE - St. Paul District; Eggers and Reed).*

I. **SHALLOW, OPEN WATER COMMUNITIES** (page 28)

High Quality: Diverse aquatic bed communities dominated by 3 or more species of native aquatic plants such as pondweeds, water lilies, bladderworts, wild celery, duckweeds, water crowfoots, native milfoils, etc.

Moderate Quality: Dominated by 1 or 2 species of native aquatic plants.

Low Quality: Dominated by Eurasian water milfoil; or no aquatic vegetation present.

II.A. and B. **DEEP AND SHALLOW MARSHES** (page 51-53)

High Quality: Dominated by a diverse assemblage (3 or more species) of native aquatic plants (e.g., bur-reeds, bulrushes, arrowheads, cattails, sweet flag, pondweeds). Cattails comprise less than 40 percent cover. Purple loosestrife absent or comprises less than 5 percent cover.

Moderate Quality: Dominants include at least 2 species of native aquatic plants, often arranged in a band or interspersed as patches. Purple loosestrife, if present, comprises less than 25 percent cover. Cattail, if present, comprises 40 to 85 percent cover.

Low Quality: Purple loosestrife comprises more than 25 percent cover; or cattail comprises more than 85 percent cover.

III. A. **SEDGE MEADOWS** (page 86)

High Quality: Stands of sedges with 5 or more species of native forbs. Grazing, haying, artificial drainage, stormwater input, excavation and/or impoundment absent or minimal. Reed canary grass, purple loosestrife and/or stinging nettle absent or cumulatively comprise less than 5 percent cover. Buckthorn absent or comprises less than 10 percent cover.

Moderate Quality: Stands of sedges subjected to moderate degree of the disturbances listed above. Two to 4 species of native forbs present. Reed canary grass, purple loosestrife and/or stinging nettle cumulatively comprise less than 40 percent cover. Buckthorn absent or comprises less than 30 percent cover.

Low Quality: Stands of sedges highly impacted by grazing, haying, artificial drainage, stormwater input and/or cropping. Reed canary grass, purple loosestrife and/or stinging nettle cumulatively comprise more than 40 percent cover; and/or buckthorn, if present, comprises greater than 30 percent cover.

III.B. **WET MEADOWS** (page 105)

High Quality: Composed of a diverse assemblage (10 or more species) of native grasses, sedges, rushes and/or forbs. Reed canary grass, if present, comprises less than 20 percent cover. Purple loosestrife absent or comprises less than 5 percent cover. Buckthorn absent or comprises less than 10 percent cover.

Moderate Quality: Community moderately impacted by disturbances (e.g., haying, grazing) and composed of 5 to 9 species of native grasses, sedges, rushes and/or forbs. Reed canary grass comprises less than 40 percent cover. Purple loosestrife, if present, comprises less than 20 percent cover. Buckthorn, if present, comprises less than 30 percent cover.

Low Quality: Community highly impacted such that reed canary grass comprises more than 40 percent cover; and/or purple loosestrife comprises greater than 20 percent cover; and/or buckthorn, if present, comprises greater than 30 percent cover; and/or vegetation is frequently removed by cropping.

III.C. **WET to WET-MESIC PRAIRIES** (page 125)

High Quality: Community composed of native grasses (e.g., prairie cord-grass, Canada bluejoint grass), sedges, and forbs characteristic of wet to wet-mesic prairies. Site is undisturbed or minimally disturbed by cropping, grazing, haying, and/or artificial drainage. Reed canary grass, purple loosestrife, quack grass and/or Canada thistle absent or cumulatively comprise less than 5 percent cover. Buckthorn absent or comprises less than 10 percent cover.

Moderate Quality: Community subjected to moderate degree of disturbances listed above. Reed canary grass, purple loosestrife, quack grass and/or Canada thistle cumulatively comprise less than 40 percent cover. Buckthorn absent or comprises less than 30 percent cover.

Low Quality: Community highly disturbed by activities listed above and reed canary grass, purple loosestrife, quack grass, Canada thistle and/or other undesirable species cumulatively comprise more than 40 percent cover; and/or buckthorn, if present, comprises greater than 30 percent cover; and any frequently cropped wet to wet-mesic prairie.

III.D. **CALCAREOUS FENS** (page 141)

High Quality: Composed of the characteristic assemblage of calcium tolerant or opportunistic species. Community undisturbed or with minimal disturbances such as artificial drainage, ground-water pumping, grazing, filling, excavation, etc. Rare, threatened or endangered species often present. Reed canary grass, *Phragmites*, purple loosestrife and/or stinging nettle absent or cumulatively comprise less than 5 percent cover. Buckthorn absent or comprises less than 10 percent cover.

Moderate Quality: Community moderately impacted by disturbances listed above. Reed canary grass, *Phragmites*, purple loosestrife, stinging nettle and/or cattail cumulatively comprise less than 40 percent cover. Buckthorn absent or comprises less than 30 percent cover.

Low Quality: Community highly impacted by the disturbances listed above. Reed canary grass, *Phragmites*, purple loosestrife, stinging nettle and/or cattail cumulatively comprise more than 40 percent cover; and buckthorn, if present, comprises greater than 30 percent cover.

IV.A. **OPEN BOGS** (page 161)

High Quality: Composed of the characteristic assemblage of sphagnum mosses, sedges and heath family shrubs, often with carnivorous plants and various orchid species. Community undisturbed or with minimal disturbances such as artificial drainage, peat mining, filling, impoundment, stormwater input (especially salt), etc.

Moderate Quality: Community moderately impacted by the disturbances listed above.

Low Quality: Community highly impacted by the disturbances listed above. Indicators could include die-out of sphagnum mosses and/or invasion by buckthorn, aspen, stinging nettle, dewberry, cattail, etc.

IV.B. **CONIFEROUS BOGS** (page 175)

High Quality: Stands of tamarack and/or black spruce undisturbed or minimally disturbed by artificial drainage, peat mining, logging, filling, impoundment, stormwater input, etc.

Moderate Quality: Stands of tamarack and/or black spruce moderately impacted by disturbances listed above.

Low Quality: Majority of stands of tamarack and/or black spruce dead or dying due to highly disturbed condition. Substantial invasion by buckthorn, aspen, stinging nettle, dewberry, cattail, etc.

V.A. **SHRUB-CARRS** (page 180)

High Quality: Community undisturbed or minimally disturbed by artificial drainage, grazing, filling or impoundment. Dominated by native shrubs (e.g., dogwoods, willows) with a groundlayer stratum composed of five or more species of native grasses, sedges, rushes and/or forbs. Buckthorn, honeysuckle and/or box elder, if present, cummulatively comprise less than 10 percent cover. Reed canary grass, if present, comprises less than 10 percent cover.

Moderate Quality: Community moderately impacted by the disturbances listed above. One of two types: (1) shrub canopy composed of native species with a nearly monotypic reed canary grass groundlayer; or (2) shrub canopy composed of up to 50 percent non-native or disturbance indicator species (e.g., buckthorn, honeysuckle, box elder) with a groundlayer stratum composed of less than 5 species of native grasses, sedges, rushes and forbs; reed canary grass may be present but comprises less than 50 percent cover.

Low Quality: Community highly impacted by the disturbances listed above. Buckthorn, honeysuckle and/or box elder comprise more than 50 percent canopy cover and the groundlayer stratum is composed of greater than 50 percent cover of reed canary grass or non-native grasses/forbs.

V.B. **ALDER THICKETS** (page 192)

High Quality: Community undisturbed or minimally disturbed by artificial drainage, grazing, filling, impoundment, etc. Non-native shrubs (e.g., buckthorn), if present, comprise less than 10 percent cover. Groundlayer stratum may be depauperate or composed of native grasses, sedges, rushes, ferns and/or forbs. Reed canary grass, if present, comprises less than 10 percent cover.

Moderate Quality: Community moderately impacted by the disturbances listed above. Non-native and/or

disturbance indicator shrubs (e.g., buckthorn, box elder, honeysuckle) cumulatively comprise less than 40 percent cover. The groundlayer stratum, if present, has less than 50 percent cover of reed canary grass.

Low Quality: Community highly impacted by the disturbances listed above with greater than 40 percent cover contributed by buckthorn, box elder and/or honeysuckle; and/or reed canary grass comprises more than 50 percent cover of the groundlayer stratum.

VI.A. **HARDWOOD SWAMPS and** VI.B. **CONIFEROUS SWAMPS** (pages 197 to 213)

High Quality: Stands undisturbed or minimally disturbed by artificial drainage, grazing, logging, impoundment, filling, etc. Seedlings and/or saplings of native tree species evident indicating regeneration. Groundlayer stratum composed of native grasses, sedges, rushes, ferns and/or forbs. Box elder, buckthorn and/or reed canary grass, if present, each comprise less than 10 percent cover.

Moderate Quality: Stands moderately impacted by the above disturbances. Disturbance indicator species such as box elder, quaking aspen and/or eastern cottonwood comprise up to 50 percent cover of tree and sapling strata. Shrub stratum has less than 40 percent cover of buckthorn. Groundlayer stratum has less than 50 percent cover of reed canary grass.

Low Quality: Stands highly impacted by the disturbances listed above. Box elder, quaking aspen, eastern cottonwood, buckthorn and/or reed canary grass comprise more than 50 percent cover in 2 or more strata (e.g., tree, sapling, shrub, groundlayer). Few to no indications of regeneration of native tree species.

VII. **FLOODPLAIN FORESTS** (page 214)

High Quality: Stands undisturbed or minimally disturbed by artificial drainage, grazing, logging, diking, impoundment, filling, catastrophic flood events, etc. Groundlayer stratum, if present, composed of native forbs/graminoids characteristic of floodplain forests: wood nettle, jewelweed, Virginia rye, cut-leaf coneflower, etc.

Moderate Quality: Stands moderately impacted by the disturbances listed above.

Low Quality: Stands highly impacted by the disturbances listed above. Indicators include high proportion of dead and/or dying native tree species.

VIII. **SEASONALLY FLOODED BASINS** (page 227)

High Quality: Located within an area of permanent vegetative cover (e.g., forest, prairie, non-agricultural settings) undisturbed or minimally disturbed by artificial drainage, haying, grazing, plowing, stormwater input, or other disturbances.

Moderate Quality: Moderately impacted by the above disturbances -- e.g., partially drained, infrequently cropped, subject to some stormwater input, etc.

Low Quality: Located in frequently cropped agricultural fields or subjected to substantial inputs of stormwater, or other disturbances.

Step 3: Based on the results from Step 1 and Step 2, complete the summary items below.

1. Y N Is the wetland plant community scarce or rare within the wetland comparison domain?

2. Y N Is an additional plant survey necessary at another time? List reasons.

3. Based on the determination from Step 2; note below the functional level of the plant community(s) present within the Wetland Assessment Area? (Also record on the page 2 summary.)

Plant community #1 = _____
% of Wetland Assessment Area *(can be >100%)* = _____ functional level = _____
Plant community #2 = _____
% of Wetland Assessment Area *(can be >100%)* = _____ functional level = _____
Plant community #3 = _____
% of Wetland Assessment Area *(can be >100%)* = _____ functional level = _____
Plant community #4 = _____
% of Wetland Assessment Area *(can be >100%)* = _____ functional level = _____

if more than 4 plant communities are present list them on the back of this page

Maintenance of Characteristic Hydrologic Regime

Wetlands with a natural outlet and mostly undisturbed conditions in the wetland and its local watershed would be ıted as **exceptional** for this function.

1. Describe the wetland outlet characteristics:

High = Lacks constructed outlet; or the watercourse/stream has not been ditched/channelized.
Med. Hi. = Constructed outlet is at or above temporary wetland zone or outlet is managed to duplicate natural conditions;
Medium = Constricted or managed outlet; outlet lowered to significantly reduce temporary (⟨ 7 days) and/or long-term (⟩ 7 days) storage; evidence of ditched/channelized watercourse.
Low = Excavated or enlarged outlet; outlet removes most/all long-term storage, no/little/some temporary storage remains.

2. Describe the dominant land use and condition of the upland watershed that contributes to the wetland:

High = Watershed conditions essentially unaltered; e.g., land use development minimal, idle lands, lands in hay or forests or low intensity grazing on gentle (⟨ 3%) to moderate (3 - 9%) slopes in good to excellent condition.
Medium = Watershed conditions somewhat modified; e.g., moderate grazing or recent logging on steep (⟩ 9%) slopes; conventional till with residue management on moderate slopes, no-till on steep slopes
Low = Watershed conditions highly modified; e.g., intensive agriculture or grazing, no residue management on moderate or steep slopes, urban semi-pervious or impervious surface, intensive mining activities.

3. Describe the conditions of the wetland itself:

High = No evidence of recent tillage, temporary wetland zone intact; e.g., idle land, hayed or lightly to moderately grazed or logged. No compaction, rutting, or trampling damage to wetland.
Medium = Temporary wetland zone tilled or heavily grazed most years. Zones wetter than temporary receive tillage occasionally. Some compaction, rutting, or trampling in wetland is evident.
Low = Wetland receives conventional tillage most (〉75%) years; or otherwise significantly impacted (e.g., fill, cleared). Severe compaction, rutting, or trampling damage to wetland.

4. For flow-through wetlands, describe the functional level of the wetland in retarding surface water flow in relation to primary wetland vegetation cover type:

High = Abundance, density and interspersion very similar to Reference Standard Wetland
Med.= Abundance, density and interspersion somewhat dissimilar to Reference Standard Wetland
Low = Abundance, density and interspersion differs considerably from Reference Standard Wetland
N/A = not applicable; wetland is not a flow-through type.

Functional Level of Maintenance of Characteristic Hydrologic Regime = _____ (*record on page 2 summary*)

Flood and Stormwater Storage/Attenuation

1. Describe the functional level of the wetland outlet characteristics in providing flood and stormwater storage/attenuation:

High = No outlet or outlet (natural or constructed) above the temporary wetland zone
Moderate = Natural outlet at or below the temporary wetland zone
Low = Excavated or enlarged outlet

2a. Estimate the flood damage potential within the **major** watershed in which the wetland is located.

High = History of flood damages
Moderate = Potential future flood damages
Low = No flood damage history and low potential in the future

2b. Estimate the flood damage potential within the **local** watershed in which the wetland is located.

High = History of flood damages
Moderate = Potential future flood damages
Low = No flood damage history and low potential in the future

3a. Describe the functional level of the wetland in providing flood and stormwater storage/detention in relation to the land cover in the **major** watershed:

High = Watershed runoff conditions highly modified due to existing development
Moderate = Watershed runoff conditions reflect moderate development
Low = Watershed runoff conditions essentially unaltered

3b. Describe the functional level of the wetland in providing flood and stormwater storage/detention in relation to the land cover in the **local** watershed:

High =Watershed runoff conditions highly modified due to existing development
Moderate = Watershed runoff conditions reflect moderate development
Low = Watershed runoff conditions essentially unaltered

4. Describe the functional level of flood and stormwater storage/attenuation based on the predominant upland soils within the local watershed:

High = Clays or shallow to bedrock
Moderate = Silts or loams
Low = Sands

5. For flow-through wetlands, describe the functional level of the wetland in providing flood or stormwater storage/attenuation in relation to primary wetland vegetation cover type:

High = Dense vegetation
Moderate = Combination of vegetation and open water
Low = Primarily open water
N/A = not applicable, wetland is not a flow-through type

6. Describe the functional level of the wetland in retarding or altering flood flows:

High = No channels present
Moderate = Channels present, but not connected
Low = Channels connecting inlet to outlet

7. Describe the flood/stormwater management level of the wetland.

High =Receives directed stormwater and water level managed to maximize flood/stormwater retention
Moderate = Receives directed stormwater and water level unmanaged for flood/stormwater retention
Low = Receives no directed stormwater and water level unmanaged for flood/stormwater retention

8. Describe the history of wetland losses in the major watershed.

High =Most wetlands drained or filled (more than 50% lost).
Moderate = Some wetlands drained or filled (20 - 50% lost).
Low = Few wetlands drained or filled (less than 20% lost).

9. Describe the location of the wetland within the watershed: **See Storm Water Plan**

local watershed:	upper	mid	lower
major watershed:	upper	mid	lower

Functional Level of Flood/Stormwater Attenuation = _____ *(record on page 2 summary)*

Water Quality Protection

. **Y N** Does the wetland receive direct discharge of managed water (e.g. municipal or road stormwater drainage, agricultural drainage outlet, industrial or municipal wastewater)?

2. **Y N** Do the surrounding or upstream land uses have the potential to deliver significant nutrient and/or sediment loads to the wetland?

3. **Y N** Does the wetland shape, flow inputs, and outlet configuration allow adequate residence time so that sediments are able to settle?

4. **Y N N/A** For non-isolated wetlands, does the wetland have significant vegetative density to decrease water energy and allow settling of suspended materials?

5. **Y N** Does the wetland have significant vegetative material to potentially increase uptake of dissolved nutrients?

6. **Y N** Does the wetland have a vegetative buffer area on upland adjacent to its boundary which slows and filters overland flow? If yes, describe buffer area width and slope:

7. **Y N** Are there recreational lakes, watercourses or water supply sources down gradient in the local watershed?

. **Y N** Is the position of the wetland in the landscape such that run-off is held or filtered before entering a downstream surface water?

9. **Y N U** Are there signs (or historical reports) of excess nutrient loading to the wetland (e.g. algal mats, excessive submergent macrophyte growth or monotypic vegetation)?

Functional Level of Water Quality Protection = _____ *(record on page 2 summary)*

Shoreline Protection

. Y N Is the wetland a fringe area of a lake or watercourse? If NO, enter "not applicable" for this function in the page 5 summary and skip to the next section. If YES, answer the applicable questions.

2. Y N Is the shoreline exposed to frequent wave action caused by a long wind fetch or boat traffic?

3. Y N Is the shoreline wetland vegetated with submerged or emergent vegetation in the wash zone that decrease wave energy or perennial wetland species that form dense root mats and/or species that have strong stems that are resistant to erosive forces?

4. Y N Is the stream/lake bank prone to erosion due to unstable soils, land uses, or ice flows?

5. Y N Is the stream/lake bank vegetated with densely rooted shrubs that provide upper bank stability?

6. Y N Does the fringe wetland intercept storm event overland flow before reaching the open water area?

Functional Level of Shoreline Protection = _____ *(record on page 2 summary)*

Wildlife Habitat: Maintenance of Characteristic Animal Communities

The following questions are designed to help ensure that the various factors involved in assessing the quality of fish and wildlife habitat are considered. There may be site-specific factors affecting the quality of habitat that are not incorporated into the questions or User Guidance. Users must have at least a basic understanding of fish and wildlife habitat requirements to properly employ this method. After answering these questions, consult the User Guidance to assign a functional rating.

Rare/Unique Species and Specialized Habitat

1. Y N Is the wetland known to be used by locally rare species or species that are state or federally listed? (A list of state and federally listed species is attached in Appendix B.) If yes, wildlife habitat functional level rating = exceptional.

2. Y N Is the wetland known to provide specialized habitat components for particular species or groups of species that are not generally available elsewhere (e.g. colonial waterbird nesting colonies, significant amphibian breeding sites, deer wintering yards). If yes, wildlife habitat functional level rating = exceptional.

3. Y N Does the wetland provide seasonal or intermittent habitat components (e.g., amphibian breeding, resting/feeding by migratory waterfowl/shorebirds)?

Habitat Structure

Indicate below how the plant species diversity of the evaluation wetland compares with a reference standard wetland of the same type and similar size within the wetland comparison domain.

More Diverse	Same	Less Diverse	Much Less Diverse

5. What is the maintenance of characteristic hydrologic regime functional level from the Hydrology Section (on page 12)?

   Exceptional High Medium Low

Habitat Interspersion and Connectivity

6. Describe the dominant land use and condition of the immediate watershed that contributes to the wetland:

   High = Watershed conditions essentially unaltered, e.g., land use development minimal, idle lands, low intensity grazing or haying, forests.
   Med. = Watershed conditions somewhat modified, e.g., moderate intensity grazing or haying; dispersed rowcrop agriculture; low density residential.
   Low = Watershed conditions highly modified, e.g., intensive rowcrop agriculture; urban semi-pervious or impervious surface, high density residential, intensive mining activities.

7. For depressional wetlands, describe the relative abundance (no. of basins/sq. mi.), relative density (acres of wetlands per sq. mi.) and interspersion of various wetland types within a 1 mile radius from the center of the assessment wetland:

   High = Abundance, density and interspersion very similar to Reference Standard Wetland
   Med. = Abundance, density and interspersion somewhat dissimilar to Reference Standard Wetland
   Low = Abundance, density and interspersion differs considerably from Reference Standard Wetland

8. Indicate below the extent to which the wetland either by itself or in conjunction with other habitat types provides a connection between larger wetlands or other habitat types that would otherwise be isolated by intensive agricultural or urban land use.

   High = The wetland provides an important connection for a variety of species, including herpetofauna; other travel corridors are few or non-existent.
   Med = The wetland is likely to be used as a corridor by wider ranging species such as furbearers, deer, and birds; other avenues for wildlife movement may be available.
   Low = The wetland does not provide an obvious connection between other wetlands or habitats; i.e. the wetland is highly isolated or wildlife movement in the area is not limited by available cover.

Maintenance of Regional Biological Diversity

Y N Considering general habitat characteristics, is the wetland of a type that has been lost or experienced a significant decline within the wetland comparison domain, relative to other wetland types?

10. Y N Does the wetland represent the only, or nearly the only wetland habitat within the wetland comparison domain?

11. List any wildlife species observed or in evidence (e.g., tracks, scat, nest/burrow, calls, viewer reports), including birds, mammals, reptiles, and amphibians: *(Note: This list is for documentation only and is not necessarily an indication of habitat quality.)*

Functional Level of Wildlife Habitat = _____ (*record on page 2 summary*)

Fishery Habitat

1. Y N Is the wetland contiguous with a permanent waterbody or watercourse such that it provides spawning/nursery habitat for native fish species?

2. Y N Does the wetland intermittently support native fish populations as a result of colonization during flood events?

3. Y N Does the wetland support native populations of minnows?

4. List any fish species observed or evidenced: *(Note: This list is for documentation only and is not necessarily an indication of habitat quality.)*

Functional Level of Fishery Habitat = _____ (*record on page 2 summary*)

Aesthetics/Recreation/Education/Cultural and Science

1. Y N Is the wetland visible from any of the following kinds of vantage points: roads, waterways, trails, public lands, houses, and/or businesses? (Circle all that apply.)

2. Y N Is the wetland in/near any population centers so as to generate aesthetic/recreation/educational/ cultural use?

3. Y N Is any part of the wetland in public or conservation ownership?

4. Y N Does the public have direct access to the wetland from public roads or waterways?

5. Is the wetland itself relatively free of obvious human influences, such as:

a. Y N Structures?
b. Y N Trash/pollution?
c. Y N Filling/dredging/draining?
d. Y N Invasive vegetation?

Is the area surrounding the wetland relatively free of obvious human influences, such as:

a. Y N Buildings?
c. Y N Other structures?
b. Y N Roads?
d. Y N Altered land uses?

7. Y N Does the wetland provide a spatial buffer between developed areas?

8. Y N Is the wetland and immediately adjacent area currently being used for (or does it have the potential to be used for) the following recreational activities? (Check all that apply.)

ACTIVITY	CURRENT USE	POTENTIAL USE
Education/cultural/scientific study		
Hiking/biking/skiing		
Hunting/fishing/trapping		
Boating/canoeing		
Food harvesting		
Wildlife observation		
Exploration/play/photography		
Others (list)		

Functional Level of Aesthetics/Recreation/Education/Cultural and Science= _____ ***(record on page 2 summary)***

Appendix F
Wetland Ordinance

December 2003
SECTION _____: WETLAND MANAGEMENT ORDINANCE (DRAFT)

Subd 1. **Purpose**
The purpose of these regulations is to achieve the policies described in the City's Wetland Management Plan relating to the protection and management of wetlands.

Subd 2. **Administration**
The City Council hereby designates the _____ as the Administrator of these regulations. The City of Coon Rapids is the Local Government Unit (LGU) for the Wetland Conservation Act.

Subd 3. **Definitions**
A **Buffer:** An upland area covered with natural vegetation (preferably native vegetation) that experienced little to no human impact such as mowing or fertilizer application.

B **Best Management Practices (BMPs):** Guidance and design criteria for storm water management facilities contained within the Minnesota Pollution Control Agency's publication entitled, "Protecting Water Quality in Urban Areas", dated March 2000 and as amended.

C **City Wetland Management Plan Map**: This map was developed as part of the Wetland Management Plan and shows the general locations of wetlands within the City. While an attempt was made to locate all wetlands within the City, omission of a wetland from this map does not exclude that wetland from this regulation.

D **DNR Protected Waters/Wetlands**: Those water bodies that the DNR has jurisdiction over up to the Ordinary High Water Level as noted on the DNR Protected Water and Wetland Inventory Map.

E **Growing Season**: The portion of the year when soil temperatures are above biologic zero in the upper part. In the Metro Area, the growing season is generally between April 21 – October 15.

F **High Water Level (HWL):** The 100-year water elevation of a water body determined by a hydrologic/hydraulic model.

G **New Wetland Credit (NWC):** Wetland replacement credit that can be used for any portion of wetland replacement as specified in the Wetland Conservation Act, as amended.

H **Normal Water Level (NWL):** The water elevation of the water body at the lowest controlling elevation as determined by an outlet

structure, pump, etc. The NWL does not reflect the lowest elevation that may be attained naturally by infiltration, evaporation, or transpiration.

I Sequencing: A five-step process outlined in the Wetland Conservation Act that evaluates the necessity of a project's impact on a wetland.

J Technical Evaluation Panel (TEP): A panel consisting of the Local Government Unit, the local Board of Water and Soil Resources board conservationist, a member of the Soil and Water Conservation District. This panel provides technical wetland support to the Local Government Unit.

K Wetland: Lands transitional between terrestrial and aquatic systems where the water table is usually at or near the surface of the land is covered by shallow water. See also Minnesota Rules 8420.0110, Subp. 52.

Subd 4. Wetland Management

A Boundaries. This regulation shall apply to those areas which are defined as jurisdictional wetland as per the *1987 Manual for Delineating and Identifying Jurisdictional Wetlands*. These areas are shown in general on the City's Wetland Management Plan map. This map also shows the management classifications for each wetland that pertain to this regulation.

These areas shall be field identified by the applicant's trained wetland professional and reviewed for accuracy by the Administrator if work is proposed within or adjacent to the wetland. The presence or absence of a wetland on the City's Wetland Management Plan map does not represent a definitive determination as to whether a wetland covered by this regulation is present or not. It is the responsibility of the applicant to determine whether a wetland exists on a subject property.

B Application. The applicant shall submit the Minnesota Local/State/Federal Application Forms for Water/Wetland Projects to the Administrator for approval prior to any work that will impact wetlands. The Administrator shall follow the review timelines and notice requirements as outlined in the Wetland Conservation Act as set forth in Minnesota Rules Chapter 8420, as amended.

C Wetland Regulations. The Wetland Conservation Act, as amended, and the rules implementing the Wetland Conservation Act as set forth in Minnesota Rules Chapter 8420, as amended, are incorporated as part of these regulations and shall govern draining, filling, and dredging in

wetlands. Where the City's Wetland Management Plan deviates from the Wetland Conservation Act, the Wetland Management Plan shall apply.

D Wetland Management. Wetlands within the City shall be managed as outlined below:

1. Wetland Buffers : Average buffer zones with a minimum buffer width of 15 feet around existing wetlands will be required for all new or redevelopment as follows:

Preserve: 40 feet

Manage 1: 25 feet for wetlands less than 2 acres
35 feet for wetlands larger than 2 acres

Manage 2: 15 feet for wetlands less than 2 acres
25 feet for wetlands larger than 2 acres

Manage 3: 15 feet

Restore: 25 feet

Storm Ponds: 15 feet

These buffer zones will be platted as easements and marked with monumentation. Public trails or sidewalks that are a maximum of 10 feet in width can be included within the buffer provided the designated buffer width is maintained. Private access to a water body will be allowed provided that the dock or access is no more than 30 feet wide along the shoreline or one-half the width of the lot, whichever is less. Public water body access is not regulated by this ordinance. Storm water ponds are allowed within the buffer. A buffer commensurate with the width required for the wetland impacted is also required around newly created wetland mitigation sites.

If the applicant successfully demonstrates that implementation of the buffer is a hardship, the requirement for the buffer width shall be reduced or waived in accordance with the provision provided by _____*(insert variance reference)*.

2. Storm Water Management. Storm water runoff directed to the wetlands will be required to be managed as follows and as outlined in the Comprehensive Storm Water Management Plan:

Preserve: Maintenance of existing bounce for a 10-year storm if feasible; Pretreatment for sediment and nutrients.

Manage 1: Limit bounce to existing plus 0.5 ft for 10-year storm if feasible. Pretreatment for sediment and nutrients

Manage 2: Limit bounce to existing level plus 1.0 ft for 10-year storm if feasible. Pretreatment for sediment and nutrients.

Manage 3: No limit on bounce. Can be used for storm water management and treatment

Restore: Limit bounce to existing level plus 1.0 ft for a 10-year storm if feasible. Pretreatment for sediment and nutrients.

Storm Ponds: Use for storm water management

If the applicant successfully demonstrates that implementation of the storm water management requirements are a hardship, this requirement shall be reduced or waived in accordance with the provision provided by _____*(insert variance reference)*.

3. Wetland Sequencing. Sequencing for the different management classifications will be as follows:

Preserve: Impacts allowed only under extreme hardship. Sequencing must be in conformance with the WCA. .

Manage 1: Sequencing in conformance with WCA

Manage 2: Sequencing in conformance with WCA.

Manage 3: Sequencing is outlined within the City's Wetland Management Plan. Reference to this sequencing must be made in the application, but no additional sequencing is required.

Restore: Sequencing in conformance with WCA.

Storm Ponds: No sequencing required as storm ponds not within the jurisdiction of the WCA.

4. Wetland Mitigation Requirements. Wetland mitigation for unavoidable impacts is required as described below. Actions eligible for wetland mitigation credit are outlined within the Wetland Conservation Act.

Preserve: Replacement at 3:1 ratio with 1.5 acres of NWC minimum and 1.5 acres of PVC maximum.

Manage 1: 2:1 with 1 acre of NWC minimum and 1 acre of PVC maximum.

Manage 2: 2:1 with 1 acre of NWC minimum and 1 acre of PVC maximum.
Manage 3: 2:1 with 1 acre of NWC minimum and 1 acre of PVC maximum.

Restore: 2:1 with 1 acre of NWC minimum and 1 acre of PVC maximum.

Storm Ponds: No mitigation required

Mitigation for passive recreation projects such as trails, scenic overlooks, and benches will be at a 1:1 ratio with 0.5 acres of NWC minimum and 0.5 acres of PVC maximum for every acre of impacted wetland. The City will maintain an overall 2:1 ratio of mitigation in the City as outlined in the Wetland Management Plan.

Subd. 5 **Exemptions.**
Those exemptions outlined in the Wetland Conservation Act as set forth in Minnesota Rules Chapter 8420.0122 are exempt from this Section.

Subd. 6 **Performance Bond Required.**
If an Application includes wetland or buffer strip alteration, the Applicant must file with the Administrator prior to release of the final plat, or if there is no plat involved, prior to the first building permit for the subject property, a performance bond, cash escrow, or letter of credit, surety, or other guarantee acceptable to the Administrator and in an amount determined by the Administrator.

Subd. 7 **Appeals and Enforcement**
A **Enforcement**: Enforcement of the Wetland Conservation Act shall be in accordance with Minnesota Rules 8420.1070.

B. **Appeals:** The management classification of a wetland can be appealed by the landowner, project proposer, or other interested party. This appeal must be submitted to the Administrator in writing and include documentation supporting the reasons for placing a wetland into a different management category. This written appeal must be submitted to the Administrator prior to or along with the wetland impact permit application. A fee will be required for each wetland being appealed. The

appeal will be reviewed by City Staff and the Technical Evaluation Panel. A decision will be made regarding the appeal within 60 days of receipt of the appropriate documentation. If the appeal is submitting outside of the growing season, the decision will be made 60 days after the start of the growing season.

Appendix G
Surface Water Elevations of Various Wetlands for the 2-year, 10-year, and 100-year Events

Surface Water Elevations of Various Wetlands for the 2 Year, 10 Year, and 100 Year Events

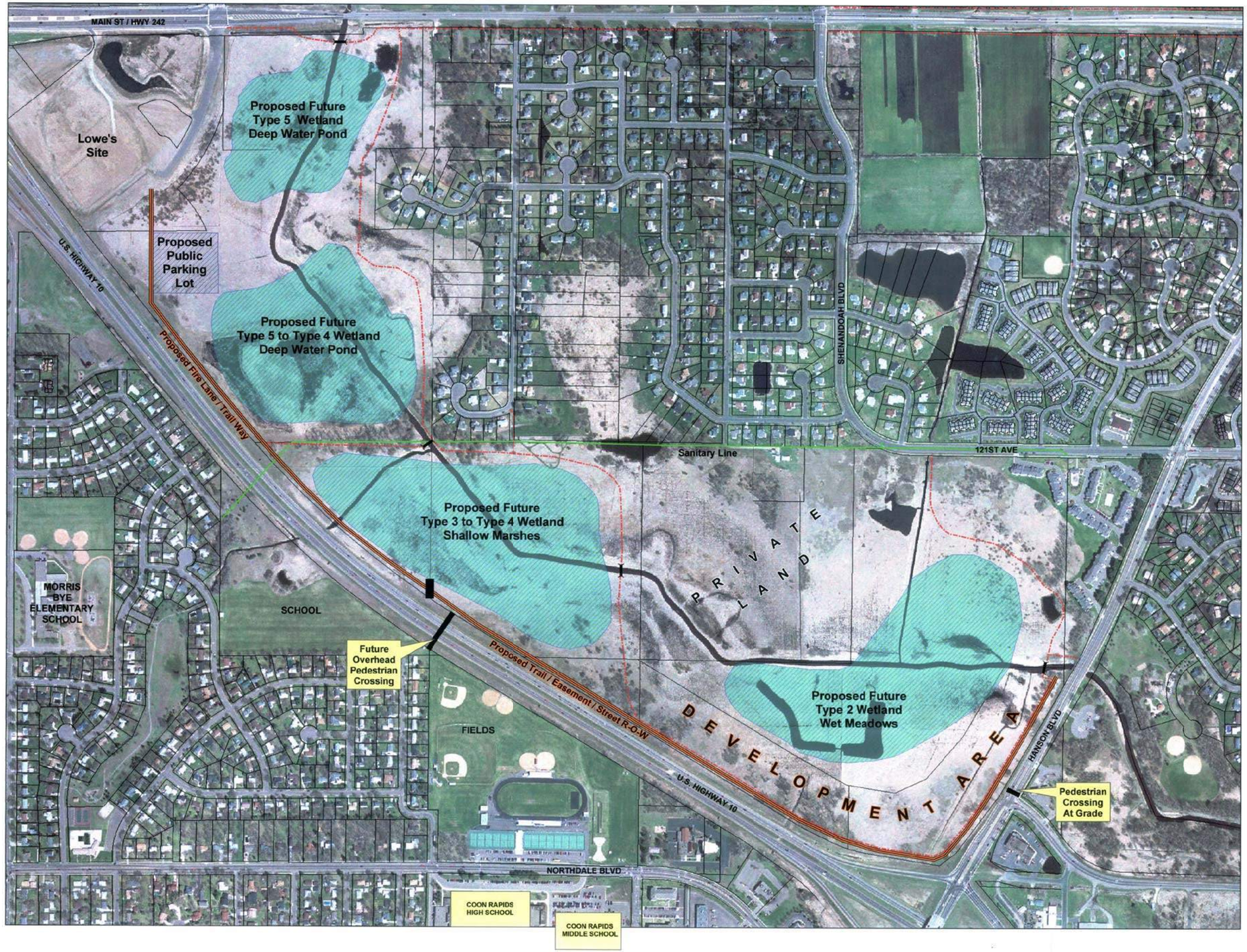
WetlandID	*NWL*	*2 YR HWL*	*10 YR HWL*	*100 YR HWL*
1-16	890.70	891.14	892.14	893.57
2-4	879.29	880.09	881.43	883.67
2-5	877.40	878.82	880.06	880.8
3-1	864.77	866.08	867.52	870.49
3-2	849.56	851.69	854.65	856.46
3-3	849.56	851.69	854.65	856.46
3-4	849.56	851.69	854.65	856.46
3-7	875.07	858.9	863.6	871.67
3-8	877.08	878.28	878.91	880.39
3-10	-	877.71	878.34	878.96
4-3	850.60	856.28	858.02	859.92
4-4	850.60	856.28	858.02	859.92
4-5	850.80	855.07	857.02	859.21
4-6	850.80	855.07	857.02	859.21
4-7	852.00	856	857.07	859.23
4-8	854.00	856.37	857.66	859.23
4-10	860.28	861.08	861.68	861.99
5-1	865.00	866.72	868.34	870.37
5-3	863.07	864.55	865.36	866.3
8-1	852.46	856.11	856.35	857.12
8-2	852.46	856.11	856.35	857.12
8-4	855.30	856.04	856.41	857.28
8-5	852.55	856	856	856.37
8-6	-	860.06	860.2	860.39
8-7	-	870.69	872.62	874.4
8-9	855.51	858.01	858.62	860.28
9-1	855.05	857.66	858.52	859.7

WetlandID	NWL	2 YR HWL	10 YR HWL	100 YR HWL
9-8	848.60	851.65	856.11	858.68
10-1	847.31	853.81	856.66	858.95
10-2	847.59	851.65	853.36	855.4
10-3	851.00	851.14	853.36	855.4
11-2	868.53	872.32	874.26	875.74
11-3	880.63	881.48	883.3	884.24
11-5	-	870.1	870.46	870.97
12-2	-	888.43	889.53	890.17
12-3	883.92	885.54	886.18	886.89
12-4	883.79	885.55	886.15	886.46
12-5	879.97	879.61	880.97	883.91
12-6	867.24	871.9	875.25	878.31
12-7	876.50	878.47	879.81	881.5
12-9	867.24	871.9	875.25	878.31
13-1	878.02	882.89	884.76	886.06
13-4	888.89	893.19	895.66	896.57
14-3	840.50	845.86	846.88	848.7
14-27	842.65	848.31	849.55	852.18
15-1	-	848.7	851.12	853.87
15-2	851.73	854.72	856.5	858.19
15-7	854.00	854.93	856.06	856.9
22-1	-	845.34	846.6	849.08
22-7	-	861.09	862.39	863.87
22-9	-	860.34	863.48	866.57
23-7	834.10	840.25	841.29	843.1
23-8	827.70	834.15	835.17	836.97
23-11	-	848.2	849.14	850.22
23-12	-	850.27	850.62	851.11
23-13	841.65	843.93	844.94	845.61
23-14	844.46	846.22	847.25	847.94

WetlandID	*NWL*	*2 YR HWL*	*10 YR HWL*	*100 YR HWL*
23-15	845.50	847.52	849.03	851
24-6	857.70	863.24	865.66	868.23
24-7	862.55	867.19	872.05	873.22
24-8	877.20	877.58	878.37	879.32
25-1	859.07	862.06	862.2	864.78
25-7	888.43	888.7	889.04	889.62
25-11	884.93	885.62	886.48	887.98
26-13	-	823.8	824.09	824.63
27-3	828.00	828.89	830.59	832.17
27-4	815.57	823.09	823.59	824.64
27-5	815.57	823.09	823.59	824.64
35-1	869.12	869.78	870.26	870.84
35-2	-	866.41	867.55	867.73
36-2	870.40	872.1	872.84	873.8
36-3	863.85	866.9	869.72	869.85
36-4	868.04	873.37	874.35	874.38
36-5	858.51	861.52	863.29	863.36
36-6	857.73	861.05	862.37	862.69
36-7	873.70	877.01	877.48	877.5
36-9	869.77	872.34	874.12	874.31
36-15	874.91	878.24	878.81	879.18
36-19	859.30	862.36	865.54	868.92
3-1-30	847.33	848.17	849.08	849.36

Appendix H
Coon Creek Wetland Project Concept Plan

Coon Creek Wetland & Development Concept Project



1 inch equals 300 feet

Legend

- Proposed Trail
- Proposed Roadways
- Parking Lot
- Wetlands
- Bridge (Maintain 100 Year Flood)

Appendix E – Engineering Design Standards for Stormwater Management

Engineering Design Standards for Storm Water Management

March 2015

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APPENDICES

Appendix A Storm Water Management Plan Checklist
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1 DESIGN OVERVIEW

The City of Coon Rapids' (the City) Storm Water Pollution Prevention Plan (SWPPP) identifies the goals and policies that define the City's storm water management program, which are implemented via the City's Surface Water Management Ordinance (Chapter 8-1200) and these Engineering Design Standards. The storm water requirements were written to meet the City's goals to preserve, protect, and manage its water resources as well as to meet federal, state, and watershed storm water regulations and to meet the following objectives:

1. Minimize increases in storm water runoff rates from any development in order to reduce flooding, siltation, and erosion and in order to maintain the integrity of stream channels;
2. Minimize increases in nonpoint source pollution caused by storm water runoff from development which would otherwise degrade local water quality;
3. Minimize the total annual volume of surface water runoff that flows from any specific site during and following development so as not to exceed the predevelopment hydrologic regime, to the maximum extent practicable;
4. Ensure that these management controls are properly maintained and pose no threat to public safety; and
5. Implement storm water management controls to help meet current and future total maximum daily load (TMDL) goals, to address the need to improve water quality, and to meet objectives in the Local Surface Water Management Plan.

2 DEFINITIONS

For the purpose of these Engineering Design Guidelines, the following definitions describe the meaning of the terms used in this manual:

Applicant means a property owner or agent of a property owner who has filed an application for a building, grading or subdivision permit.

Applicability means any land disturbing activity requiring a Storm Water Management Plan as defined in City Code Chapter 8-1200 Surface Water Management.

Channel means a natural or artificial watercourse with a definite bed and banks that conducts continuously or periodically flowing water.

Impervious Area means those surfaces that cannot effectively infiltrate rainfall (e.g., building rooftops, pavement, sidewalks, gravel, driveways, swimming pools, etc.).

Land Disturbance Activity means any activity which changes the volume or peak flow discharge rate of rainfall runoff from the land surface. This may include the grading, digging, cutting, scraping or excavating of soil, placement of fill materials, paving, construction, substantial removal of vegetation, or any activity which bares soil or rock or involves the maintenance, repair, improvement, diversion, or piping of any natural or man-made watercourse.

Maintenance Agreement means document recorded against the property which provides for long-term maintenance of storm water treatment practices.

Municipal Separate Storm Sewer System (MS4) means a conveyance or system of conveyances (roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, man-made channels, storm drains, etc.) that is also:

- Owned or operated by a public entity (which can include cities, townships, counties, military bases, hospitals, prison complexes, highway departments, universities, etc.) having jurisdiction over disposal of sewage, industrial wastes, stormwater, or other wastes, including special districts under State law such as a sewer district, flood control district or drainage districts, or similar entity, or an Indian tribe or an authorized Indian tribal organization, or a designated and approved management agency under section 208 of the Clean Water Act that discharges to waters of the United States;
- Designed or used for collecting or conveying stormwater;
- Which is not a combined sewer; and
- Which is not part of a publicly owned treatment works.

Nonpoint Source Pollution means pollution from any source other than from any discernible, confined, and discrete conveyances, and shall include but not be limited to, pollutants from agricultural, silvicultural, mining, construction, subsurface disposal and urban runoff sources.

Off-Site Facility means a storm water management measure located outside the subject property boundary described in the permit application for land development activity.

Redevelopment means for projects with one acre or greater of impervious and reconstructing greater than 15 percent of the existing impervious surfaces the requirements of the MPCA's Minimal Impact Design Standards (MIDS) will apply to both the reconstructed and new impervious surface. For projects reconstructing less than 15 percent of the existing impervious only the new impervious will be subject to conformance with the MIDS requirements. (*MPCA, Tech Support Document for Post-Construction Storm Water Management).*

Responsible Party means the entity which will be responsible for ownership and maintenance of Storm Water Treatment Practices.

Stop Work Order means an order which requires that all construction activity on a site be stopped.

Storm Water Management means the use of structural or non-structural practices that are design to reduce storm water runoff pollutant loads, discharge volumes, and/or peak discharge rates.

Storm Water Management Plan means a set of drawings or other documents submitted by a person as a prerequisite to obtaining a storm water management approval, which contains all of the required information and specifications pertaining to Storm Water Management.

Storm Water Reviews means any site that either increases impervious surface by greater than one acre or redevelops one acre or greater of impervious. The review will be completed to evaluate compliance with the MPCA's MIDS. For sites either creating or redeveloping less than one acre of impervious, the City will work with the applicant to determine if water quality practices can be incorporated into the site. Sites less than one acre in size will also not be allowed to have its site drainage negatively impact downstream properties (or water bodies).

Storm Water Runoff means flow on the surface of the ground, resulting from precipitation.

Storm Water Treatment Practices (STPs) means measures, either structural or nonstructural, that are determined to be the most effective and practical means of preventing or reducing point source or nonpoint source pollution inputs to storm water runoff and waterbodies.

Water Quality Volume (WQ_v) means that runoff storage volume needed to treat the specified phosphorus loading as determined in the Coon Rapids Engineering Design Guidelines.

Watercourse means a permanent or intermittent stream or other body of water, either natural or fabricated, which gathers or carries surface water.

Watershed means the total drainage area contributing runoff to a single point.

3 PROCEDURE FOR REVIEWING STORM WATER MANAGEMENT PLANS

3.1 City of Coon Rapids' Procedures for Review

Every applicant for a building permit, subdivision approval, or a permit to allow land disturbing activity must submit an Erosion Control Plan and a Storm Water Management Plan to the City's Community Development Department. However, the following activities are exempt from the Erosion Control Plan and Storm Water Management Plan requirements:

1. Any part of a subdivision or a plat for the subdivision that has been approved by the City Council on or before the effective date of City Ordinance Chapter 8-1200: Surface Water Management;
2. Any land disturbing activity for which plans have been approved by the watershed management organization within six months prior to the effective date of City Ordinance Chapter 8-1200: Surface Water Management;
3. A lot for which a building permit has been approved on or before the effective date of City Ordinance Chapter 8-1200: Surface Water Management;

4. Installation of fence, sign, telephone, and electric poles and other kinds of posts or poles; or
5. Emergency work to protect life, limb, or property.

The general review process, from the submittal of the concept and final plans to the issuance of the Storm Water Management Plan approval, is summarized in the following six steps:

1. Determine what storm water management provisions apply (storm water management, erosion control, buffers, floodplain management).
2. What permits, or approvals, are required for the project site, and what waivers and/or exemptions are applicable (COE, DNR, MPCA, Watershed, WCA, etc.)
3. Are the selected practices appropriate for this site? Do selected practices need higher engineering review before approval?
4. Are the practices designed to meet the minimum performance criteria?
5. Does the Plan meet other resource protection requirements as specified in the City of Coon Rapids Code and Comprehensive Plan?
6. Are provisions for long-term maintenance adequate, including access and methods for maintenance defined?
7. Is the project within one mile of an impaired water?

3.2 Coon Creek Watershed District's (CCWD) Procedures for Review

Prior to receiving any of the building, grading, or land development permits required for land disturbance activities applicants must first meet the requirements of the CCWD's Rules.

1. Schedule a pre-application meeting with CCWD staff. A technical assistance application can also be filled out and submitted to determine if a watershed permit is required.
2. Submit Grading & Development application materials, as required by the CCWD. Refer to the CCWD's permit applications forms and Rules at www.cooncreekwd.org for application and submittal requirements.
3. CCWD Board meetings are held on the 2nd and 4th Monday of each month. For a proposed project to be included on the agenda, submit plans to CCWD twelve and one half (12 ½) days prior to a regularly scheduled Board meeting. Complex projects may require additional review time.
4. The applicant shall submit an application form, two sets of plans, specifications, and supporting materials for CCWD to review. All submittals shall be in hard copy format.
5. Upon receipt of a submittal, CCWD staff will review the submittal and prepare findings and recommendations to the Board. A memorandum describing each project and the staff findings and recommendations will be sent to the Board and applicant about two to three days before each meeting.
6. The CCWD will review and comment on the submittal at its regularly scheduled meeting and then approve, table, or deny the submittal. A letter with CCWD comments, including a list of deficiencies or required modifications, will be sent to the applicant and the City of Coon Rapids.

Any activity affecting the course, current, cross-section, or quality of water within the CCWD will require review by the CCWD:

Floodplain

If the project proposes to alter or fill below the 100-year critical flood elevation (as determined by the CCWD model or Federal Emergency Management Agency (FEMA) of any waters, wetlands, and ditch or conveyance system within the CCWD, the applicant must obtain a Grading and Development permit from the CCWD.

Soils & Erosion Control

The following activities will require a Grading and Development permit from the CCWD:

1. Land disturbing activities on lands within the CCWD of one acre or more of cumulative land disturbance.
2. Land disturbing activities within 100 feet of 3rd, 4th, or 5th order streams, lakes or type 3, 4, 5 wetlands.
3. Land disturbing activities within 50 feet of 1st and 2nd order streams, or Type 1, 2, 6, or 7 wetlands.
4. Land disturbing activities involving excavation or filling or a combination of excavation and filling of dirt, sand or other excavation or fill material including the laying, repairing, replacing, or enlarging of an underground pipe or facility where it crosses a public ditch or waters of the state.
5. Land disturbance of any amount within one mile of an impaired water.

Storm Water

The following activities will require a Grading and Development permit from the CCWD:

1. Land disturbing activities of one acre or greater of cumulative impact.
2. Work adjacent to lakes or wetlands.
3. Activities upstream from land that is dependent upon removal of water from the soil profile for their continued use (Drainage Sensitive Land Uses).

Water Quality

The following activities will require a Water Quality permit from the CCWD:

1. Land disturbing activities of one acre or more of cumulative disturbance. Projects containing greater than or equal to one acre of impervious surface shall contain storm-water detention, erosion and sediment control and pollution prevention BMPs.
2. Work adjacent to or discharging into wetlands, lakes or water courses.

Wetlands

If the project proposes to impact a wetland by draining, filling or excavating, the applicant must obtain a Wetland permit from the CCWD.

4 SUBMITTAL REQUIREMENTS

4.1 City Submittal Requirements for Storm Water Management Plan Approval

4.1.1 Storm Water Management Plan Required

No storm water management permit will be approved unless it includes a Storm Water Management Plan detailing how runoff and associated water quality impacts resulting from the development will be controlled or managed (note the exceptions in Section 3.). This plan must indicate whether storm water will be managed on-site or off-site and, if on-site, the general location and type of practices.

The Storm Water Management Plan must be signed by a licensed professional engineer in the State of Minnesota, who will verify that the design of all storm water management practices meet the submittal requirements outlined in the Submittal Checklist found in the section below. No building permit, grading permit, or subdivision approval shall be issued until a satisfactory final Storm Water Management Plan, or a waiver thereof, shall have undergone a review and been approved by the City after determining that the plan waiver is consistent with the requirements of these Engineering Design Guidelines.

4.1.2 Storm Water Management Conceptual Plan Requirements (Optional)

A Storm Water Management Conceptual Plan submittal is optional, but highly encouraged. In addition, applicants are encouraged to submit their Storm Water Management Conceptual Plan to the CCWD for their review. A conceptual plan identifies basic site information, locations of proposed development features, and preliminary locations and sizing of STPs, and treatment levels. The conceptual submittal has a greater chance of identifying major obstacles and can facilitate alternative storm water management arrangements in a timely fashion and at the onset of project planning. If a conceptual plan is submitted for review, it should include sufficient information (e.g., maps, basic hydrologic and water quality calculations etc.) to evaluate the environmental characteristics of the project site. This information should show the potential impacts of all proposed development of the site, both present and future, on the water resources, and show the effectiveness and acceptability of the measures proposed for managing storm water generated at the project site. The intent of this conceptual planning process is to determine the type of storm water management of storm water runoff from future development, and to identify major issues prior to completing final plans. The conceptual plan is less time consuming and more efficient to evaluate proposed development plans with this step of the review process. The final plan provides more detailed design information for the proposed STPs, and includes much more detail in terms of hydrologic conditions and site features.

For redevelopment an applicant should include within a conceptual plan measures for controlling existing storm water runoff discharges and water quality from the site in accordance with the standards of this manual. After review of the conceptual plan and modifications are made to that plan as deemed necessary by the City, a final Storm Water Management Plan may be submitted for approval.

4.1.3 Storm Water Management Plan Requirements (Required)

Record drawings are required for all projects that impact wetlands and/or the floodplain, require water quality ponding, have significant grade changes, and/or have other unusual circumstances. Record drawings must be certified by a professional land surveyor or civil engineer. Record drawings should not include temporary erosion control measures.

Plan Details

- ☐ North arrow, street names, and lot and block numbers for property or subdivision.
- ☐ Location of benchmark, based on the City/County benchmark system.
- ☐ Key with all line types, symbols, shading, and cross-hatching denoted.
- ☐ Illustration key showing symbols for all information pertaining to lot and building design, including grades, easements, lot and block, setbacks, etc.
- ☐ Plan scale (shown graphically on a bar scale) of: 1 inch = 20 feet, 1 inch = 30 feet, 1 inch = 40 feet, 1 inch = 50 feet, or 1 inch = 100 feet. Plans in other scales will not be reviewed.
- ☐ Total area of subject property, with subtotals of disturbed **and** undisturbed areas (tabulation permitted).
- ☐ Subject property's boundary lines, lot lines, and right of way lines.
- ☐ All existing and proposed drainage and utility easements.
- ☐ All man-made features, including existing and proposed buildings, structures, and paved areas.
- ☐ All existing storm sewer facilities within 150 feet of the subject parcel.
- ☐ All proposed storm sewer facilities (include grades and size of structures).
- ☐ All existing and proposed natural features including, but not limited to, significant trees and tree lines, wetlands, ponds, lakes, streams, drainage channels, floodplain, etc.
- ☐ Show setbacks and buffers for wetlands, ponds, lakes, streams, and floodplains.
- ☐ All adjacent plats, parcels, rights-of-way, section lines, extended a minimum of 150 feet beyond the subject parcel in all directions.

Topography

- ☐ Topography details in a minimum of two-foot contour intervals with existing contours as **dashed lines** and proposed contours as dark, **solid lines**, labeled at each edge of the plan and at other appropriate locations.
- ☐ Standard lot benching detail, where appropriate (maximum slopes: 3:1).
- ☐ Direction arrows indicating swales and lot drainage patterns (show percent grades along drainage swales on plan).

Elevation Information

- ☐ Proposed top of curb elevations at lot corners and driveway or entrances.
- ☐ Finished spot elevations at all high and low points.
- ☐ Proposed elevations at garage and lowest floor for proposed buildings.
- ☐ Proposed finished ground elevations around home for final grading.

Temporary Erosion Control Best Management Practices (BMPs)

Show location of all structural erosion control measures (with standard detail plates and maintenance information for each), including, but not limited to:

- ☐ Temporary rock entrance/exit for all vehicle access points (show on plan and provide detail).
- ☐ Perimeter silt fence: silt fence and/or bale checks should also be placed along swales or slopes greater than 50 feet in length (flare ends of silt fence up slope).
- ☐ Storm sewer inlet filters (indicate type and show graphically on plan at each location).
- ☐ Temporary sediment basins.
- ☐ Erosion control mats, fiber blankets, netting, temporary seed, or temporary mulch. All exposed soil areas must be stabilized as soon as possible to limit soil erosion, but in no case later than 14 days after the construction activity if that portion of the site has temporarily or permanently ceased, and no later than seven days after construction activity in that portion of the site where construction has temporarily or permanently ceased and discharge points on the project are within one mile of a special or impaired water, as well as flows to that special or impaired water.
- ☐ Soil stockpile areas (indicate temporary stabilization measures).
- ☐ Street Sweeping Required: Plans must include a note indicating that all adjacent streets will be swept daily, or as directed by the City, to remove all accumulated materials. Failure to perform any street sweeping within six hours of notice by the City will result in the work being performed by the City and all associated costs billed. The City also requires removal of accumulated materials on streets during winter.

Final Stabilization

New residential construction requires vegetated stabilization from the front curb line to the back of the structure for the entire width of the lot. Show seeding and/or turf establishment locations and specifications, including:

- ☐ Type of seeding (permanent, temporary, dormant).
- ☐ Seed type and application rate.
- ☐ Fertilizer type and application rate.
- ☐ Mulch type, application rate, and method of anchoring.
- ☐ Specifications for installation and maintenance of erosion control mats, blankets, or netting.
- ☐ Note requiring seeding/restoration to be completed within 48 hours of final grading.

- ☐ Location of all areas to be vegetated.

Tree Preservation

Show the following standards when a Tree Preservation Permit is required (see Tree Preservation ordinance for more requirements and information).

- ☐ Identify, tally, and locate all significant trees on site (tally and show graphically on plan).
- ☐ Identify, tally, and locate all significant tree removals on site (tally and show graphically on plan).
- ☐ Use tally information and calculations from ordinance to determine if mitigation is required.
- ☐ If mitigation is required, provide separate landscape plan identifying requirements.
- ☐ Show location of all tree preservation fencing required by ordinance specifications (heavy-duty silt fence can also be used for tree protection).

4.2 CCWD Submittal Requirements

Floodplain

- ☐ Site plan showing boundary lines, delineation and existing elevation contours of the work area, ordinary high water level, and 100-year critical flood elevation. All elevations shall be referenced to NAVD88 datum.
- ☐ Grading plan showing any proposed elevation changes.
- ☐ Preliminary plat of any proposed subdivision.
- ☐ Determination by a registered professional engineer of the 100-year critical flood elevation before and after the proposed activity.
- ☐ Computation of the change in flood storage capacity as a result of the proposed alteration or fill.
- ☐ Erosion and sediment control plan which complies with the CCWD's Rules.
- ☐ Soil boring logs and report, if available.

Soils & Erosion Control

- ☐ A natural resource map identifying soils, forest cover, and resources protected under other provisions of this rule, city rule or state statute.
- ☐ A sequence or construction of the development site including: clearing and grubbing, rough grading, construction of utilities, infrastructure, and buildings as well as final grading and landscaping. Sequencing shall identify the expected date on which clearing will begin and the duration of exposure of cleared areas, areas of clearing, installation of temporary erosion and sediment control measures, and establishment of permanent vegetation.
- ☐ All erosion and sediment control measures necessary to meet the objectives of this local regulation throughout all phases of construction and after completion of development of

the site. Depending upon the complexity of the project, the drafting and implementation of intermediate plans may be required at the close of each season.

- ☐ Seeding mixtures and rates, types of sod, method of seed bed preparation, expected seeding dates, type and rate of fertilizer application, and kind and quantity of mulching for both temporary and permanent vegetative control measures
- ☐ Provisions for maintenance of control facilities including easements and estimates of the cost of maintenance.
- ☐ Explanation of how the site will be stabilized after construction, but who will be responsible for the maintenance of vegetation at the site and what practices will be employed to ensure that adequate vegetative cover is preserved.

Storm Water

- ☐ Topographic base map.
- ☐ Calculations: hydrologic and hydraulic design calculations (using Atlas 14) for pre- and post-development conditions for the design storms specific in the CCWD's Rules.
- ☐ Soils information.
- ☐ Maintenance plan.
- ☐ Landscaping plan.
- ☐ Maintenance easements.
- ☐ Erosion and sediment control plans for construction of storm water management measures.

Water Quality

- ☐ The applicant must submit with its permit application the exhibits for the Storm Water permit requirements.

Wetlands

- ☐ A site plan showing property lines and delineation of lands in which the applicant has an ownership or legal interest: existing and proposed elevation contours, including existing runout elevation and flow capacity of the wetland outlet, and area of the wetland proposed to be filled, drained or excavated
- ☐ A complete delineation of all existing wetland(s), including data sheets with complete and detailed information on field indicators (soils, vegetation and hydrology) and summary report. Wetland delineations must be performed during the normal growing season. Wetland boundaries must be staked in the field, easily identifiable, and accompanied by data sheets.
- ☐ The total wetland acres, wetland types and number of jurisdictional wetland basins on the property
- ☐ Identification of the water source and hydric period for each wetland basin and the depth and duration for all proposed storm water discharges.
- ☐ The size and nature of the proposed impact to each wetlands and the reason the impact is unavoidable shall be identified.

- ☐ The wetland dependence of each proposed impact of the project shall be determined.
- ☐ The nature and scope of the appropriate Wetland Conservation Act exemption shall be noted if applicable.
- ☐ Alternatives to avoid and minimize each proposed impact.

5 LIST OF ACCEPTABLE PRACTICES

In the development of the STP appropriate for the development or redevelopment, infiltration (water quality volume) is foremost in importance to apply in the design. Filtration is warranted when site conditions do not allow for an effective infiltration facility. For flooding or rate control, detention systems are typically the preferred practice. Low Impact Design (LID) practices are encouraged when they can be functionally incorporated into the design. Alternative practices may be approved at the discretion of the City Engineer. For when infiltration is not feasible the STPs proposed shall meet the performance standards identified in the MIDS Flexible Treatment Options (FTO).

5.1 Volume Control Systems:

1. Infiltration trench/basin
2. Raingarden
3. Underground storage
4. Reuse
5. Green Roofs
6. Trees/Tree Planters

5.2 Filtration Systems:

1. Surface sand filter
2. Underground sand filter
3. Perimeter sand filter
4. Organic filter
5. Bioretention system
6. Raingarden with underdrain
7. Pervious pavement with underdrain
8. Underground storage with underdrain
9. Tree trench

5.3 Detention Systems:

1. Wet pond
2. Storm water re-use systems
3. Multiple pond systems
4. Extended detention basin
5. Micro-pool extended detention basin
6. Dry detention ponds

7. Underground storage
8. Other, as approved by the City of Coon Rapids

5.4 Wetlands:

1. Shallow wetland
2. Pond/wetland systems

5.5 Open Channel Systems:

1. Dry swale
2. Wet swale
3. Grass swale
4. Natural channel, or stream

6 CONSTRUCTION SITE STORM WATER RUNOFF CONTROL

6.1 Training

The SWPPP must provide a chain of command showing who prepared the SWPPP as well who is responsible for the management of the construction site and inspections.

The training shall consist of a course developed by a local, state or federal agency, professional organization, water management organization, or soil and water conservation district and must contain information that is related to erosion prevention, sediment control, or permanent storm water management and must relate to the work that you are responsible for managing.

6.2 Erosion Control

1. The permittee must plan for and implement appropriate construction phasing vegetative buffer strips, horizontal slope grading, and other construction practices to minimize erosion. All areas not to be disturbed shall be marked (e.g. with flags, stakes, signs, silt fence etc.) on the project site before any work begins.
2. All exposed soil areas must be stabilized as soon as possible to limit soil erosion but in no case later than 14 days after the construction activity in that portion of the site has temporarily or permanently ceased and no later than seven days after construction activity in that portion of the site has temporarily or permanently ceased when discharge points on the project are within one mile of a special or impaired water and flows to that special or impaired water.
3. Additional BMPs together with enhanced runoff controls are required for discharges to special waters and impaired waters. The BMPs identified for each special or impaired water are required for those areas of the project draining to a discharge point on the project that is within one mile of a special or impaired water and flows to that water.
4. The permittee must stabilize the normal wetted perimeter of any temporary or permanent drainage ditch or swale that drains water from any portion of the construction site, or

diverts water around the site, within 200 lineal feet from the property edge, or from the point of discharge into any surface water. Stabilization of the last 200 lineal feet must be completed within 24 hours after connecting to a surface water or property edge.

5. Pipe outlet must have temporary or permanent energy dissipation before connecting to surface water.
6. When possible, all slopes must be graded in such a fashion so that tracking marks made from heavy equipment are perpendicular to the slope.
7. All areas disturbed during construction must be restored as detailed in these requirements. The type of permanent restoration shall be clearly shown on the plans including but not limited to sod, seed, impervious cover and structures. A minimum of six inches of topsoil must be installed prior to permanent restoration. Areas in which the topsoil has been placed and finish graded, or areas that have been disturbed and other grading or site building construction operations are not actively underway must be temporary or permanently restored as set forth in the following requirements.
   a. Areas with slopes that are less than 3:1 must be seeded and mulched within 14 days of the area not being actively worked.
   b. Areas with slopes that are greater or equal to 3:1 must be seeded and erosion control blanket placed within 14 days of the area not being actively worked.
   c. All seeded areas must be either mulched and disc anchored, hydro- mulched, or covered by erosion control blanket to reduce erosion and protect the seed. Temporary or permanent mulch must be disc anchored and applied at a uniform rate of two tons per acre and have 90% coverage.
   d. If the disturbed area will be re-disturbed within a six month period, temporary vegetative cover may be required consisting of an approved seed mixture and application rate.
   e. If the disturbed area will not be re-disturbed within a six month period, permanent vegetative cover shall be required consisting of an approved seed mixture and application rate.
   f. All areas that will not have maintenance done such as mowing as part of the final design shall be permanently restored using an approved seed mixture and application rate.
   g. Restoration of disturbed wetland areas shall be accomplished using an approved seed mixture and application rate.

8. All erosion control measures must be maintained for the duration of the project until final stabilization has been achieved in accordance with Section 1.7. If construction operations or natural events damage or interfere with any erosion control measures, they shall be restored to serve their intended function.
9. Additional erosion control measures shall be added as necessary to effectively protect the natural resources of the City. The temporary and permanent erosion control plans shall be revised as needed based on current site conditions and to comply with all applicable requirements.

6.3 Sediment Control Practices

1. Sediment control practices must be established on all down gradient perimeters before any upgradient land disturbing activities begin. These practices must remain in place until final stabilization has been achieved.
2. If down gradient treatment system is overloaded additional up gradient sediment control practices must be installed to eliminate overloading. The SWPPP must be amended to identify the additional practices.
3. All storm drain inlets must be protected by approved BMPs during construction until all potential sources for discharge have been stabilized. These devices must be maintained until final stabilization is achieved. Inlet protection may be removed if a specific safety concern (street flooding/freezing) has been identified.
4. Temporary stockpiles must have silt fence or other effective sediment controls on the down gradient side of the stockpile and shall not be placed at least 25 feet from any road, wetland, protected water, drainage channel, or storm water inlets. Stockpiles left for more than 14 days must be stabilized with mulch, vegetation, tarps or other approved means.
5. Vehicle tracking of sediment from project shall be minimized by approved BMPs. These shall be installed and maintained at the City approved entrances. Individual lots shall each be required to install and maintain entrances throughout the construction building until a paved driveway is installed.
6. Sediment that has washed or tracked from site by motor vehicles or equipment shall be cleaned from paved surfaces throughout the duration of construction.
7. Silt fence or other approved sediment control devices must be installed in all areas as shown on the SWPPP.
8. Silt fence or other approved sediment control devices shall be required along the entire curb line, except for approved openings where construction entrances will be installed or drainage flows away from curb. This device must be maintained until final stabilization is achieved. Ditch checks shall be required in ditch bottoms. Spacing for the check must be as follows: [***Height in feet*** (of the sediment device used)] ***X 100 / Slope Gradient***
9. Dust control measures, such as application of water must be performed periodically due to weather, construction activity, and/or as directed by the City.
10. Flows from diversion channels or pipes (temporary or permanent) must be routed to sedimentation basins or appropriate energy dissipaters to prevent the transport of sediment to outflow or lateral conveyors, and to prevent erosion and sediment buildup when runoff flows into the conveyors.
11. A concrete washout shall be installed on projects that require the use of concrete. All liquid and solid wastes generated by concrete washout operations must be contained in a leak-proof containment facility or impermeable liner. A sign must be installed adjacent to each washout facility to inform operators to utilize the proper facilities.
12. All sediment control measures shall be used and maintained for the duration of the project until final. If construction operations or natural events damage or interfere with any erosion control measures, they must be restored to serve their intended function.

13. Additional sediment control measures shall be added as necessary to effectively protect the natural resources of the City. The temporary and permanent erosion control plans shall be revised as needed based on current site conditions and to comply with all applicable requirements.
14. Restrict clearing and grading within 20 feet of an existing wetland boundary to provide for a protective buffer strip of natural vegetation.

6.4 Waterway and Watercourse Protection

1. A temporary stream crossing must be installed and approved by the local government unit administrating the Wetland Conservation Act and ditch authority, and regulating agency if a wet watercourse will be crossed regularly during construction. In addition, a temporary stream crossing will require a permit from CCWD for wetlands or county ditches.
2. The watercourse channel shall be stabilized before, during, and within 24 hours after any in-channel work.
3. No in-water work shall be allowed in Public Waters during the MnDNR's work exclusion dates.
4. Prior to placement of any equipment into any waters, all equipment must be free of aquatic plants and non-native animals.
5. All on-site storm water conveyance channels shall be designed according to the criteria outlined in this document.
6. Stabilization adequate to prevent erosion located at the outlets of all pipes and paved channels is required.

6.5 Temporary Sediment Basins

1. A temporary sediment basin (or permanent) shall be provided when 10 or more acres of disturbed soil drain to a common location prior to the runoff leaving the site or entering surface waters. The permittee is also encouraged, but not required, to install temporary sediment basins in areas with steep slope or highly erodible soils even if the area is less than 10 acres and it drains to one common area. The basins shall be designed and constructed according to the following requirements.
   a. The basins must provide storage below the outlet pipe for a calculated volume of runoff from a 2-year, 24-hour storm from each acre drained to the basin, except that in no case shall the basin provide less than 1,800 cubic feet of storage below the outlet pipe from each acre drained to the basin.
   b. Where no such calculation has been performed, a temporary (or permanent) sediment basin providing 3,600 cubic feet of storage below the outlet pipe per acre drained to the basin shall be provided where attainable until final stabilization of the site.
   c. Temporary basin outlets will be designed to prevent short-circuiting and the discharge of floating debris. The basin must be designed with the ability to allow complete basin drawdown (e.g., perforated riser pipe wrapped with filter fabric and covered with crushed gravel, pumps or other means) for maintenance activities, and provide a

stabilized emergency overflow to prevent failure of pond integrity. Energy dissipation must be provided for the basin outlet.

d. Temporary (or permanent) basins must be constructed and made operational concurrent with the start of soil disturbance that is up gradient of the area and contributes runoff to the pond.
e. Where the temporary sediment basin is not attainable due to site limitations, equivalent sediment controls such as smaller sediment basins, and/or sediment traps, silt fences, vegetative buffer strips, or any appropriate combination of measures are required for all down slope boundaries of the construction area and for those side slope boundaries deemed appropriate as dictated by individual site conditions. In determining whether installing a sediment basin is attainable, the permittee must consider public safety and may consider factors such as site soils, slope, and available area on site. This determination must be documented in the SWPPP.
f. The permittee shall maintain the sedimentation basins and will remain functional until an acceptable vegetative cover is restored to the site. The City will not issue building permits for lots containing sediment basins until they have been removed or relocated based on the projects restoration progress.
g. Basins designed to be used for permanent storm water management shall be brought back to their original design contours prior to acceptance by the City.

6.6 Dewatering and Basin Draining

1. If water cannot be discharged into a sedimentation basin before entering a surface water, it must be treated with the appropriate BMPs, such that the discharge does not adversely affect the receiving water or downstream landowners. The permittee must make sure discharge points are appropriately protected from erosion and scour. The discharge must be dispersed over riprap, sand bags, plastic sheeting, or other acceptable energy dissipation measures. Adequate sediment control measures are required for discharging water that contains suspended soils.
2. All water from dewatering or basin draining must discharge in a manner that does not cause nuisance conditions, erosion in receiving channels, on down slope properties, or inundation in wetlands causing significant adverse impact to wetlands.

6.7 Inspections and Maintenance

1. The permittee shall be responsible for inspecting and maintenance of the BMPs.
2. The permittee must routinely inspect the construction project once every seven days during active construction and within 24 hours of a rainfall event of 0.5 inches or greater in 24 hours.
3. All inspections and maintenance conducted during construction must be recorded in writing and must be retained with the SWPPP. Records of each inspection and maintenance activity shall include:
   a. Date and time of inspection.
   b. Name of person(s) conducting the inspections.
   c. Findings of inspections, including recommendations for corrective actions.

d. Corrective actions taken (including dates, times, and the party completing the maintenance activities).
e. Date and amount of all rainfall events 0.5 inches or greater in 24 hours.
f. Documentation of changes made to SWPPP.

4. Parts of the construction site that have achieved final stabilization, but work continues on other parts of the site, inspections of the stabilized areas can be reduced to once a month. If work has been suspended due to frozen ground conditions, the required inspections and maintenance must take place as soon as runoff occurs or prior to resuming construction, which ever happens first.
5. All erosion and sediment BMPs shall be inspected to ensure integrity and effectiveness. All nonfunctional BMPs shall be repaired, replaced or supplemented with a functional BMP. The permittee shall investigate and comply with the following inspection and maintenance requirements.
6. All silt fences must be repaired, replaced, or supplemented when they become nonfunctional or the sediment reaches half of the height of the fence. These repairs shall be made within 24 hours of discovery, or as soon as field conditions allow access.
7. Temporary and permanent sedimentation basins must be drained and the sediment removed when the depth of sediment collected in the basin reaches half the storage volume. Drainage and removal must be completed within 72 hours of discovery, or as soon as field conditions allow access.
8. Channels that receive sediment must be cleaned when channel becomes one quarter full of sediment.
9. Surface waters, including drainage ditches and conveyance systems, must be inspected for evidence of sediment being deposited by erosion. The permittee shall remove all deltas and sediment deposited in surface waters, including drainage ways, catch basins, and other drainage systems, and restabilize the areas where sediment removal results in exposed soil. The removal and stabilization shall take place within seven days of discovery unless precluded by legal, regulatory, or physical access constraints. The permittee shall use all reasonable efforts to obtain access. If precluded, removal and stabilization shall take place within seven calendar days of obtaining access. The permittee is responsible for contacting all local, regional, state, and federal authorities and receiving any applicable permits, prior to conducting any work.
10. Construction site vehicle exit locations shall be inspected for evidence of off-site sediment tracking onto paved surfaces. Tracked sediment shall be removed from all off-site paved surfaces, within 24 hours of discovery, or if applicable, within a shorter time.
11. The permittee is responsible for the operation and maintenance of temporary and permanent water quality management BMPs, as well as all erosion prevention and sediment control BMPs, for the duration of the construction work at the site. The permittee is responsible until another permittee has assumed control over all areas of the site that have not been finally stabilized or the site has undergone final stabilization, and a Notice Of Termination has been submitted to the MPCA.
12. If sediment escapes the construction site, off-site accumulations of sediment shall be removed in a manner and at a frequency sufficient to minimize off-site impacts (e.g.

fugitive sediment in streets could be washed into storm sewers by the next rain and/or pose a safety hazard to users of public streets).

13. All infiltration areas shall be inspected to ensure that no sediment from ongoing construction activities is reaching the infiltration area and these areas are protected from compaction due to construction equipment driving across the infiltration area.

6.8 Pollution Management Measures/Construction Site Waste Control

1. The permittee must implement the following pollution prevention management measures on the site.
   a. Solid Waste – collected sediment, asphalt and concrete millings, floating debris, paper, plastic, fabric, construction and demolition debris, and other wastes must be disposed of properly and must comply with MPCA disposal requirements.
   b. Hazardous Materials such as oil, gasoline, paint, and any hazardous substances must be properly stored, including secondary containment, to prevent spills, leaks or other discharge. Restricted access to storage areas shall be provided to prevent vandalism. Storage and disposal of hazardous waste shall be in compliance with MPCA regulations.
   c. External washing of trucks and other construction vehicles must be limited to a defined area of the site. Runoff shall be contained and waste properly disposed of. No engine degreasing is allowed on site.
   d. The City prohibits discharges of any material other than storm water, and discharges from dewatering or basin draining activities. Prohibited discharges include but are not limited to vehicle and equipment washing, maintenance spills, wash water, and discharges of oil and other hazardous substances.

6.9 Final Stabilization

The permittee must ensure final stabilization of the project. Final stabilization is not complete until the following criteria are met:

1. All soil disturbing activities at the site have been completed and all soils will be stabilized by a uniform perennial vegetative cover with a density of at least 70 percent over the entire pervious surface area, or other equivalent means necessary to prevent soil failure under erosive conditions and;
   a. All drainage ditches, constructed to drain water from the site after construction is complete, must be stabilized to preclude erosion; and
   b. All temporary synthetic, and structural erosion prevention and sediment control BMPs (such as silt fence) must be removed as part of the site final stabilization; and
   c. The permittee must clean out all sediment from conveyances and from temporary sedimentation basins that are to be used as permanent water quality management basins. Sediment must be stabilized to prevent it from washing back into the basin, conveyances or drainage ways discharging off-site or to surface waters. The cleanout of permanent basins must be sufficient to return the basin to design capacity.

2. For residential construction only, final stabilization has been achieved when:
   a. Temporary erosion protection and down gradient perimeter control for individual lots has been completed, and the residence has been transferred to the homeowner.
   b. The Permittee must distribute the MPCA "homeowner factsheet" to the homeowner so the homeowner is informed for the need, and benefits, of final stabilization.

7 GUIDANCE ON STORM WATER TREATMENT PRACTICES (STPS)

Designers are expected to follow the Minimal Impact Design Standards (MIDS) flowchart detailed in the *Minnesota Stormwater Manual* (Appendix D). Deviations from recommended guidance in the *Minnesota Stormwater Manual* will require detailed written explanation. Approval of any deviation from the *Minnesota Stormwater Manual* guidance will be at the discretion of the City.

8 BASIC SIZING CRITERIA

Proposed Storm Water Management Plans must incorporate Volume Control, Water Quality Control, and Rate Control as the basis for storm water management in the proposed development plan. The City of Coon Rapids, as a permitted Municipal Separate Storm Sewer System (MS4), requires for new development projects to have a no net increase from pre-project conditions of total volume, TSS, and TP; in addition, for redevelopment projects within the city, it is required to have a net reduction from pre-project conditions of total volume, TSS and TP.

8.1 Volume Control Requirements

Volume control measures are required on projects to meet the water quality criteria of the City of Coon Rapids' City Code Chapter 8-1200 and to meet the requirements of the City's MS4 Permit obligations. Volume control shall be required for proposed new impervious areas greater than one acre or redevelopment of impervious greater than one acre. If an applicant can demonstrate that the volume control standard has been met, then the water quality sizing criteria shall be considered satisfied.

8.2 Volume Control Calculations

Depending on applicability, a proposed development shall capture and retain on site 1.1 inches of runoff from the impervious surfaces in post-construction conditions for increases in impervious surface greater than one acre. For redevelopment projects, the performance goal is to capture and retain on site 1.1 inches of runoff from the new and/or fully redeveloped impervious surfaces over one acre. For projects less than one acre, the City encourages applicants to incorporate volume control or the water quality provisions to the extent feasible. For linear projects, the performance goal is to capture and retain onsite the larger of the following:

- 0.55 inches of runoff from the new and fully reconstructed impervious surfaces
- 1.1 inches of runoff from the net increase in impervious surfaces

The use of infiltration techniques shall be prohibited where the infiltration BMP will be will receive discharges from or be in constructed in areas where:

- Industrial facilities are not authorized to infiltrate industrial storm water under an NPDES/SDS Industrial Stormwater Permit issued by the MPCA.
- Vehicle fueling and maintenance occur.
- Less than three feet of separation distance from the bottom of the infiltration system to the elevation of the seasonally saturated soils or the top of the bedrock.
- High levels of contaminant in soil or groundwater will be mobilized by the infiltrating storm water.

The use of infiltration techniques shall be restricted and subject to additional review where the infiltration BMP will be constructed in any of the following areas:

- Soils are predominately Hydrologic Soil Group D (clay) soils.
- Drinking Water Supply Management Areas are present, as defined by Minn. R. 4720.51000, subp.13, unless precluded by a local unit of government with an MS4 permit.
- Within 1,000 feet up-gradient, or 100 feet down-gradient of active karst features.
- Soil infiltration rates are more than 8.3 inches per hour unless soils are amended to flow the infiltration rate below 8.3 inches per hour.

Where the site factors listed above limit the construction of infiltration systems, the project proposer shall provide appropriate documentation to the City regarding the limitations. If the City determines that infiltration is restricted or prohibited onsite, the applicant shall consider alternative volume reduction STPs according to the MIDS flexible treatment options outlined below, in addition to the MIDS Design Sequence Flowchart (Appendix D).

8.2.1 MIDS Flexible Treatment Options:

<u>Option 1:</u>

- Applicant attempts to comply with the following conditions:
  - Achieve at least 0.55 inch volume reduction goal, and
  - Remove 75 percent of the annual total phosphorus load, and
  - Options considered and presented shall examine the merits of relocating project elements to address varying soil conditions and other constraints across the site.

<u>Option 2:</u>

- Applicant attempts to comply with the following conditions:
  - Achieve volume reduction to the maximum extent practicable (as determined by the Local Authority), and
  - Remove 60 percent of the annual total phosphorus load, and
  - Options considered and presented shall examine the merits of relocating project elements to address varying soil conditions and other constraints across the site.

Option 3:

- Off-site mitigation (including banking or cash or treatment on another project, as determined by the local authority) equivalent to the volume reduction performance goal can be used in areas selected in the following order of preference:
  - Locations that yield benefits to the same receiving water that receives runoff from the original construction activity.
  - Locations within the same Department of Natural Resources (DNR) catchment area as the original construction activity.
  - Locations in the next adjacent DNR catchment area up-stream.
  - Locations anywhere within the local authority's jurisdiction.

If off-site mitigation is required, mitigation projects will be chosen in the following order of preference:

1. Locations that yield benefits to the same receiving water that receives runoff from the original construction activity.
2. Locations within the same Department of Natural Resource (DNR) catchment area as the original construction activity.
3. Locations in the next adjacent DNR catchment area up-stream.
4. Locations anywhere within the City of Coon Rapids.

In addition, mitigation projects shall ensure the following requirements are met:

- Mitigation projects shall involve the establishment of new structural storm water BMPs, or the retrofit of existing structural storm water BMPs, or the use of a properly designed regional structural storm water BMP.
- Previously required routine maintenance of structural storm water BMPs cannot be considered mitigation.
- Mitigation projects must be finished within 24 months after the original construction activity begins.
- A maintenance agreement specifying the responsible party for long-term maintenance shall be identified.

8.3 Water Quality Control

For new development, the water quality control standard shall be considered satisfied if the volume control standard has been satisfied. In the event that it is infeasible to meet the volume control standard due to contaminated soils, site constraints, etc., the proposed STP will need to satisfy the water quality standards using the MIDS flexible treatment options as outlined above, in addition to the MIDS Design Sequence Flowchart (Appendix D).

8.3.1 Rate Control

1. At a minimum, detention basins shall maintain existing flow rates for the 2-,10-, and 100-year 24-hour rainfalls in accordance to the Atlas14 data as shown in the table below:

Event	Rainfall/Snowmelt Depth (inches)
2-year, 24 hour	2.86
10-year, 24 hour	4.27
100-year, 24 hour	7.22
100-year, 10 day snowmelt	10.1

2. Detention basins shall be designed with capacity for the critical 100-year event, which is defined as the 100-year event that produces the highest water level among a 24 hour rainfall event or the 10-day snowmelt runoff event.
3. The maximum duration for rainfall critical event analysis shall be 24 hours except in cases where basins are landlocked, where back to back 24-hour events and the 10-day snowmelt runoff event shall also be used. In all cases, a hydrograph method of analysis should be used. For the 24-hour rainfall event, or back to back 24-hour rainfall events, an SCS Type II distribution should be used. For shorter duration critical events other distributions may be used with the approval of the City Engineer.
4. All drainage system analyses and designs shall be based on proposed full development land use patterns.
5. Development adjacent to a landlocked basin and the basin is not provided an outlet, freeboard should be determined based on one of three methods (whichever provides for the highest freeboard elevation):
   a. Three feet above the HWL determined by modeling back to back 100- year, 24-hour events,
   b. Three feet above the highest known water level, or
   c. Five feet above the HWL determined by modeling a single 100-year, 24- hour event.

6. When modeling landlocked basins, the starting water surface elevation should be the basins Ordinary High Water elevation, which can be determined through hydrologic modeling or, in the case of a DNR regulated basin, from a DNR survey.
7. For basins with a suitable outlet, freeboard will be two feet above the HWL determined by modeling the 100-year critical event. Emergency overflows a minimum of one and a half feet below lowest ground elevation adjacent to a structure should also be provided.
8. Adjacent to channels, creeks, and ravines, freeboard will also be two feet to the 100-year critical event elevation.
9. A Type II 24-hour rainfall distribution with average antecedent moisture conditions should be utilized for runoff calculations.
10. The recommended minimum outlet diameter is six inches due to plugging susceptibility and may supersede the rate control requirement for the 2-year event.
11. City standard detail plates should be utilized for pond outlet structures.
12. Outlet structures should be designed in three phases with primary outlet structure and secondary overflow structure routed to the storm sewer and a defined emergency overflow as the tertiary outlet structure.

8.4 Freeboard

Elevation separations of buildings with respect to ponds, lakes, streams, and storm water features shall be designed as follows:

1. At least two feet of vertical separation is required from the low floor elevation above the 100-year high water elevation and DNR Ordinary High Water level (if applicable) for the area providing the structure is flood proofed in accordance with Section 11.60 of the City Code. Drainage easements and outlots for ponds, lakes, wetlands, streams, etc., shall encompass an area to the calculated two foot above the 100-year HWL.

8.5 Floodplain Management

The City prohibits filling activities within the 100-year floodplain that will cause an increase in the stage of the 100-year or regional flood, or cause in increase in the flood damages in the reach affected unless compensatory storage is provided and/or channel improvement is provided that will not result in the flood stage. Filling within the floodway is prohibited unless the filling meets FEMA, DNR, and Watershed District requirements, and City Code Chapter 11-1101: Floodplain Management Regulations. Applications proposing to alter the floodplain shall submit the following:

1. Conditional Use Permit and Variances
2. Cut/fill diagrams along with calculations demonstrating that the filling or alteration of the floodplain is not resulting in a reduction in the flood stage/storage. Compensatory storage may be required.
3. Approval by the CCWD.

8.6 Buffers

Buffers are required adjacent to wetlands and encouraged adjacent to 1st and 2nd order streams and lakes for projects requiring a storm water management permit as defined in City Code Chapter 11-1102: Wetland Management.

1. The following standards shall guide the creation or restoration of buffers to achieve the goals and policies of the City's Wetland Management Plan. The City Engineer may modify or waive standards depending on each project Site and goals for the wetland.
2. The buffers zones per the CCWD are as follows:
   a. Ditches or watercourses of stream order 1, 2 – 15 feet
   b. Ditches or watercourses of stream order 3, 4, 5 – 25 feet
   c. Lakes – 25 feet

3. Wetland buffers shall be managed as outlined below:
   a. Average buffer zones with a minimum width of 15 feet around existing wetlands will be required for all new or redevelopment as follows:
      i. Preserve – 40 feet

ii. Manage 1 – 25 feet for wetlands less than two acres; 35 feet for wetlands larger than two acres.
iii. Manage 2 – 15 feet for wetlands less than two acres; 25 feet for wetlands larger than two acres
iv. Manage 3 – 15 feet
v. Restore – 25 feet
vi. Storm Ponds – 15 feet

b. These buffer zones will be platted as easements and marked with monumentation. Public trails or sidewalks that are a maximum of 10 feet in width can be included within the buffer provided the designated buffer width is maintained. Private access to a water body will be allowed provided that the dock or access is no more than 30 feet wide along the shoreline or one-half the width of the lot, whichever is less. Public water body access is not regulated by this ordinance. Storm water ponds are allowed within the buffer. A buffer commensurate with the width required for the wetland impacted is also required around newly created wetland mitigation sites. If the applicant believes that implementation of the buffer is a hardship, the applicant may apply for a variance in accordance with subsection 11-304.9.
c. Buffer strip vegetation should be appropriate to the goals for the water body. Where acceptable natural vegetation exists in buffer strip areas, the retention of such vegetation in an undisturbed state is preferred. The Minnesota PCA's manual "Plants for Storm water Design: Species Selection for the Upper Midwest" provides guidance on buffer plant selection.

8.7 Shoreland Management

The City code has established setbacks for placement of structures and impervious surfaces and also requirements for shoreland alterations. The City also encourages the following for work occurring within the shoreland zone:

1. Encourage the use of natural vegetation or bioengineering techniques for the stabilization of shorelines.
2. Use materials such as granite or fieldstone for shoreline stabilization project where hard armoring is necessary.
3. Encourage the use of techniques that will minimize runoff and improve water quality associated with new development and redevelopment. When possible use existing natural drainage ways, wetlands, and vegetated soil surfaces to convey, store, filter, and retain storm water runoff before discharge to public waters. When development density, topographic features, and soil and vegetation conditions are not sufficient to adequately handle storm water runoff using natural features and vegetation, various types of constructed facilities such as diversions, settling basins, skimming devices, dikes, waterways, and ponds may be used. Preference shall be given to designs using surface drainage, vegetated filter strips, bioretention areas, rainwater gardens, enhanced swales, off-line retention areas, and natural depressions for infiltration rather than buried pipes

and human-made materials and facilities (*MnDNR Alternative Shoreland Standards, 2005).*

8.8 Long Term Inspection and Maintenance of Storm Water Facilities

1. No private storm water facilities may be approved unless a maintenance plan is provided that defines how access will be provided, who will conduct the maintenance, the type of maintenance and the maintenance intervals. At a minimum, all private storm water facilities shall be inspected annually and maintained in proper condition consistent with the performance goals for which they were originally designed and as executed in the storm water facilities maintenance agreement.
2. Access to all storm water facilities must be inspected annually and maintained as necessary. The applicant shall obtain all necessary easement or other property interests to allow access to the facilities for inspection or maintenance for both the responsible party and the City of Coon Rapids.
3. All settled materials including settled solids, shall be removed from ponds, sumps, grit chambers, and other devices, and disposed of properly.

9 STORM WATER TREATMENT PRACTICE DESIGN STANDARDS

9.1 Storm Sewers

1. Manhole spacing shall not exceed 400 feet.
2. Where more than one pipe enters a structure, a catch basin/manhole shall be used.
3. Storm sewer pipe should match top of pipe on top of pipe unless grade constraints prevent this. In that case, hydraulic calculations will be necessary to verify that excessive surcharging will not occur.
4. Storm water pipes shall be designed utilizing the Rational Method. Channel design shall be hydrograph method only. All methods are subject to the City Engineer's approval.
5. Lateral systems shall be designed for the 10-year rainfall using the Rational Method. State Aid roadway storm sewer shall be designed per State Aid requirements.
6. The minimum full flow velocity within the storm sewer should be three feet per second (fps). The maximum velocity shall be 10 fps, except when entering a pond, where the maximum velocity shall be limited to six fps.
7. Trunk storm sewer should be designed at a minimum to carry 100-year pond discharge in addition to the 10-year design flow for direct tributary areas. The following table shall be used for the calculation of peak rates using the Rational Method:

Cover Type	10-Year Runoff Coefficient
Single-family Residential	0.4
Multi-family Residential	0.5
Commercial	0.7
Industrial	0.7
Parks, Open Space	0.2
Ponds, Wetlands	1.0

8. For storms greater than the 10-year event, and in the case of plugged inlets, transient street ponding will occur. For safety reasons, the maximum depth in streets should not exceed one and a half feet at the deepest point.
9. To promote efficient hydraulics within manholes, manhole benching shall be provided to half the diameter of the largest pipe entering or leaving the manhole.
10. Vaned grate catch basin castings shall be used on all streets.
11. The maximum design flow at a catch basin for the 10-year storm event shall be three cubic feet per second (cfs), unless high capacity grates are provided. Catch basins at low points will be evaluated for higher flow with the approval of the City Engineer.
12. All structures located in the street are to be a minimum of four-feet-deep (rim to invert) and a minimum of three-feet-deep elsewhere. Two-by-three catch basins are to be four-feet-deep.

9.2 Outlet and Inlet Pipes

1. Inlet pipes of storm water ponds shall be extended to the pond normal water level whenever possible.
2. Outfalls with velocities greater than four fps into channels, where the angle of the outfall to the channel flow direction is greater than 30-degrees, requires energy dissipation or stilling basins.
3. Outfalls with velocities of less than four fps, that project flows downstream into a channel in a direction 30-degrees or less from the channel flow direction, generally do not require energy dissipaters or stilling basins, but will require riprap protection.
4. In the case of discharge to channels, riprap shall be provided on all outlets to an adequate depth below the channel grade and to a height above the outfall or channel bottom. Riprap shall be placed over a suitably graded filter material and filter fabric to ensure that soil particles do not migrate though the riprap and reduce its stability. Riprap shall be placed to a thickness at least two and a half times the mean rock diameter to ensure that it will not be undermined or rendered ineffective by displacement. If riprap is used as protection for overland drainage routes, grouting may be recommended.
5. Discharge velocity into a pond at the outlet elevation shall be six fps or less. Riprap protection is required at all inlet pipes into ponds from the NWL to the pond bottom.
6. Where outlet velocities to ponds exceed six fps, the design should be based on the unique site conditions present. Submergence of the outlet or installation of a stilling basin approved by the City is required when excessive outlet velocities are experienced.

9.3 Channels and Overland Drainage

1. Overland drainage routes where velocities exceed four fps should be reviewed by the City Engineer and approved only when suitable stabilization measures are proposed.
2. Open channels and swales are recommended where flows and small grade differences prohibit the economical construction of an underground conduit. Open channels and swales can provide infiltration and filtration benefits not provided by rip rap.
3. The minimum grade in all unpaved areas shall be two percent.
4. Maximum length for drainage swales shall be 400 feet.

5. Channel side slopes should be a maximum of 4:1 (horizontal to vertical) with gentler slopes being desirable.
6. Riprap shall be provided at all points of juncture, particularly between two open channels and where storm sewer pipes discharge into a channel.
7. Open channels should be designed to handle the expected velocity from a 10-year design storm without erosion. Riprap may need to be provided.
8. Periodic cleaning of an open channel is required to ensure that the design capacity is maintained. Therefore, all channels shall be designed to allow easy access for equipment.

9.4 Ponds

1. Where on-site water quality detention basins are required, copies of the calculations determining the design of the basin(s) will be provided. The size and design considerations will be dependent on the receiving water body's water quality category, the imperviousness of the development and the degree to which on-site infiltration of runoff is achieved. Design of on-site detention basins, as described in the site's runoff water management plan, shall incorporate recommendations from the nationwide urban runoff program (NURP) and "Protecting Water Quality in Urban Areas", published by the Minnesota pollution control agency, as adopted by the City, or the applicable publications, as adopted by the City. The following design considerations are required for on-site water quality detention basins based on the receiving water's water quality category. These designs include permanent detention for water quality treatment; extended detention designs may be substituted provided that they provide treatment equivalent to the requirements below:
   a. A permanent pool (dead storage) volume below the normal outlet shall be greater than or equal to the runoff from a two and one-half inch 24-hour storm over the entire contributing drainage area assuming full development.
   b. A permanent pool average depth (basin volume/basin area) which shall be greater than four feet, with a maximum depth of less than 10 feet.
   c. An emergency spillway (emergency outlet) adequate to control the 100-year frequency critical duration rainfall event.
   d. Basin side slopes above the normal water level should be no steeper than 3:1 when possible, and preferably flatter. A basin shelf with a minimum width of 10 feet and a maximum slope of 10:1 below the normal water level is recommended to enhance wildlife habitat, reduce potential safety hazards, and improve access for long term maintenance.
   e. To prevent short circuiting, the distance between the major inlets and normal outlet shall be maximized.
   f. A flood pool (temporary storage) volume above the principal outlet spillway shall be adequate so that the peak discharge rate from the 1-, 10- and 100-year frequency critical duration storm is not greater than the peak discharge for a similar storm and predevelopment watershed conditions.
   g. Extended detention of runoff from the more frequent (1-year to 5-year) storms shall be achieved through a principal spillway design which shall include a perforated vertical riser, a small orifice outlet or a compound weir. The spillway must be

constructed of a limited maintenance material. The use of treated or naturally decay resistant timber shall not be allowed.

h. Effective energy dissipation devices which reduce outlet velocities to four feet per second or less shall consist of riprap, stilling pools or other such measures to prevent erosion at all storm water outfalls into the basin and at the detention basin outlet.

i. Trash and floatable debris skimming devices shall be placed on the outlet of all on site detention basins to provide treatment up to the critical duration 10-year storm event. These devices can consist of baffled weirs, submerged inlets or other such measures capable of restricting the overflow of floatable materials, including litter, oil and grease. The skimming device must be constructed of a limited maintenance material. The use of treated or naturally decay resistant timber shall not be allowed. Computations for the design of such devices shall be included. The maximum velocity through the skimming device shall be less than one foot per second (fps) on the 2-year 24-hour event.

j. For purposes of erosion control, vegetation protection and wildlife habitat enhancement, the 10-year flood level of the basin shall be no more than two feet above the normal level of the basin.

k. All constructed ponds shall be provided a maintenance access from an adjacent roadway. The maintenance access shall be provided in the form of an easement no narrower than 20 feet. The maintenance access shall have a longitudinal slope no steeper than 6:1 and minimal cross slope. Maintenance access routes, due to their extra width, also serve well as emergency overflow (EOF) routes.

9.5 Infiltration/Filtration Practices

1. Sizing of filtration/infiltration practices, or STPs, shall be in conformance with the volume control requirements of these Engineering Design Guidelines and the *Minnesota Stormwater Manual*.
2. When designing an infiltration practice for volume control and water quality management, on-site testing and detailed analysis are strongly encouraged in order to determine the infiltration rates of the proposed infiltration facility. Documented site-specific infiltration or hydraulic conductivity measurements (double-ring infiltrometer) completed by a licensed soil scientist or engineer is required. In the absence of a detailed analysis, the saturated infiltration rates listed in the Infiltration Rates for Infiltration STPs table found on the *Minnesota Stormwater Manual* shall be used. A piezometer shall be installed in order to ascertain the level of the local groundwater table and demonstrate at least three feet of separation between the bottom of the proposed facility and the groundwater. The soil boring is required to go to a depth of at least five feet below the proposed bottom of the STP. The soils shall be classified using the Unified Soil Classification system. The least permeable soil horizon will dictate the infiltration rate. Infiltration practices shall be designed to infiltrate the required runoff volume within 48 hours.
3. Pretreatment, in the form of ponds, forebays, filter strips, or other approved methods, shall be provided for all infiltration areas. Pretreatment upstream of volume management practices is a key element in the long-term viability of infiltration areas. The level of

pretreatment varies largely depending on the STP and drainage area, CCWD, City staff, and *Minnesota Stormwater Manual* recommendations shall be utilized for determining the appropriate level of pretreatment on a case-by-case basis.

4. The infiltration practice shall not be used within 50 feet of a municipal, community or private well, unless specifically allowed by an approved wellhead protection plan.
5. The infiltration practice shall not be used for runoff from fueling and vehicle maintenance areas and industrial areas with exposed materials posing contamination risk, unless the infiltration practice is designed to allow for spill containment and oil/grit separators are used to remove course sediment, oils and grease from storm water prior to delivery to the infiltration/filtration feature.
6. The infiltration practice shall not be used in Hydrologic Soil Group (HSG) D soils without soil corrections.
7. Vegetation of infiltration/filtration practices shall be as shown in the City of Coon Rapids Standard Details. A plan for management of vegetation shall be included in the Storm Water Pollution Prevention Plan.
8. If soils are unsuitable for infiltration, then filtration may be used with drain tile, provided in accordance with the City of Coon Rapids Standard Details.
9. Subgrade soils for infiltration/filtration practices shall be as presented in the City of Coon Rapids Standard Details. Assume a 40 percent void ratio for clean washed rock and 20 percent for construction sand for the purposes of volume calculations.
10. Rock storage beds shall be constructed using crushed angular granite that has been thoroughly washed to remove all fine particles that could result in clogging of the system.
11. For infiltration benches adjacent to ponds, benches shall have slopes no steeper than 5:1 over the proposed infiltration zone. A slope of 10:1 is preferred. The *Minnesota Stormwater Manual* cites concerns with locating infiltration features immediately adjacent to ponds. To address this, benches shall be located to maintain hydraulic separation from the saturated zone of the pond in order to minimize the loss of infiltration potential over time.

9.6 Emergency Overflow Paths

1. EOFs shall be sized with a minimum bottom width of five feet and 4:1 side slopes.
2. The maximum flow depth in EOFs shall be less than or equal to one foot as calculated for a 100-year back-to-back storm event.

10 DESIGN EXAMPLES

The design process for each of the acceptable Storm Water Treatment Practices is detailed in the *Minnesota Stormwater Manual*, http://stormwater.pca.state.mn.us/index.php/Main_Page.

11 STORM WATER TREATMENT PRACTICE DETAIL DRAWINGS

Please refer to the City of Coon Rapids' Engineering Details for the following:

- Bioretention

- Sand Filter System
- Wet & Dry Swale
- Infiltration Trench
- Infiltration Basin
- Storm Water Pond/Wetland

12 CONSTRUCTION SPECIFICATIONS

Construction specifications and details are found in the *Minnesota Stormwater Manual* for each of the acceptable STPs, unless otherwise restricted by these Engineering Design Guidelines.

13 CHECKLISTS

Refer to Appendix A & B

- Checklists for Construction Inspection and Operation & Maintenance
- Construction Inspection and Operation & Maintenance Checklists for each of the approved Storm water Treatment Practices are available in the *Minnesota Stormwater Manual.*

City of Coon Rapids Site Plan Review

Address:		Permit No:	
PID:		Date Approved:	
Date Received:		Signature:	
Site Size (acres):		Area of Disturbance(acres):	
Existing Impervious (acres):		Proposed Impervious (acres):	

Submittals Received

Date	Document	Author

General Site Plan		
	Yes √	**No √**
Scale of Survey. Minimum scale 1” = 50’. Maximum size plan sheet 24” x 36”		
Survey signed by a registered survey with elevations in NGVD-1929 datum for the following locations:		
• Each lot corner		
• Grade elevation at the foundation and elevation of top of foundation of structures on adjacent lots		
• Grade elevation at the foundation, elevation of top of foundation and garage floor of proposed new construction		
• Lowest point of entry (i.e. door sill or top of window well) of proposed and existing construction		
• Lowest floor of proposed and existing construction		
Any proposed retaining wall must have a top and bottom elevation and bottom elevation would be finish grade. Also, no retaining wall is allowed to be built on private property		
Retaining walls greater than 4.0 feet in height have been designed and certified by a licensed professional engineer and a building permit has been acquired		
Easements are clear of any encroachments?		
New curb cuts proposed? If new curb cut is proposed, stamp all survey maps with the curb cut stamp. Also, write a note on the Residential Plan & Routing Approval form reminding the builder that a curb cut permit is required if the driveway is moved or a new driveway is added		
Low floor a minimum of 4.25’ (feet) above the sanitary sewer invert elevation		

Comments:

_____

_____

_____

_____

Erosion Control Plan		
	Yes √	**No √**
SWPPP notes provided on the plan		
Temporary stabilization measures provided		
Erosion control blankets provided on all slopes greater than 3:1		
Perimeter Control i.e., Silt Fence, Filter Log, etc.		
Phasing for sites that are ≥ 1 acre		
CB Inlet Protection		
Dewatering		
Sediment control		
Waste control		
Concrete washout		
Rock entrance		
Street sweeping schedule		
Permanent restoration plan		
SWPPP includes an erosion and sediment control inspection schedule and person responsible for maintenance		

Comments:

_____

_____

_____

Stormwater Management Plan		
	Yes √	**No √**
Delineation map		
Modeling calculations for existing and proposed conditions		
• 2, 10, 100, Snowmelt		
• Modeled direct connected impervious separate		
Off-site drainage included		
Wetlands shown on plans and wetland permitting completed		
Pretreatment		
Skimmer structures provided on the outlets of all ponds.		
Soil borings		
Design Infiltration Rate Determination		
Seasonal High Water Elevation		

Comments:

_____

_____

_____

Water Quality		
	Yes √	**No √**
Volume control provided as per the Coon Creek Watershed District		
Sequencing provided for alternatives where infiltration is infeasible		
Required Water Quality Volume:		
Provided Water Quality Volume:		

Comments:

_____

_____

_____

Rate Control		
	Yes √	**No √**
Peak Discharge Rates < Existing		

Comments:

_____

_____

_____

Freeboard		
	Yes √	**No √**
Building Opening:		
• 3’ above the critical 100-yr HWL of local basins, wetlands, & infiltration basins		
• 2’ above EOF of local basins, wetlands, & infiltration basins		
• 2’ above the 100-yr flow elevation of a swale or channel at the point where the swale channel is closest to the building		
Low Floor Elevation:		
• 2’ above the critical 100-yr HWL of major basins		
• 2’ above EOF of major basins		
• For landlocked basins: 2’ above the HWL from back to back 100-yr rainfalls or 2’ above the HWL from the 100-yr 10-day snowmelt, whichever is higher. Starting elevation of the basin/waterbody prior to runoff is one of the following:		
o Existing Ordinary High Water level established by the Minnesota Department of Natural Resources		
o Annual water balance calculation approved by the City		
o Local observation well records, as approved by the City		
o Mottled soil		

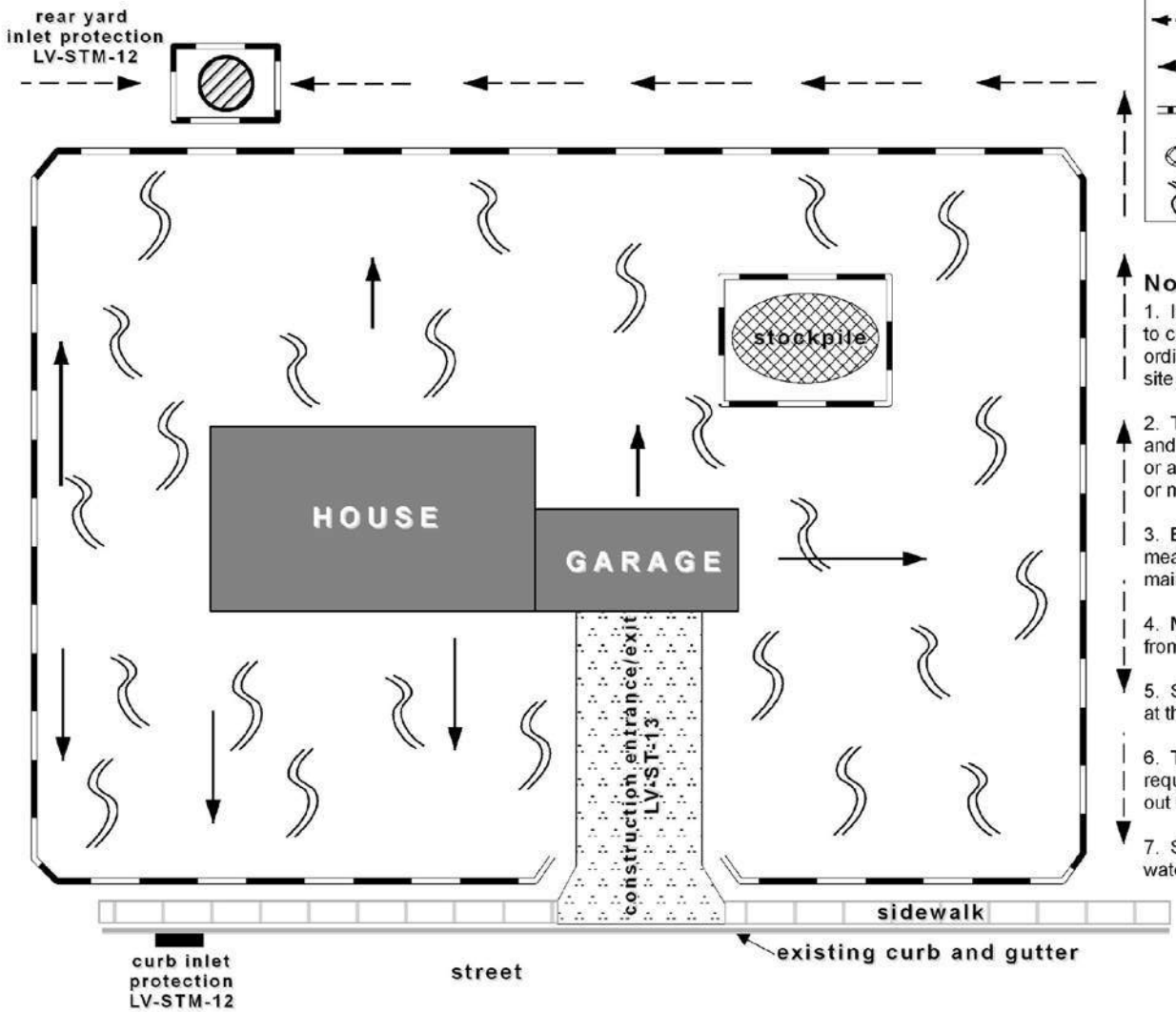
Comments:

_____

_____

_____

Individual Lot Erosion and Sediment Control



Erosion Control Legend

- direction of drainage
- finished grade
- silt fence
- stockpile
- temporary/permanent cover

Notes

1. It is the responsibility of the builder to comply with State laws and local ordinances regarding construction site erosion and sediment control.
2. This plan is only a sample plan and is not intended to be all inclusive or address every situation, additional or modified practices may be required.
3. Erosion and sediment control measures must be functional and maintained throughout construction.
4. Maintain positive drainage away from the structure(s).
5. Streets must be cleared of all debris at the end of each day.
6. Temporary/permanent cover is required on all exposed soils through out the building process.
7. Stockpiles must not be placed near waterbodies or on streets or sidewalks.

Construction Site Stormwater Runoff ESC Inspection Form

Site Name:	**Permit No.:**	**Inspector(s):**
Address:	**Inspection Date:** ____ / ____ / ____ **Time:** _____ am/pm	**Photos Taken?** ☐Yes ☐No
Owner:	**Weather:**	**Date of Last Inspection:** ____ / ____ / ____
Contractor:	**Priority Area:** ☐Yes ☐No	**Last Rain Date:** ____ / ____ / ____ **Amount:** _____(inches)
Inspection Reason: ☐Routine ☐Complaint ☐Spot-Check	**Today's Rainfall** **Amount :** _____(inches)	**Rainfall Data Source :** ☐On-site Gauge ☐Weather Station w/in 1 mile

	BMP	Compliant?	Maintenance Required?	Corrective Action(s) Needed & Notes	Date Corrected
1.	Perimeter controls installed/maintained?	☐Yes ☐No	☐Yes ☐No		
2.	Natural features are protected with a BMP?	☐Yes ☐No	☐Yes ☐No		
3.	Storm drain inlets are properly protected?	☐Yes ☐No	☐Yes ☐No		
4.	Stockpiles protected and not placed in a conveyance?	☐Yes ☐No	☐Yes ☐No		
5.	Construction entrance prevents tracking?	☐Yes ☐No	☐Yes ☐No		
6.	Trash/litter collected and contained?	☐Yes ☐No	☐Yes ☐No		
7.	Non-active disturbed areas are stabilized?	☐Yes ☐No	☐Yes ☐No		
8.	Discharge points are free of sediment deposits?	☐Yes ☐No	☐Yes ☐No		
9.	Washout facilities are available/used?	☐Yes ☐No	☐Yes ☐No		
10.	Vehicle fueling areas are free of leaks and spills?	☐Yes ☐No	☐Yes ☐No		
11.	Potential contaminants are protected?	☐Yes ☐No	☐Yes ☐No		

BMP		Compliant?	Maintenance Required?	Corrective Action(s) Needed & Notes	Date Corrected
12.	Any evidence of discharges?	☐Yes ☐No	☐Yes ☐No		
13.	Portable toilets are upright and secure?	☐Yes ☐No	☐Yes ☐No		
15	Dewatering activities are using appropriate BMPs to avoid scour and selected chemicals are suited to soil types?	☐Yes ☐No	☐Yes ☐No		
16.	SWPPP on site?	☐Yes ☐No	☐Yes ☐No		
17.	Inspection reports available?	☐Yes ☐No	☐Yes ☐No		
18.	Training documentation is available?	☐Yes ☐No	☐Yes ☐No		
19.	Other:	☐Yes ☐No	☐Yes ☐No		
20.	Other:	☐Yes ☐No	☐Yes ☐No		

Additional Comments:

CITY OF COON RAPIDS
COUNTY OF ANOKA
STATE OF MINNESOTA

STORMWATER FACILITIES MAINTENANCE AGREEMENT WITH ACCESS RIGHTS AND COVENANTS

(_____Insert Project Reference Numbers___)

This AGREEMENT, made and entered into this ___ day of _____, 20___, for the maintenance and repair of certain Stormwater Management Facilities is entered into between _____ (hereinafter referred to as "OWNER") and the City of Coon Rapids (hereinafter referred to as "CITY") for the benefit of the CITY, the OWNER, the successors in interest to the CITY or the OWNER, and the public generally.

WITNESSETH

WHEREAS, the undersigned is the owner of that certain real property lying and being in the _____ Land Lot/District, _____ identified as [Tax Map/Parcel Identification Number] _____ and being more particularly described by deed as recorded in the land records of the City of Coon Rapids, Minnesota, Deed Book _____ Page ____, hereinafter called the "Property".

WHEREAS, the undersigned is proceeding to build on and develop the property; and has submitted the Site Plan/Subdivision Plan known as _____, (Name of Plan/Development) hereinafter called the "Plan", which is expressly made a part hereof, as approved or to be approved by the City, provides for detention of stormwater within the confines of the property; and

WHEREAS, the City and the undersigned, its successors and assigns, including any homeowners association, (hereinafter the "Landowner") agree that the health, safety, and welfare of the residents of the City of Coon Rapids, Minnesota, requires that on-site stormwater management facilities be constructed and maintained on the Property; and

WHEREAS, the City requires that on-site stormwater management facilities as shown on the Plan (the "Facilities") be constructed and adequately maintained by the Landowner.

NOW, THEREFORE, in consideration of the foregoing premises, the mutual covenants contained herein, and the following terms and conditions, the parties hereto agree as follows:

(1) When a new drainage control facility is installed, the party having the facility installed shall obtain a copy of the as-built plans from the City of Coon Rapids Engineering Department. Responsible parties shall make records of the installation and of all maintenance and repair, and shall retain the records for at least ten years. These records shall be made available to the City of Coon Rapids' City Engineer during Inspection of the facility and at other reasonable times upon request of the City Engineer.

(2) The following operational maintenance activities shall be performed on all permitted systems on a regular basis or as needed:

a) Removal of trash and debris,
b) Inspection of inlets and outlets,
c) Removal of sediments when the storage volume or conveyance capacity of the stormwater management system is below design levels
d) Ensure systems designed for infiltration are drawing down within 48 hours, and
e) Stabilization and restoration of eroded areas.

(3) Specific operational maintenance activities are required, depending on the type of permitted system, in addition to the practices listed in subsection (2), above.

a) Retention, swale and underdrain systems shall include provisions for:
    1. Mowing and removal of grass clippings, and
    2. Aeration, tilling, or replacement of topsoil as needed to restore the percolation capability of the system. If tilling or replacement of the topsoil is utilized, vegetation must be established on the disturbed surfaces.
b) Exfiltration systems shall include provisions for removal of sediment and debris from pretreatment or sediment collection systems.
c) Wet detention systems shall include provisions for operational maintenance of the littoral zone. Replanting shall be required if the percentage of vegetative cover falls below the permitted level. It is recommended that native vegetation be maintained in the littoral zone as part of the system's operation and maintenance plan. Undesirable species such as cattail and exotic plants should be controlled if they become a nuisance.
d) Dry detention systems shall include provisions for mowing and removal of grass clippings.

(4) If the system is not functioning as designed and permitted, operational maintenance must be performed immediately to restore the system. If operational maintenance measures are insufficient to enable the system to meet the design and performance standards of this chapter, the permittee must either replace the system or construct an alternative design.

(5) In the event the Landowner fails to maintain the Facilities in good working condition acceptable to the City, the City may enter upon the Property and take such steps as are necessary to correct deficiencies identified in the inspection report and to charge the costs of such repairs to the Landowner. This provision shall not be construed to allow the City to erect any structure of permanent nature on the land of the Landowner outside of the easement for the stormwater management facilities. It is expressly understood and agreed that the City is under no obligation to routinely maintain or repair said facilities, and in no event shall this Agreement be construed to impose any such obligation on the City. The Landowner grants to the City, its authorized agents and employees, a non-exclusive, perpetual easement over, across, under and through the Property for such purposes.

IN WITNESS THEREOF, the parties hereto acting through their duly authorized agents have caused this Agreement to be signed, sealed and delivered:

(Insert Company/Corporation/Partnership Name) [SEAL]

_____

By: (Type Name and Title)

The foregoing Agreement was acknowledged before me
this ____ day of _____, 20___, by

_____

Unofficial Witness

_____

NOTARY PUBLIC

My Commission Expires: _____

CITY OF COON RAPIDS, MINNESOTA

ATTACHMENT 1: CITY OF COON RAPIDS
GENERAL ENGINEERING STANDARDS FOR STORM WATER TREATMENT FACILITIES

The following are the maintenance requirements for the proper operation of water quality treatment structures provided by the *Minnesota Stormwater Manual,* as amended, and the *Minnesota BMP Manual*, as mended:

Pond Maintenance Requirements

1. Annual inspection, maintenance reporting and certification by a professional engineer (Provided by Owner). Information must be submitted to the City annually.

2. Excavate pond to original design capacity when one half (1/2) of the wet volume of the pond is lost due to sediment deposition.

3. Remove floatable debris in and around the pond area including, but not limited to: oils, gases, debris and other pollutants.

4. Maintain landscape adjacent to the facility per original design, including but not limited to: maintenance of the buffer strip and other plant materials as per original plan design.

5. Maintenance of all erosion control measures including but not limited to: rip rap storm sewer outlets, catch basin inlets, etc.

Environmental Manhole Maintenance Requirements

1. Annual inspection, maintenance reporting and certification by a professional engineer (Provided by Owner). Information must be submitted to the City annually.

2. Maintenance should be performed once the sediment or oil depth exceeds the established requirements recommended by the manufacturer.

3. Maintenance should occur immediately after a spill takes place. Appropriate regulatory agencies should also be notified in the event of a spill.

4. Disposal of materials shall be in accordance with local, state and federal requirements as applicable.

Rain Garden Maintenance Requirements

1. Inlet and Overflow Spillway – Remove any sediment build-up or blockage and correct any erosion.

2. Vegetation
    a. Maintain at least 80% surface area coverage of plants approved per plan.
    b. Removal of invasive plants and undesirable woody vegetation.
    c. Removal of dried, dead and diseased vegetation.
    d. Re-mulch void or disturbed/exposed areas.

3. Annual inspection and maintenance efforts must be documented and submitted to the City.

Filtration Basin Maintenance Requirements

1. Sweep sediment from parking lot 4 times per year

2. Ongoing and as needed:
    a. Prune and weed to maintain appearance
    b. Remove trash and debris
    c. Maintain at least 80% surface area coverage of plants approved per plan.
    d. Removal of invasive plants and undesirable woody vegetation.
    e. Removal of dried, dead and diseased vegetation.
    f. Re-mulch void or disturbed/exposed areas.

3. Semi-annually:
    a. Remove sediment from inflow points (off-line systems)
    b. Inspect aggregate filter system and clean as needed
    c. Shrubs should be inspected to evaluate health. Remove dead and diseased vegetation.

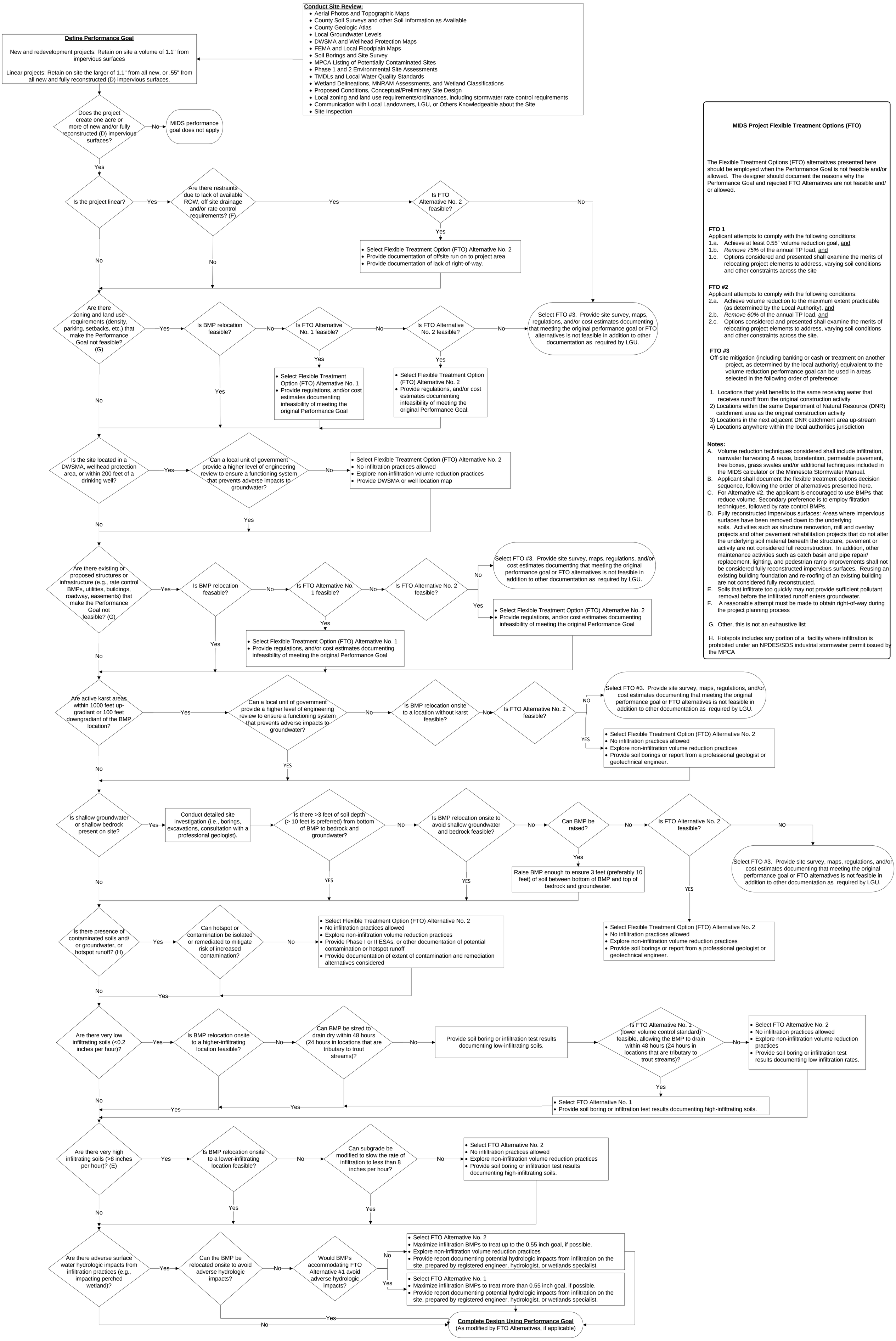
4. Annually:
    a. Inspect and remove any sediment and debris build-up in pre-treatment areas
    b. Inspect inflow points and bioretention surface for buildup of road sand associated with spring melt period. Remove and replant as necessary.

5. 2 to 3 years:
    a. Test pH of planting soils. If pH is below 5.2, add limestone. If pH is 7.0 to 8.0, add iron sulfate plus sulfur.

6. Annual inspection and maintenance efforts must be documented and submitted to the City.

MIDS DESIGN SEQUENCE FLOW CHART

version 6.18.13



MIDS Project Flexible Treatment Options (FTO)

The Flexible Treatment Options (FTO) alternatives presented here should be employed when the Performance Goal is not feasible and/or allowed. The designer should document the reasons why the Performance Goal and rejected FTO Alternatives are not feasible and/ or allowed.

FTO 1
Applicant attempts to comply with the following conditions:
1.a. Achieve at least 0.55" volume reduction goal, and
1.b. *Remove 75%* of the annual TP load, and
1.c. Options considered and presented shall examine the merits of relocating project elements to address, varying soil conditions and other constraints across the site

FTO #2
Applicant attempts to comply with the following conditions:
2.a. Achieve volume reduction to the maximum extent practicable (as determined by the Local Authority), and
2.b. *Remove 60%* of the annual TP load, and
2.c. Options considered and presented shall examine the merits of relocating project elements to address, varying soil conditions and other constraints across the site.

FTO #3
Off-site mitigation (including banking or cash or treatment on another project, as determined by the local authority) equivalent to the volume reduction performance goal can be used in areas selected in the following order of preference:

1. Locations that yield benefits to the same receiving water that receives runoff from the original construction activity
2) Locations within the same Department of Natural Resource (DNR) catchment area as the original construction activity
3) Locations in the next adjacent DNR catchment area up-stream
4) Locations anywhere within the local authorities jurisdiction

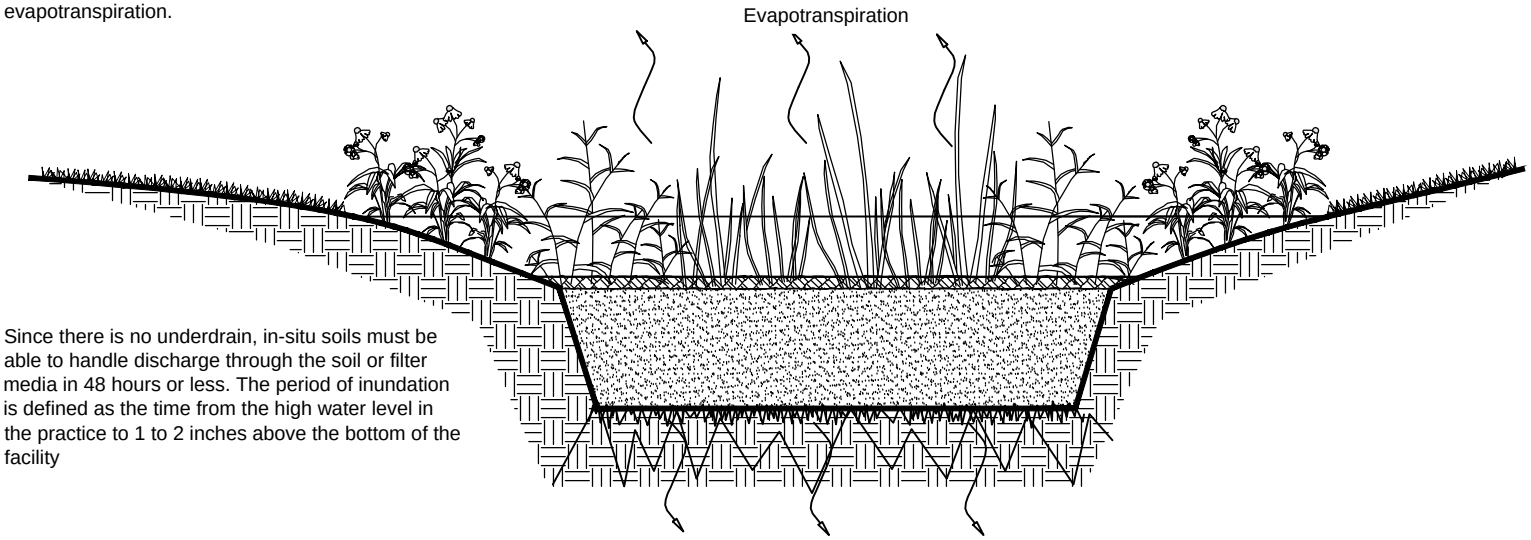
Notes:
A. Volume reduction techniques considered shall include infiltration, rainwater harvesting & reuse, bioretention, permeable pavement, tree boxes, grass swales and/or additional techniques included in the MIDS calculator or the Minnesota Stormwater Manual.
B. Applicant shall document the flexible treatment options decision sequence, following the order of alternatives presented here.
C. For Alternative #2, the applicant is encouraged to use BMPs that reduce volume. Secondary preference is to employ filtration techniques, followed by rate control BMPs.
D. Fully reconstructed impervious surfaces: Areas where impervious surfaces have been removed down to the underlying soils. Activities such as structure renovation, mill and overlay projects and other pavement rehabilitation projects that do not alter the underlying soil material beneath the structure, pavement or activity are not considered full reconstruction. In addition, other maintenance activities such as catch basin and pipe repair/ replacement, lighting, and pedestrian ramp improvements shall not be considered fully reconstructed impervious surfaces. Reusing an existing building foundation and re-roofing of an existing building are not considered fully reconstructed.
E. Soils that infiltrate too quickly may not provide sufficient pollutant removal before the infiltrated runoff enters groundwater.
F. A reasonable attempt must be made to obtain right-of-way during the project planning process

G. Other, this is not an exhaustive list

H. Hotspots includes any portion of a facility where infiltration is prohibited under an NPDES/SDS industrial stormwater permit issued by the MPCA

Bioinfiltration

There is no underdrain, so all runoff that flows into the basin and does not overflow into an overflow structure is abstracted from the stormsewer system through infiltration or evapotranspiration.



Since there is no underdrain, in-situ soils must be able to handle discharge through the soil or filter media in 48 hours or less. The period of inundation is defined as the time from the high water level in the practice to 1 to 2 inches above the bottom of the facility

Figure 2-1: Bioinfiltration

Not To Scale

NO.	REVISION DESCRIPTION	DATE	BY

I hereby certify that this plan was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota

Print Name:

Sign Name: License No.

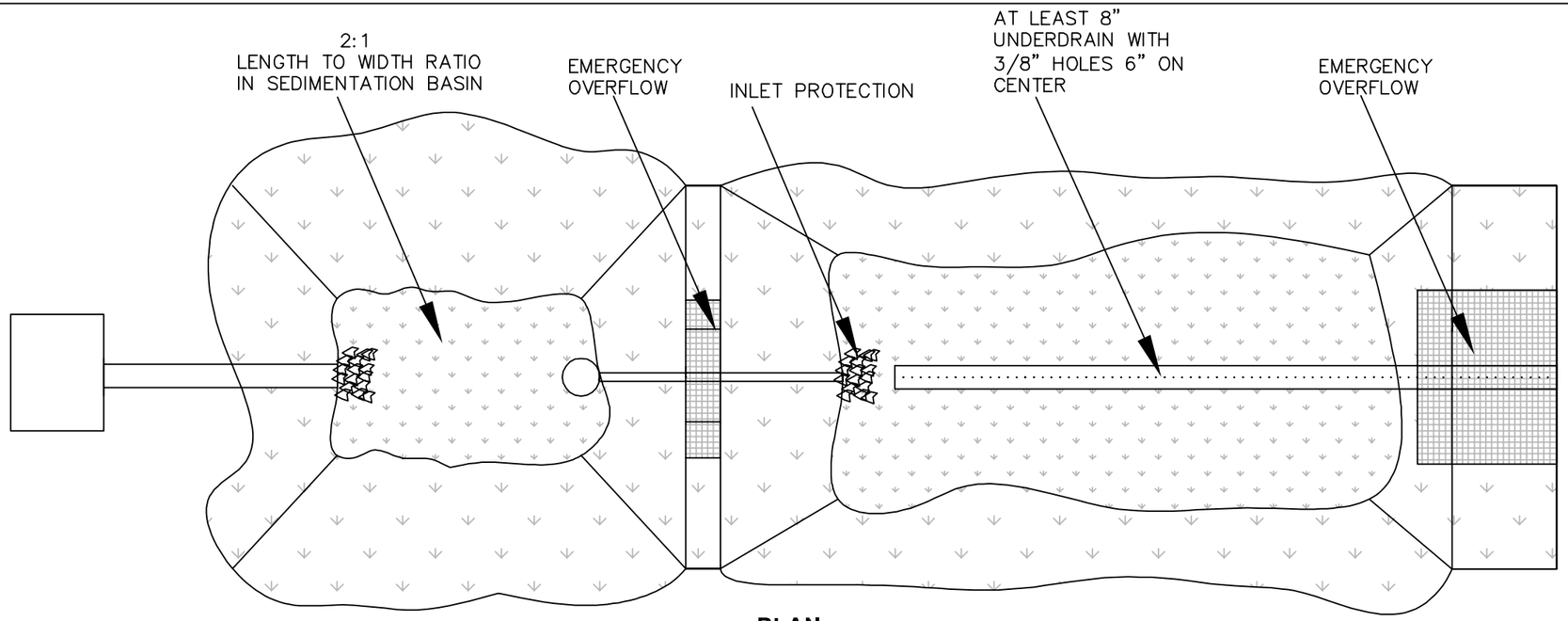
Date

Designed By

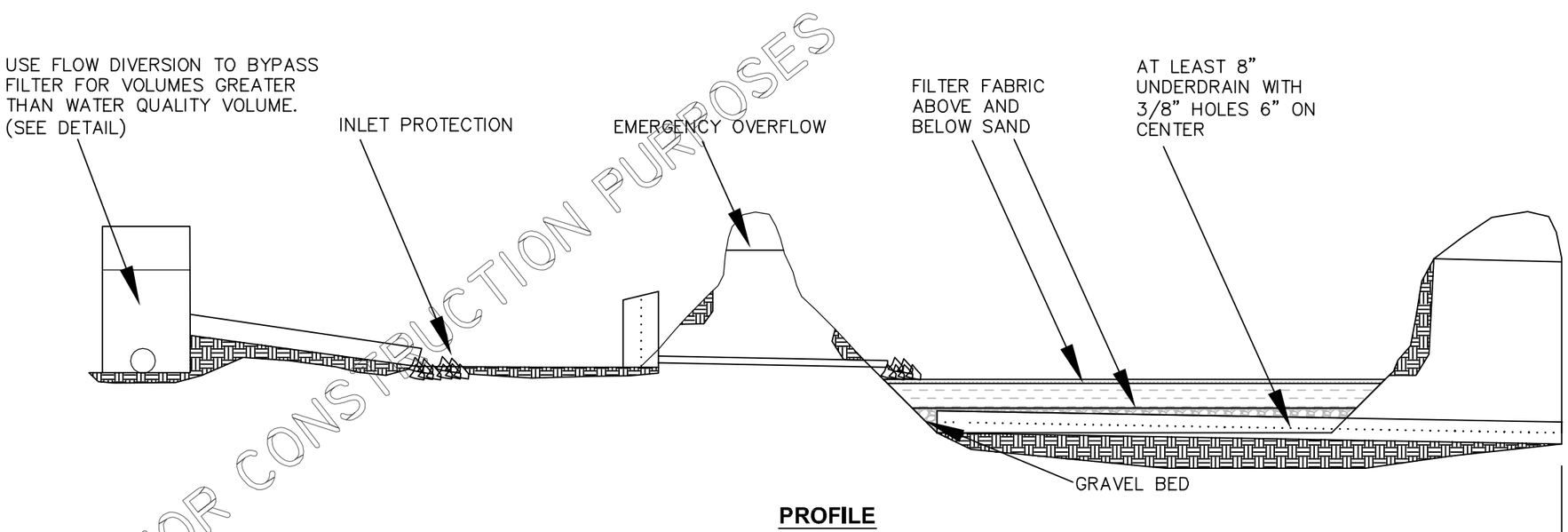
Drawn By

NOT FOR CONSTRUCTION PURPOSES

Sheet No. of Sheets



PLAN



PROFILE

NOT FOR CONSTRUCTION PURPOSES

CONSTRUCTION SEQUENCING:

1. PERFORM CONTINUOUS INSPECTIONS OF EROSION CONTROL PRACTICES.
2. INSTALL SILT FENCE ALONG THE PERIMETER OF THE SITE TO PREVENT SEDIMENT FROM LEAVING THE SITE DURING THE CONSTRUCTION PROCESS.
3. ALL DOWNGRADIENT PERIMETER SEDIMENT-CONTROL BMPS MUST BE IN PLACE BEFORE ANY UP GRADIENT LAND-DISTURBING ACTIVITY BEGINS.
4. REMOVE TOPSOIL FROM THE SITE AND PLACE IN TEMPORARY STOCKPILE LOCATION. TEMPORARY SEED THE STOCKPILE.
5. INSTALL UNDERGROUND UTILITIES (WATER, SANITARY SEWER, ELECTRIC AND PHONES) TAKING THE LOCATION AND FUNCTION OF STORM WATER BMPS INTO CONSIDERATION.
7. SEED AND MULCH DISTURBED AREAS ON SITE.
8. CONSTRUCT THE ROADS TAKING THE LOCATION AND FUNCTION OF STORM WATER BMPS INTO CONSIDERATION.
9. PERFORM ALL OTHER SITE IMPROVEMENTS TAKING THE LOCATION AND FUNCTION OF THE STORM WATER BMPS INTO CONSIDERATION.
10. FINAL GRADE THE SITE.
11. STABILIZE THE SITE BY IMPLEMENTING THE NATIVE SEEDING AND PLANTING PORTION OF THE LANDSCAPING PLAN.
12. INSTALL THE EROSION CONTROL BLANKET
13. REMOVE THE SILT FENCE AFTER THE SITE IS STABILIZED PER PROJECT ENGINEER APPROVAL.

GENERAL NOTES:

1. INSTALL ALL TEMPORARY EROSION CONTROL MEASURES (IN ACCORDANCE WITH MnDOT GENERAL CONDITIONS 2573) PRIOR TO THE START OF ANY CONSTRUCTION OPERATION THAT MAY CAUSE ANY SEDIMENTATION OR SILTATION AT THE SITE.
2. INSTALL STORM DRAIN INLET PROTECTION TO PREVENT CLOGGING OF THE STORM SEWER AND SEDIMENT LOADS TO DOWNSTREAM STORM WATER FACILITIES OR WATERBODIES.
5. EXCAVATE THE INFILTRATION BASIN TO THE SPECIFIED DEPTH (ELEVATION). IT IS RECOMMENDED THAT ALL SUB MATERIAL BELOW THE SPECIFIED ELEVATION SHALL BE LEFT UNDISTURBED, UNLESS OTHERWISE DIRECTED BY THE ENGINEER.
6. GRADE TO THE DEPTH (ELEVATION) SPECIFIED IN THE CONSTRUCTION DOCUMENTS UNLESS OTHERWISE DIRECTED BY THE ENGINEER.
7. IN THE EVENT THAT SEDIMENT IS INTRODUCED INTO THE BMP DURING OR IMMEDIATELY FOLLOWING EXCAVATION, THIS MATERIAL WILL NEED TO BE REMOVED FROM THE BASIN PRIOR TO INITIATING THE NEXT STEP IN THE CONSTRUCTION PROCESS. SEDIMENT THAT HAS BEEN WASHED INTO THE BASIN DURING THE EXCAVATION PROCESS CAN SEAL THE PERMEABLE MATERIAL, SIGNIFICANTLY REDUCING THE INFILTRATION CAPACITY OF THE SOILS.
9. **NON-STANDARD COMPONENT:** CLEAN, WASHED 1.5 TO 3.5-INCH GRAVEL SHALL BE PLACED IN THE BOTTOM OF THE BASIN TO THE DEPTH OF AT LEAST 12 INCHES OR AS SPECIFIED IN THE CONSTRUCTION DOCUMENTS. GRAVEL SHOULD BE PLACED IN LIFTS AND LIGHTLY COMPACTED WITH PLATE COMPACTORS.
10. **NON-STANDARD COMPONENT:** THE PERFORATED PIPE (UNDERDRAIN) SHALL BE LAID DIRECTLY ON THE GRAVEL BED. GRADE AND ALIGNMENT SHALL NOT VARY FROM THE PRESCRIBED GRADE BY MORE THAN 0.03 FEET (9 MM) AT ANY POINT. THE JOINTS BETWEEN SECTIONS OF PIPE SHALL BE CONNECTED IN A FASHION ACCEPTABLE TO ENGINEER. ONCE THE PIPE IS IN PLACE, IT SHALL BE COVERED IMMEDIATELY WITH GRANULAR MATERIAL AS SPECIFIED IN THE CONSTRUCTION DOCUMENTS. THE GRANULAR MATERIAL SHALL BE OF UNIFORM DEPTH ON BOTH SIDES OF THE PIPE. SPECIAL INLETS AND SPECIAL DEVICES AT THE OUTLET END OF THE PIPE SHALL BE CONSTRUCTED AS SHOWN IN THE PLANS.
14. SEEDING AND INSTALLATION OF EROSION CONTROL BLANKET SHALL BE COMPLETED WITHIN 48 HOURS OF FINAL GRADING.

SURFACE SAND FILTER DETAILS

NOT TO SCALE

NO.	REVISION DESCRIPTION	DATE	BY

I hereby certify that this plan was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota

Print Name:_____

Sign Name:_____ License No._____

Date _____

Date | Designed By | Drawn By

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SURFACE SAND FILTER DETAILS

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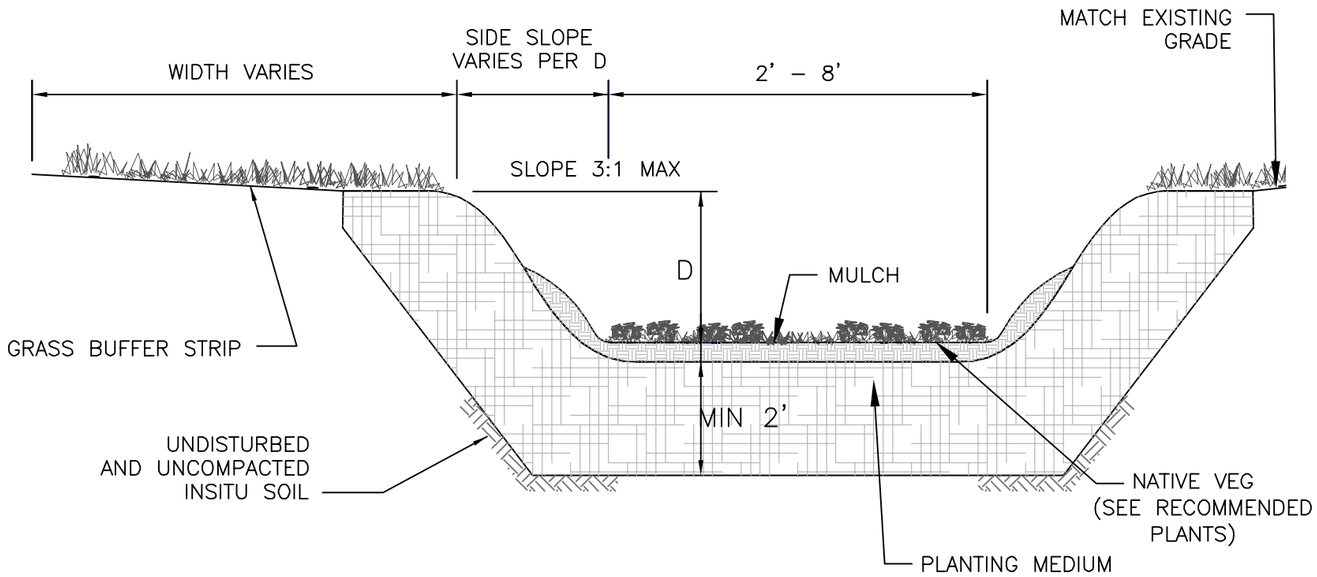
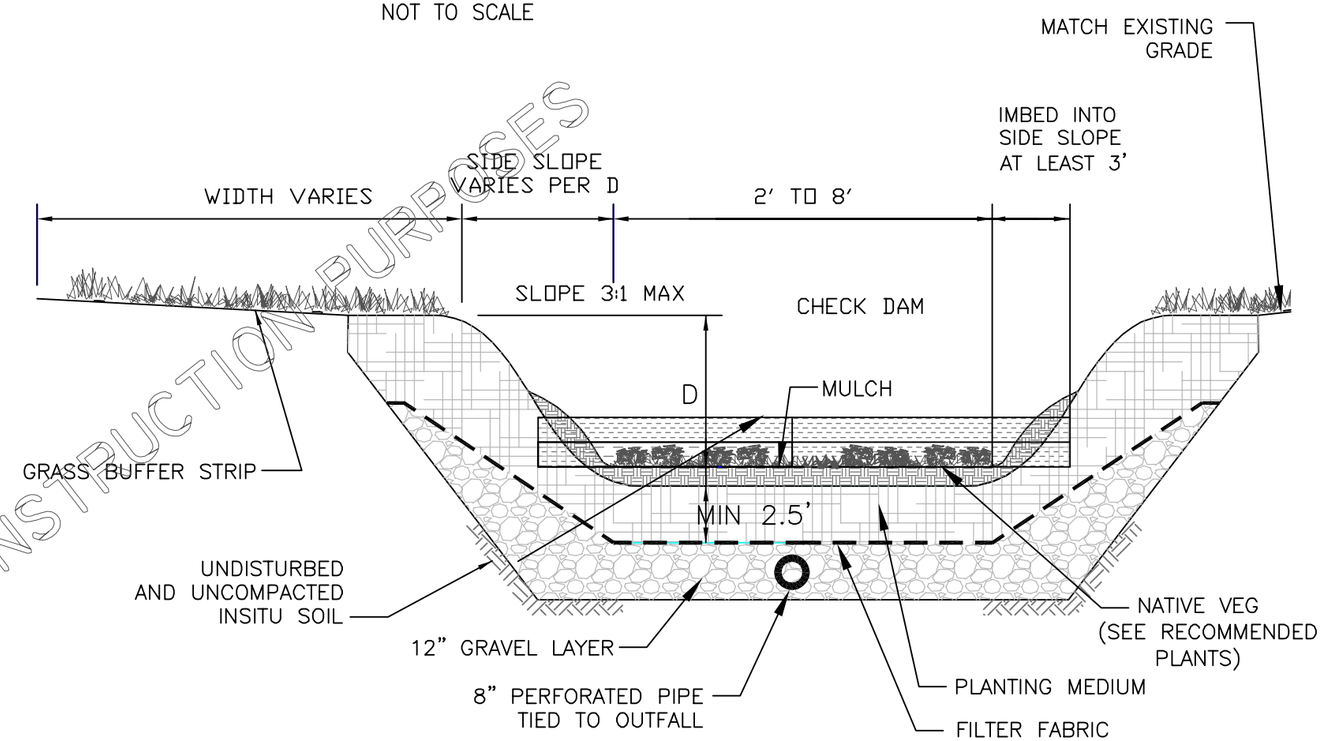


TYPICAL WET SWALE CROSS–SECTION

NOT TO SCALE



NOT FOR CONSTRUCTION PURPOSES

TYPICAL DRY SWALE CROSS–SECTION (WITH CHECKDAM)

NOT TO SCALE

CONSTRUCTION SEQUENCING:

1. PERFORM CONTINUOUS INSPECTIONS OF EROSION CONTROL PRACTICES.
2. INSTALL SILT FENCE ALONG THE PERIMETER OF THE SITE TO PREVENT SEDIMENT FROM LEAVING THE SITE DURING THE CONSTRUCTION PROCESS.
3. ALL DOWNGRADIENT PERIMETER SEDIMENT-CONTROL BMPS MUST BE IN PLACE BEFORE ANY UP GRADIENT LAND-DISTURBING ACTIVITY BEGINS.
4. REMOVE TOPSOIL FROM THE SITE AND PLACE IN TEMPORARY STOCKPILE LOCATION. TEMPORARY SEED THE STOCKPILE.
5. INSTALL UNDERGROUND UTILITIES (WATER, SANITARY SEWER, ELECTRIC AND PHONES) TAKING THE LOCATION AND FUNCTION OF STORM WATER BMPS INTO CONSIDERATION.
7. SEED AND MULCH DISTURBED AREAS ON SITE.
8. CONSTRUCT THE ROADS TAKING THE LOCATION AND FUNCTION OF STORM WATER BMPS INTO CONSIDERATION.
9. PERFORM ALL OTHER SITE IMPROVEMENTS TAKING THE LOCATION AND FUNCTION OF THE STORM WATER BMPS INTO CONSIDERATION.
10. FINAL GRADE THE SITE.
11. STABILIZE THE SITE BY IMPLEMENTING THE NATIVE SEEDING AND PLANTING PORTION OF THE LANDSCAPING PLAN.
12. INSTALL THE EROSION CONTROL BLANKET AND COIR ROLL/CHECK DAMS.
13. REMOVE THE SILT FENCE AFTER THE SITE IS STABILIZED PER PROJECT ENGINEER APPROVAL.

GENERAL NOTES:

1. INSTALL ALL TEMPORARY EROSION CONTROL MEASURES (IN ACCORDANCE WITH MnDOT GENERAL CONDITIONS 2573) PRIOR TO THE START OF ANY CONSTRUCTION OPERATION THAT MAY CAUSE ANY SEDIMENTATION OR SILTATION AT THE SITE.
2. INSTALL STORM DRAIN INLET PROTECTION TO PREVENT CLOGGING OF THE STORM SEWER AND SEDIMENT LOADS TO DOWNSTREAM STORM WATER FACILITIES OR WATERBODIES.
4. GRADING OF THE SWALE SHALL BE ACCOMPLISHED USING LOW-IMPACT EARTH-MOVING EQUIPMENT TO PREVENT COMPACTION OF THE UNDERLYING SOILS. SMALL TRACKED DOZERS AND BOBCATS WITH RUNNER TRACKS ARE RECOMMENDED.
5. EXCAVATE THE SWALE TO THE SPECIFIED DEPTH (ELEVATION). IT IS RECOMMENDED THAT ALL SUB MATERIAL BELOW THE SPECIFIED ELEVATION SHALL BE LEFT UNDISTURBED, UNLESS OTHERWISE DIRECTED BY THE ENGINEER.
6. GRADE TO THE DEPTH (ELEVATION) SPECIFIED IN THE CONSTRUCTION DOCUMENTS UNLESS OTHERWISE DIRECTED BY THE ENGINEER.
7. IN THE EVENT THAT SEDIMENT IS INTRODUCED INTO THE BMP DURING OR IMMEDIATELY FOLLOWING EXCAVATION, THIS MATERIAL WILL NEED TO BE REMOVED FROM THE SWALE PRIOR TO INITIATING THE NEXT STEP IN THE CONSTRUCTION PROCESS. THIS IS ESPECIALLY IMPORTANT IF THE SWALE HAS BEEN DESIGNED TO INFILTRATE STORM WATER; SEDIMENT THAT HAS BEEN WASHED INTO THE SWALE DURING THE EXCAVATION PROCESS CAN SEAL THE PERMEABLE MATERIAL, SIGNIFICANTLY REDUCING THE INFILTRATION CAPACITY OF THE SOILS.
8. MATERIAL EXCAVATED FROM THE SWALE(S) SHALL BE DISPOSED OF ON-SITE AT LOCATIONS (STOCKPILE AREAS) DESIGNATED BY ENGINEER.
9. **NON-STANDARD COMPONENT:** CLEAN, WASHED 1.5 TO 3.5-INCH GRAVEL SHALL BE PLACED IN THE BOTTOM OF THE SWALE TO THE DEPTH SPECIFIED IN THE CONSTRUCTION DOCUMENTS. GRAVEL SHOULD BE PLACED IN LIFTS AND LIGHTLY COMPACTED WITH PLATE COMPACTORS.
10. **NON-STANDARD COMPONENT:** THE PERFORATED PIPE (UNDERDRAIN) SHALL BE LAID DIRECTLY ON THE GRAVEL BED. GRADE AND ALIGNMENT SHALL NOT VARY FROM THE PRESCRIBED GRADE BY MORE THAN 0.03 FEET (9 MM) AT ANY POINT. THE JOINTS BETWEEN SECTIONS OF PIPE SHALL BE CONNECTED IN A FASHION ACCEPTABLE TO ENGINEER. ONCE THE PIPE IS IN PLACE, IT SHALL BE COVERED IMMEDIATELY WITH GRANULAR MATERIAL AS SPECIFIED IN THE CONSTRUCTION DOCUMENTS. THE GRANULAR MATERIAL SHALL BE OF UNIFORM DEPTH ON BOTH SIDES OF THE PIPE. SPECIAL INLETS AND SPECIAL DEVICES AT THE OUTLET END OF THE PIPE SHALL BE CONSTRUCTED AS SHOWN IN THE PLANS.
12. PORTIONS OF SWALE TO BE PLANTED SHALL RECEIVE 3" OF WOODCHIP MULCH (MnDOT TYPE 6).
13. PORTIONS OF SWALE TO BE SEEDED SHALL BE MULCHED WITH CLEAN GRAIN STRAW (MnDOT TYPE 3) AT A RATE OF 2 TONS PER ACRE.
14. SEEDING AND INSTALLATION OF EROSION CONTROL BLANKET SHALL BE COMPLETED WITHIN 48 HOURS OF FINAL GRADING.

NO.	REVISION DESCRIPTION	DATE	BY

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Print Name:_____

Sign Name:_____ License No._____

Date _____

Date

Designed By

Drawn By

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WET AND DRY SWALES

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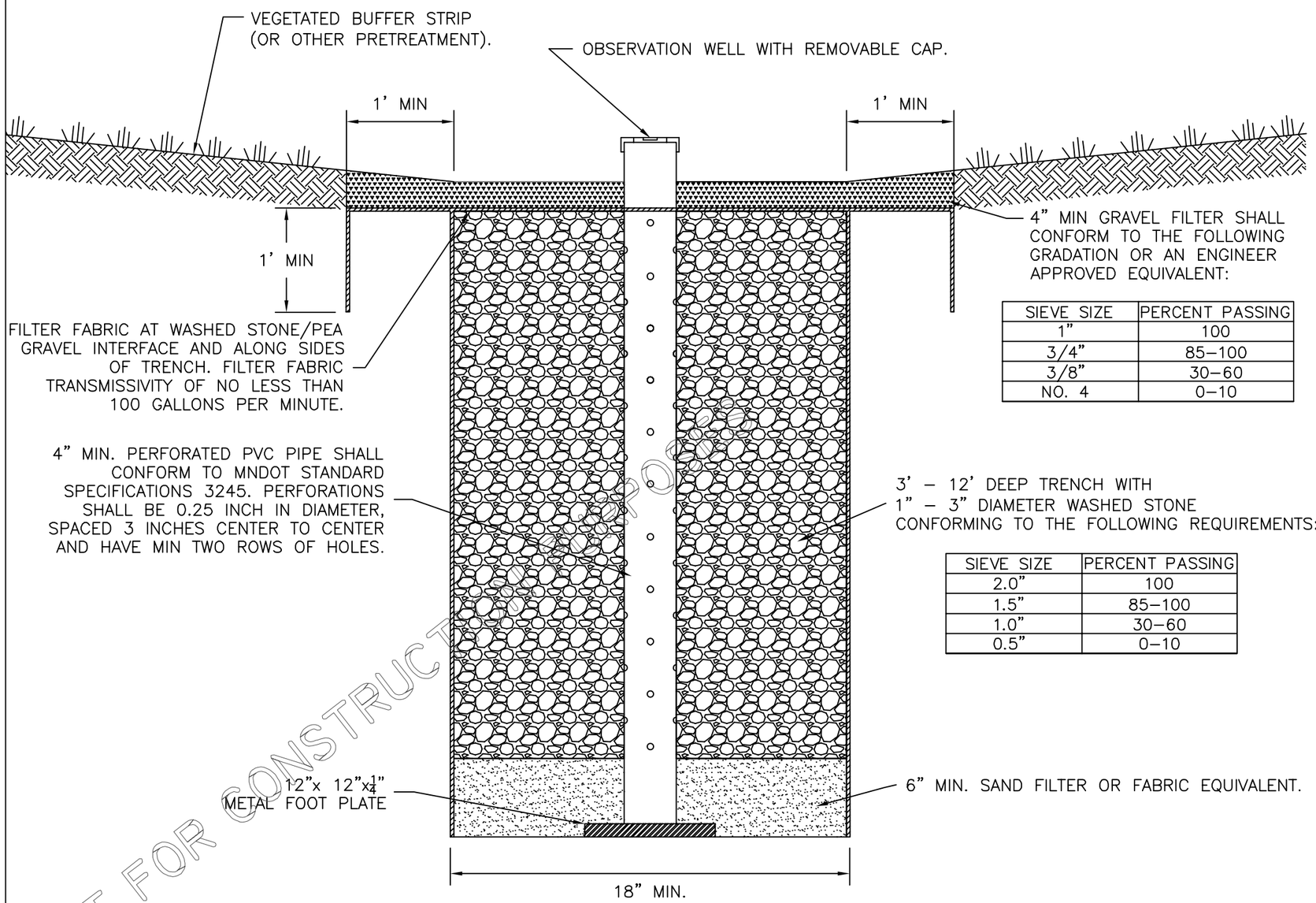

SIEVE SIZE	PERCENT PASSING
1"	100
3/4"	85–100
3/8"	30–60
NO. 4	0–10

SIEVE SIZE	PERCENT PASSING
2.0"	100
1.5"	85–100
1.0"	30–60
0.5"	0–10

NOT FOR CONSTRUCTION PURPOSES

TYPICAL INFILTRATION TRENCH CROSS–SECTION

NOT TO SCALE

CONSTRUCTION SEQUENCING:

1. PERFORM CONTINUOUS INSPECTION OF EROSION CONTROL PRACTICES.
2. INSTALL SILT FENCE ALONG THE PERIMETER OF THE SITE TO PREVENT SEDIMENT FROM LEAVING THE SITE DURING THE CONSTRUCTION PROCESS.
3. ALL DOWNGRADIENT PERIMETER SEDIMENT-CONTROL BMPS MUST BE IN PLACE BEFORE ANY UP GRADIENT LAND-DISTURBING ACTIVITY BEGINS.
4. REMOVE TOPSOIL FROM THE SITE AND PLACE IN TEMPORARY STOCKPILE LOCATION. TEMPORARY SEED THE STOCKPILE.
5. INSTALL UNDERGROUND UTILITIES (WATER, SANITARY SEWER, ELECTRIC AND PHONES) TAKING THE LOCATION AND FUNCTION OF STORM WATER BMPS INTO CONSIDERATION.
6. ROUGH GRADE THE SITE. IF THE INFILTRATION TRENCH IS GOING TO BE USED FOR TEMPORARY SEDIMENT CONTROL, GRADE THE INFILTRATION TRENCH TO WITHIN THREE (3) FEET OF FINAL GRADE TO PREVENT CLOGGING OF INSITU SOIL.
7. SEED AND MULCH DISTURBED AREAS ON SITE.
8. CONSTRUCT THE ROADS TAKING THE LOCATION AND FUNCTION OF STORM WATER BMPS INTO CONSIDERATION.
9. PERFORM ALL OTHER SITE IMPROVEMENTS TAKING THE LOCATION AND FUNCTION OF THE STORM WATER BMPS INTO CONSIDERATION.
10. FINAL GRADE THE SITE.
11. STABILIZE THE SITE BY IMPLEMENTING THE NATIVE SEEDING AND PLANTING PORTION OF THE LANDSCAPING PLAN.
12. REMOVE THE SILT FENCE AFTER THE SITE IS STABILIZED PER PROJECT ENGINEER APPROVAL.

GENERAL NOTES:

1. INSTALL ALL TEMPORARY EROSION CONTROL MEASURES (IN ACCORDANCE WITH MnDOT GENERAL CONDITIONS 2573) PRIOR TO SITE DISTURBANCE.
2. INSTALL STORM DRAIN INLET PROTECTION TO PREVENT CLOGGING OF THE STORM SEWER AND SEDIMENT LOADS TO DOWNSTREAM STORM WATER FACILITIES OR WATERBODIES.
3. IF THE STORM WATER BMP IS BEING DESIGNED TO SERVE AS A TEMPORARY SEDIMENT BASIN, GRADE THE BMP TO WITHIN THREE (3) FEET OF FINAL GRADE TO PREVENT CLOGGING OF INSITU SOIL. ONCE CONSTRUCTION IN THE CONTRIBUTING DRAINAGE AREA HAS BEEN COMPLETED AND THE SITE IS STABILIZED, EXCAVATE THE INFILTRATION TRENCH TO FINAL GRADE AND COMPLETE CONSTRUCTION OF THE INFILTRATION TRENCH.
4. GRADING OF THE INFILTRATION TRENCH SHALL BE ACCOMPLISHED USING LOW-IMPACT EARTH-MOVING EQUIPMENT TO PREVENT COMPACTION OF THE UNDERLYING SOILS. WIDE TRACKED VEHICLES SUCH AS BACK HOES, SMALL DOZERS AND BOBCATS ARE RECOMMENDED.
5. EXCAVATE THE INFILTRATION TRENCH TO THE SPECIFIED DEPTH (ELEVATION). ALL SUB MATERIAL BELOW THE SPECIFIED ELEVATION SHALL BE LEFT UNDISTURBED, UNLESS OTHERWISE DIRECTED BY THE ENGINEER.
6. GRADE TO THE DEPTH (ELEVATION) SPECIFIED IN THE CONSTRUCTION DOCUMENTS UNLESS OTHERWISE DIRECTED BY THE ENGINEER.
7. IN THE EVENT THAT SEDIMENT IS INTRODUCED INTO THE BMP DURING OR IMMEDIATELY FOLLOWING EXCAVATION, THE SEDIMENT WILL NEED TO BE REMOVED FROM THE INFILTRATION TRENCH PRIOR TO INITIATING THE NEXT STEP IN THE INFILTRATION TRENCH CONSTRUCTION PROCESS.
8. MATERIAL EXCAVATED FROM THE INFILTRATION TRENCH SHALL BE DISPOSED OF ON-SITE AT LOCATIONS (TEMPORARY STOCKPILE AREAS) DESIGNATED BY ENGINEER.
9. CLEAN, WASHED 1 TO 3-INCH GRAVEL SHALL BE PLACED IN THE BOTTOM OF THE INFILTRATION TRENCH TO THE DEPTH SPECIFIED IN THE CONSTRUCTION DOCUMENTS. GRAVEL SHOULD BE PLACED IN LIFTS AND LIGHTLY COMPACTED WITH PLATE COMPACTORS.

NO.	REVISION DESCRIPTION	DATE	BY

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Print Name:_____

Sign Name:_____ License No._____

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Designed By

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WEBSITE:www.pca.state.mn.us/

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TYPICAL INFILTRATION TRENCH CROSS–SECTION

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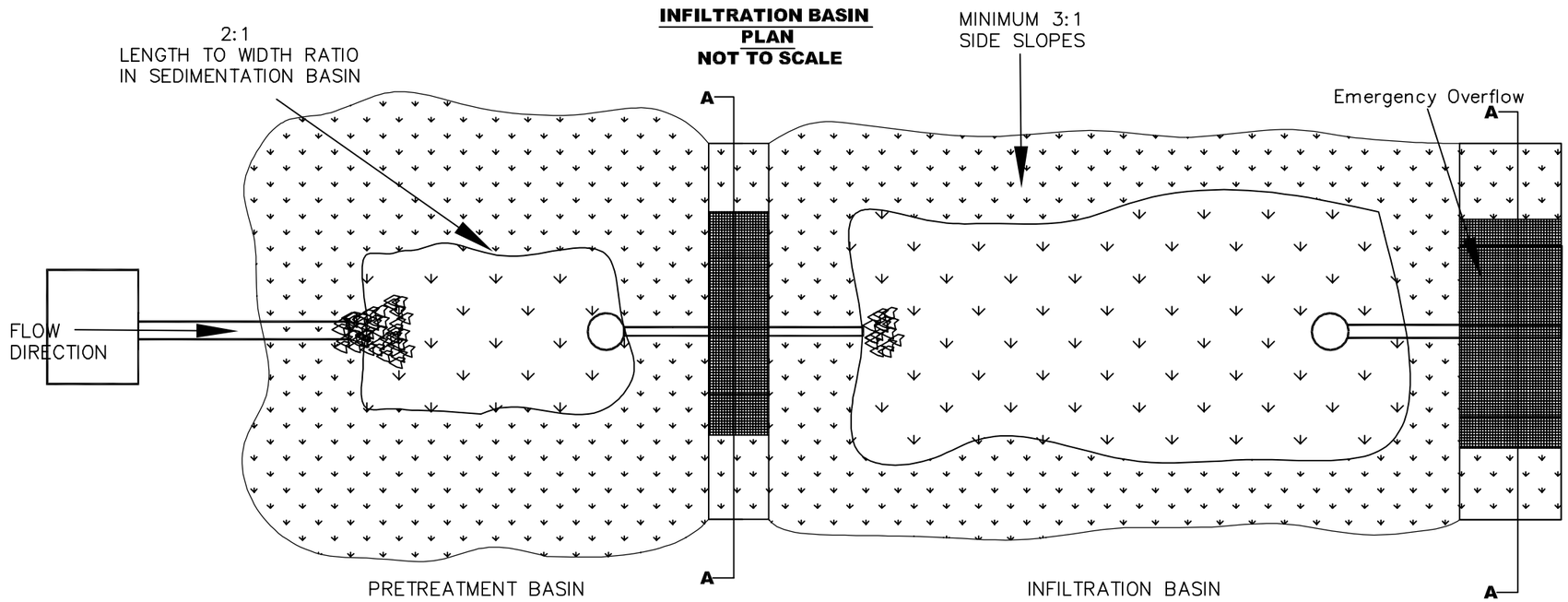

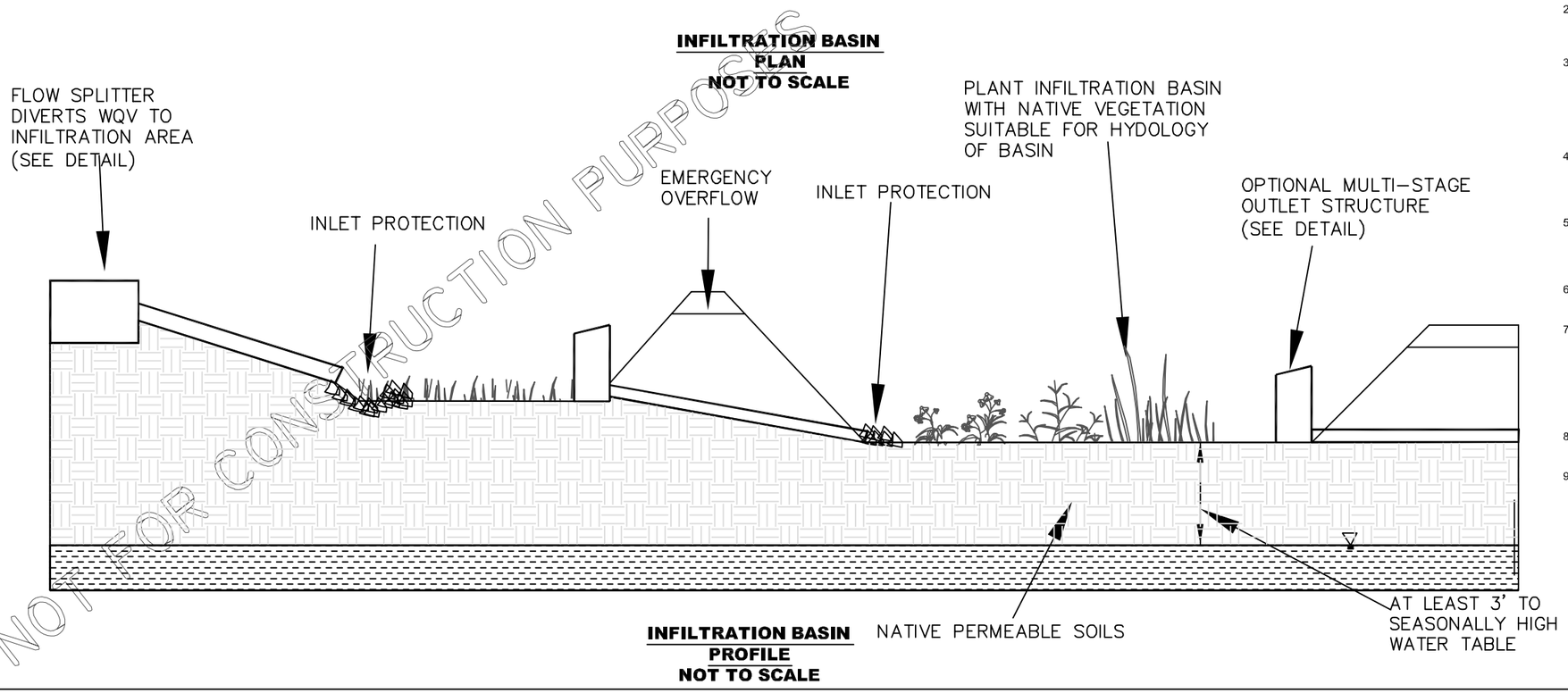

CONSTRUCTION SEQUENCING:

1. PERFORM CONTINUOUS INSPECTIONS OF EROSION CONTROL PRACTICES.
2. INSTALL SILT FENCE ALONG THE PERIMETER OF THE SITE TO PREVENT SEDIMENT FROM LEAVING THE SITE DURING THE CONSTRUCTION PROCESS.
3. ALL DOWNGRADIENT PERIMETER SEDIMENT-CONTROL BMPS MUST BE IN PLACE BEFORE ANY UP GRADIENT LAND-DISTURBING ACTIVITY BEGINS.
4. REMOVE TOPSOIL FROM THE SITE AND PLACE IN TEMPORARY STOCKPILE LOCATION. TEMPORARY SEED THE STOCKPILE.
5. INSTALL UNDERGROUND UTILITIES (WATER, SANITARY SEWER, ELECTRIC AND PHONES) TAKING THE LOCATION AND FUNCTION OF STORM WATER BMPS INTO CONSIDERATION.
7. SEED AND MULCH DISTURBED AREAS ON SITE.
8. CONSTRUCT THE ROADS TAKING THE LOCATION AND FUNCTION OF STORM WATER BMPS INTO CONSIDERATION.
9. PERFORM ALL OTHER SITE IMPROVEMENTS TAKING THE LOCATION AND FUNCTION OF THE STORM WATER BMPS INTO CONSIDERATION.
10. FINAL GRADE THE SITE.
11. STABILIZE THE SITE BY IMPLEMENTING THE NATIVE SEEDING AND PLANTING PORTION OF THE LANDSCAPING PLAN.
12. INSTALL THE EROSION CONTROL BLANKET
13. REMOVE THE SILT FENCE AFTER THE SITE IS STABILIZED PER PROJECT ENGINEER APPROVAL.

GENERAL NOTES:

1. INSTALL ALL TEMPORARY EROSION CONTROL MEASURES (IN ACCORDANCE WITH MnDOT GENERAL CONDITIONS 2573) PRIOR TO THE START OF ANY CONSTRUCTION OPERATION THAT MAY CAUSE ANY SEDIMENTATION OR SILTATION AT THE SITE.
2. INSTALL STORM DRAIN INLET PROTECTION TO PREVENT CLOGGING OF THE STORM SEWER AND SEDIMENT LOADS TO DOWNSTREAM STORM WATER FACILITIES OR WATERBODIES.
3. IF THE STORMWATER BMP IS BEING DESIGNED TO SERVE AS A TEMPORARY SEDIMENT BASIN, GRADE THE BMP TO WITHIN THREE (3) FEET OF FINAL GRADE TO PROTECT THE UNDERLYING MATERIAL FROM CLOGGING. ONCE CONSTRUCTION IN THE CONTRIBUTING DRAINAGE AREA HAS BEEN COMPLETED AND THE SITE IS STABILIZED, EXCAVATE THE INFILTRATION BASIN TO FINAL GRADE AND COMPLETE CONSTRUCTION OF THE BMP.
4. GRADING OF THE INFILTRATION BASIN SHALL BE ACCOMPLISHED USING LOW-IMPACT EARTH-MOVING EQUIPMENT TO PREVENT COMPACTION OF THE UNDERLYING SOILS. SMALL TRACKED DOZERS AND BOBCATS WITH RUNNER TRACKS ARE RECOMMENDED.
5. EXCAVATE THE INFILTRATION BASIN TO THE SPECIFIED DEPTH (ELEVATION). IT IS RECOMMENDED THAT ALL SUB MATERIAL BELOW THE SPECIFIED ELEVATION SHALL BE LEFT UNDISTURBED, UNLESS OTHERWISE DIRECTED BY THE ENGINEER.
6. GRADE TO THE DEPTH (ELEVATION) SPECIFIED IN THE CONSTRUCTION DOCUMENTS UNLESS OTHERWISE DIRECTED BY THE ENGINEER.
7. IN THE EVENT THAT SEDIMENT IS INTRODUCED INTO THE BMP DURING OR IMMEDIATELY FOLLOWING EXCAVATION, THIS MATERIAL WILL NEED TO BE REMOVED FROM THE BASIN PRIOR TO INITIATING THE NEXT STEP IN THE CONSTRUCTION PROCESS. SEDIMENT THAT HAS BEEN WASHED INTO THE BASIN DURING THE EXCAVATION PROCESS CAN SEAL THE PERMEABLE MATERIAL, SIGNIFICANTLY REDUCING THE INFILTRATION CAPACITY OF THE SOILS.
8. SEEDING AND INSTALLATION OF EROSION CONTROL BLANKET SHALL BE COMPLETED WITHIN 48 HOURS OF FINAL GRADING.
9. INFILTRATION AREA SHALL BE STAKED OFF DURING CONSTRUCTION TO RESTRICT HEAVY EQUIPEMENT TRAFFIC FROM COMPACTING NATIVE SOILS.

NO.	REVISION DESCRIPTION	DATE	BY

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Sign Name:_____ License No._____

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INFILTRATION BASIN PLAN AND PROFILE

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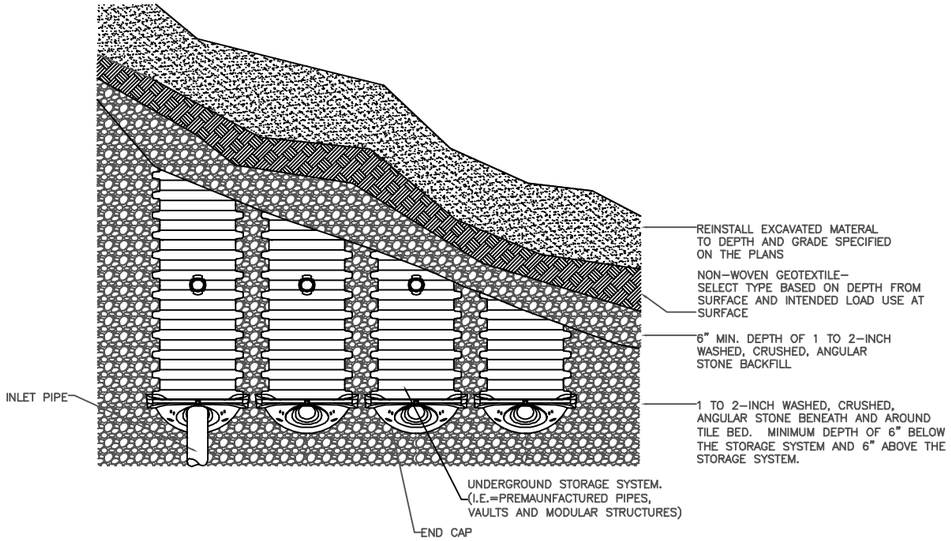
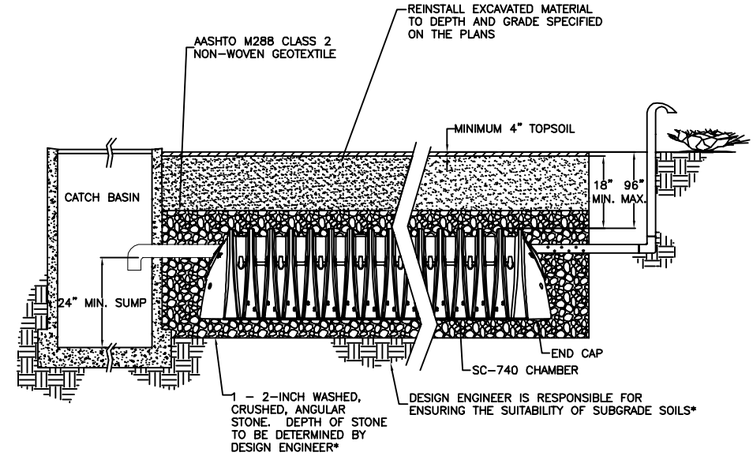


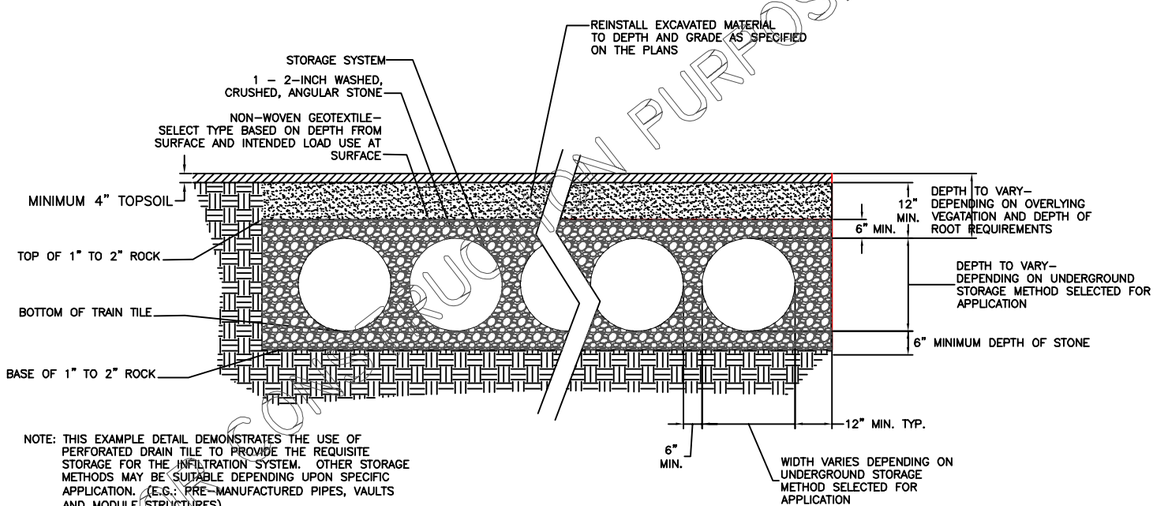
UNDERGROUND INFILTRATION SYSTEM
PLAN VIEW DETAIL

NOT TO SCALE



UNDERGROUND INFILTRATION SYSTEM
VENT DETAIL

NOT TO SCALE



NOTE: THIS EXAMPLE DETAIL DEMONSTRATES THE USE OF PERFORATED DRAIN TILE TO PROVIDE THE REQUISITE STORAGE FOR THE INFILTRATION SYSTEM. OTHER STORAGE METHODS MAY BE SUITABLE DEPENDING UPON SPECIFIC APPLICATION. (E.G.: PRE-MANUFACTURED PIPES, VAULTS AND MODULE STRUCTURES)

UNDERGROUND INFILTRATION SYSTEM
TYPICAL CROSS SECTION DETAIL

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NOT FOR CONSTRUCTION PURPOSES

INFILTRATION SUBSURFACE PLANS & PROFILE

NOT TO SCALE

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INFILTRATION SUBSURFACE PLANS AND SECTIONS

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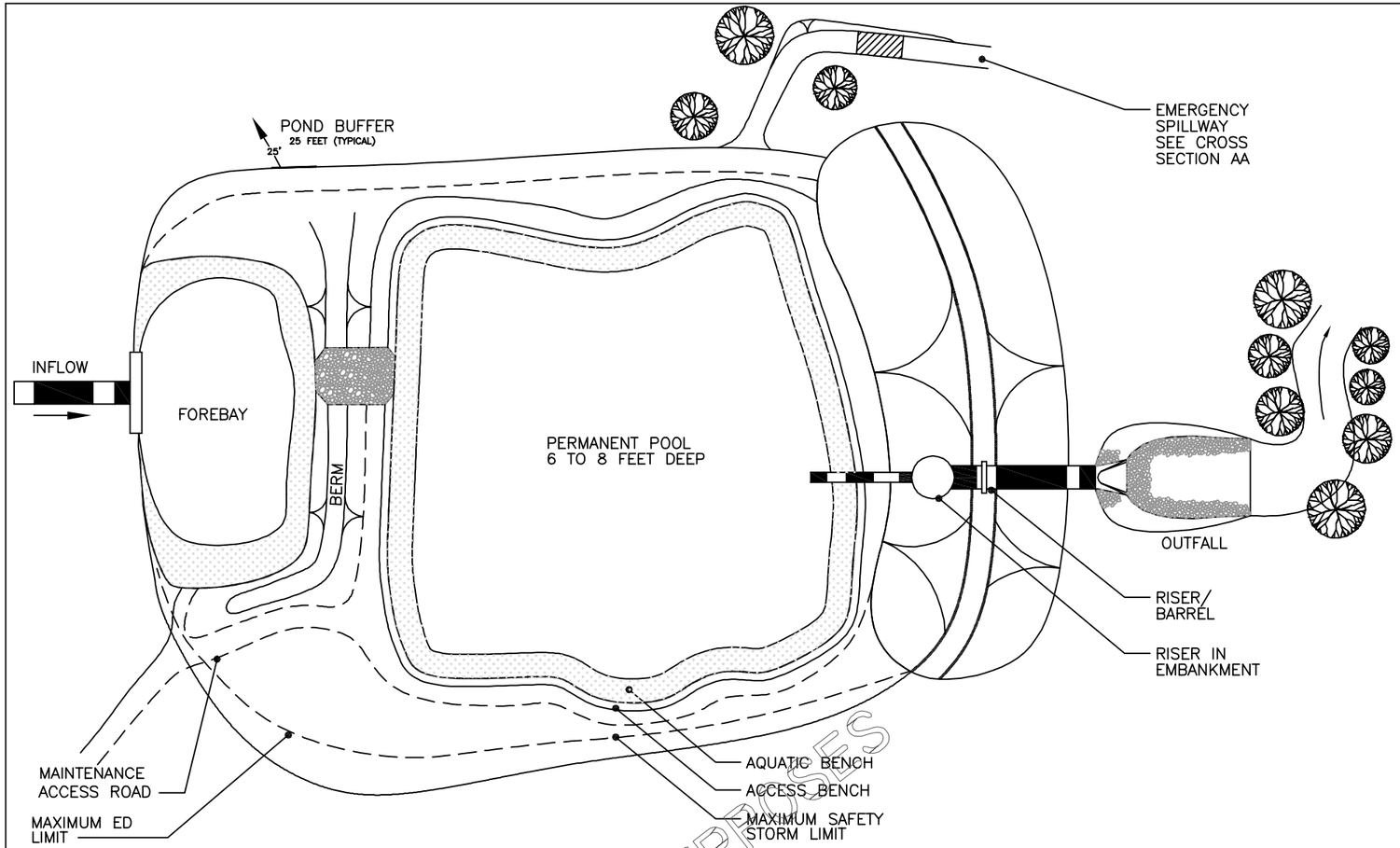
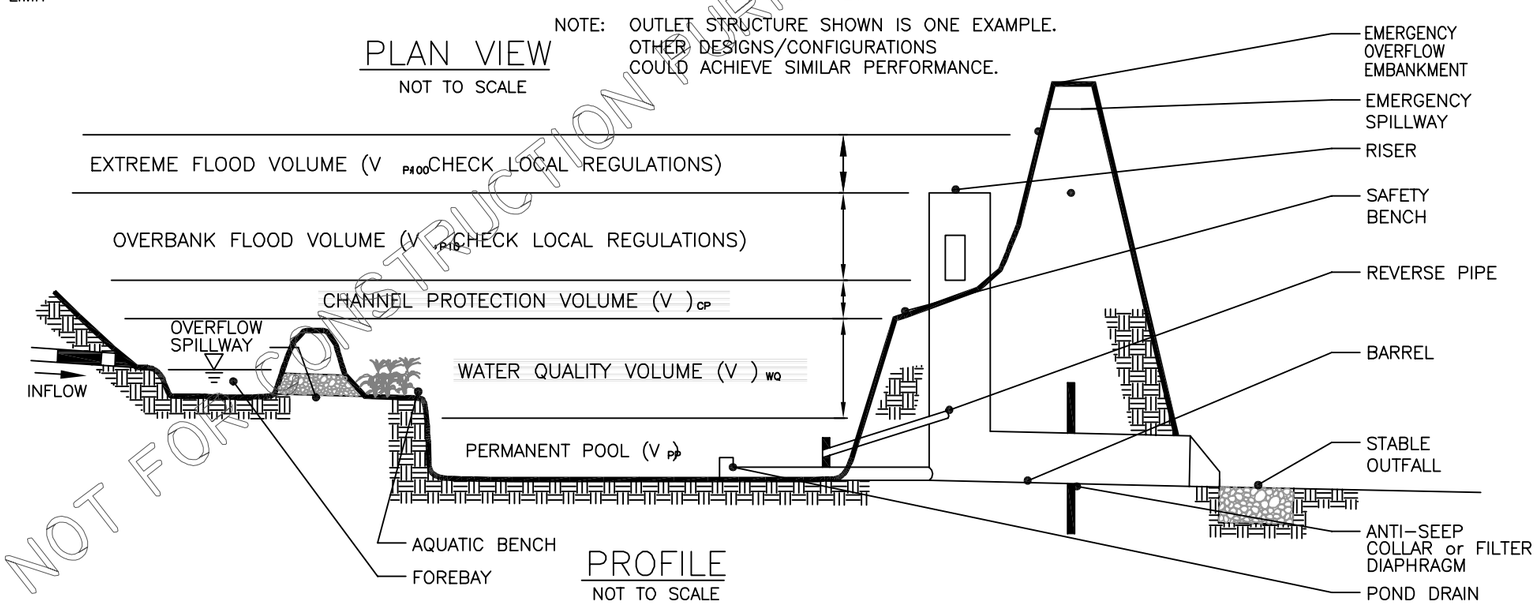


PLAN VIEW

NOT TO SCALE

NOTE: OUTLET STRUCTURE SHOWN IS ONE EXAMPLE. OTHER DESIGNS/CONFIGURATIONS COULD ACHIEVE SIMILAR PERFORMANCE.



PROFILE

NOT TO SCALE

NOT FOR CONSTRUCTION PURPOSES

CONSTRUCTION STANDARDS AND SPECIFICATIONS

(ADAPTED FROM STORMWATER MANAGER'S RESOURCE CENTER, WWW.STORMWATERCENTER.NET <http://www.stormwatercenter.net> WITH SOME ADDITIONS)

SITE PREPARATION

1. TEMPORARY EROSION CONTROL MEASURES IN ACCORDANCE WITH MNDOT GENERAL CONDITIONS 2573 SHALL BE INSTALLED PRIOR TO THE START OF ANY CONSTRUCTION OPERATION THAT MAY CAUSE ANY SEDIMENTATION OR SILTATION AT THE SITE.
2. AREAS DESIGNATED FOR BORROW AREAS, EMBANKMENT, AND STRUCTURAL WORKS SHALL BE CLEARED, GRUBBED AND STRIPPED OF TOPSOIL.
3. VEGETATION AND OTHER MATERIAL SHALL BE CLEARED FROM POND AREA.
4. TOPSOIL SHALL BE STOCKPILED FOR FUTURE USE AS SPECIFIED.

EARTH FILL

1. FILL MATERIAL SHALL BE TAKEN FROM APPROVED BORROW AREAS AND SHALL BE FREE OF ROOTS, STUMPS, WOOD, RUBBISH, STONES GREATER THAN 6", FROZEN MATERIAL, AND OTHER OBJECTIONABLE MATERIALS.
2. FILL MATERIAL FOR CENTER OF EMBANKMENT SHALL CONFORM TO UNIFIED SOIL CLASSIFICATION GC, SC, CH, OR CL AND MUST HAVE AT LEAST 30% PASSING THE #200 SIEVE. CONSIDERATION MAY BE GIVEN TO THE USE OF OTHER MATERIALS IN THE EMBANKMENT IF DESIGNED BY A GEOTECHNICAL ENGINEER.
3. MATERIALS USED IN THE OUTER SHELL OF THE EMBANKMENT MUST HAVE THE CAPABILITY TO SUPPORT VEGETATION OF THE QUALITY REQUIRED TO PREVENT EROSION OF THE EMBANKMENT.
4. AREAS ON WHICH FILL IS TO BE PLACED SHALL BE SCARIFIED PRIOR TO PLACEMENT OF FILL. FILL MATERIALS SHALL BE PLACED IN MAXIMUM 8 INCH THICK (BEFORE COMPACTION) LAYERS WHICH ARE TO BE CONTINUOUS OVER THE ENTIRE LENGTH OF THE FILL. THE MOST PERMEABLE BORROW MATERIAL SHALL BE PLACED IN THE DOWNSTREAM PORTIONS OF THE EMBANKMENT. THE PRINCIPAL SPILLWAY MUST BE INSTALLED CONCURRENTLY WITH FILL PLACEMENT AND NOT EXCAVATED INTO THE EMBANKMENT.
5. WHEN REQUIRED BY THE REVIEWING AGENCY THE MINIMUM REQUIRED DENSITY SHALL NOT BE LESS THAN 95% OF MAXIMUM DRY DENSITY WITH A MOISTURE CONTENT WITHIN 2% OF THE OPTIMUM. EACH LAYER OF FILL SHALL BE COMPACTED AS NECESSARY TO OBTAIN THAT DENSITY, AND IS TO BE CERTIFIED BY THE ENGINEER AT THE TIME OF CONSTRUCTION. ALL COMPACTION IS TO BE DETERMINED BY AASHTO METHOD T-99 (STANDARD PROCTOR).
6. THE CORE OF THE EMBANKMENT SHALL BE PARALLEL TO THE CENTERLINE OF THE EMBANKMENT. THE TOP WIDTH OF THE CORE SHALL BE A MINIMUM OF FOUR FEET. THE HEIGHT SHALL EXTEND UP TO AT LEAST THE 10 YEAR WATER ELEVATION OR AS SHOWN ON THE PLANS. THE SIDE SLOPES SHALL BE 1 TO 1 OR FLATTER. THE CORE SHALL BE COMPACTED WITH CONSTRUCTION EQUIPMENT, ROLLERS, OR HAND TAMPERS TO ASSURE MAXIMUM DENSITY AND MINIMUM PERMEABILITY. IN ADDITION, THE CORE SHALL BE PLACED CONCURRENTLY WITH THE OUTER SHELL OF THE EMBANKMENT.

STRUCTURE BACKFILL

1. BACKFILL ADJACENT TO PIPES OR STRUCTURES SHALL BE OF THE TYPE AND QUALITY CONFORMING TO THAT SPECIFIED FOR THE ADJOINING FILL MATERIAL. THE FILL SHALL BE PLACED IN HORIZONTAL LAYERS NOT TO EXCEED FOUR INCHES IN THICKNESS AND COMPACTED BY HAND TAMPERS OR OTHER MANUALLY DIRECTED COMPACTION EQUIPMENT. THE MATERIAL NEEDS TO FILL COMPLETELY ALL SPACES UNDER AND ADJACENT TO THE PIPE.
2. AT NO TIME DURING THE BACKFILLING OPERATION SHALL DRIVEN EQUIPMENT BE ALLOWED TO OPERATE CLOSER THAN FOUR FEET, MEASURED HORIZONTALLY, TO ANY PART OF A STRUCTURE. UNDER NO CIRCUMSTANCES SHALL EQUIPMENT BE DRIVEN OVER ANY PART OF A CONCRETE STRUCTURE OR PIPE, UNLESS THERE IS A COMPACTED FILL OF 24" OR GREATER OVER THE STRUCTURE OR PIPE.

CARE OF WATER DURING CONSTRUCTION

1. ALL WORK ON PERMANENT STRUCTURES SHALL BE CARRIED OUT IN AREAS FREE FROM WATER. TEMPORARY DIKES, LEVEES, COFFERDAMS, DRAINAGE CHANNELS, AND STREAM DIVERSIONS NECESSARY TO PROTECT THE AREAS TO BE OCCUPIED BY THE PERMANENT WORKS SHALL BE INSTALLED, AS WELL AS PUMPING AND OTHER EQUIPMENT REQUIRED FOR REMOVAL OF WATER FROM VARIOUS PARTS OF THE WORK.
2. AFTER HAVING SERVED THEIR PURPOSE, ALL TEMPORARY PROTECTIVE WORKS SHALL BE REMOVED OR LEVELED AND GRADED TO THE EXTENT REQUIRED TO PREVENT OBSTRUCTION OF THE FLOW OF WATER TO THE SPILLWAY OR OUTLET WORKS.
3. STREAM DIVERSIONS SHALL BE MAINTAINED UNTIL THE FULL FLOW CAN BE PASSED THROUGH THE PERMANENT WORKS.

STABILIZATION AND EROSION CONTROL

1. ALL EXPOSED SURFACES OF THE EMBANKMENT, SPILLWAY, SPOIL AND BORROW AREAS, AND BERMS SHALL BE STABILIZED BY SEEDING, LIMING, FERTILIZING AND MULCHING IN ACCORDANCE WITH LOCAL NATURAL RESOURCES CONSERVATION SERVICE STANDARDS AND SPECIFICATIONS. A 4-INCH LAYER OF TOPSOIL SHALL BE PLACED ON THESE AREAS TO SUPPORT STABILIZING VEGETATION
2. FILTER FABRIC PLACED BENEATH THE RIP-RAP SHALL MEET STATE OR LOCAL DEPARTMENT OF TRANSPORTATION REQUIREMENTS FOR A CLASS "C" FILTER FABRIC.

NO.	REVISION DESCRIPTION	DATE	BY

I hereby certify that this plan was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota

Print Name:_____

Sign Name:_____ License No._____

Date _____

Date

Designed By

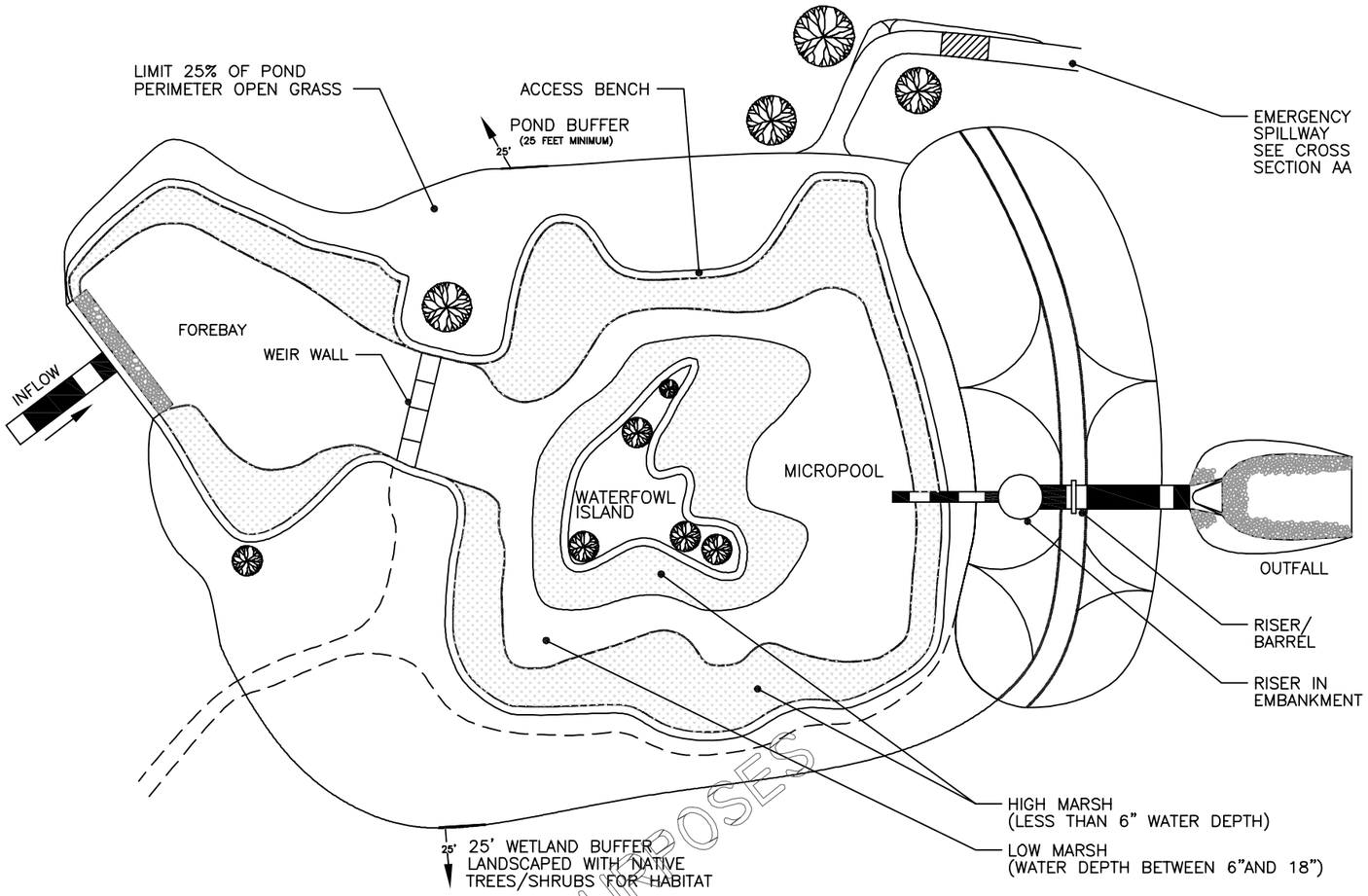
Drawn By

Minnesota Pollution Control Agency
520 Lafayette Road
St. Paul, MN 55155-4194
Phone: (651)-296-6300
TTY: (651)-282-5332
WEBSITE:www.pca.state.mn.us/

2005 MINNESOTA STORMWATER MANUAL

TYPICAL POND PLAN AND PROFILE

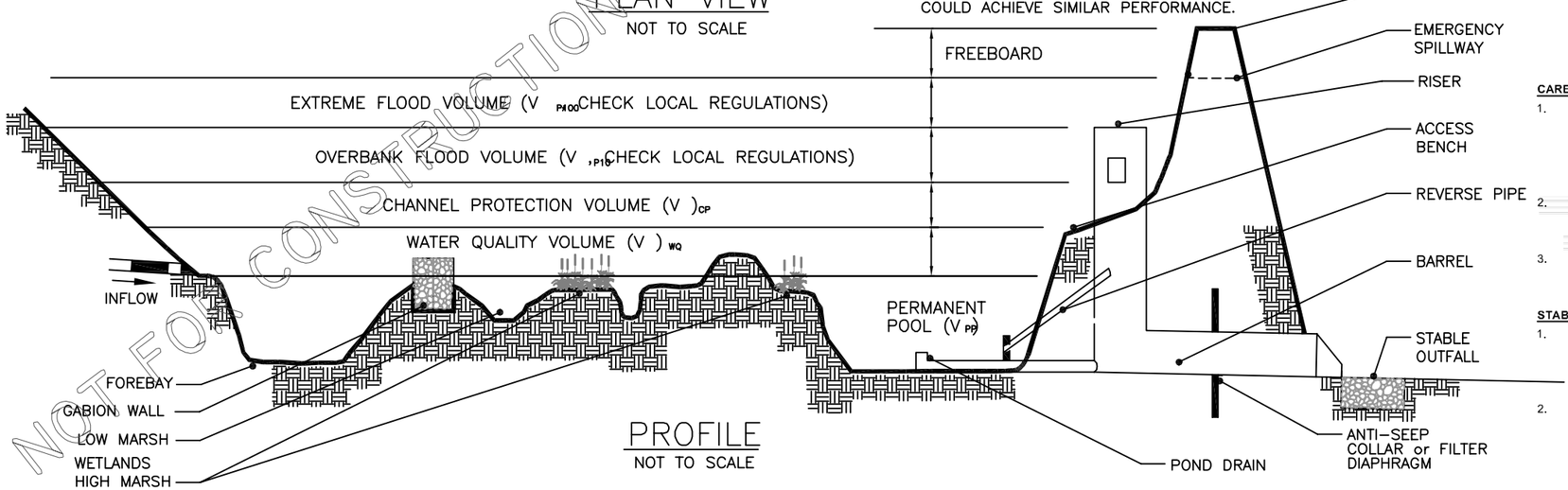
Sheet No. of Sheets



PLAN VIEW

NOT TO SCALE

NOTE: OUTLET STRUCTURE SHOWN IS ONE EXAMPLE. OTHER DESIGNS/CONFIGURATIONS COULD ACHIEVE SIMILAR PERFORMANCE.



PROFILE

NOT TO SCALE

NOT FOR CONSTRUCTION PURPOSES

CONSTRUCTION STANDARDS AND SPECIFICATIONS

(ADAPTED FROM STORMWATER MANAGER'S RESOURCE CENTER, WWW.STORMWATERCENTER.NET <http://www.stormwatercenter.net> WITH SOME ADDITIONS)

SITE PREPARATION

1. TEMPORARY EROSION CONTROL MEASURES IN ACCORDANCE WITH MNDOT GENERAL CONDITIONS 2573 SHALL BE INSTALLED PRIOR TO THE START OF ANY CONSTRUCTION OPERATION THAT MAY CAUSE ANY SEDIMENTATION OR SILTATION AT THE SITE.
2. AREAS DESIGNATED FOR BORROW AREAS, EMBANKMENT, AND STRUCTURAL WORKS SHALL BE CLEARED, GRUBBED AND STRIPPED OF TOPSOIL.
3. VEGETATION AND OTHER MATERIAL SHALL BE CLEARED FROM POND AREA.
4. TOPSOIL SHALL BE STOCKPILED FOR FUTURE USE AS SPECIFIED.

EARTH FILL

1. FILL MATERIAL SHALL BE TAKEN FROM APPROVED BORROW AREAS AND SHALL BE FREE OF ROOTS, STUMPS, WOOD, RUBBISH, STONES GREATER THAN 6", FROZEN MATERIAL, AND OTHER OBJECTIONABLE MATERIALS.
2. FILL MATERIAL FOR CENTER OF EMBANKMENT SHALL CONFORM TO UNIFIED SOIL CLASSIFICATION GC, SC, CH, OR CL AND MUST HAVE AT LEAST 30% PASSING THE #200 SIEVE. CONSIDERATION MAY BE GIVEN TO THE USE OF OTHER MATERIALS IN THE EMBANKMENT IF DESIGNED BY A GEOTECHNICAL ENGINEER.
3. MATERIALS USED IN THE OUTER SHELL OF THE EMBANKMENT MUST HAVE THE CAPABILITY TO SUPPORT VEGETATION OF THE QUALITY REQUIRED TO PREVENT EROSION OF THE EMBANKMENT.
4. AREAS ON WHICH FILL IS TO BE PLACED SHALL BE SCARIFIED PRIOR TO PLACEMENT OF FILL. FILL MATERIALS SHALL BE PLACED IN MAXIMUM 8 INCH THICK (BEFORE COMPACTION) LAYERS WHICH ARE TO BE CONTINUOUS OVER THE ENTIRE LENGTH OF THE FILL. THE MOST PERMEABLE BORROW MATERIAL SHALL BE PLACED IN THE DOWNSTREAM PORTIONS OF THE EMBANKMENT. THE PRINCIPAL SPILLWAY MUST BE INSTALLED CONCURRENTLY WITH FILL PLACEMENT AND NOT EXCAVATED INTO THE EMBANKMENT.
5. WHEN REQUIRED BY THE REVIEWING AGENCY THE MINIMUM REQUIRED DENSITY SHALL NOT BE LESS THAN 95% OF MAXIMUM DRY DENSITY WITH A MOISTURE CONTENT WITHIN 2% OF THE OPTIMUM. EACH LAYER OF FILL SHALL BE COMPACTED AS NECESSARY TO OBTAIN THAT DENSITY, AND IS TO BE CERTIFIED BY THE ENGINEER AT THE TIME OF CONSTRUCTION. ALL COMPACTION IS TO BE DETERMINED BY AASHTO METHOD T-99 (STANDARD PROCTOR).
6. THE CORE OF THE EMBANKMENT SHALL BE PARALLEL TO THE CENTERLINE OF THE EMBANKMENT. THE TOP WIDTH OF THE CORE SHALL BE A MINIMUM OF FOUR FEET. THE HEIGHT SHALL EXTEND UP TO AT LEAST THE 10 YEAR WATER ELEVATION OR AS SHOWN ON THE PLANS. THE SIDE SLOPES SHALL BE 1 TO 1 OR FLATTER. THE CORE SHALL BE COMPACTED WITH CONSTRUCTION EQUIPMENT, ROLLERS, OR HAND TAMPERS TO ASSURE MAXIMUM DENSITY AND MINIMUM PERMEABILITY. IN ADDITION, THE CORE SHALL BE PLACED CONCURRENTLY WITH THE OUTER SHELL OF THE EMBANKMENT.

STRUCTURE BACKFILL

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NO.	REVISION DESCRIPTION	DATE	BY

I hereby certify that this plan was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota

Print Name:

Sign Name:

Date License No.

Date

Designed By

Drawn By

Minnesota Pollution Control Agency
520 Lafayette Road
St. Paul, MN 55155-4194
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2005 MINNESOTA STORMWATER MANUAL

SHALLOW WETLAND PLAN AND PROFILE

Sheet No. of Sheets

Appendix F – Pond Aesthetic Treatment Reference Documents

CITY OF COON RAPIDS
PUBLIC WORKS DEPARTMENT
COMMON DRAINAGE PROBLEM POLICY

I. INTRODUCTION

The purpose of this policy shall be to outline the process to address common drainage problems. The City of Coon Rapids believes it is in the best interest of residents and businesses to offer assistance reviewing, investigating, and providing recommendations to remedy such concerns. Following analysis, City staff will work directly with property owners and/or the City Council to implement potential corrective actions.

Common drainage problems are defined as follows:

1. Flooding on private property or within the public right of way that originates from conveyance systems – such as easements, creeks, ditches, culverts, stormwater treatment ponds, and wetlands – with the potential to damage certain structural elements of a home or business.
2. Isolated flooding within localized low areas on private property, generally involving standing water which poses minimal to no risk of damage to a home or business. Often these situations are viewed as a nuisance by the property owner, and are due to land subsidence and/or activities of the property owner or adjacent property owners.

II. BACKGROUND

The Engineering and Streets Divisions of the City of Coon Rapids Public Works Department respond to common drainage concerns reported by property owners.

The Streets Division is responsible for street sweeping and the general cleaning and maintenance of the storm sewer system located within the public right of way and drainage and utility easements. Each year, the City is responsible for inspecting 20% of its outfall culverts and stormwater ponds, as well as 100% of its water quality structures (BMPs) as part of the City's MS4 permit requirements administered by the Minnesota Pollution Control Agency (MPCA). The Storm Water Technician within the Streets Division is responsible for performing and documenting required inspections and recommending maintenance activities as needed.

The Engineering Division responds to drainage concerns submitted by property owners on public and private property. Additionally, the Engineering Division performs design services, completes permitting tasks, and coordinates work within the public right of way and/or drainage and utility easements that require private contractor equipment and expertise. The Engineering Division routinely partners with the Coon Creek Watershed District to seek assistance and technical expertise on common drainage problems.

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III. EMERGENCY DRAINAGE PROBLEMS

Public Works staff shall be authorized to make determinations on the need for emergency repairs related to the City's public drainage infrastructure. Emergency drainage problems shall be defined as situations where public safety could be compromised, and/or where structural damage to public or private property could occur.

In the event of an emergency drainage problem, Public Works staff shall be authorized to self-perform or coordinate with contractors on the approved City Master Contracting list to initiate necessary repairs. Required permits shall be submitted after the fact.

The Public Works Director shall be authorized to direct City staff (or its contractor) to use pumps to address an emergency drainage problem, but only to the extent that it would prevent or minimize public safety concerns and/or significant structural damage.

IV. NON-EMERGENCY DRAINAGE ISSUES WITHIN THE PUBLIC RIGHT OF WAY

The Streets Division shall review and perform drainage repairs within the public right of way. The Streets Division shall determine if the necessary repair will be self-performed or submitted to an approved contractor. The Engineering Division shall assist the Streets Division as needed in the determination of the repair method.

This policy recognizes that most drainage problems within the public right of way can be addressed with routine maintenance (cleaning) of the public stormwater system. Drainage issues caused by settlement, inadequate design, or updated standards shall be addressed by the City's street reconstruction program.

V. NON-EMERGENCY DRAINAGE ISSUES ON PRIVATE PROPERTY

The City recognizes the need for property owners to seek assistance from the City in the development of solutions to private drainage issues.

When structural damage is a concern due to the risk of flooding from a creek, ditch, stormwater treatment pond, or easement area located on or adjacent to private property, the Engineering Division shall coordinate with the Coon Creek Watershed District (as needed) to determine a meaningful solution. Pumping will only be considered under the parameters of Section III (Emergency Drainage Problems) of this policy. If repairs are determined to be necessary, they shall be performed using contractors on the approved City Master Contract list.

When drainage and utility easements are involved, it shall be the property owner's responsibly to remove any private item(s) located within the easement area that could

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impact the common conveyance of stormwater within the easement. These items shall include, but not be limited to: grading, sheds or other structures, fences, vegetation, retaining walls, paved surfaces, swimming pools, playground equipment, etc. The items shall be relocated outside of the easement area with the exception of fences, as long as such fence does not impede flow through the easement. It shall be incumbent on the property owner to understand that placement of private items within a drainage and utility easement can only occur with City permission and by execution of an encroachment agreement. Private items placed within the easement are done so at the property owner's risk and the City shall not be held responsible for replacement of private items that are damaged within an easement area.

The City shall inspect and perform as-needed maintenance on public storm sewer culverts that convey storm water into and out of drainage and utility easements that exist on private property.

Ditches located within drainage and utility easements on private property will occasionally require maintenance. Maintenance may include tree or vegetation removal, sediment removal, channel realignment, or other required grading. The City shall self-perform or contract for this work. Personnel from the Streets and Engineering Divisions shall have the authority to determine when this maintenance is required. When warranted, the City shall perform this work utilizing financing from the Storm Water Utility Fund. Property owners shall provide right of entry to the City when access over private property is necessary, and any damage that occurs to private property as a result of this access shall be repaired to pre-existing conditions. Property owners shall cooperate and collectively work together in the removal of private property items within the easement area to allow the City or its contractor to perform the required maintenance. Property owners shall be held solely responsible for all costs related to the relocation of private property from easement areas.

In cases of localized low areas on private property, the Engineering Division shall review and provide recommendations for solutions if and when a solution exists. The City recognizes that some areas cannot be properly drained without significant impacts to adjacent private properties. The City also recognizes that a majority of these drainage problems are considered nuisance only, and have no long-term impact to the property.

The Engineering Division will assist in communicating and coordinating activities with all property owners that may be affected by potential solutions, and provide good faith estimates for corrective actions. Affected property owners shall be responsible to initiate and correct these types of drainage concerns. Should the property owners request additional assistance from the City, benefited properties may be assessed for all costs of the work occurring on private property. Property owners shall be required to petition the City to request the improvement, and waive their right to a public/assessment hearing. Special assessments shall be levied over a five-year period at an interest rate determined by the City Finance department. Depending on the solution implemented, property

owners may be required to perform future maintenance of improvements on their property. A written agreement shall be required between the City and property owner for any work performed on private property. Depending on current workload, the City and property owners need to recognize that such review, analysis, and implementation takes time. As schedule allows, the City may perform the following tasks based upon the property owner's needs and requests:

1. Act as a resource – provide advice, ideas, recommendations and referrals for the property owner to use in resolving the issue on their own.
2. Project assistance – provide design and/or contracting assistance, with the property owner responsible for execution and implementation.
3. Project oversight – provide full services to resolve the issue; including design, contracting, permitting, inspections, and general oversight through project completion.

VI. STORMWATER TREATMENT POND AESTHETICS

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City Council Work Session **1.**

Meeting Date: 10/24/2017

Subject: Neighborhood Drainage Issues Follow-Up

Submitted For: Tim Himmer, Public Works Director

From: Sarah Greene, Administrative Assistant II

INTRODUCTION

Staff would like to provide follow-up details, estimated costs, and recommendations to Council on previously identified drainage concerns located throughout the City, and gain feedback on a draft policy for addressing common drainage issues.

DISCUSSION

At the September 12 Council Work Session, staff provided details on five specific drainage area concerns. Additionally, stormwater treatment pond aesthetics were discussed in relation to a City pond located at Goldenrod Street and Foley Boulevard.

Following is a summary of each of these items.

121st Lane Ditch - Between Sycamore Street and Unity Street

Background: A 40-foot wide drainage and utility easement allows for overland ditch flow in the rear yards of 13 private properties. Residents have complained to the City about excessive standing water within the ditch system. Storm water is conveyed into the ditch by a City culvert located at Sycamore Street, and outlets via a culvert at Unity Street. Extensive vegetation has grown within the easement area, and numerous private encroachments (sheds, retaining walls, fences, etc.) have taken place over the years. During the spring of 2017, public works crews cleaned the downstream culvert at

Unity Street, which has improved the ditch flow through the easement. Residents have also commented that the catch basin inlets on Sycamore Street frequently become plugged or inundated during rain events; occasionally causing localized flooding of the roadway and adjacent boulevards and front yards. Staff intends to perform additional analysis of the upstream drainage area and storm sewer system (north and east of Sycamore Street).

Recommendation: The City will partner with the Coon Creek Watershed District to complete the review of the upstream drainage system to verify that culvert size, location, and elevation are appropriate. The streets in this neighborhood are scheduled to be reconstructed within the next five years, so any necessary additions and/or modifications to the upstream storm sewer system can be corrected at that time. Staff recommends performing as-needed pipe cleaning and ancillary grading adjacent to the Sycamore Street culvert during late fall of 2017 or summer of 2018. Staff also recommends a coordinated neighborhood clean-up of the easement area in 2018. The coordination of this work should be led by the neighborhood, with the City assisting by picking up and hauling away any vegetation placed at curbside by residents. Disposal of all other debris, including significant trees, from the easement would be the homeowners' responsibility.

Estimated Cost: $1,500 for culvert cleaning (assumes two days of Public Works crew time); $2,500 for public works crews to pick up, haul, and dispose of easement vegetation debris.

<u>Tronson Creek between 119th Avenue and Grouse Street</u>

Background: A 40-foot wide drainage and utility easements allows for overland ditch flow in the rear yards of 10 private properties. The ditch is fed by groundwater and upstream wetlands, and consistently conveys water throughout the year (even during dry periods). Stormwater is conveyed into the ditch by a City culvert at Grouse Street and outlets via two culverts at 119th Avenue. Residents have complained to the City about general aesthetics, damaged or settled fence posts and retaining walls, and water occasionally flowing outside of easement areas. Over the years, fence and grading encroachments have taken place. Due primarily to the alignment and depth of the outlet culverts, combined with the continuous groundwater flow, the culverts at 119th Ave can become blocked with ice during the winter (periods of freeze/thaw). These culvert obstructions have caused instances where water may extend beyond the platted drainage easements.

Recommendation: The City will clean and place rip rap at the culvert apron located between 1636 and 1624 120th Avenue to correct erosion concerns. In conjunction with the redevelopment of Lions Coon Creek park in 2019, the City will realign the dual pipe culvert crossing below 119th Avenue. Staff recommends property owners adjacent to the ditch relocate their existing rear yard fences outside the easement and establish a vegetative buffer along the banks of the ditch.
Estimated Cost: $150,000 to replace two 27" x 44" Reinforced Concrete Arch Pipe Culverts. $2,500 to clean and install rip rap at existing culvert apron.

Cottonwood Street Cul-De-Sac
Background: Residents along the Cottonwood Street cul-de-sac, south of 116th Avenue, have contacted the City numerous times over many years regarding temporary flooding of their rear yard drainage and utility easement areas. These dedicated easements were designed as a temporary holding area (pond) for stormwater water, and are considered floodplain areas. The City performed grading work within the easement areas in 2004, and again in 2014, in an effort to confine and restrict stormwater flowing into the backyards. Updated standards and stormwater modeling performed by the Coon Creek Watershed District (CCWD) indicates that the 100-year flood elevation in this easement area has increased by approximately one-foot since the time of development. While the low entry point into all adjacent homes are still located above this new flood elevation (with the exception of one due to recent construction that is required to be corrected), they are subject to an increased risk of flooding. Wenck Engineering, working on behalf of the CCWD and City, has developed a couple of potential options that will reduce the flood risk to properties along Cottonwood Street (see attached layouts). While minimizing the concern for flooding, these options will not totally eliminate the water that was designed to run into and through the existing easements.
Recommendation: Staff concurs with the recommended options, but there are complicating factors for each. Option one would require the acquisition of additional easements from off-site properties to run another pipe system to the downstream receiving body, and option two would require significant roadway work in conjunction with up-sizing the existing storm sewer in the area. Both options also require major grading, tree removals, and private property impacts within the existing easements areas. If Council is agreeable,

staff will begin the process of project scoping and surveying for implementation in 2018. This project would likely include the execution of agreements with the impacted property owners to define the terms of the project (project budget, cost sharing, dedication of required easements and/or maintenance responsibilities).

Estimated Cost: $200,000 to $250,000; with the estimates including full project costs (survey, design, permitting, inspections, and administration), and an approximation of the potential additional easement acquisitions (if required). While staff's concern is primarily related to flood protection of the homes, the property owners complaints have generally been related to aesthetics and nuisance flooding in the rear yard easement area. Staff is recommending that the City participate in the costs for the up-sizing the conveyance system at the easement outlet and associated roadway impacts, with the property owners being assessed for the required acquisitions, pipe extensions, tree removal, restoration, and required grading and/or retaining wall work.

Woodcrest Area - Back Yard Low Areas

Background: Residents of properties between Palm Street and Norway Street, north of 99th Avenue, have contacted the City regarding standing water within their back yards. For many years, the property owner at 9911 Palm Street has used a garden hose and small pump to remove standing water from the back yard. The underlying soils within the Woodcrest development area tend to be very slow-draining and have settled over time, creating localized low areas that hold water in the back yards of several private properties. To the City's knowledge, no properties have sustained structural damage, and few to none have basements. Due to the age of the development (with limited rear yard drainage and utility easements), the reported and observed backyard flooding extends beyond any platted easements and has caused ancillary damage to private fences, sheds, and gardens.

Recommendation: It is feasible to extend storm sewer pipe from adjacent roadways into the rear yard low areas at 9911 Palm Street and 9901 Olive Street to collect and convey drainage into the public storm sewer system, but doing so would be difficult due to existing constraints (structures, utilities, fences, etc.) and lack of easements. Staff recommends the development of a design that is agreeable to all parties and the execution of agreements with the impacted property owners that would define the terms of the project; including cost sharing, dedication of required easements and/or maintenance

responsibilities for the new infrastructure.
Estimated Cost: $20,000 to construct a pipe and inlet basin to the back yard of 9911 Palm Street. $30,000 to construct a pipe and inlet basin to the back yard of 9901 Olive Street, with the potential to extend a smaller diameter pipe and additional inlet basins or allow for appropriate elevations of the basins that would require adjacent property owners to perform grading of their lots to the new basins. The final costs and funding for this work would need to be included in the property owner agreements and would most likely include a combination of Storm Water Utility dollars and special assessments. It is recommended that the City perform the design, contracting, permitting, surveying, inspections, and maintenance; with the property owners responsible for the contracted costs, private property removals (fences, trees, etc.) within the impacted area, and dedication of easements required for the work and future maintenance.

Staff has attached a draft Common Drainage Problem Policy that would provide future guidance to City staff when addressing drainage problems similar to those noted above. Staff seeks Council feedback on the attached policy.

Stormwater Treatment Pond Aesthetics

The purpose of a stormwater pond is to control downstream flooding, and provide water quality treatment of runoff collected from both public and private spaces.

During summer months stormwater ponds can become inundated with algae or other plant life, which often generates aesthetic complaints from adjacent residents. The presence of algae is considered an indication by the City and CCWD that the pond is performing as designed, because algae is caused by nutrient loadings (nitrogen and phosphorous) often associated with fertilizers and other practices taking place on adjacent property. Treatment of stormwater ponds to reduce algae and similar plant life does not provide a water quality benefit to downstream water bodies. The City recommends property owners adjacent to a stormwater pond create a vegetated buffer around the pond to absorb and filter nutrients prior to entering the pond. In addition, the City recommends adjacent property owners reduce or eliminate the use of fertilizers and irrigation immediately adjacent to the pond.

The City last performed aesthetic pond treatments in 2014 on seven different ponds at a cost of approximately $13,000. At that time, aesthetic stormwater pond treatments were derived from a complaint-based system. The practice was eliminated in 2015 due to the lack of water quality benefit and process for determining which ponds were being treated. Additionally, there was no supporting data that such treatments were providing any lasting or sustainable benefit without perpetual treatments. Since 2015, the City has continued to receive pond aesthetic complaints from several townhome associations and property owners near Goldenrod Street and Foley Boulevard. In every case, staff met with property owners to provide recommendations on buffer strips and fertilizer/irrigation use. Staff from the CCWD often attended these meetings as well to provide additional information and expertise.

In 2017 several property owners along Goldenrod Street, near Foley, contracted for pond treatments on their own. Due to the size of the subwatershed that conveys runoff into this pond, including the public right-of-way, the property owners have requested the City once again coordinate and pay for additional chemical treatments of this stormwater basin. Costs for treatments are based upon the size and volume of the pond. Reviewing past invoices for this location, it appears the City spent approximately $3,000 for treatments to this particular pond in 2014.

If pond treatments are desired by the City or adjacent property owner(s), staff recommends a cost share for such treatments according to the following guidelines:

- **No discharge from public infrastructure outside of the development area:** 100% private cost based upon the pro-rata contribution of adjacent property owners, with the basis being no (or minimal) public benefit.
- **Off-site public discharge into the basin:** 25% - 75% City contribution based upon the pro-rata flow distribution within the subwatershed (runoff generated in vs. outside the immediate development).
- **Ponds completely located within the public realm and regional basins:** 100% City cost, but only if a public water quality benefit (as prescribed by the City Council) can be attained.

It is recognized that chemical treatment of ponds cannot occur in perpetuity as the sole means of improving aesthetics. As part of any treatment program the adjacent property owners must agree to alter their practices adjacent to the

basins. Such practices may include establishment and maintenance of reasonable buffer strips, reduction or elimination of fertilizers and irrigation near the pond, and the elimination of certain storage and deposition in the immediate area adjacent to the pond (grass clippings and/or vegetation material). Staff recommends this be considered the basic City policy for responding to aesthetic stormwater complaints and pond treatment requests.

RECOMMENDATION

Staff seeks Council feedback on the recommendations to address the identified 2017 drainage area concerns, as well as the draft policy on Common Drainage Problems.

Attachments

2017 Drainage Problem Locations
Tronson Creek Ditch
121st Lane Ditch
Cottonwood Street Drainage Concerns
Cottonwood Options
Woodcrest Area Drainage Concerns
Draft Drainage Concern Policy

City of Coon Rapids
11155 Robinson Drive
Coon Rapids, MN 55433-3761
Tel: 763-755-2880
Fax: 763-767-6491
www.coonrapidsmn.gov

TO: Cynthia Hoffman
Tralee Terrace Condo Association
800 98th Avenue NW #205
Coon Rapids, MN 55433

FROM: Mark Hansen, Assistant City Engineer

SUBJECT: Maintenance Responsibilities for Palm Street Median; Storm Water Ponds; and Palm Street Drainage Ditch

DATE: November 4, 2016

The purpose of this memorandum is to follow up on our phone conversation held October 18, 2016 where information was requested on the responsible parties for the ongoing maintenance of: 1) the Palm Street median landscaping; 2) storm water ponds located in the southwest corner of Coon Rapids Boulevard Extension and Palm Street; 3) storm water ponds between Redwood Street and Palm Street; and, 4) the drainage ditch located adjacent to Palm Street. A graphic showing these items is included for reference.

A summary of maintenance responsibilities for each item is as follows:

1) Palm Street Median Landscaping (Property Identification Number 26-31-24-14-0064)
This median and the associated landscaping appear to have been constructed by the original developer of the Tralee Terrace Condominiums (Gaughan Companies). The intent at the time of development was for the condominium association to own and maintain the landscaping. This was spelled out in a maintenance agreement that is attached for your reference. There's currently a source of power located within the median area that appears to be used for a nearby Tralee Terrace association-owned sign or light (Connexus Energy meter #93 628 975). We confirmed that the Tralee Terrace Condominium Association is paying the electricity bill for this source of power location.

Based on a review of the property ownership, it appears the median area went into tax forfeit shortly after the development was constructed. It's likely that the original developer stopped paying taxes on the median land. Therefore, it was forfeit to the State of Minnesota. The association may have continued to maintain the landscaping within the median area without knowing the status of property ownership. If the association was interested in purchasing the median area property, it would need to be through an Anoka County land sale. Anoka County plans on having a land sale in 2017, and this parcel could be included.

The City would conclude that the landscaping located within the median area is the association's responsibility to maintain since it was the intent of the original maintenance agreement. The association appears to have maintained this area throughout the years, and the landscaping fits with the rest of the Tralee Terrace development area. The median itself provides a benefit to the various association's by serving as a gateway into the development, and calming traffic.

2) Storm Water Pond – SW Corner of Coon Rapids Blvd Extension and Palm Street

Storm water coming into this pond is from a combination of both public and private areas. Generally, removal of vegetation or debris from culvert ends, and excavation for sediment removal within the pond itself, would be a shared responsibility between the City and the Tralee Terrace Condominium Association. Algae treatments would be the sole responsibility of the association. City policy does not provide for algae treatments on storm water ponds as they are conducted for aesthetic purposes only, and do not improve water quality.

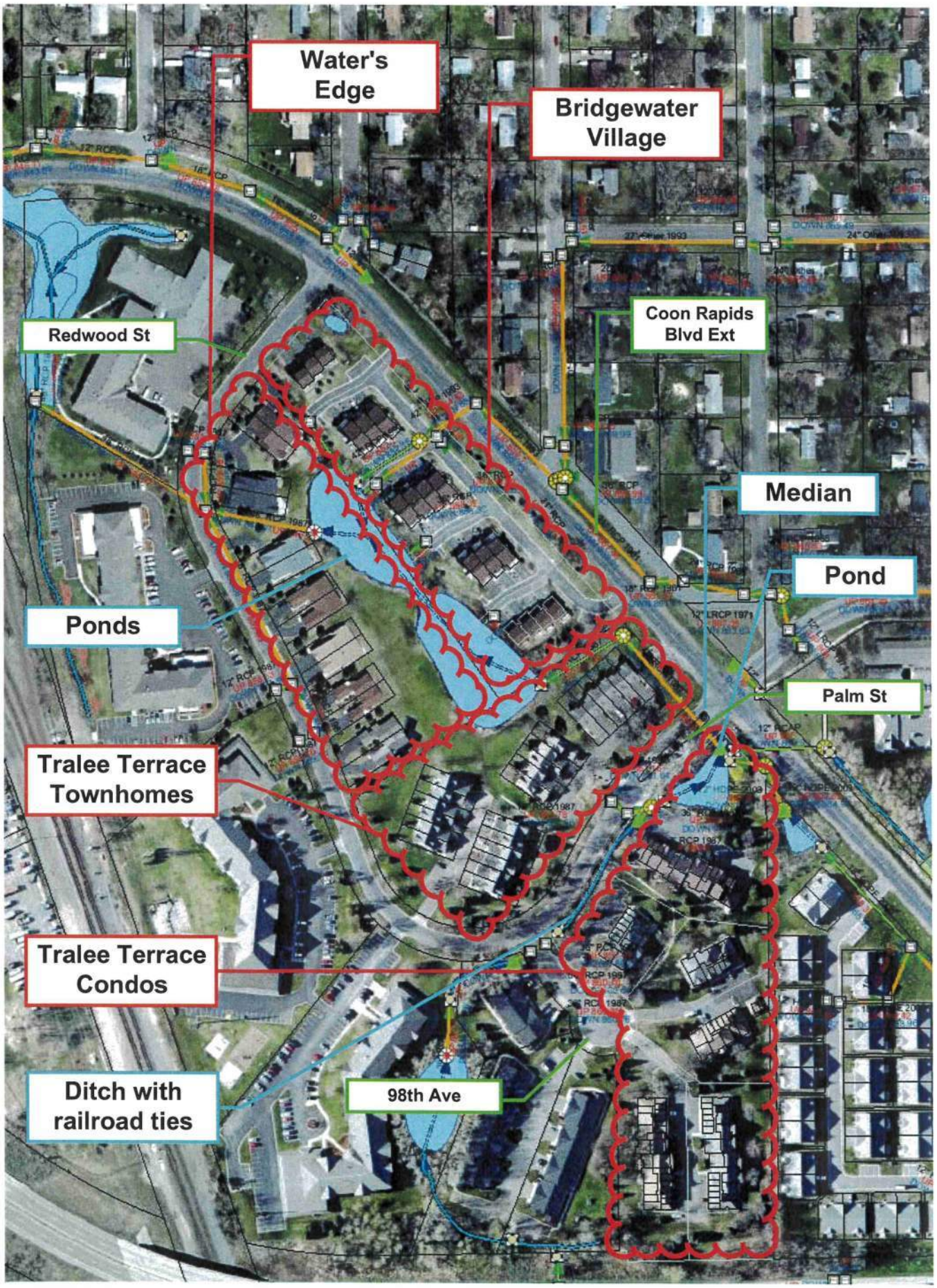
3) Storm Water Ponds – Between Redwood Street and Palm Street

Storm water coming into this pond is entirely from private areas. Removal of vegetation or debris from culvert ends, and excavation for sediment removal within the pond itself, would be a shared responsibility between the Bridgewater Village, Tralee Terrace Townhomes, and Water's Edge Townhome Associations. The City is responsible for keeping the pond outlet structure clean and free of debris. Algae treatments would be the sole responsibility of the adjacent associations. City policy does not provide for algae treatments on storm water ponds as they are conducted for aesthetic purposes only, and do not improve water quality.

4) Drainage Ditch Adjacent to Palm Street

This drainage ditch is lined with railroad ties that are similar in appearance to what is located in the median area and other portions of the Tralee Terrace development. Most of the water being conveyed through this ditch is from areas within and around the Tralee Terrance Condominium Association property. Only a small amount of water enters the ditch from the public streets of Palm Street and 98th Avenue. There's a small walking bridge that crosses over the ditch north of 98th Avenue.

It is the associations' responsibility to maintain the railroad ties, walking bridge, and any other ancillary landscaping located adjacent to the ditch. Removal of vegetation or debris from culvert ends, and excavation of sediment within the ditch itself, would be a shared responsibility between the City and the Tralee Terrace Condominium Association.


Water's Edge
Bridgewater Village
Redwood St
Coon Rapids Blvd Ext
Median
Pond
Ponds
Palm St
Tralee Terrace Townhomes
Tralee Terrace Condos
Ditch with railroad ties
98th Ave

The Gaughan Companies
Gaughan Land Incorporated, P. J. Gaughan, Inc., Gaughan Management, Inc., Gaughan Realty
299 Coon Rapids Blvd., Suite 210, Coon Rapids, Minnesota 55433

April 20, 1988

Mr. Lee Starr
City of Coon Rapids
1313 Coon Rapids Blvd.
Coon Rapids, MN 55433

Re: Tralee Terrace Plat

Dear Mr. Starr:

Please find enclosed for your records, a copy of the recorded plat for Tralee Terrace which has been revised to include Outlot C to describe the center median area located in the Palm Street N.W. Right-of-Way.

Also enclosed, is a draft of the Maintenance Agreement for your review. Please contact me with any necessary changes after you have had the opportunity to review this document.

Your attention to this matter is appreciated.

Very truly yours,

Karen J. White
Corporate Counsel

Enclosures

CALLED KAREN ON 6/9/88 - DISCUSSED MAINTENANCE
KAREN WILL REVISE & SEND RECORD COPY TO
CITY ATTY
VJ

MAINTENANCE AGREEMENT

The Tralee Terrace Condominium Association agrees to maintain and keep in good repair the center median area located in the Palm Street N.W. Right-of-Way at its intersection with Coon Rapids Boulevard within the Tralee Terrace Addition. AKA Aurora Ave.

The Association shall maintain the grass, shrubs, trees and any improvements in a well manicured and trimmed condition and further agrees to remove and replace any vegetation which may die or become diseased or damaged.

The undersigned parties agree to the terms and conditions expressed herein.

Tralee Terrace Condominium Association

By: _____ _____
Its: President Date

City of Coon Rapids, Minnesota

By: _____ _____
Its: ~~Manager~~ Mayor Date

By: _____ _____
Its: City Manager Date

The Gaughan Companies
Gaughan Land Incorporated, P. J. Gaughan, Inc., Gaughan Management, Inc., Gaughan Realty
299 Coon Rapids Blvd., Suite 210, Coon Rapids, Minnesota 55433

June 15th, 1988

Mr. Lee Starr
City of Coon Rapids
1313 Coon Rapids Blvd.
Coon Rapids, MN 55433

RE: Outlot C, Tralee Terrace Addition

Dear Mr. Starr:

I spoke with Alan Hamel regarding the changes you have requested in the Maintenance Agreement on the above property at Tralee Terrace and he indicated that it was his understanding that the Maintenance Agreement would not be needed as a result of our having added the property to the Association's Common Area.

I am enclosing a copy of P4 of the Declaration which identifies Outlot C as being part of the Tralee Terrace Development. Also, I have included a copy of Section 19.2 of the Declaration which provides for maintenance of the common areas by the Association.

Please contact me after you have had the opportunity to review the enclosed documents.

Very truly yours,

Karen J. White
Corporate Counsel

Enclosures

cc: file

KJW/dlm

Per 6-16-88 / PER CALL TO K.J. WHITE

DECLARATION FOR

TRALEE TERRACE CONDOMINIUMS
CONDOMINIUM NUMBER 49

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1.16 "Unit", whether Residential or Garage, shall mean a portion of the Condominium within the boundaries of each dwelling designated for separate ownership;

1.17 "Residential Unit" shall mean a Unit designed for living purposes which has been designated for separate ownership;

1.18 "Garage Unit" shall mean a Unit designed for storage and parking purposes which has been designated for separate ownership;

1.19 "Family Unit" shall mean one Residential Unit, and the Garage Unit or Units owned by the same Owner together with the undivided interest in the Common Elements allocated to those units;

1.20 "Unit Owner" shall mean the Declarant, If it owns a Unit, and a person to whom ownership of the Unit has been conveyed or transferred but does not include a holder of an interest as Security for an Obligation.

2. Name, Location and Legal Description of Condominium. The name of the Condominium is Condominium Number 49, Tralee Terrace Condominiums and it is located in the City of Coon Rapids, County of Anoka, State of Minnesota, and is legally described as follows: Outlot C and Lot 1, Block 1 Tralee Terrace Addition.

3. General Description of Land and Building. The Development consists of outlot C and one residential building which includes twelve Residential units and twelve Garage Units. The residential building is two stories in height, the levels being referred to as first and second floors. The building is constructed of face brick and aluminum siding over a wood frame. The Floor Plans filed for record contemporaneously herewith, show the layout, location, unit numbers and unit dimensions.

xpectable expansion, sag or structural adjustment of a building a valid easement for the encroachment and for the maintenance of the same,as long as such building stands, shall exist. In the event any portion of the Condominium shall be partially or totally destroyed and rebuilt, minor encroachment of any part of the Common Elements due to construction shall be permitted and valid easements for such encroachments and maintenance thereof shall exist.

18.2 The Declarant retains an easement through the Common Elements as may be reasonably necessary for the purpose of discharging Declarant's obligation or exercising Declarant's rights as set forth in the Act or the Condominium Documents.

18.3 The Association shall have the right, to be exercised by its Board or Managing Agent, to enter each Unit from time to time during reasonable hours as may be necessary for the operation of the Condominium or for making emergency repairs therein necessary to prevent damage to any Unit or Common Element.

19. Maintenance.

19.1 Units and Limited Common Elements. All maintenance and repairs of any Unit shall be made by the Owner at such Owner's expense. All maintenance and repairs of any part of the Limited Common Elements, designated for the exclusive use of a particular Unit, may be made by the Association at the expense of the Owner of such Unit. Each Unit Owner shall be responsible for any and all damage to any Units or any of the Common Elements caused by the failure of such Owner promptly to perform necessary maintenance and repairs to such Owner's Unit.

19.2 Common Elements. All maintenance, repairs and replacements of the Common Elements not designated for the exclusive use of a particular Unit, shall be made by the Association as Common Expenses, unless necessitated by the

2/18/88

[illegible] WITH AL MANEL:
· PALM ST. MEDIAN WILL BE SHOWN
AS OUTLOT - EASEMENT FOR STREET
WILL BE PROVIDED TO GO OVER
OUTLOT - HOMEOWNERS ASSOC.
DOCUMENTS WILL INCLUDE ASSOC
WITH MAINTAIN OUTLOT

MELANIE FORWARDED TO
GAUCHAY LAND ON 2/18/88
Lee Ann

City of Coon Rapids
11155 Robinson Drive
Coon Rapids, MN 55433-3761
Tel: 763-755-2880
Fax: 763-767-6491
www.coonrapidsmn.gov

TO: Ashley Oaks Townhome Association

FROM: Mark Hansen, Assistant City Engineer

SUBJECT: Stormwater pond inspection

DATE: June 13, 2016

The purpose of this letter is to document the findings from the on-site stormwater pond inspection meeting held on May 26, 2016. The meeting was attended by Merle Johnson (Erin Contracting and representing Shamrock Development), Jon Janke (Coon Creek Watershed District), Tim Himmer and Mark Hansen (City of Coon Rapids), and Dina Brooks (representing the Ashley Oaks Townhome Association). The inspection focused on the existing stormwater pond that was constructed northwest of, adjacent to, and for the Ashley Oaks Townhome development.

It was noted at the conclusion of the meeting that, generally, the stormwater pond is in good condition.

The following items were identified as maintenance recommendations that will provide for a better functioning stormwater pond in the future:

1. The south inlet pipe ideally should be extended closer to the water surface of the pond. However, the act of doing so will destabilize the existing south slope of the pond. It's recommended that the inlet pipe remain as is, but be monitored by the Association for further erosion. The rip rap (large rock boulders) located at the end of the inlet pipe appear to be functioning properly.
2. Several rills and gullies exist on the south pond slope. These are due to gutter downspouts that are pointed toward or located directly on the slope. It is recommended the Association replace the downspouts with devices that allow rainwater to flow down the pond slope in a sheet-like manner. Point source-directed rainwater will continue to erode the pond slopes if left in place.
3. A trash guard is recommend to be installed on the pond outlet pipe. The purpose of the trash guard is to prevent the outlet pipe from clogging in the future. Periodically, trash and debris will need to be removed from the outlet pipe.
4. Leftover silt fence was identified in several areas around the pond. Ideally, this material should be removed; however, doing so could adversely impact the existing pond slopes

and cause additional erosion. It is recommended the silt fence leftover from the original site grading of the development remain in place.

5. Several animal burrows and locations of soft soils were identified on the north stormwater pond slope. It is recommended these slopes be re-graded and stabilized to avoid excessive erosion in the future during high stormwater events.

In conclusion, it is recommended the Ashley Oaks Townhome Association consider addressing item numbers 2, 3 and 5 of the above maintenance recommendations.

It is also recommended the Association begin budgeting for future maintenance of the stormwater pond.

Typical stormwater pond maintenance includes the following:

1. Erosion and vegetation removal – once every five years. Estimated cost: $2,500 to $5,000, depending on extent.
2. Sediment delta removal – once every 10 years. Estimated cost: $10,000, depending on amount of material to be removed. Note that this can be mitigated by eliminating sand use on private streets during the winter, as well as performing periodic street sweeping.
3. Pond dredging – once every 30 to 40 years. Estimated cost: up to $50,000. This type of maintenance is seldom required, and can be extensively mitigated by practicing good snow and ice control techniques (eliminating sand use), as well as periodic street sweeping.

Cc: Tim Himmer, Public Works Director
Jon Janke, Coon Creek Watershed District
Merle Johnson, Erin Contracting
Lynn Leegard, Shamrock Development

City of Coon Rapids
11155 Robinson Drive
Coon Rapids, MN 55433-3761
Tel: 763-755-2880
Fax: 763-767-6491
www.coonrapidsmn.gov

TO: De Gardner's Pond Townhome Association

FROM: Mark Hansen, Assistant City Engineer

SUBJECT: Stormwater pond review

DATE: June 14, 2016

The purpose of this letter is to summarize the discussion from the on-site stormwater pond review meeting held on June 2, 2016. The meeting was attended by Mark Hansen (City of Coon Rapids) and two representatives from the De Gardner's Pond Townhome Association.

The stormwater pond discussed is generally located south of 121st Avenue, north of 119th Lane, east of Tronson Creek, and west of Yellowpine Street. At the meeting, it was noted that the purpose of a stormwater pond is to capture sediment and nutrients from stormwater prior to entering downstream creeks, as well as control the rate of stormwater runoff from adjacent public streets.

It was discussed that the stormwater entering this pond is from public streets via concrete storm sewer pipe. The City periodically inspects the pipe inlets in and around the pond, and is responsible for the maintenance of those pipes. Since the pond itself is taking public water, the City would be responsible for the ongoing maintenance of the pond. This maintenance includes bank erosion, sediment removal, and as-needed pipe inlet or outlet repair. The City's maintenance responsibilities would not include ancillary vegetation removal near the pond, algae control, or vegetation buffer maintenance.

Association representatives noted that algae control has been a concern. Typically algae blooms in stormwater ponds are a direct result of adjacent fertilizer applications, and are a sign that the pond is performing its job of nutrient capture. The City recommends the Association work with their lawn maintenance provider to reduce fertilizer applications, as well as incorporate a 15- to 20-foot-wide natural buffer around the pond. Additionally, lawn irrigation practices can contribute to algae growth. The City does not treat stormwater ponds for algae or nutrient control.

Appendix G – Water Resource Related Agreements

Record ID 3642925

2121006.016

[space above reserved for recording information]

OPERATIONS, MAINTENANCE, AND EASEMENT AGREEMENT FOR DRAINAGE AND STORMWATER FACILITIES

THIS OPERATIONS, MAINTENANCE, AND EASEMENT AGREEMENT FOR DRAINAGE AND STORMWATER FACILITIES (this "***Agreement***") is made this 19th day of October, 2015, by and among the Economic Development Authority in and for the City of Coon Rapids, Minnesota, a public body corporate and politic (the "***Parcel 1 Owner***"), Coon Rapids Leased Housing Associates IV, LLLP, a Minnesota limited liability limited partnership (the "***Parcel 2 Owner***"), and the Coon Creek Watershed District, a political subdivision of the State of Minnesota (the "***District***").

RECITALS:

A. WHEREAS, the Parcel 1 Owner is the owner of real property located in the City of Coon Rapids, Anoka County, Minnesota legally described as follows ("***Parcel 1***"):

Lot 1, Block 1, Robinwood Plat 6, Anoka County, Minnesota;

B. WHEREAS, the Parcel 2 Owner is the owner of real property located in the City of Coon Rapids, Anoka County, Minnesota, contiguous to Parcel 1 and legally described as follows (the "***Parcel 2***"):

Lot 2, Block 1, Robinwood Plat 6, Anoka County, Minnesota;

C. WHEREAS, the parties intend for Parcel 1 and Parcel 2 to share certain storm water drainage and treatment facilities, including, without limitation, storm water drain inlets and pipes, storm water detention and treatment ponds, and storm sewer control structures that are depicted and described on **Exhibit A** (collectively, the "***Drainage Facilities***"), some of which have heretofore been installed upon Parcel 1, and some of which are contemplated to be constructed hereafter upon Parcels 1 and 2;

D. WHEREAS, pursuant to the Coon Creek Watershed District Permit Application No. 15-064 (the "***Permit Application***") the Parcel 2 Owner has agreed to construct and maintain such Drainage Facilities; and

Return to:
Commercial Partners Title, LLC
200 South Sixth Street
Suite 1300
Minneapolis, MN 55402

39384 16 of 24 GL (A)

E. WHEREAS, pursuant to the recorded plat of Robinwood Plat 6 filed in the Office of the Recorder of Anoka County, Minnesota on _____, 2015 as Document No. 2121006.010, the Parcel 1 Owner and Parcel 2 Owner have dedicated certain public drainage easements comprising the Joint Easement Area and Additional Easement Areas (hereinafter defined).

F. WHEREAS, the parties hereto desire to enter into this Agreement for the purposes of (i) creating a non-exclusive, appurtenant easement in favor of the other party, their successors and assigns, to discharge storm water into the Drainage Facilities located on each of their respective properties and to govern the Parcel 1 Owner's and Parcel 2 Owner's rights and obligations with respect to each other, and (ii) to grant to the District an easement to access and maintain the Drainage Facilities.

NOW, THEREFORE, in consideration of the Recitals, which are hereby made a part hereof, and for other good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, the parties agree as follows:

1. Parcel 1 Owner's Grant of Easement. The Parcel 1 Owner hereby grants and conveys to the Parcel 2 Owner, its successors and assigns, a permanent non-exclusive easement appurtenant to Parcel 2, to (i) construct, maintain, manage, repair, and replace the Drainage Facilities as set forth below, and (ii) allow discharge of storm water runoff from Parcel 2 into the Drainage Facilities located on Parcel 1, all in the easement area more particularly described on **Exhibit B** hereto (the "***Parcel 1 Easement Area***"). The easement granted hereby shall include the rights of ingress and egress for Parcel 2 Owner, its contractors, officers, employees, agents, successors and assigns, over, upon and across Parcel 1 to the extent necessary to allow the Parcel 2 Owner to exercise its rights and perform its obligations pursuant to this Agreement.

2. Parcel 2 Owner's Grant of Easement. The Parcel 2 Owner hereby grants and conveys to the Parcel 1 Owner, its successors and assigns, a permanent non-exclusive easement appurtenant to Parcel 1, to allow discharge of storm water runoff from Parcel 1 into the Drainage Facilities located on Parcel 2 in the easement area more particularly described on **Exhibit C** hereto (the "***Parcel 2 Easement Area***" and, together with the Parcel 1 Easement Area, the "***Joint Easement Area***").

3. Interference With Easements. Each of the Parcel 1 Owner and the Parcel 2 Owner agrees that it shall not erect or allow on the Joint Easement Area or Additional Easement Areas any buildings or permanent structures or obstructions which would prevent, unreasonably restrict or otherwise unreasonably hinder the reasonable passage of water into the Drainage Facilities, or to otherwise interfere with use by the other party of the Joint Easement Area or Additional Easement Areas for the purposes permitted herein; provided, however, that the parties shall have the right to construct and maintain in the Joint Easement Area or Additional Easement Areas landscaping, sidewalks, and any improvements that do not materially interfere with the use of the Drainage Facilities for the purposes set forth herein. The grant of rights of ingress and egress over and across Parcel 1 and Parcel 2 pursuant hereto shall not impair the rights of the parties to construct or place improvements of any kind upon their respective properties, and the parties shall exercise reasonable care in the exercise of such rights of ingress and egress to avoid damage

or disturbance of Parcel 1, Parcel 2, and any improvements thereon. Notwithstanding the foregoing, the Parcel 1 Owner shall not cause or permit any change to the grade of Parcel 1, or construct, place or alter any improvements on Parcel 1, or otherwise modify the flow of storm water from Parcel 1, such that said action or omission would materially increase the volume of storm water entering the Drainage Facilities, without the prior written consent of the Parcel 2 Owner, which shall not be unreasonably withheld, conditioned or delayed.

4. Construction and Maintenance of Drainage Facilities. The Parcel 2 Owner, at its sole cost and expense, shall construct, operate, repair, maintain, and manage the Drainage Facilities in accordance with the requirements listed in the Permit Application and permit issued in connection therewith (the "***Permit***"), and the approved plans and specifications for the Drainage Facilities. Without in any way limiting the foregoing, the Parcel 2 Owner shall, at its sole cost and expense, regularly (1) remove accumulated sediment from any detention ponds comprising the Drainage Facilities in order to maintain at least two feet of dead storage volume in the entire pond(s), (2) maintain the structural integrity of any outlet structures, to insure their proper operation, (3) remove all floatable debris from the pond(s) on a monthly basis during the open water season, (4) properly dispose of any spoil material resulting from dredging operations, (5) promptly repair or restore any grass or other vegetation in the Drainage Facilities area disturbed by maintenance, (6) complete in a timely manner any mowing, weed control and any other maintenance activities to the pond(s) or its appurtenances, (7) inspect the entirety of the Drainage Facilities at least annually to insure their proper operation. Violation of the inspection and/or maintenance provisions of this Agreement is a violation of the Permit for which the District may take the actions against the Parcel 1 Owner and Parcel 2 Owner described in this Agreement. Notwithstanding the foregoing, the Parcel 1 Owner and Parcel 2 Owner shall not forfeit their respective rights to use the easements herein granted as a result of a violation of the Permit or the failure to inspect and maintain the Drainage Facilities.

5. Maintenance and Improvements within Joint Easement Area. The Parcel 2 Owner agrees that it shall be solely responsible and liable for the performance and cost of all construction, maintenance, management, repair, and replacement of the Drainage Facilities, unless such maintenance, repair, or replacement costs arise solely from the negligent act or omission or willful misconduct of another party hereto. Should the Parcel 2 Owner fail to perform required construction, maintenance, and/or repair of Drainage Facilities located in or about the Joint Easement Area as and when required, then following thirty (30) days' written notice to the Parcel 2 Owner, its partners and lenders set forth in Section 10, from either the Parcel 1 Owner or the District, if Parcel 2 Owner, its partners or lenders fail to cure such default during such thirty- (30-) day period, such other party shall have the right (but not the obligation) to enter upon the Joint Easement Area with its contractors, officers, employees, and agents and perform such reasonable construction, maintenance, repair, and/or replacement of the Drainage Facilities as is needed for the Drainage Facilities to function properly, and the Parcel 2 Owner shall reimburse the other party, upon demand, for all reasonable costs actually incurred in performing such work. The easements granted by the Parcel 1 Owner and Parcel 2 Owner pursuant to this Agreement include rights of ingress and egress over the Joint Easement Area to the extent necessary to allow the parties, and their contractors, officers, employees, agents, successors and assigns, to exercise their rights and perform their obligations pursuant to this Section.

6. Maintenance and Improvements of other Drainage Facilities. Should the Parcel 2 Owner fail to perform required construction, maintenance, and/or repair of Drainage Facilities located in or about the areas described on **Exhibit D** hereto (the "***Additional Easement Areas***"), then following thirty (30) days' written notice from the District, the District shall have the right (but not the obligation) to enter upon the Additional Easement Areas with its contractors, officers, employees, and agents and perform such reasonable construction, maintenance, repair, and/or replacement of the Drainage Facilities as is needed for the Drainage Facilities to function properly, and the Parcel 2 Owner shall reimburse the District, upon demand, for all reasonable costs incurred in performing such work.

7. Duration; Termination. This Agreement shall be recorded and shall constitute covenants and obligations running with land which shall be binding upon and inure to the benefit of future owners, tenants, and holders of any interest in Parcel 1 and Parcel 2, or any portion thereof, and their successors and assigns, and shall be binding upon and inure to the benefit of the District's successors or assigns. This Agreement will be unlimited in duration, without being re-recorded.

8. Access Easement. The Parcel 1 Owner hereby grants to the District, its successors and assigns, a permanent, non-exclusive easement to maintain and repair the Drainage Facilities, over, under and across the Parcel 1 Easement Area in accordance with this Agreement. The Parcel 2 Owner hereby grants to the District, its successors and assigns, a permanent, non-exclusive easement to maintain and repair the Drainage Facilities, over, under and across the Parcel 2 Easement Area and Additional Easement Areas in accordance with this Agreement. The grants of the foregoing easements includes the right of the District, its contractors, officers, employees and agents, to enter upon the Joint Easement Area and Additional Easement Areas at all reasonable times and in a manner designed to minimize disturbance to residents and occupants and which will not interfere with any improvements owned by the Parcel 1 Owner or Parcel 2 Owner, to inspect, maintain, repair and reconstruct the Drainage Facilities; and further the District shall have the right to remove trees, brush, undergrowth and other obstructions necessary to exercise the foregoing rights. After completion of such inspection, reconstruction, maintenance, or repair, the District shall restore the Joint Easement Area and Additional Easement Areas to the condition in which they were found prior to the commencement of such actions, save only for the necessary removal of trees, brush, undergrowth and other obstructions.

9. Indemnification. Each of the Parcel 1 Owner and the Parcel 2 Owner agrees to indemnify, hold harmless and defend the other party, from any loss, claims, damages, actions, lawsuits, costs or expenses, including reasonable attorneys' fees arising from or related to the indemnifying party's negligent acts or omissions or willful misconduct in connection with the use of the Drainage Facilities or Joint Easement Area or entry upon Parcel 1 or Parcel 2 by or on behalf of such indemnifying party, its employees, agents, invitees, successors or assigns. Each of the Parcel 1 Owner and the Parcel 2 Owner agrees to indemnify, defend, and hold harmless the District, its officers, employees and agents from all present and future claims, damages, costs and expenses, including reasonable attorneys' fees, arising out of or resulting from the negligent acts, errors, omissions or other wrongful acts of such owner, its employees, contractors, agents, in constructing, repairing, maintaining or otherwise working on the Drainage Facilities as described above. The District agrees to indemnify, hold harmless and defend the Parcel 1 Owner and Parcel 2 Owner

from any loss, claims, damages, actions, lawsuits, costs or expenses, including reasonable attorneys' fees arising from or related to the District's negligent acts or omissions or willful misconduct in connection with the use of the Drainage Facilities, Joint Easement Area or Additional Easement Areas or entry upon Parcel 1 or Parcel 2 by or on behalf of the District, its employees, agents, invitees, successors or assigns.

10. Notices. Any notice required or permitted hereunder shall be given by personal delivery upon an authorized representative of a party hereto; or if mailed in a sealed wrapper by United States registered or certified mail, return receipt requested, postage prepaid; or if transmitted by facsimile copy followed by mailed notice; or if deposited cost paid with a nationally recognized, reputable overnight courier, properly addressed as follows:

If to Parcel 1 Owner:	Economic Development Authority in and for the City of Coon Rapids, Minnesota 11155 Robinson Drive NW Coon Rapids, MN 55422 Attention: Executive Director
If to Parcel 2 Owner:	Coon Rapids Leased Housing Associates IV, LLLP 2905 Northwest Blvd., Suite 150 Plymouth, MN 55441 Attention: Mark S. Moorhouse and Ryan J. Lunderby
With Copy to:	Winthrop & Weinstine, P.A. 225 South Sixth Street, Suite 3500 Minneapolis, Minnesota 55402 Attention: John M. Stern Esq.
And Copy to:	RBC Tax Credit Equity, LLC 600 Superior Avenue, Suite 2300 Cleveland, Ohio 44114 Attention: President and General Counsel
If to District:	Coon Creek Watershed District Attention: District Administrator Suite 100 12301 Central Avenue NE Blaine, MN 55434

An additional copy of any notice to Parcel 2 Owner regarding a default or breach of this Agreement by Parcel 2 Owner shall be sent to the following parties:

Copy to: U.S. Bank National Association
BC-MN-HO3A
800 Nicollet Mall, 3rd Floor
Minneapolis, Minnesota 55402-7020
Attention: U.S. Bancorp Community Development Corporation, Community Lending Division

And copy to: Stinson Leonard Street LLP
150 South Fifth Street, Suite 2300
Minneapolis, Minnesota 55402
Attention: David W. Kelley

Notices shall be deemed effective on the earlier of the date of receipt or the date of deposit, as aforesaid; provided, however, that if notice is given by deposit, the time for response to any notice by the other party shall commence to run one business day after any such deposit. Any party may change its address for the service of notice by giving notice of such change ten (10) days prior to the effective date of such change.

11. Amendment, Modification or Waiver. No amendment, modification or waiver of any condition, provision or term of this Agreement shall be valid or of any effect unless said amendment is made in writing, signed by the parties to be bound or their duly authorized representative(s) and specifying with particularity the extent and nature of such amendment, modification or waiver. Any waiver by any party of any default of another party hereunder shall not affect or impair any right arising from any subsequent default.

12. Headings. The headings of sections of this Agreement are for convenience of reference only and do not form a part hereof and in no way interpret or construe such paragraphs.

13. Authority. The undersigned each represent that they are authorized to act for and bind their respective parties.

14. Counterparts. This Agreement may be executed in counterparts, each of which shall be deemed an original, but which together shall constitute one and the same instrument.

15. Integration. This Agreement is the entire agreement between the parties with respect to its subject matter and supersedes all prior agreements and understandings between the parties hereto with respect to such subject matter.

16. Severability. If any provision of this Agreement is held to be unenforceable or void, such provision shall be deemed to be severable and shall in no way affect the validity of the remaining terms of this Agreement.

17. Governing Law. This Agreement will be governed and construed in accordance with the laws of the State of Minnesota, without giving effect to choice of law provisions of the State of Minnesota.

10955390v2

[Remainder of page left intentionally blank. Signature Pages to follow.]

IN WITNESS WHEREOF, the undersigned have executed this Agreement as of the date first above written.

PARCEL 1 OWNER:

Economic Development Authority in and for the City of Coon Rapids, Minnesota,
a public body corporate and politic,

By: _____
Name: Jerry Koch
Title: President

By: _____
Name: Matt Stemwedel
Title: Executive Director

STATE OF MINNESOTA)
) ss.
COUNTY OF Anoka)

The foregoing instrument was acknowledged before me this 5th day of October, 2015, by Jerry Koch, the President of the Economic Development Authority in and for the City of Coon Rapids, Minnesota, a public body corporate and politic, on behalf of said public body.

_____
Notary Public

JOAN R. LENZMEIER
NOTARY PUBLIC - MINNESOTA
My Commission Expires
January 31, 2018

STATE OF MINNESOTA)
) ss.
COUNTY OF Anoka)

The foregoing instrument was acknowledged before me this 5th day of October, 2015, by Matt Stemwedel, the Executive Director of the Economic Development Authority in and for the City of Coon Rapids, Minnesota, a public body corporate and politic, on behalf of said public body.

_____
Notary Public

JOAN R. LENZMEIER
NOTARY PUBLIC - MINNESOTA
My Commission Expires
January 31, 2018

PARCEL 2 OWNER:

Coon Rapids Leased Housing Associates IV, LLLP,
a Minnesota limited liability limited partnership

By: Coon Rapids Leased Housing Associates IV, LLC
Its: General Partner

By: _____
Name: Mark S. Moorhouse
Title: Senior Vice President

STATE OF MINNESOTA)
) ss.
COUNTY OF Hennepin)

The foregoing instrument was acknowledged before me this 1 day of October, 2015, by Mark S. Moorhouse, the Senior Vice President of Coon Rapids Leased Housing Associates IV, LLC, a Minnesota limited liability company, the General Partner of Coon Rapids Leased Housing Associates IV, LLLP, a Minnesota limited liability limited partnership, on behalf of said partnership.

ABIGAIL HEIM
NOTARY PUBLIC
MINNESOTA
My Commission Expires Jan. 31, 2020

_____
Notary Public

DISTRICT:

Coon Creek Watershed District,
a political subdivision of the State of Minnesota

By: _____
Name: _____
Title: President of the Board of Managers

STATE OF MINNESOTA)
) ss.
COUNTY OF Anoka)

The foregoing instrument was acknowledged before me this 12th day of October, 2015, by Byron Westlund, the President of the Board of Managers of the Coon Creek Watershed District, a political subdivision of the State of Minnesota, on behalf of said political subdivision.

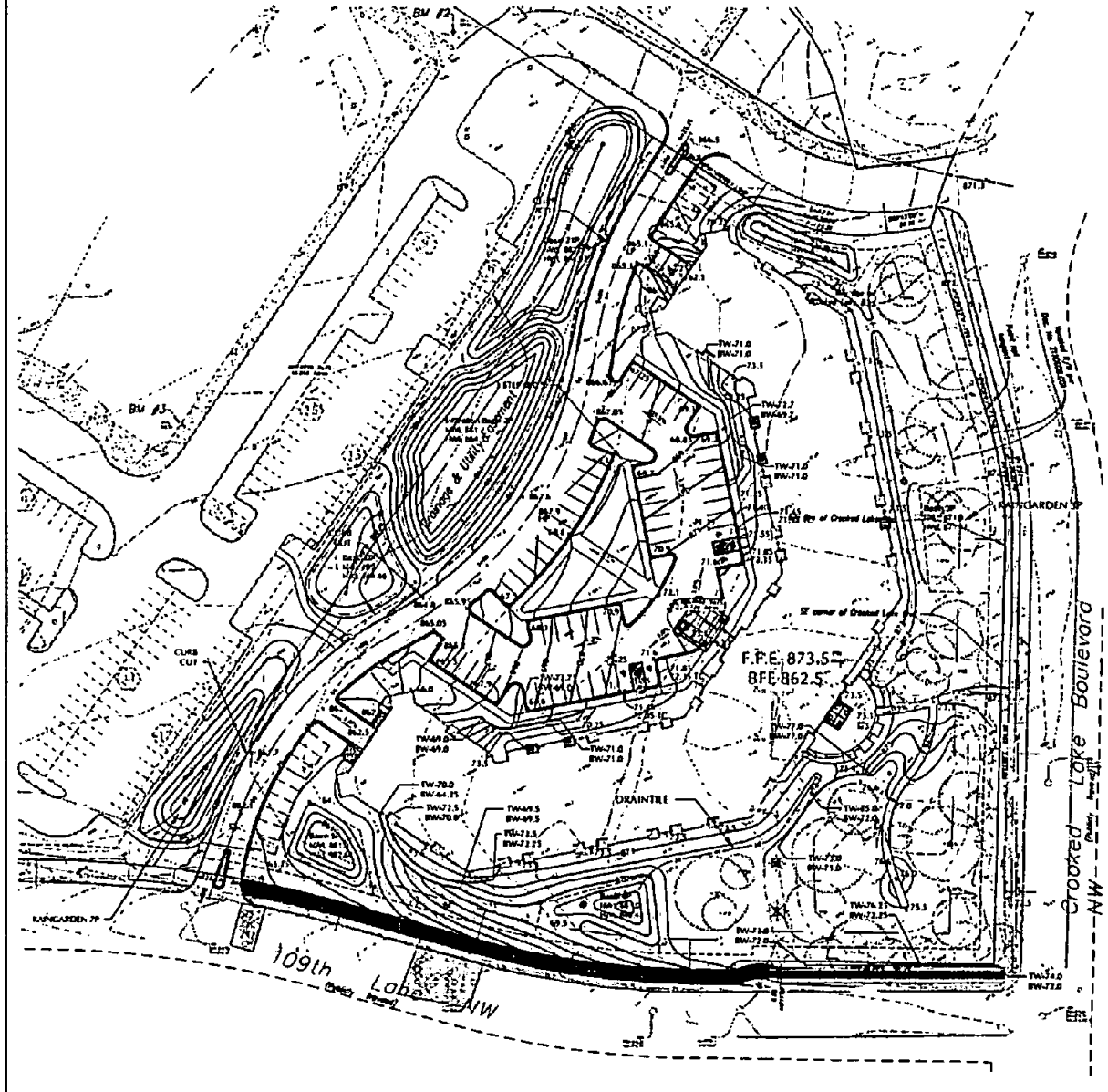
_____
Notary Public

MICHELLE J ULRICH
NOTARY PUBLIC - MINNESOTA
MY COMMISSION EXPIRES 01/31/2020

This document was prepared by:
Winthrop & Weinstine, P.A. (RBH)
225 South Sixth Street, Suite 3500
Minneapolis, Minnesota 55402

EXHIBIT A

(Description and Depiction of Drainage Facilities - attached)



Gopher State One Call

GRADING, DRAINAGE & EROSION CONTROL NOTES

1. THE CONTRACTOR SHALL REFER TO THE ARCHITECTURAL PLANS FOR EXACT LOCATIONS AND DIMENSIONS OF BUILDINGS, VESTIBULES, SLOPED PAVING, EXIT PORCHES, RAMPS, TRIALS, DOCKS, ENTRY LOCATIONS AND LOCATIONS OF UTILITIES.
2. ALL DISTURBED UNPAVED AREAS ARE TO RECEIVE MINIMUM [illegible] OF TOPSOIL AND SOD OR SEED. THESE AREAS SHALL BE MAINTAINED BY THE CONTRACTOR UNTIL THE SOD OR SEED IS ESTABLISHED, IN A HEALTHY MANNER.
3. THE CONTRACTOR SHALL TAKE ALL PRECAUTIONS NECESSARY TO AVOID PROPERTY DAMAGE TO ADJACENT PROPERTIES DURING THE CONSTRUCTION PHASE OF THIS PROJECT. THE CONTRACTOR WILL BE HELD RESPONSIBLE FOR ANY DAMAGES TO ADJACENT PROPERTIES OCCURRING DURING THE CONSTRUCTION PHASE OF THIS PROJECT.
4. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING AND MAINTAINING TRAFFIC CONTROL DEVICES SUCH AS BARRICADES, WARNING LIGHTS, SIGNS, FLAGS, FLAGMEN AND GUARDS TO CONTROL THE MOVEMENT OF TRAFFIC. WHEN NECESSARY, PLACEMENT OF THESE DEVICES SHALL BE APPROVED BY THE ENGINEER PRIOR TO PLACEMENT. TRAFFIC CONTROL DEVICES SHALL CONFORM TO THE APPROPRIATE MINNESOTA DEPARTMENT OF TRANSPORTATION STANDARDS.
5. IN ACCORDANCE WITH LOCAL MUNICIPAL ADOPTED CONSTRUCTION PRACTICES, THE CONTRACTOR SHALL BE SOLELY AND COMPLETELY RESPONSIBLE FOR CONDITIONS ON THE JOB SITE, INCLUDING SAFETY OF ALL PERSONS AND PROPERTY DURING THE PERFORMANCE OF THE WORK. THIS REQUIREMENT SHALL APPLY CONTINUOUSLY AND NOT BE LIMITED TO NORMAL WORKING HOURS.
6. THE ENTRY OF THE ENGINEER OF THE DEVELOPER TO CONDUCT CONSTRUCTION REVIEW OF THE CONTRACTORS PERFORMANCE IS NOT INTENDED TO INCLUDE REVIEW OF THE NORTH, NOR OF THE CONTRACTOR'S WORK PRACTICES IN OR NEAR THE CONSTRUCTION SITE.
7. PRIOR BEGINNING CONSTRUCTION, THE CONTRACTOR SHALL INSTALL A TEMPORARY BLACK ENTRANCE PAD AT ALL POINTS OF VEHICLE EXIT FROM THE PROJECT SITE. SAID TEMPORARY PAD SHALL BE MAINTAINED BY THE CONTRACTOR FOR THE DURATION OF THE PROJECT. SEE DETAILS ON UTILITY PLANS (SHEET C-4) OR THE PROJECT PLANS.
8. EROSION AND SEDIMENTATION CONTROL MEASURES SHALL BE ESTABLISHED ALONG THE ENTIRE SITE PERIMETER AND IN ACCORDANCE WITH LOCAL MEANS AND BEST MANAGEMENT PRACTICES. CITY REQUIREMENTS. REFER TO THE LATEST REVISION ON SHEET C-4 (UTILITY PLANS).
9. ALL EXCAVATION AND COMPACTION PER CITY SPECS SHALL BE PERFORMED PER THE REQUIREMENTS OF THE CITY. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL PERMITS AND NOTIFICATIONS AS REQUIRED BY THE CITY.
10. SEE UTILITY PLAN FOR ALL FINER DETAIL REGARDING THE UTILITY SERVICES

WARNING:

THE CONTRACTOR SHALL BE RESPONSIBLE FOR CALLING FOR LOCATIONS OF ALL EXISTING UTILITIES. THEY SHALL COOPERATE WITH ALL UTILITY COMPANIES IN MAINTAINING THEIR SERVICE AND/OR RELOCATION OF LINES.

THE CONTRACTOR SHALL CONTACT GOPHER STATE ONE CALL AT 651-454-0002 AT LEAST 48 HOURS IN ADVANCE FOR THE LOCATIONS OF ALL UNDERGROUND WIRES, CABLES, CONDUITS, PIPES, MANHOLES, VALVES OR OTHER BURIED STRUCTURES. IF ANY OF THESE ARE DAMAGED DURING CONSTRUCTION, THE CONTRACTOR SHALL REPAIR OR REPLACE THE SAME WHEN CAUSED DURING CONSTRUCTION AT NO COST TO THE OWNER.

SCALE IN FEET

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Minneapolis, MN 55401
Telephone: 612.339.3752
Facsimile: 612.339.8212
www.bkvgroup.com
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CONSULTANTS

LOUCKS

PROJECT TITLE

RIVER NORTH APARTMENTS

KEY PLAN

AREA A AREA B

ISSUE	DATE	DESCRIPTION
	[illegible]	[illegible]
	[illegible]	[illegible]
	[illegible]	[illegible]
	[illegible]	[illegible]

CERTIFICATION

I hereby certify that this plan, specification or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.

Signature
Printed / Typed Name
License Number Date

DATE	
REVIEWED	
APPROVED	
CONSTRUCTION SURVEY	

SHEET TITLE

GRADING AND DRAINAGE PLAN

SHEET NUMBER

C3-1

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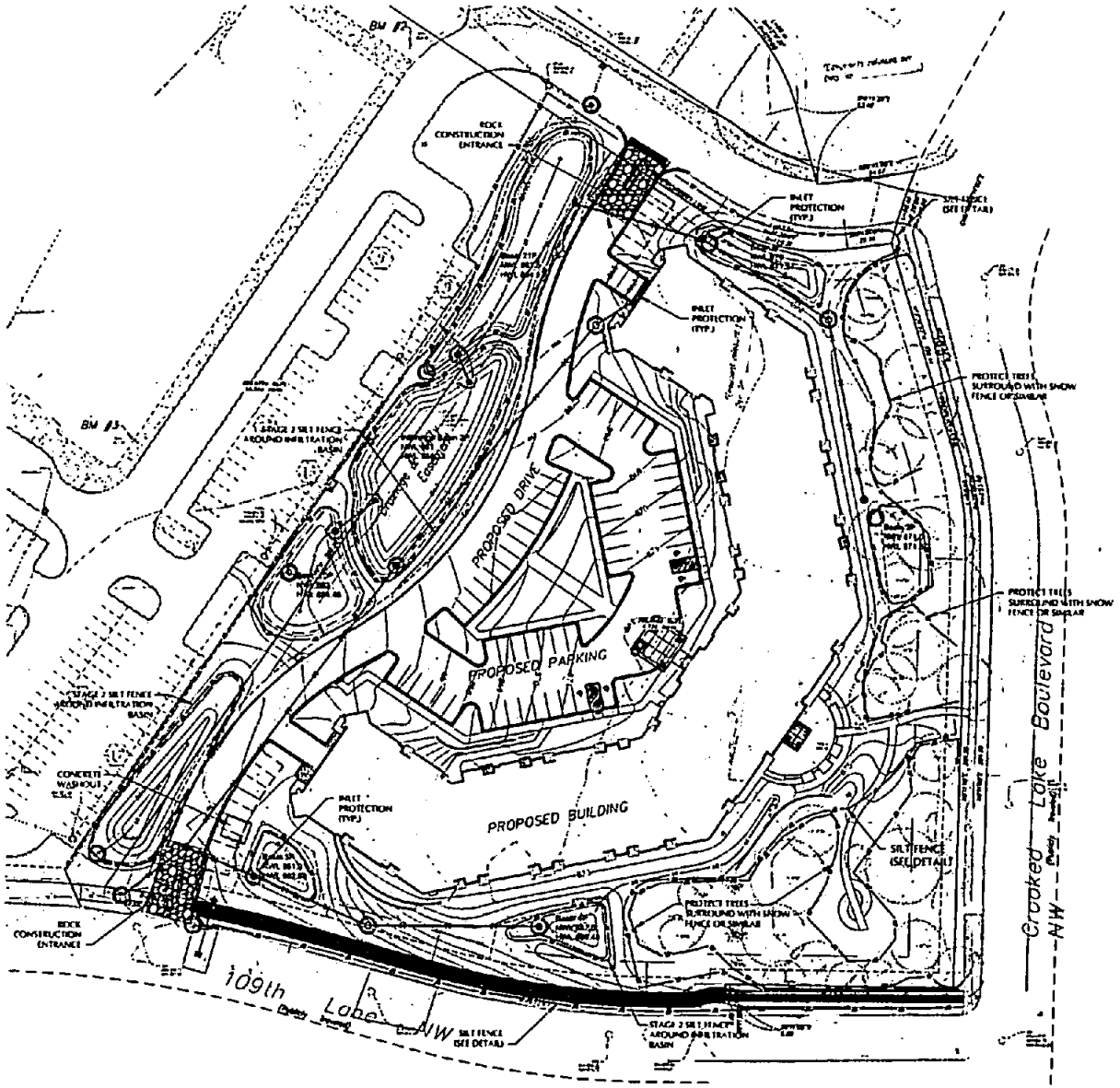

Gopher State One Call

STORMWATER POLLUTION PREVENTION PLAN (SWPPP)

GENERAL NOTES:

1. THE NATURE OF THIS PROJECT WILL CONSIST OF CONSTRUCTING A 3 STORY BRICK HOUSING APARTMENTS, PARKING, PAVED WALKS, PATIOS, AND GARDENS.
2. THE INTENDED SEQUENCE OF MAJOR CONSTRUCTION ACTIVITIES ARE AS FOLLOWS:
   1. INSTALL STABILIZED ROCK CONSTRUCTION ENTRANCE PAD.
   2. INSTALLATION OF SILT FENCE AROUND SITE.
   3. CLEAR AND GRUB FOR BASIN/GREEN AREAS.
   4. CONSTRUCT MAIN GARDENS.
   5. ROUGH GRADING OF SITE.
   6. INSTALL A GROUND INFILTRATION BASIN.
   7. STABILIZE DISTURBED AREAS AND BASIN AREAS.
   8. INSTALL SANITARY SEWER, WATERMAIN, STORM SEWER, AND SERVICES.
   9. BLACKTOP STREETS, INSTALL STREET MATERIAL.
   10. INSTALL CURB AND GUTTER.
   11. FINAL GRADE BOULEVARD AND INSTALL SOD AND MULCH.
   12. REMOVE ACCUMULATED SEDIMENT FROM BASIN.
   13. WHEN ALL CONSTRUCTION ACTIVITY IS COMPLETE AND THE SITE IS STABILIZED, REMOVE SILT FENCE AND STAKES AND AREAS DISPLAYED IN THE PERMIT.
3. SITE DATA
   AREA TO BE DISTURBED = 4.47 ac.

PRE-DEVELOPMENT (EXIST)	POST CONSTRUCTION
IMPERVIOUS AREA: 0.17 ac.	2.17 ac.

   SOIL TYPES: SEE SOILS REPORT
   POST CONSTRUCTION RUNOFF COEFFICIENT (C-factor)
4. THE LOCATION OF AREAS NOT TO BE DISTURBED MUST BE IDENTIFIED WITH FLAGS, STAKES, SILT FENCE, ETC. BEFORE CONSTRUCTION BEGINS.
5. CONSTRUCTION ACTIVITY - EROSION PREVENTION PRACTICES

TIME OF YEAR (EXPECTED)	TYPE OF EVENT EXPECTED (I.e. 2 yr 24 hr)
2 DAYS	2 YR 24 HR
14 DAYS	10 YR 24 HR
21 DAYS	25 YR 24 HR

   1 DISTURBED SLOPES MEDIUM (Slope: 3:1)
6. ON SLOPES 3:1 OR GREATER MAINTAIN SHEET FLOW AND MINIMIZE RILLS AND/OR GULLIES. SLOPE LENGTHS CAN NOT BE GREATER THAN 75 FEET.
7. ALL STORM DRAINS AND INLETS MUST BE PROTECTED UNTIL ALL SOURCES OF POTENTIAL SEDIMENTS ARE STABILIZED.
8. TEMPORARY SOIL STOCKPILES MUST HAVE EFFECTIVE SEDIMENT CONTROL AND CAN NOT BE PLACED IN WETLANDS, WATERS OR UPON PAVED CONVEYANCE SYSTEMS. TEMPORARY STOCKPILES WITH A SIGNIFICANT AMOUNT OF SILT, CLAY OR ORGANIC MATERIALS ARE SUBJECT TO CLEAN ACCESS TO STREET PER ORDINANCE. COMPLETE STABILIZATION SEEDING, SODDING OR MULCHING.
9. SEDIMENT LADEN WATER MUST BE DISCHARGED TO A SEDIMENTATION BASIN WHENEVER POSSIBLE. IF NOT POSSIBLE IT MUST BE TREATED WITH THE APPROPRIATE BMPS.
10. ALL WASTE MUST BE DISPOSED OF PROPERLY AND MUST COMPLY WITH MPCA DISPOSAL REQUIREMENTS.
11. EXTERNAL WASHING OF CONSTRUCTION VEHICLES MUST BE LIMITED TO A DEFINED AREA OF THE SITE.
12. NO ENGINE DISCHARGING IS ALLOWED ON SITE.
13. THE OWNER WHO SIGNS THE NPDES PERMIT APPLICATION IS A PERMITTEE AND IS RESPONSIBLE FOR COMPLIANCE WITH ALL TERMS AND CONDITIONS OF THE PERMIT. THE OPERATOR (CONTRACTOR WHO SIGNS THE NPDES PERMIT APPLICATION) IS A PERMITTEE FOR PART II.B., PART III, AND PART IV. OF THE NPDES PERMIT AND IS JOINTLY RESPONSIBLE WITH THE OWNER FOR COMPLIANCE WITH THOSE PORTIONS OF THE PERMIT.
14. ON-SITE CONTRACTOR UPON COMPLETION OF GRADING, UTILITIES, AND STREET CONSTRUCTION THE NEW OWNER BY AND RESPONSIBLE FOR THE OPERATION, MAINTENANCE, WITHIN 7 DAYS OF ASSUMING OPERATIONAL CONTROL OF THE SITE COMMENCING WORK ON THEIR PORTION OF THE SITE OR OF THE LEGAL TRANSFER PART OF OWNING ON THE PROPERTY, NOTIFY THE NEW OWNER CAN IMPLEMENT THE ORIGINAL SWPPP CREATED FOR THE PROJECT OR DEVELOP AND IMPLEMENT THE A NEW SWPPP.
15. TERMINATION OF CONSTRUCTION STORMWATER PERMIT TO TERMINATE COVERAGE MUST BE MADE A NOTICE OF TERMINATION (NOT) TO THE MPCA. ALL PERMITTEES MUST SUBMIT A NOT WITHIN 30 DAYS AFTER ONE OR MORE OF THE FOLLOWING CONDITIONS HAVE BEEN MET:
   A. FINAL STABILIZATION. ALL AREAS PRIOR PART A, C, AND EXTENSION IN APPENDIX B HAS BEEN ACHIEVED ON ALL PORTIONS OF THE SITE FOR WHICH THE PERMITTEE IS RESPONSIBLE.
   B. ANOTHER OWNER HAS ASSUMED CONTROL OVER ALL AREAS OF THE SITE THAT HAVE NOT BEEN FINALLY STABILIZED.
   C. FOR TEMPORARY CONSTRUCTION ONLY. TEMPORARY EROSION PROTECTION AND DOWN GRADING REMAINS CONDITIONS ARE NECESSARY AS WORK HAS BEEN COMPLETED AND THE RESOURCE HAS BEEN TRANSFERRED TO THE HOMEOWNERS. ADDITIONALLY, THE PERMITTEE MUST INSTRUCTS THE MPCA TERMINATION FACT SHEET TO THE NUMBERS TO INCLUDE THE NUMBERS OF THE NOTICE FOR FINAL STABILIZATION.
16. INSPECTIONS
   A. INITIAL INSPECTION FOLLOWING INITIAL INSTALLATION BY CITY REPRESENTATIVE IS REQUIRED.
   B. REPORTS MUST INCLUDE ONCE EVERY 7 DAYS AND WITHIN 24 HOURS FOLLOWING A 0.5 INCH OR 24 HOUR RAIN EVENT.
   C. SEDIMENTS AREAS SHALL BE DONE TO FREEZE & SNOW AS SOON AS POSSIBLE OR AS PRIOR TO FREEZING CONDITIONS.
17. OWNER MUST KEEP RECORDS OF ALL PERMITS REQUIRED FOR THE PROJECT, ALL INSPECTIONS AND MAINTENANCE, REPAIRS, OPERATION AND MAINTENANCE, MONITORING, AND REQUIRED CALCULATIONS FOR TEMPORARY AND PERMANENT SEDIMENTATION BASIN. DISPOSAL MUST BE RETAINED FOR THREE YEARS.
18. SWPPP MUST BE AMENDED WHEN:
   A. THERE IS A CHANGE IN DESIGN, OPERATION, MAINTENANCE, WEATHER OR SEASONAL CONDITIONS THAT HAS A SIGNIFICANT EFFECT ON DISCHARGE.
   B. INSPECTIONS INDICATE THAT THE SWPPP IS NOT EFFECTIVE AND DISCHARGES IS INCREASING WATER QUALITY DEGRADATION.
   C. THE SWPPP IN THE SWPPP ARE NOT CONTROLLING POLLUTANTS IN EROSION FORCES OR IS NOT CONSISTENT WITH THE TERMS AND CONDITIONS OF THE PERMIT.

SILT FENCE (REQUIRED MAINTENANCE)

1. REMOVE SEDIMENT WHEN IT REACHES HALF THE HEIGHT OF THE FENCE. IF MUST BE REMOVED WITHIN 24 HOURS.
2. REPAIR OR REPLACE DAMAGED SILT FENCE WITHIN 24 HOURS.

SCALE IN FEET

WARNING

THE CONTRACTOR SHALL BE RESPONSIBLE FOR CALLING FOR LOCATIONS OF ALL UNDERGROUND UTILITIES THAT SHALL COORDINATE WITH ALL UTILITY COMPANIES IN MAINTAINING THEIR SERVICE AND/OR RELOCATION OF LINES.

THE CONTRACTOR SHALL CONTACT GOPHER STATE ONE CALL AT 651-454-0002 AT LEAST 48 HOURS IN ADVANCE FOR THE LOCATION OF ALL UNDERGROUND UTILITIES. ALSO, THE PARTY RESPONSIBLE FOR DAMAGE TO UTILITIES IN THE SITE DURING DRILLING. THE CONTRACTOR SHALL REPAIR OR REPLACE THE AREAS WHICH DAMAGED DURING CONSTRUCTION AT NO COST TO THE OWNER.

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Phone: 763-474-6700
Fax: 763-474-0520
www.loucks.com

PROJECT TITLE

RIVER NORTH APARTMENTS

KEY PLAN

ISSUE #	DATE	DESCRIPTION
	01-13-2011	60% CD SET
	02-04-2011	90% SET
	03-18-2011	CITY REVIEW SET
	04-08-2011	CITY COMMENT

CERTIFICATION

I hereby certify that this plan, specification or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.

Michael W. Hinton

04-08-2011

Issued Number	Date
DATE	
DRAWN BY	
CHECKED BY	
CONSULTANT NUMBER	

SHEET TITLE

STORMWATER PULLUTION PREVENTION PLAN

SHEET NUMBER

C3-2

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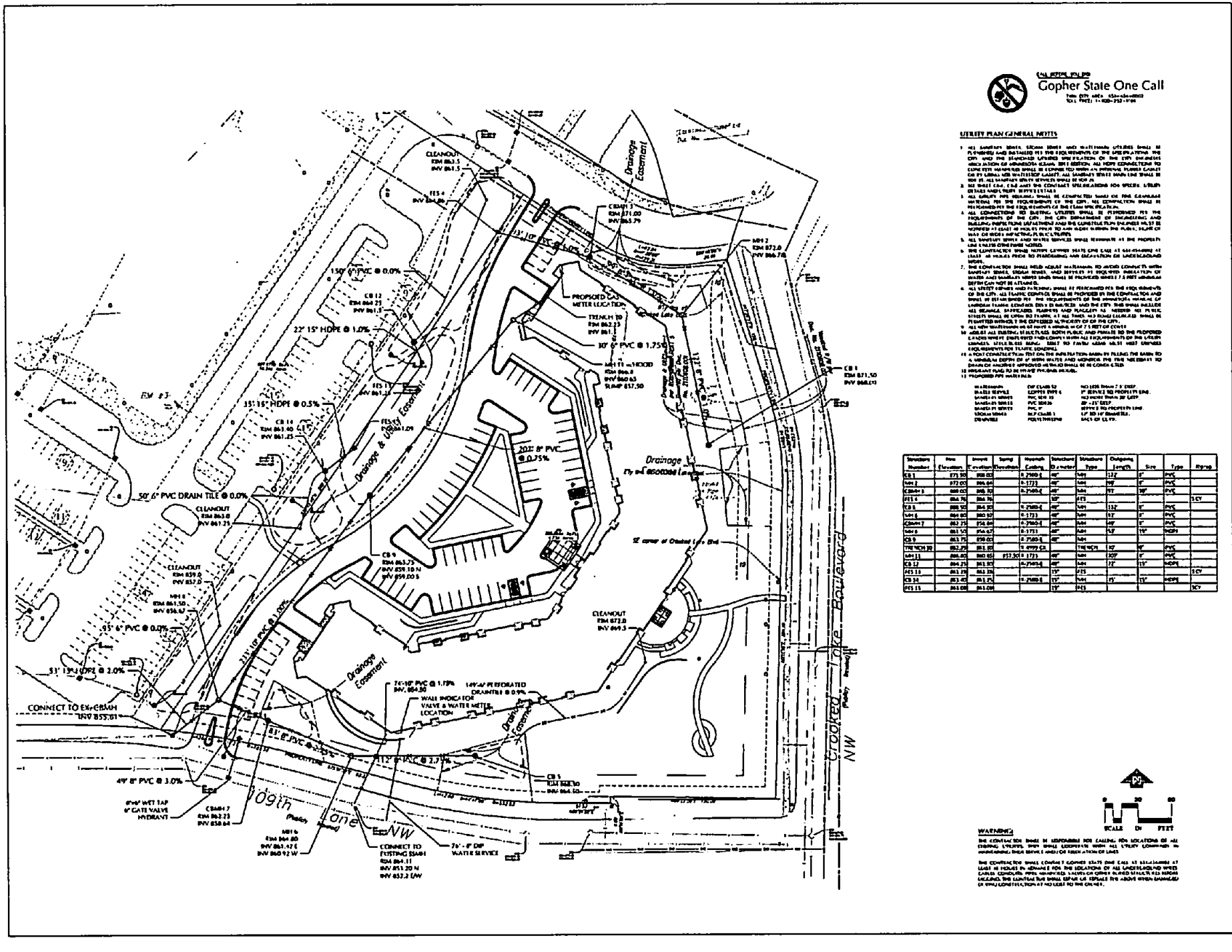

Structure Number	Rim Elevation	Invert Elevation	Sump Elevation	Hypotenuse Casting	Structural Diameter	Structure Type	Outgoing Length	Size	Type	Riprap
CB 1	871.50	868.00		0.2500-S	48"	MH	112'	6"	PVC	
MH 2	872.00	866.64		0.1771	48"	MH	98'	6"	PVC	
CBMH 3	869.00	866.30		0.2500-S	48"	MH	97'	10"	PVC	
FES 4	864.79	864.79			18"	FES				SCY
CB 5	868.50	865.50		0.2500-S	48"	MH	112'	6"	PVC	
MH 6	864.85	860.97		0.1771	48"	MH	93'	6"	PVC	
CBMH 7	862.75	854.64		0.2500-S	48"	MH	48'	6"	PVC	
MH 8	861.50	854.67		0.1771	48"	MH	93'	15"	HDPE	
CB 9	863.75	858.00		0.2500-S	48"	MH				
TRENCH 10	862.79	861.85		0.4999 CS		TRENCH	15'	8"	PVC	
MH 11	864.85	860.65	857.30	0.1771	48"	MH	203'	6"	PVC	
CB 12	864.25	861.50		0.2500-S	48"	MH	22'	15"	HDPE	
FES 13	861.25	861.25			15"	FES				SCY
CB 14	863.40	861.25		0.2500-S	15"	MH	15'	15"	HDPE	
FES 15	861.00	861.00			15"	FES				SCY

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CONSULTANTS

LOUCKS

PROJECT TITLE

RIVER NORTH APARTMENTS

KEY PLAN

AREA A AREA B

ISSUE #	DATE	DESCRIPTION
	04/05/21	PD SUP SET
	07/06/21	CUP SET
	11/19/21	CONSTRUCTION SET
	04/01/22	CITY COMMENTS

CERTIFICATION

I hereby certify that this plan, specification or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.

Michael R. Nunes - PE

Date
License Number
DATE
REVISED BY
CERTIFIED BY
CONSULTANT NUMBER

SHEET TITLE

UTILITY PLAN

SHEET NUMBER

C4-1

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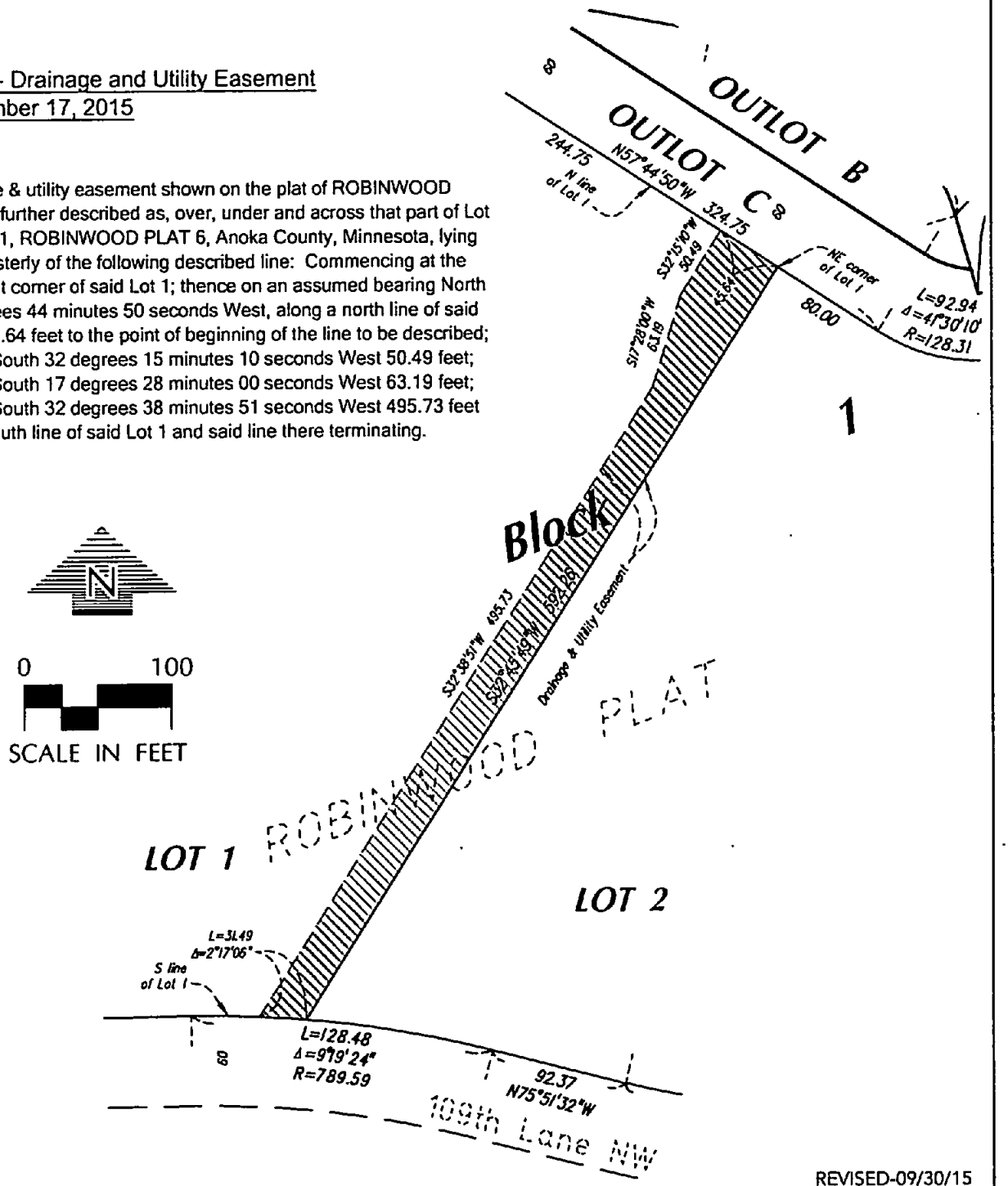
EXHIBIT B

(Legal Description of Parcel 1 Easement Area)

EXHIBIT B

LOT 1 - Drainage and Utility Easement
September 17, 2015

Drainage & utility easement shown on the plat of ROBINWOOD PLAT 6, further described as, over, under and across that part of Lot 1, Block 1, ROBINWOOD PLAT 6, Anoka County, Minnesota, lying southeasterly of the following described line: Commencing at the northeast corner of said Lot 1; thence on an assumed bearing North 57 degrees 44 minutes 50 seconds West, along a north line of said Lot 1, 45.64 feet to the point of beginning of the line to be described; thence South 32 degrees 15 minutes 10 seconds West 50.49 feet; thence South 17 degrees 28 minutes 00 seconds West 63.19 feet; thence South 32 degrees 38 minutes 51 seconds West 495.73 feet to the south line of said Lot 1 and said line there terminating.



REVISED-09/30/15

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ENVIRONMENTAL

Henry D. Nelson, PLS

17255 — License No.

09/17/15 — Date

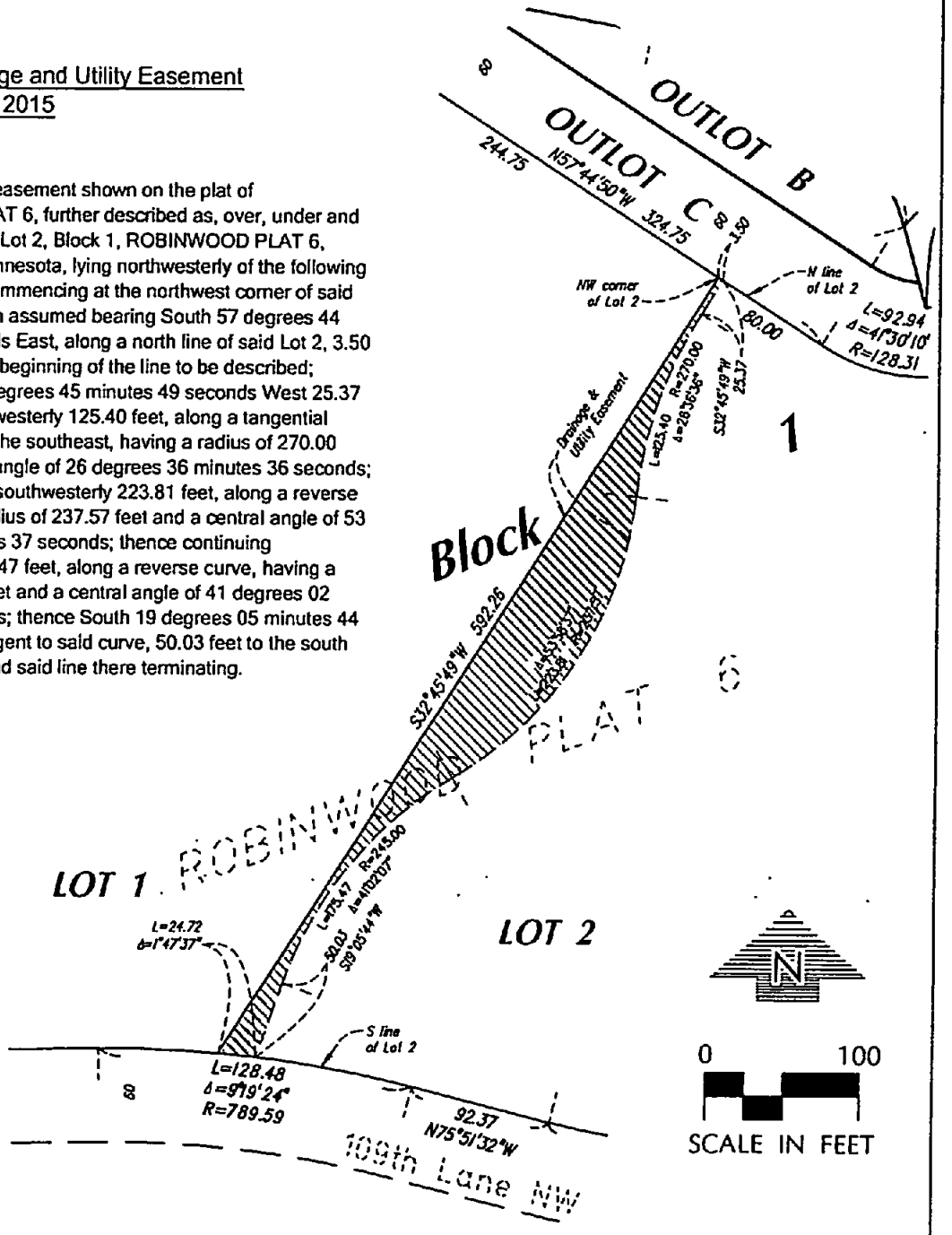
EXHIBIT C

(Legal Description of Parcel 2 Easement Area)

EXHIBIT C

LOT 2 - Drainage and Utility Easement
September 17, 2015

Drainage & utility easement shown on the plat of ROBINWOOD PLAT 6, further described as, over, under and across that part of Lot 2, Block 1, ROBINWOOD PLAT 6, Anoka County, Minnesota, lying northwesterly of the following described line: Commencing at the northwest corner of said Lot 2; thence on an assumed bearing South 57 degrees 44 minutes 50 seconds East, along a north line of said Lot 2, 3.50 feet to the point of beginning of the line to be described; thence South 32 degrees 45 minutes 49 seconds West 25.37 feet; thence southwesterly 125.40 feet, along a tangential curve, concave to the southeast, having a radius of 270.00 feet and a central angle of 26 degrees 36 minutes 36 seconds; thence continuing southwesterly 223.81 feet, along a reverse curve, having a radius of 237.57 feet and a central angle of 53 degrees 58 minutes 37 seconds; thence continuing southwesterly 175.47 feet, along a reverse curve, having a radius of 245.00 feet and a central angle of 41 degrees 02 minutes 07 seconds; thence South 19 degrees 05 minutes 44 seconds West, tangent to said curve, 50.03 feet to the south line of said Lot 2 and said line there terminating.



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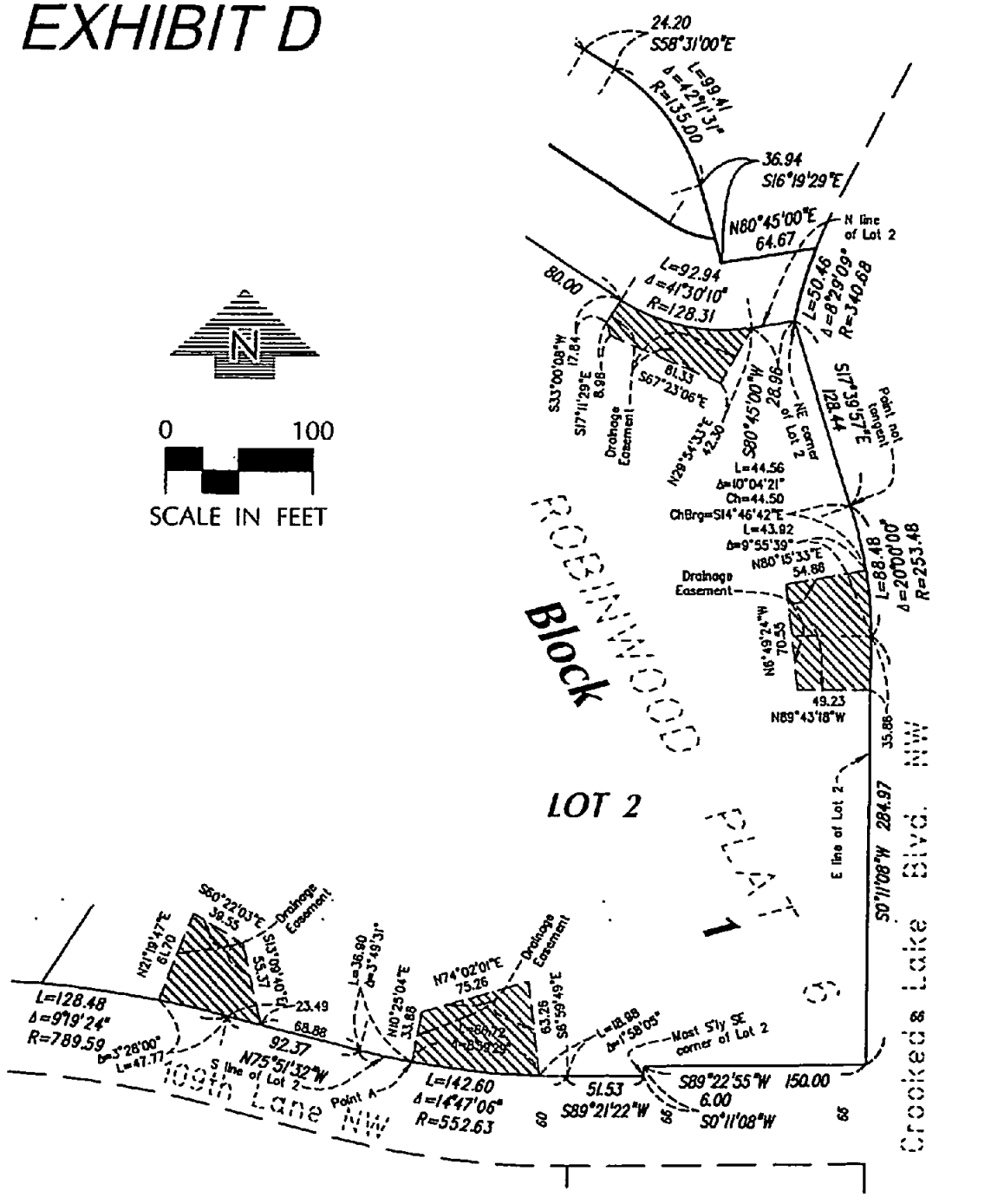
Henry D. Nelson
Henry D. Nelson, PLS
17255 — License No.
09/17/15 — Date

EXHIBIT D

(Legal Description of Additional Easement Areas)

EXHIBIT D



SHEET 2 OF 2 SHEETS

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ENVIRONMENTAL

Henry D. Nelson

Henry D. Nelson, PLS

17255 — License No.

09/17/15 — Date

EXHIBIT D

LOT 2 - Drainage Easements
September 17, 2015

Drainage easements shown on the plat of ROBINWOOD PLAT 6, over, under and across that part of Lot 2, Block 1, ROBINWOOD PLAT 6, Anoka County, Minnesota, further described as follows:

Commencing at the northeast corner of said Lot 2; thence on an assumed bearing South 80 degrees 45 minutes 00 seconds West, along the north line of said Lot 2, 28.96 feet to the point of beginning; thence westerly continuing along said north line of Lot 2, 92.94 feet, along a tangential curve, concave to the north, having a radius of 128.31 feet and a central angle of 41 degrees 30 minutes 10 seconds; thence South 33 degrees 00 minutes 08 seconds West, not tangent to said curve, 17.84 feet; thence South 17 degrees 11 minutes 29 seconds East 8.96 feet; thence South 67 degrees 23 minutes 06 seconds East 81.33 feet; thence North 29 degrees 54 minutes 33 seconds East 42.30 feet to said north line of Lot 2 and the point of beginning.

And

Commencing at said northeast corner of Lot 2; thence on an assumed bearing South 17 degrees 39 minutes 57 seconds East, along the east line of said Lot 2, 128.44 feet; thence southerly continuing along said east line of Lot 2, 44.56 feet, along a non-tangential curve, concave to the west, having a radius of 253.48 feet, a central angle of 10 degrees 04 minutes 21 seconds, a chord of 44.50 feet and a chord bearing of South 14 degrees 46 minutes 42 seconds East to the point of beginning; thence continuing southerly along said east line of Lot 2, 43.92 feet, along a compound curve, having a radius of 253.48 feet and a central angle of 09 degrees 55 minutes 39 seconds; thence continuing along said east line of Lot 2 South 00 degrees 11 minutes 08 seconds West, tangent to said curve, 35.86 feet; thence North 89 degrees 43 minutes 18 seconds West 49.23 feet; thence North 06 degrees 49 minutes 24 seconds West 70.55 feet; thence North 80 degrees 15 minutes 33 seconds East 54.86 feet to said east line of Lot 2 and the point of beginning.

And

Commencing at the most southerly southeast corner of said Lot 2; thence on an assumed bearing South 89 degrees 21 minutes 22 seconds West, along the south line of said Lot 2, 51.53 feet; thence westerly, continuing along said south line of Lot 2, 18.98 feet, along a tangential curve, concave to the north, having a radius of 552.63 feet and a central angle of 01 degree 58 minutes 05 seconds, to the point to beginning; thence continuing westerly along said south line of Lot 2, 86.72 feet, along a compound curve, having a radius of 552.63 feet and a central angle of 08 degrees 59 minutes 29 seconds to a point hereinafter referred to as Point A; thence North 10 degrees 25 minutes 04 seconds East, not tangent to said curve, 33.86 feet; thence North 74 degrees 02 minutes 01 second East 75.26 feet; thence South 06 degrees 59 minutes 49 seconds East 63.26 feet to said south line of Lot 2 and the point of beginning.

And

Commencing at aforesaid said Point A; thence westerly, along said south line of Lot 2, 36.90 feet, along a tangential curve, concave to the north, having a radius of 552.63 feet and a central angle of 03 degrees 49 minutes 31 seconds; thence continuing along said south line of Lot 2, North 75 degrees 51 minutes 32 seconds West, tangent to said curve, 68.88 feet to the point of beginning; thence continuing along said south line of Lot 2 North 75 degrees 51 minutes 32 seconds West 23.49 feet; thence westerly continuing along said south line of Lot 2, 47.77 feet, along a tangential curve, concave to the south, having a radius of 789.59 feet and a central angle of 03 degrees 28 minutes 00 seconds; thence North 21 degrees 19 minutes 47 seconds East, not tangent to said curve, 61.70 feet; thence South 60 degrees 22 minutes 03 seconds East 39.55 feet; thence South 13 degrees 09 minutes 40 seconds East 55.37 feet to said south line of Lot 2 and the point of beginning.

SHEET 1 OF 2 SHEETS

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LANDSCAPE ARCHITECTURE
ENVIRONMENTAL

Henry D. Nelson, PLS

17255 — License No.

09/17/15 — Date

ANOKA COUNTY MINNESOTA

Document No.: 2121006.016 ABSTRACT

I hereby certify that the within instrument was filed in this office for record on: 10/20/2015 1:31:00 PM

Fees/Taxes In the Amount of $46.00

JONELL M. SAWYER

Anoka County Property Tax Administrator/Recorder/Registrar of Titles

BAP, Deputy

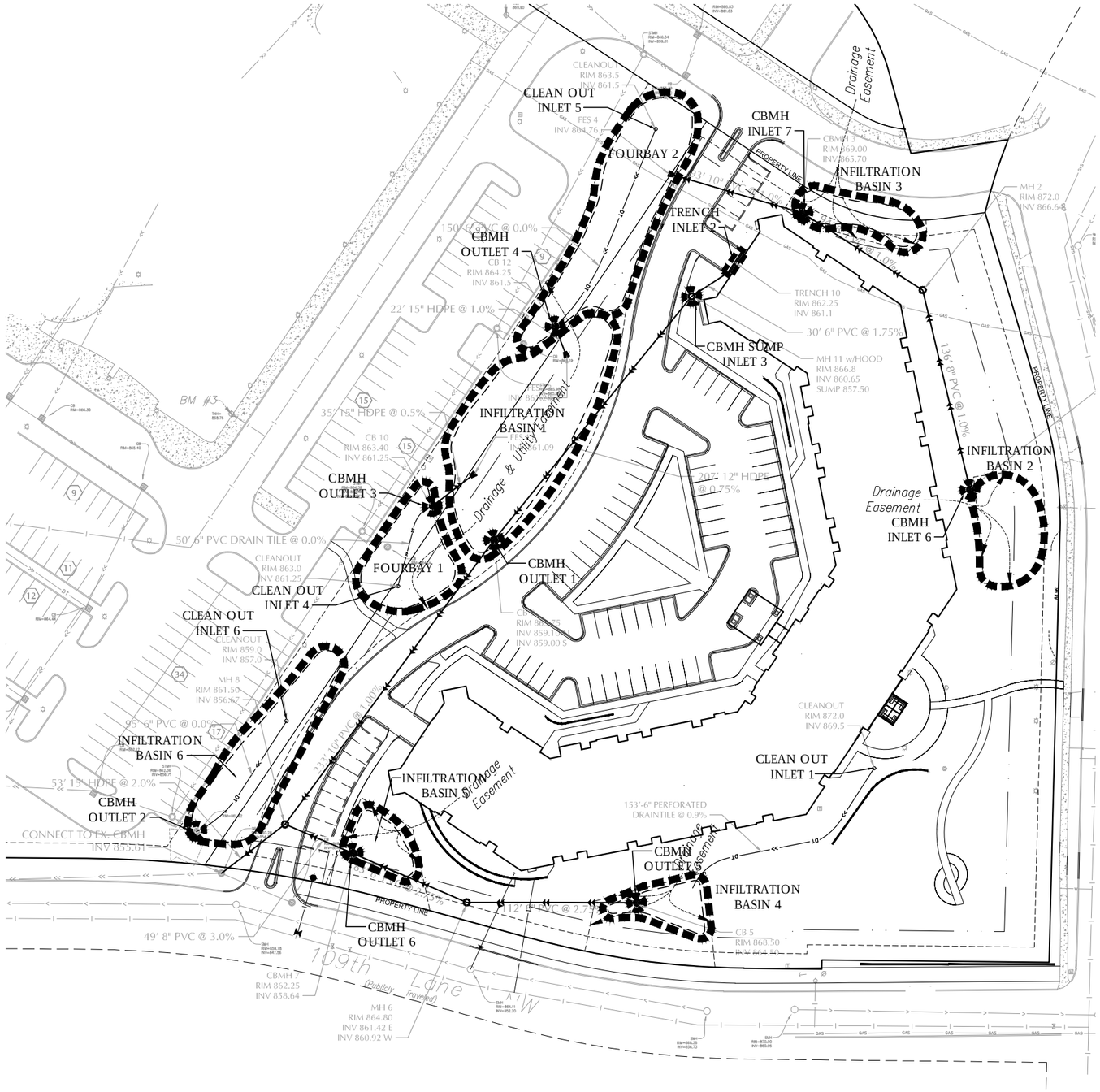
Record ID: 3642925

River North Apartments
Coon Rapids, MN

Stormwater Best Management Practice
Operations and Maintenance Plan

Infiltration System

1. BMP Location Map
2. Inspection Activities and Maintenance Activities
3. Inspection and Maintenance Log



CALL BEFORE YOU DIG!
Gopher State One Call
TWIN CITY AREA: 651-454-0002
TOLL FREE: 1-800-252-1166

N

0 30 60
SCALE IN FEET

WARNING:

THE CONTRACTOR SHALL BE RESPONSIBLE FOR CALLING FOR LOCATIONS OF ALL EXISTING UTILITIES. THEY SHALL COOPERATE WITH ALL UTILITY COMPANIES IN MAINTAINING THEIR SERVICE AND / OR RELOCATION OF LINES.

THE CONTRACTOR SHALL CONTACT GOPHER STATE ONE CALL AT 651-454-0002 AT LEAST 48 HOURS IN ADVANCE FOR THE LOCATIONS OF ALL UNDERGROUND WIRES, CABLES, CONDUITS, PIPES, MANHOLES, VALVES OR OTHER BURIED STRUCTURES BEFORE DIGGING. THE CONTRACTOR SHALL REPAIR OR REPLACE THE ABOVE WHEN DAMAGED DURING CONSTRUCTION AT NO COST TO THE OWNER.

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Maple Grove, MN 55369
763.424.5505
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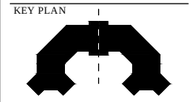
PROJECT TITLE

RIVER NORTH APARTMENTS

KEY PLAN



ISSUE #	DATE	DESCRIPTION
	06/16/2015	PERMIT SET
	07/09/2015	BID SET

NOT FOR CONSTRUCTION

CERTIFICATION

I hereby certify that this plan, specification or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.

Michael J. St. Martin - PE
24440 — 07-09-2015
License No. — Date

DATE	07/09/2015
DRAWN BY	Author
CHECKED BY	Checker
COMMISSION NUMBER	1393.83

SHEET TITLE

MAINTENANCE STRUCTURE PLAN

SHEET NUMBER

M4-1

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Inspection Activities-Infiltration System

Inspection Activity	Recommended Inspection Frequency	Outcomes/Actions
1. Visual inspection for debris and trash: inlets, sump manholes, basins and outlet structure	Monthly	Notify maintenance staff/Property Manager of need for debris removal
2. Visual inspection for erosion and undesirable vegetation around inlets, outlets, parking lot and basins	Monthly	Notify maintenance staff/Property Manager of need to repair erosion damage/stabilize
3. Sediment accumulation in sump manholes and basins	Every 6 months	Notify maintenance staff/Property Manager of need to remove sediment when depth exceeds 6 inches.
4. Inspect structural components of inlet structures and outlet structures	Every 6 months	Notify maintenance staff/Property Manager of any observed structural damage, loose or missing bolts, blockage, etc…
5. Inspect ground surface above and adjacent to the basins and around structures for sinkholes, rutting or other unusual depression areas	Monthly	Notify maintenance staff/Property Manager of the presence of sinkholes
6. Dewatering	After Large storm events	Notify maintenance staff/Property Manager of the system's failure to drain within 72 hours of a storm event

Maintenance Activities-Infiltration System

Maintenance Activity	Frequency	Procedure	Maintenance by
1. Trash and debris removal from sumps, inlets and outlets	As needed per inspection	Remove accumulated debris	Property owner or designated contractor
2. Erosion repair	As needed per inspection	Handwork	Property owner or designated contractor
3. Sediment removal from sumps and basin	Annually or as required when sediment exceeds 6 inches for sumps or basins	Remove accumulated sediment through access MH, preferably vacuum.	Property owner or designated contractor
4. Clean/Fix structural components	As needed per inspection	Dependent on type of damage; Repair or replace components per manufacturer's recommendations	Property owner or designated contractor
5. Repair of basins	As needed per inspection	Follow manufacturer's recommendation	Property owner or designated contractor
6. Dewatering	As needed per inspection	Pump water to downstream storm sewer per manufacturer's recommendation. Inspect for possible causes.	Property owner or designated contractor

Stormwater Inspection and Maintenance Log

River North Apartments	
Address:	
Property Manager:	Contact #:

Date	BMP ID#	BMP Description	Inspected by:	Issues	Maintenance Performed	Comments

Instructions: Record all inspections and maintenance for all treatment BMPs on this form. Use additional log sheets and/or attach extended comments or documentation as necessary. Submit a copy of the completed log with the annual independent inspectors' report to the municipality, and start a new log at that time.

- BMP ID# — Always use ID# from the Operation and Maintenance Manual.
- Inspected by — Note all inspections and maintenance on this form, including the required independent annual inspection.
- Cause for inspection — Note if the inspection is routine, pre-rainy-season, post-storm, annual, or in response to a noted problem or complaint.
- Exceptions noted — Note any condition that requires correction or indicates a need for maintenance.
- Comments and actions taken — Describe any maintenance done and need for follow-up.

Appendix H – Goose Management Plan

A CANADA GOOSE MANAGEMENT PLAN FOR THE CITY OF COON RAPIDS

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1.2 Visitation and Recreation Areas
1.3 Concentrated Habitat Use and Human Use Conflicts
1.3.1 Proximity Sensitive Areas
1.3.2 Water Quality Impacts
1.3.3 Water Quality Sampling

Canada Goose Management Recommendations
2.1 Goals and Measures
2.2 Geographic Scope
2.3 Management Techniques
2.3.1 Population Reduction
2.4 Public Information
2.5 Partner Relationships and Permit Requirements

Appendices:
- Appendix A- Coon Rapids Context and Land Cover Map
- Appendix B- Canada Goose Population Reduction & Management Zones
- Appendix C- Management Activity Tracking Form
- Appendix D: Canada Goose Nest Search Area Map

1. The City of Coon Rapids Context and Goose Management Concerns

1.1. Canada Goose Habitat Use and Population Estimate

The City of Coon Rapids encompasses approximately 14,950 acres of varied habitats. Urban development, various wetland types, floodplains, ponds, lakes, rivers, creeks, and developed recreational areas are the dominant land cover types within the boundaries (see Appendix A).

Canada geese use various areas of Coon Rapids. Nesting occurs in sod farms and natural open spaces found within and adjacent to the areas identified in Appendix A. Newly hatched broods tend to loaf and feed in the public open spaces and developed recreation areas. After their flightless period, Canada geese are more mobile and frequently move from wetland, floodplain, public open space and recreation areas to adjacent feeding areas in developed urban and recreational areas, and the City's natural and man-made stormwater ponding/drainage system.

During the late spring and early summer months, when adult geese pair and build nests, approximately 100 breeding pairs are typically present. In mid-summer, as many as 400 young and adult geese are found in these same areas, depending on reproductive success. Later in the summer, (late July through September) flocks exceeding 800 individuals are observed in area, due to birds flying into the vicinity from surrounding areas.

1.2 Visitation and Recreation Areas

Visitor and recreation areas in Coon Rapids that are impacted the most by geese include Bunker Hills Golf Course, Sand Creek Athletic Complex, Wintercrest Park, the Coon Rapids Soccer Complex, and the Coon Rapids Ice Center. These locations have surface water elements and vast areas of open space. The general public occupies all areas of the open space for active (organized athletic field usage and golf) and passive recreation (picnicking, pick-up games and hiking/trail use), and general recreational use (playgrounds, horse shoes, etc.).

1.3 Concentrated Habitat Use and Human Use Conflicts

All park and recreation spaces typical experience excessive goose excrement in many areas; including parking lots and picnic areas, along trails, on the athletic fields, and around the concession and bathroom areas. Geese often feed on and cause damage to the fairways and greens at the Bunker Hills Golf Course and also cause similar concerns on the athletic fields (baseball, football, soccer, etc.), typically at the most critical time of establishment and high usage during the athletic seasons. These excrement deposits are a nuisance and elicit numerous complaints by both employees and park users, especially from the various recreational groups that rely on the City's park spaces.

Rocket Turf sod farm is a large open area adjacent to Coon Creek that also experiences high numbers of geese and the negative impacts of them (fecal deposits, turf damage, aggressive behavior, etc.).

1.3.1 Proximity Sensitive areas

In addition to the public and recreational spaces listed above there are several schools, regional parks, and the Springbrook Nature Preserve located in close proximity that may experience additional geese if management resulted in dispersal of the goose population vs. removal. Additionally, if geese take flight during goose management activities it could lead to a scattering of the population to adjacent municipalities, town home association open spaces, or alternate local park and/or treatment pond locations; resulting in similar nuisances and complaints from area residents and business owners.

1.3.2 Water Quality Impacts

In addition to the damage and nuisance concerns on the green spaces and hard surfaces, creeks and treatment ponds are also experiencing E.coli loadings from wildlife and goose excrement (whether direct or via the storm sewer system). As storm water travels through the City collection system towards the Mississippi River significant concentrations could become problematic and have already impacted many creeks in the City and Coon Creek Watershed District (Coon Creek, Pleasure Creek, Sand Creek, and Springbrook Creek). Crooked Lake is also a popular recreational area for fishing and water sports, and while there is no active beach component people do use it for swimming purposes.

Coon Rapids works cooperatively with the Coon Creek Watershed District (CCWD) on all water quality issues, and has actively participated in Minnesota Pollution Control Agency (MPCA) Watershed Restoration and Protection Strategy (WRAP) and Total Maximum Daily Load (TMDL) studies for surface waters within the City limits. These studies analyzed and reviewed impairments (including E.coli) of local waterbodies, and how E.coli from wildlife (including geese) attributed to the associated impairments in the waterbodies described above. Animal unit estimates were made for both deer and waterfowl from previous population surveys conducted by the Minnesota Department of Natural Resources (DNR) and the United States Fish and Wildlife Service (USFWS). Deer and waterfowl observations were recorded during roadside animal counts; however, the numbers of observations were less conservative than estimates derived from population studies done by DNR and USFWS. The percentage of total E. coli made available by all wildlife ranged from a low of 7% in Coon Creek to a high of 10% in Springbrook Creek. Of all the animals considered in the wildlife category geese accounted for approximately 40% of the E.coli loading in the impaired waterbodies. Wildlife contributions are anticipated to fluctuate during early spring and fall as a result of migration patterns. Expansive sod fields, and multiple open recreational areas inside the CCWD are ideal resting locations for migrating waterfowl.

Based upon these studies the City of Coon Rapids and the CCWD will be preparing and implementing Waste Load Allocations (WLA). The agreed upon approach to meeting the WLA will be a cooperative approach with all member cities, whereby mitigation and improvements will be made in the most cost effective location within the District vs. each city being responsible for their own municipal boundaries. The implementation and the outcomes will be tracked by the CCWD and reviewed by the MPCA. The report and its goals can be viewed at https://www.pca.state.mn.us/sites/default/files/wq-iw8-44e.pdf.

1.3.3 Water Quality Sampling

All water quality sampling in Coon Rapids to date has been conducted by the Anoka Conservation District and/or the CCWD. All sampling is conducted on regular intervals and reviewed for elevated levels that could be concerning to human health and welfare. The protocols for testing (frequency, locations, etc.) can be found in the report at the link above.

2. Canada Goose Management Recommendations

2.1 Goals and Measures

Canada goose management goals for Coon Rapids have historically been conducted by trap and removal practices of adult birds and goslings in the summer (before goslings take flight). Coon Rapids would, however, like to keep all possible options available; including recording and tracking, habitat modifications, redistribution, egg removal, trap and process, and hunting. Management activities should be flexible and allow for the use of the best option available based upon the conditions present at the

time of permitting and past management practices. Coon Rapids would like to achieve a localized reduction in nesting and flightless geese, and has adopted the ongoing goal of no more than 75 breeding pairs within the City limits. The ongoing goal for reducing loafing on and near Bunker Hills Golf Course, Sand Creek Athletic Complex, Wintercrest Park, the Coon Rapids Soccer Complex, and the Coon Rapids Ice Center area(s) is to prevent all significant use of the open green space and hard surface areas utilized for recreational and public use purposes by Canada geese during the summer months (May through September).

2.2 Geographic Scope

The population reduction and concentrated use reduction goals are primarily focused on 5 distinct areas, but should also be considered in all areas within the City limits as conditions dictate. The population reduction area outlined in Appendix B represents the areas adjacent to Bunker Hills Golf Course, Sand Creek Athletic Complex, Wintercrest Park, the Coon Rapids Soccer Complex, and the Coon Rapids Ice Center that would be expected to produce broods that would subsequently move to these sites after hatching. Due to the historically observed quantity of geese and proximity of impaired surface waters, population reduction activities may also be focused near the Rocket Turf sod farm or other similar environmentally susceptible areas not within the public domain (private properties).

2.3 Management Techniques

The proposed techniques for Canada goose management at the City of Coon Rapids are varied in type and geographic area. Meeting the goals as outlined will require the implementation of a broad set of techniques. Any one management technique used alone will likely be ineffective for any significant length of time, since tolerance and habituation will likely occur. As a result we propose to use an integrated management approach, with a number of various techniques applied in varying ways, times and locations.

Recording/Tracking Management Activities for Future Adjustments/Improvements

All management activities will be documented on the Management Activity Tracking Form in Appendix C and submitted to the Area Wildlife Manager by September 10th of each year. Permitee must keep a copy of this on file to help facilitate future management activities that might need adjustments or improvements.

Habitat Modification

Various private properties and/or businesses regularly report goose damage and fecal deposits on or adjacent to their property. Coon Rapids would like to be able to adjust management activities to address such verified complaints within the City limits on an as needed basis, as documented by the previous record and tracking activities. Options to consider for habitat modification will be tailored to meet the unique characteristics and concerns of the location(s); including increased height of vegetation, vegetation buffer distance, planting or promoting shrub or natural willow colonization, landscape plantings, or by ceasing to mow certain areas. Any ideas to be considered would be discussed with appropriate DNR staff.

Temporary Physical Barriers

The use of temporary electric, snow fence, or woven wire fencing that limits Canada goose access to Crooked Lake, public open spaces, stormwater treatment ponds, and other impaired waterbodies during the spring, summer, and/or fall season will be considered. Any fencing that is installed would need to be removed and re-established in a manner that prevents geese from entering the fenced off area from the water or from the adjacent upland area in a more permanent fashion.

Permanent Physical Barriers
The use of permanent woven wire fencing that limits Canada goose access to Crooked Lake, public open spaces, stormwater treatment ponds, and other impaired waterbodies during the spring, summer, and/or fall season may be considered. Fencing would be installed and established in a manner that prevents geese from entering the fenced off area from the water or from the adjacent upland area. Routine inspection of the fence will be done on a monthly basis. Fencing could be used in conjunction with vegetation barriers, or the use of vegetation to obscure the fence. The area DNR Wildlife Office may be contacted for further information and assistance.

Redistribution Techniques
Preventing Canada geese from loafing on the beach, developed recreational and public spaces, and adjacent areas will be an ongoing activity during the summer months. We anticipate using a number of techniques to redistribute the geese to other areas within the park. Additionally, we plan to use multiple techniques at varied times and with subtle shifts in methods so that the geese do not become habituated to any one technique or get accustomed to a particular schedule of activity. All of the methods will have some degree of impact on the park visitor experience, and mitigating this disruption will be a priority. Some redistribution techniques require specific training, personal protective equipment and adherence to policies and procedures for their safe use. While some of these visitor impacts and safety considerations are mentioned alongside each technique, a thorough examination of these and other issues should be conducted prior to employing a particular redistribution technique. Depending on the methods used, notification will be provided via location specific signage, direct mailings to adjacent properties, and/or a posting to the City website.

- Human and mechanical disruption
    - Disturbing loafing and feeding Canada geese by individuals on foot so geese can be moved from the area of concern to an adjacent area or off the property.
- Predator decoys
    - The use of 2D or 3D coyote/dog decoys on the athletic fields or open green space to discourage use by geese is a management option. Decoys that are placed intermittently and exhibit periodic motion due to wind gusts can be effective at deterring geese.

Excrement Removal
Sporadic removal of goose excrement from public open spaces may be necessary during the late spring and summer months. The primary goal is to effectively redistribute geese away from these areas, with the goal being a reduction of feces in these areas. However, it may be necessary to remove incidental goose feces from the athletic fields, trails, and/or open green space areas on an as-needed basis.

2.3.1 Population Reduction

Nesting Management
Annual nest search and treatment should be conducted in localized areas. The areas to be searched and treated include suitable nesting habitat immediately adjacent to Bunker Hills Golf Course, Sand Creek Athletic Complex, Wintercrest Park, the Coon Rapids Soccer Complex, the Coon Rapids Ice Center, and

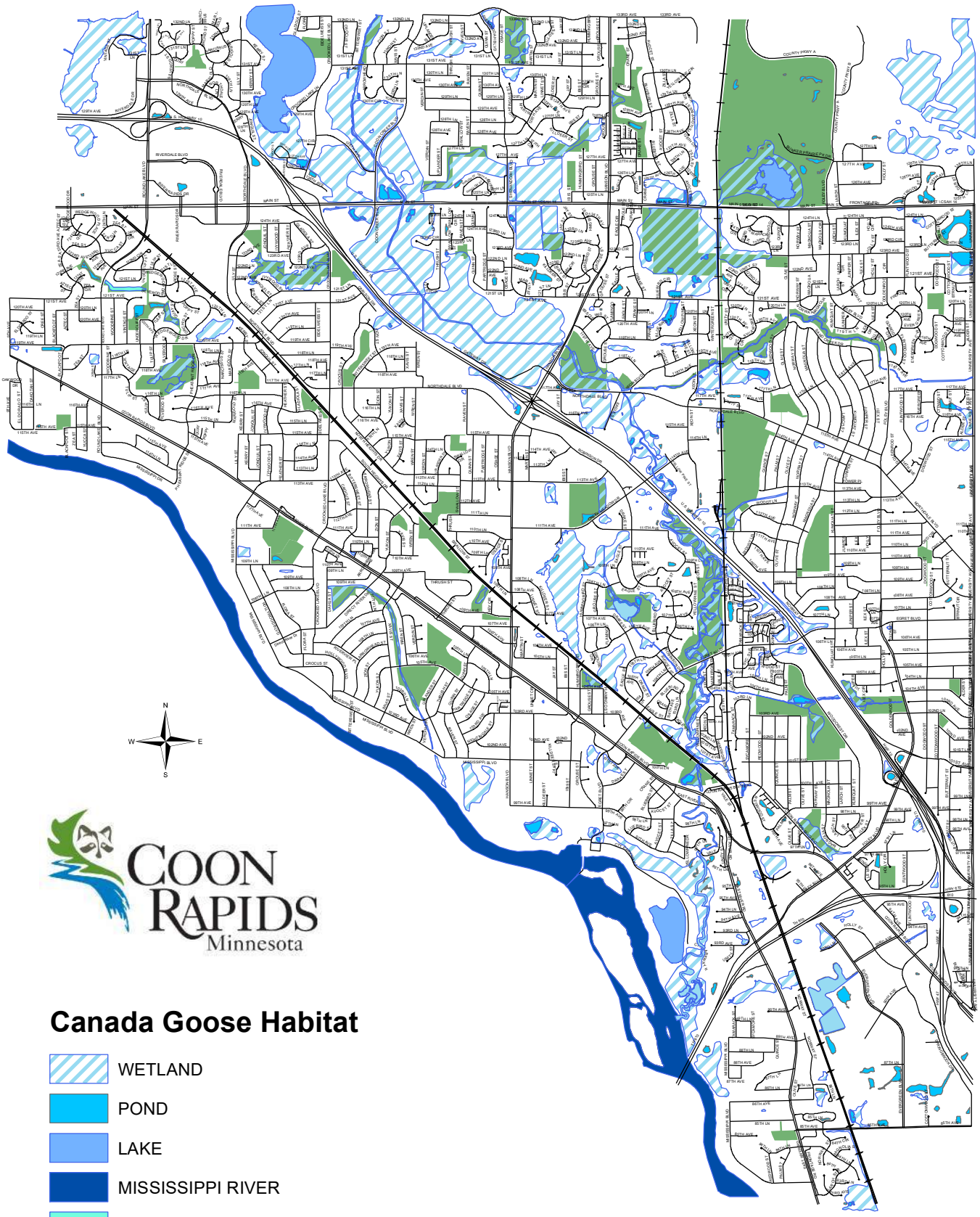
Rocket Turf sod farm see Appendix D. Nest searches and treatment protocol should follow methods prescribed by the required USFWS and MN-DNR permits. Permit conditions will be followed and reporting will be conducted on an annual basis. To facilitate future nest searches in large areas, GPS coordinates of all Canada goose nests should be obtained since nest site fidelity is strong and the same nest sites are likely to be used in subsequent years.

Trapping and removal (during flightless period)
Capture and removal of flightless, mixed age groups of geese during the summer flightless period is an effective way to reduce the localized population of geese during the peak beach and recreational use time (June-July). The use of contractors or trained staff (if permitted) to capture, remove and dispose of geese from the City of Coon Rapids is a management option. Such removal would need to be detailed as part of a removal permit application through the DNR Fish & Wildlife Division, and goose removal and disposition would need to be conducted according to the permit conditions.

Goose harvest
Selective and occasional lethal removal of individual geese is an effective complement to pyrotechnic shells and other redistribution or hazing methods. Lethal removal of geese by means of shooting geese on an occasional basis is a management option. Such removal would need to be detailed as part of a removal permit application through the DNR Fish & Wildlife Division, and goose removal and disposition would need to be conducted according to the specific permit conditions. Such conditions would include the number of individuals and the specific information about the methods to be used in their harvest and disposition.

2.4 Public Information
Informing the public and park users about Canada goose management activities is an integral part of a successful goose management plan. Information and signage detailing some of the methods being used will be developed to provide users with background information. Signage or posted notices may be developed for certain activities. Additionally, individual users will be notified of pending activities that might be considered alarming had they not received prior notice and explanation. All persons performing management activities should provide users with accurate and thorough information about our goose management objectives, and also inform users how the particular management activity being conducted fits into the larger Canada goose management plan.

2.5 Partner Relationships and Permit Requirements
Coordination with all appropriate entities; including (but not limited to) residents, local law enforcement, lake area association(s), the MPCA, and the CCWD will be conducted for population monitoring and permitting, and all goose management activities. Compliance with all DNR permitting requirements; including annual reporting, and notification and involvement of the Area Wildlife Manager will be strictly adhered to.



COON RAPIDS
Minnesota

Canada Goose Habitat

- WETLAND
- POND
- LAKE
- MISSISSIPPI RIVER
- CREEK
- DEVELOPED RECREATION

Date: 12/28/2016

COON RAPIDS
Minnesota

Canada Goose Management

- GOOSE MANAGEMENT SITES
- WETLAND
- POND
- LAKE
- MISSISSIPPI RIVER
- CREEK
- DEVELOPED RECREATION

Date: 12/28/2016

APPENDIX C: MANAGEMENT ACTIVITY DOCUMENTATION FORM

DATE	Time	Name	Activity/Method	Location	Notes

COON RAPIDS
Minnesota

Canada Goose Management

- GOOSE NEST SEARCH SITES
- WETLAND
- POND
- LAKE
- MISSISSIPPI RIVER
- CREEK
- DEVELOPED RECREATION

Date: 12/28/2016

Appendix I – Coon Creek Watershed District Rules

Coon Creek Watershed District

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1. STATUTORY AUTHORIZATION

1.1 Authority

These rules are adopted pursuant to:
Minnesota Statutes Section 103B.201
Minnesota Statutes Section 103B.231
Minnesota Statutes Section 103D.201
Minnesota Statutes Section 103D.335
Minnesota Statutes Section 103D.341

2. FINDINGS

The Coon Creek Watershed District Board of Managers finds that:

1. The watershed's environment is determined by a set of existing natural resources and processes.
2. The primary determinant for management within the watershed is the hydrologic system.
3. The hydrologic cycle is the unifying factor of the natural resource components identified above.
4. Ditches and other watercourses, wetlands and other water bodies, floodplains and groundwater recharge are all integral parts of the hydrologic system of the watershed.
5. Water quality, soils, vegetation and wildlife are related in that they are affected by or affect the hydrologic system.
6. Land development projects and associated increases in impervious cover alter the hydrologic response of local watersheds and can increase stormwater runoff rates and volumes, flooding, stream channel erosion, and sediment transport and deposition.
7. This stormwater runoff contributes to increased quantities of water-borne pollutants.
8. Stormwater runoff, soil erosion and nonpoint source pollution can be controlled and minimized through the regulation of stormwater runoff from development sites through a land management and development approach that minimizes impact on water resources.

The Coon Creek Watershed District has determined that the regulation of stormwater runoff discharges from land development projects and other construction activities is essential to control and minimize increases in stormwater runoff rates and volumes, soil erosion, stream channel erosion, and nonpoint source pollution associated with stormwater runoff, and that regulation is in the public interest and will prevent threats to public health and safety.

Therefore, the Coon Creek Watershed District (District) establishes this set of water quality and quantity policies applicable to all surface waters to provide reasonable guidance for the regulation and management of water for the purpose of protecting local water resources from degradation.

3. PURPOSE AND INTENT

3.1 Purpose

The Purpose of these rules is to enable the District to evaluate, permit and monitor activities affecting the water and related land resources of the District in an orderly and informed fashion.

3.2 Intent

The intent of these rules is to:

1. Manage the watershed's water and related land resources so they remain clean.
2. Prevent public health and safety hazards.
3. Prevent property damage.
4. Promote beneficial uses.
5. Reduce the discharge of pollutants from stormwater to the maximum extent practicable (MEP)
6. Identify waterways, floodplains and wetlands in which land disturbance activity should be restricted, and, in appropriate cases, prohibited.
7. Give due consideration to alternatives and creative solutions in planning and using the water and related land resources of the watershed to encourage and pursue low impact development.

Where no feasible and prudent alternative exists, the use shall be accomplished in a manner which assures the protection and safety of persons and property, public and private and which as nearly as possible:

- Preserves and protects the natural environment; and
- Will not result in the degradation of waterways, floodplains and wetlands

4. SCOPE AND APPLICABILITY

4.1 Scope

In general, a permit from the Watershed District shall be required for activities affecting the course, current, cross section, quantity, or quality of surface water, groundwater or related land resource features within the Coon Creek Watershed. This includes, but is not limited to drainage, conveyance, retention or detention of water, including lakes and wetlands.

4.2 Applicability

The District will require a permit application for all land disturbing activities involving any of the following:

1. Any work within or adjacent to a Public ditch within the Watershed District.
2. Any work in or adjacent to wetlands, lakes or water courses
3. One or more cumulative acres of land disturbance
4. The lands and waters that have been, or may be covered by the regional flood.
5. Activities upstream from land that is dependent upon removal of water from the soil profile for their continued use (Drainage Sensitive Land Uses)
6. Appropriation and use of groundwater
7. High water table, outwash and organic soils
8. High infiltration soils
9. Highly erodable soils
10. Excavation or filling or a combination of excavation and filling of sand or other excavation or fill material including the laying, repairing, replacing or enlarging of a culvert or an underground pipe or facility where it crosses a public ditch or waters of the state.
11. Endangered, Threatened or Special concern species, elements or communities

5. GENERAL POLICY and PROCEDURAL REQUIREMENTS

5.1 Permit Required

No land owner or land operator shall receive any of the building; grading or other land development permits required for land disturbance activities without first meeting the requirements of this rule prior to commencing the proposed activity.

5.2 Treatment to the Maximum Extent Practicable

The intent and requirements of this rule to reduce the discharge of pollutants from stormwater must be pursued to the maximum extent practicable (MEP).

A proposed plan/ permit application has reduced the discharge of pollutants to the MEP when the Board finds that the application has made a good faith effort in meeting all of the following requirements:

1. The proposed plan is capable of being done from an engineering point of view.
2. The proposed plan is in accordance with accepted engineering standards and practices.
3. The proposed plan is consistent with reasonable requirements of the public health safety and welfare.
4. The proposed plan is environmentally preferred based on a review of social, economic and environmental impacts, and

5. The proposed plan creates no unusual problems.

5.3 Pre-Application Meeting

Prior to applying for approval of a permit required under these rules, an applicant may have the application reviewed by the District staff at a pre-application meeting

5.4 Application

Any person undertaking any activity for which a permit is required by these rules shall, before commencing work, submit to the District a permit application, engineering design data and such other required information so that the District may determine whether the proposed activity is in compliance with the criteria established by these rules.

5.5 Submittals

All applications for a permit shall include the following information, unless the submission requirements are modified or waived:

1. Applicant's name, address and phone number; and his/her interest in the property (e.g. owner/developer/consultant)
2. The owners name and address, if different from the applicant.
3. Project Name, address and city
4. Section in which the project is located.
5. Brief description of the proposed project purpose.
6. A $10.00 permit application fee
7. A site plan showing:
    a. Property lines
    b. Delineation of lands in which the applicant has an ownership or legal interest
    c. Existing and proposed elevation contours including the existing runout elevations and flow capacity of all water resource features
8. The required exhibits for addressing each water resources identified in Section 9 of these rules

Permit application forms may be obtained from the District office or at the District's Internet Web site.

5.6 Timing of Applications and Board Meetings

Complete applications shall be submitted to the District's office by noon, at least twelve and one half (12 ½) calendar days prior to the regularly scheduled Board meeting date.

The Board of Managers holds regularly scheduled meetings on the second and fourth Monday of each month.

5.7 Authorization to Enter and Inspect Property

The application for a permit shall be deemed authorization for District staff to enter and inspect the property that is subject to application.

6.0 FEES AND SECURITY ESCROWS

6.1 Policy

The District finds that it is in the public interest to conserve the District's water resources by assuring compliance with its rules. Requiring applicants to pay fees for permit administration, review, project inspection and to provide a bond or other surety to secure performance of permit conditions, is an effective way to assure rule compliance and water resource conservation.

The Board of Managers by resolution will establish a schedule of fees and performance sureties that may be amended from time to time to reflect the costs of providing such services or covering potential liabilities to the District. The District will maintain an accounting of all deposits made under this rule. No interest will be paid to applicants for funds held in deposit.

6.2 Fees

The District will charge the following fees:

1. Application Fees: $10.00 fee charged for processing permit applications

2. Review and Inspection Fee: Fee charged for review and inspection work performed by District staff on permit applications. Fee will be reviewed and established by the Board of Managers annually.

6.3 Government Agencies Exempt from Fees

The above fees will not be charged to the federal government, the State of Minnesota or a political subdivision of the State of Minnesota.

6.4 Escrows

The District will collect the following escrows from the applicant before a permit is issued. Escrow amounts will be reviewed and established annually by the Board of Managers.

1. Performance Escrow: Escrow collected to ensure performance of permit requirements.
2. Wetland Escrow: Escrow collected to ensure replacement of mitigated wetlands.

7.0 PERMIT APPLICATION REVIEW PROCEDURE

7.1 Policy

Permit applications meeting the requirements of Section 5 shall be submitted by the Watershed District Staff to the Board of Managers for public review in accordance with the standards of Section 9

7.2 Determination of Whether the

Within 15 days following receipt of any permit application, the District Administrator shall determine whether such application

Application is Complete

is complete. An application is complete if:

1. All of the information required on the permit application and by these rules has been submitted.
2. The required information is free of significant material errors or omissions.
3. The applicant or the applicant's agent has made a good faith effort to comply with the rules, regulations and standards of the District.

If the District Administrator determines that the application is not complete, the Administrator or Engineer shall notify the applicant in writing via a notice of application status specifying the deficiencies of the application. The Board, Administrator and staff may take no further action on the application until the deficiencies are remedied.

7.3 Remedy of Deficiencies

Following receipt of the notice of application deficiencies from the administrator, the applicant shall have 60 days to submit the information requested by the District. The failure of the applicant to submit such information shall be deemed as a withdrawal of the permit application.

7.4 Timing of Board Review and Board Actions

All complete permit applications shall be reviewed and acted upon by the Board of Managers at its next regularly scheduled meeting.

The Board may approve, deny, or table an application. The Board of Managers will review applications that have been tabled after all stipulations have been addressed, unless a significant material change to the application is proposed. If a significant material change has occurred to the proposed project and plans, the application may be forwarded to the Board for review.

7.5 Stipulations and Variances

The Board may also make the permit conditional on specific stipulations, or grant variances to the provisions of the District rules, regulations and policies.

- Stipulations are intended to be site-specific requirements for meeting the policies and goals of the District.
- Variances are intended to provide relief where strict compliance with the rules, regulations and policies of the District create an undue hardship.

7.6 Staff Report-Findings and Conclusions

Prior to the public review, the staff shall file a staff report with the Board of Managers and make a copy available to the applicant or applicant's contact. The staff report shall include findings and conclusions of the application's consistency with the

District's approval standards (Section 9).

7.7 Presentation of Information

At the public review of the permit application, the District staff shall present information concerning pertinent application considerations and the standards set out in the District's Comprehensive Management Plan, rules and regulations, and associated policy and guidance documents.

7.8 Record of Review

The District Administrator shall ensure that the proceedings of the review are recorded. A copy of the review record may be requested of any person upon application to the District and payment of a fee for transcription, or on order of the Board of Managers. The record shall consist of:

1. The portion of the minutes approved by the Board of Managers addressing the application;
2. All applications, exhibits and papers submitted;
3. All staff reports prepared.

7.9 Notice of Application Status

Pursuant to determination of an application's incompleteness (section 7.2) or Board action (section 7.4) the applicant shall be notified of the status of his or her permit application and the requirements for further action or review.

The Notice of Permit Application Status shall contain:

1. The name and address of the owner or applicant
2. The address of the owner or applicant as it appears on the permit application
3. The Permit Application Number (PAN) given to the project by the District
4. A statement specifying the action taken by the Board of Managers (Approve, Tabled, Denied) and the date on which that action was taken
5. A listing of the issues or concerns that led to the Board action
6. A statement specifying the information, material and or actions which the applicant must provide to the District to proceed with the permit review and potentially obtain a permit

8.0 REQUIREMENTS

8.1 Bridges and Culverts

All bridges and culverts are the responsibility of the owner

No bridge or culvert for the disposition of storm water shall be constructed, reconstructed or laid without approval of the Board as to its location, size and elevation and a permit for the installation thereof from the Board. Plans and specifications for

all proposed bridges and culverts shall be submitted to the managers when an application for a permit is filed.

Water inlets, culvert openings and bridge approaches shall have adequate shoulder and bank protection in order to minimize soil erosion.

8.2 Buffer Strips

Buffer strips are strongly encouraged and may be required of:

1. All proposed development except for that development which meets waiver or variance criteria
2. All surface mining operations
3. All agricultural operations constructing new ditches
4. All parcels of land, structures, and activities that are causing or contributing to:
   a. Pollution, including nonpoint source pollution, of the waters of the District
   b. Erosion or sedimentation of stream channels
   c. Degradation of aquatic or riparian habitat

The required width for all natural buffers (i.e., the base width) shall be a minimum of 15 feet, with the requirement to expand the buffer depending on the character of the water resource

Water resource character	Total Buffer Strip Width
Type 3, 4, or 5 wetlands Lakes Ditches or watercourses of stream order 3,4,5	25 Feet
Type 1, 2, 6, 7 or 8 wetlands Ditches or watercourses of stream order 1, 2.	15 Feet

When buffer strips are required, a buffer plan shall be submitted in conjunction with the required grading plan, and the natural buffer should be clearly delineated on the final grading plan.

Permanent boundary markers, in the form of signage approved by the Coon Creek Watershed District, should be installed prior to final approval of the required clearing and grading plan.

8.3 Infiltration

At a minimum, recharge from the one-inch storm from impervious surfaces shall be infiltrated

Infiltration shall not be allowed within a one-year travel zone of a public well as determined by the municipal well-head protection plan.

Unless determined by the District to be exempt or granted a waiver, the following shall be addressed for stormwater management at all sites:

1. Stormwater volume management practices shall be the equivalent of infiltrating the first inch of precipitation
2. These practices should seek to utilize pervious areas for stormwater treatment and to infiltrate stormwater runoff from driveways, sidewalks, rooftops, parking lots and landscaped areas to the maximum extent practical to provide treatment for both water quantity and quality.

Soil Series	**Soil Texture**	**Hydrologic Soil Group**	**Infiltration Rate (in/hr)**
*Alluvial	Loamy fine sand	D	<0.2
*Anoka	Loamy fine sand	A	0.8 / 1.63
*Becker	Very fine sandy loam	B	0.3 / 0.6
*Blomford	Loamy fine sand	D/B	<0.2 / 0.6
*Braham	Loamy fine sand	B	0.3 / 0.6
*Cathro	Muck (Sapric)	D/A	<0.2 / 1.63
*Dickman	Sandy loam	B	0.3 / 0.6
Duelm	Loamy coarse sand	A	0.8 / 1.63
*Hayden	Fine sandy loam	B	0.3 / 0.6
Hubbard	Coarse sand	A	0.8 / 1.63
Isan	Sandy loam	D/B	<0.2 / 0.6
Isanti	Fine sandy loam	D/B	<0.2 / 0.6
*Kratka	Loamy fine sand	D/B	<0.2 / 0.6
Lino	Loamy fine sand	A	0.8 / 1.63
Markey	Muck (Sapric)	D/A	<0.2 / 1.63
Marsh		D/A	<0.2 / 1.63
*Meehan	Sand	A	0.8 / 1.63
Millerville	Muck (Hemic)	D/A	<0.2 / 1.63
Nymore	Loamy sand	A	1.63
Rifle	Muck (Hemic)	D/A	<0.2 / 1.63
*Rondeau	Muck (Sapric)	D/A	<0.2 / 1.63
Sartell	Fine sand	A	0.8 / 1.63
Seelyeville	Muck (Sapric)	D/A	<0.2 / 1.63
Soderville	Fine sand	A	0.8 / 1.63
Zimmerman	Fine sand	A	0.8 / 1.63

NOTE:* Denotes a soil that is found infrequently.

8.4 Lake & Wetland Management

To provide for coordinated management of surface waters a developer of land shall submit to the Storm Water Pollution Prevention Plan (SWPPP) which is in conformity with Municipal, District and State Standards.

Permits for improvements by riparian owners of the beds, banks and shores of lakes, streams, ditches and wetlands is required before such work may be done.

8.5 Nondegradation

It is the policy of the District to implement the nondegradation requirements of the NPDES program using 1988 as the baseline year

If regulatory, hydrologic, topographic or landscape conditions (e.g. drainage sensitive uses, TMDL or nondegradation requirements) warrant greater control than that provided by the minimum control requirements, the District reserves the right to impose additional requirements deemed necessary to control the volume, timing and rate of runoff.

For new development, structural stormwater treatment practices shall be designed to remove **80%** of the average annual post development total suspended solids (TSS) unless otherwise specified by a nondegradation requirement.

8.6 Pipeline and Utility Crossings

All plans for pipelines shall be submitted to the District for its comment, review and recommendations as to the effect of the construction on the waters of the district and the adequacy of erosion and sediment control during and after construction.

All placement or replacement of pipelines or utility lines that cross ditches or waterways of the District shall be placed so that the top elevation is at least 4 feet below the approved low elevation of ditch or waterway in order to avoid or minimize damage to the line during maintenance or repair of the ditch.

8.7 Pretreatment

All stormwater treatment practices shall have an acceptable form of water quality pretreatment, in accordance with the pretreatment requirements found in the current Minnesota stormwater design manual.

All stormwater runoff generated from new development shall not discharge untreated stormwater directly into jurisdictional wetlands or local water bodies without adequate treatment. Where such discharges are proposed, the impact proposed on wetland function shall be assessed using a method acceptable to

the District. In no case shall the impact on wetland function or value be allowed to degrade the current function as identified in the District's Comprehensive Water Management Plan.

All discharges into wetlands and waterbodies must be pretreated by an appropriate best management practice.

Waterbody	**Hydrology**	**BMP**
1st 2nd order stream		Sedimentation basin or equivalent designed for 0.5 inch
Type 1,2 6,7 wetland	Temporarily flooded Saturated Seasonally flooded or saturated	Sedimentation basin designed for 0.5 inch
3rd, 4th 5th order stream		NURP/Walker Pond or equivalent sized for 2.5 inch rainfall
Type 3,4,5 wetland or Lake	Permanently flooded Artificially flooded	NURP/Walker Pond or equivalent sized for 2.5 inch rainfall

8.8 Rate Control

Proposed projects that affect the conveyance capacity of channels or crossings shall document that equivalent hydraulic capacity is provided. When hydraulic equivalents are not desired or feasible for the proposed project, the District will review hydraulic information prepared by the sponsor which details easement acquisition or permission for increased flood levels (upstream or downstream of the project) emergency overflow elevations, and assessment of the adequacy of the outlet as generally described in M.S. 103E

All site designs shall establish stormwater management practices to control the peak flow rates of stormwater discharge associated with the 1, 10, 25 and 100 year design storms and reduce the generation of stormwater.

Stormwater plans must ensure that discharge rates from the proposal are controlled such that within Drainage-Sensitive Uses Areas the post-development 100-year peak flow rate shall not exceed predevelopment 25-year peak flow rate (by subwatershed)

In Non-Drainage Sensitive Uses Areas the post-development 100-year peak flow rate shall not exceed predevelopment 100-year peak flow rate (by subwatershed)

8.9 Volume Control

All stormwater management practices will be designed so that the specific storm frequency storage volumes (e.g. recharge, water quality, channel protection, 10 year and 100 year) as identified in the current Minnesota Pollution Control Agency Stormwater Design Manual are met, unless the District grants the applicant a waiver or the applicant is exempt from such requirements.

Stormwater volume management practices shall be the equivalent of infiltrating the first inch of precipitation. These practices should seek to utilize pervious areas for stormwater treatment and to infiltrate stormwater runoff from driveways, sidewalks, rooftops, parking lots and landscaped areas to the maximum extent practical to provide treatment for both water quantity and quality.

In addition, if regulatory, hydrologic, topographic or landscape conditions (e.g. drainage sensitive uses, TMDL or nondegradation requirements) warrant greater control than that provided by the minimum control requirements, the District reserves the right to impose additional requirements deemed necessary to control the volume, timing and rate of runoff.

9.0 APPROVAL STANDARDS

All permit applicants must comply with the applicable standards set forth in this section:

9.1 DRAINAGE

Policy

It is the policy of the District to:

1. Maintain ditch and conveyance systems within the watershed to fulfill the role identified within the District's Comprehensive Management Plan and the drainage law.
2. Promote, preserve and enhance the water and related land resources of the Coon Creek Watershed.
3. Protect the water and related land resources of the Coon Creek Watershed from the adverse effects resulting from poor or incompatible land use activities.
4. Encourage compatibility between land use activities upstream and down stream.
5. Regulate land-disturbing activities affecting the course, current, cross section and quality of ditches and water courses.
6. Regulate improvements by riparian property owners of the bed, banks, and shores of lakes, streams, and wetlands for preservation and beneficial use.
7. Protect stream channels from degradation.
8. To regulate crossings of ditches and watercourses in the District to maintain channel profile stability and conveyance capacity.

Scope and Applicability

This policy, regulation and criteria apply to:

1. All public and private ditches within the Watershed District.

Regulation

This permit requirement is in addition to any procedures that may be required for public ditches under Minnesota Statutes 103E or other ditch law.

No person shall commence a land disturbing activity in or adjacent to a ditch or conveyance without:

1. Submitting plans for work within and/or adjacent to public or private ditches, or water courses <u>and</u>
2. Obtaining a permit from the District.

No person shall construct, improve, repair or alter the hydraulic characteristics of a bridge profile control or culvert structure on a creek, public ditch or major watercourse in the District, without

first obtaining a permit from the District.

Every person owning property through which a ditch or watercourse passes, or such person's lessee, shall keep and maintain that part of the ditch or watercourse within the property, free of trash, debris, excessive vegetation, and other obstacles that would pollute, contaminate, obstruct or significantly retard the flow of water, or access for maintenance or repair of the watercourse.

In addition, the owner or lessee shall maintain existing privately owned structures within or adjacent to a watercourse, so that such structures will not become a hazard to the use, function, or physical integrity of the watercourse.

The natural drainage system shall be used as far as is feasible for storage and flow of runoff. Stormwater drainage may be discharged to wetlands, retention basins or other treatment facilities. Temporary storage areas or retention basins scattered throughout developed areas shall be encouraged to reduce peak flow, erosion damage, and construction cost.

The widths of a constructed waterway shall be sufficiently large to adequately channel runoff from a ten (10) year storm. Adequacy shall be determined by the expected runoff when full development of the drainage area is reached.

No fences or structures shall be constructed across the waterway that will reduce or restrict the flow of water.

The banks of the waterway shall be protected with permanent vegetation.

The gradient of the waterway bed should not exceed a grade that will result in a velocity that will cause erosion of the banks of the waterway.

The bed of the waterway should be protected with turf, sod, or rip-rap. If turf or sod will not function properly, rip-rap shall be used. Rip-rap, in conformity with engineering specifications, shall consist of MnDOT 3601 material Class A with filter blanket Type 1.

If the flow velocity in the waterway is such that erosion of the turn side wall will occur and said velocity cannot be decreased by velocity control structures, then rip-rap shall replace turf on the

side walls.

Sediment Control of Waterways
To prevent sedimentation of waterways, pervious and impervious sediment traps and other sediment, control structures shall be incorporated throughout the contributing watershed.

Temporary pervious sediment traps could consist of a construction of bales of hay, per plan requirements. Such structures would serve as temporary sediment control features during the construction stage of development. Development of housing and other structures shall be restricted from the area on either side of the waterway required to convey a one hundred (100) year storm.

Permanent impervious sediment control structures consist of sediment basins (debris basins, desilting basins, or silt traps) and shall be utilized to remove sediment from runoff prior to its disposal in any permanent body of water or stream.

Standards

1. Public ditches shall be inspected using the criteria in the District's Comprehensive Management Plan.
2. Prior to realignment or repair, alternative measures to conserve, allocate and use the water should be considered (versus removing it from the area and watershed.)
3. The need for repair of the ditch shall be determined.

A permit application for construction, improvement or repair of a public or private drainage system in the District must:

1. Identify all public drainage ditches on the site, including ditch number and year of establishment;
2. Identify the acres of agricultural land directly affected by the ditch.
3. Identify the trend in land use for the affected drainage area.
4. Determine the drainage needs and flooding characteristics for land upstream and downstream.
5. Determine the primary role of the ditch in providing for agricultural drainage and/or stormwater conveyance.
6. Provide the approved/as-built elevations and grades of the public ditch through the subject property.
7. Demonstrate that such proposed activity will not adversely impact down stream water quality or quantity.
8. Provide stable channel and outfall.
9. Comply with all federal, state and District wetland protection rules and regulations.
10. Demonstrate concurrence with regional pond or subdivision

drainage plans approved by the District, if applicable.

11. If a drainage system is proposed to outlet a landlocked basin, provide sufficient dead storage volume to retain back-to-back 100-year, twenty-four- hour rainfalls and runoff.

Bridge and Culvert Crossings. Crossings must:
1. Provide equivalent hydraulic capacity as existing condition.
2. Retain existing navigational capacity.
3. Not adversely affect water quality.
4. Represent the minimal impact solution to a specific need with respect to all other alternatives.
5. Be constructed to allow for future erosion, scour and sedimentation considerations.

Exhibits

The applicant must submit with its permit application the following.

For construction, improvement or repair of a public or private drainage system:
1. Map showing section of the ditch to be maintained.
2. Depth, in feet, proposed to be dredged.
3. Plan for placement of dredge material
4. Plan for final vegetative cover of dredge. Evidence that the affected property owners have been contacted and will allow access for maintenance purposes.

For construction or installation of crossings:
1. Construction details showing:
    (1) Existing and proposed flow line (invert) elevations.
    (2) End details with flared end sections, wingwalls and/or riprap (energy dissipators).
    (3) Size and description of structure.
    (4) Emergency overflow elevation and route.
2. Construction schedule.
3. Narrative describing construction methods.
4. An erosion control plan that complies with these rules.
5. Computations of watershed area, peak flow rates and elevations, and discussion of potential effects on water levels above and below the project area.

9.2 FLOODPLAIN

Policy

It is the policy of the District to

1. To secure safety from floods.
2. To prevent loss of life, property damage, and the losses and risks associated with flood conditions.
3. To preserve the location, character, and extent of natural drainage courses.
4. To preserve the natural integrity of drainage patterns
5. To provide a storm and surface water system capable of handling a 100 year storm.

Scope and Applicability

This policy, regulation and standards apply to:

1. The channel and channel bed and the lands and waters adjoining a wetland, lake or water course that has been, or hereafter may be covered by the 100 year flood.
2. All lands transitional between upland and lowland that are inundated or saturated by surface water or groundwater during the 100 year flood.

Regulation

No person shall alter or fill below the 100-year critical flood elevation of any waters, wetlands, and ditch or conveyance system within the Watershed, without first obtaining a permit from the District.

Proposed projects that affect the conveyance capacity of channels or crossings shall document that equivalent hydraulic capacity is provided. When hydraulic equivalents are not desired or feasible for the proposed project, the District will review hydraulic information prepared by the sponsor which details easement acquisition or permission for increased flood levels (upstream or downstream of the project) emergency overflow elevations, and assessment of the adequacy of the outlet as generally described in M.S. 103E

Standards

1. The existence of floodplain on the property must be determined.
2. Proposed floodplain impacts must be identified and quantified
   a. Such encroachment cannot lie within the floodway and can not result in a violation of State or District floodplain, shoreland or wetland policies.
   b. Construction or development subject to flood damage will have a minimum floor elevation of at least 1 foot above the 100-year flood profile.
   c. Any structures, facilities, or embankments within the floodplain shall be capable of passing the 100-year flood

without increasing the elevation of the 100-year flood profile or creating excessive velocities as determined by the District.

3. The floodplain storage volume after encroachment is equal to or greater than the floodplain storage volume prior to encroachment within the relevant reach (Compensatory storage must be provided).

Exhibits

The applicant must submit with its permit application the following:

1. Site plan showing boundary lines, delineation and existing elevation contours of the work area, ordinary high water level, and 100-year critical flood elevation. All elevations shall be referenced to NAVD (1988 datum)
2. Grading plan showing any proposed elevation changes
3. Preliminary plat of any proposed subdivision
4. Determination by a registered professional engineer of the 100-year critical flood elevation before and after the proposed activity.
5. Computation of the change in flood storage capacity as a result of the proposed alteration or fill
6. Erosion and sediment control plan which complies with these Rules
7. Soil boring logs and report if available

9.3 GROUNDWATER

Policy

It is the policy of the District to

1. To implement the purpose and intent of the water quality provisions of the District's Comprehensive Management Plan as they may relate to ground water.
2. To maintain the present and natural rate of recharge to the surficial aquifer, and when possible, enhance the rate of recharge.
3. To ensure a dependable water supply and ensure the integrity of natural drainage patterns.
4. To protect fresh water supplies from the dangers of drought, overdraft, pollution, or mismanagement.
5. To define the roles and responsibilities of governmental units in implementing land use controls for the protection of groundwater quality
6. To prevent property damage, and the losses and risks associated with flood conditions that may arise from high water tables.

Scope and Applicability

This policy, regulation and standards apply to:

1. All wetlands
2. All high water table outwash and organic soils
3. All high infiltration soils
4. All appropriation of groundwater

Regulation

A person must submit a permit application and obtain a permit from the District for appropriation or disposal of groundwater.

The withdrawal of ground and surface water and the location of the place of discharge thereof shall conform to the standards of the Minnesota Pollution Control Agency and the Department of Natural Resources
Consider alternative measures to conserve, allocate and use ground water, versus removing the water from the area and watershed.

Demonstrate that at a minimum, recharge from the one inch storm from impervious surfaces will be infiltrated.

Infiltration shall not be allowed within a one year travel zone of a public well as determined by the municipal well-head protection plan

Standards

An applicant must demonstrate compliance with the following standards:

1. The quality of water infiltrated to the water table or surficial aquifer shall remain unchanged or improved by the land disturbance activity.
2. Low floors must be at least 2 feet above high water table elevation or mottled soils, which ever is higher, unless the applicant can show that the potential for property damage, and the losses and risks associated with high water table conditions are nonexistent or acceptably remote or as required by local ordinance
3. Ground water may not be discharged in a manner that causes erosion or flooding of the site or receiving channels or a wetland.
4. Water pumped from a project site shall be treated by temporary sedimentation basins, grit chambers, sand filters or other appropriate controls designed and used to remove particles of 100 microns or greater for the highest pumping rate.
5. The withdrawal from the Surficial Aquifer and the location of the place of discharge thereof shall conform to the standards of the Minnesota Pollution Control Agency and the

Department of Natural Resources.

Exhibits

The applicant must submit with its permit application the following:

1. A grading plan showing final grades and low floor elevation of any structures proposed for the site
2. The infiltration rates and the dewatering site and place of discharge
3. The location, rate, and place of discharge
4. A geotechnical report that addresses the availability and depth to ground water and soil mottling.

9.4 SOILS AND EROSION CONTROL

Policy

It is the policy of the District to:

1. To reduce the siltation into, and the pollution of water bodies and streams.
2. To guide, regulate and control the design, construction, use and maintenance of development to promote water quality and prevent pollution.
3. To control and minimize pollution caused by erosion and sedimentation.
4. To reduce siltation to, and the pollution of, water bodies and streams.

Scope and Applicability

This policy, regulation and standards apply to:

1. Land disturbing activities on lands within the Coon Creek Watershed District of 1 acre or more of cumulative disturbance.
2. Land disturbing activities within 100 feet of 3rd, 4th or 5th order streams, lakes, or type 3, 4, 5 wetlands
3. Land disturbing activities within 50 feet of 1st and 2nd order streams, or type 1, 2, 6 or 7 wetlands
4. Those land disturbing activities involving excavation or filling or a combination of excavation and filling of dirt, sand or other excavation or fill material including the laying, repairing, replacing or enlarging of an underground pipe or facility where it crosses a public ditch or waters of the state.

Regulation

A person must submit a permit application and obtain a permit from the District incorporating an erosion control plan before commencing an activity described in the scope and applicability section above.

Sediment Control of Waterways

1. To prevent sedimentation of waterways, pervious and impervious sediment traps and other sediment, control structures shall be incorporated throughout the contributing watershed.
2. Temporary pervious sediment traps could consist of a construction of bales of hay, per plan requirements. Such structures would serve as temporary sediment control features during the construction stage of development. Development of housing and other structures shall be restricted from the area on either side of the waterway required to convey a one hundred (100) year storm.
3. Permanent impervious sediment control structures consist of sediment basins (debris basins, desilting basins, or silt traps) and shall be utilized to remove sediment from runoff prior to its disposal in any permanent body of water or stream.

Soils Information: If a stormwater management control measure depends on the hydrologic properties of soils (e.g., infiltration basins), then a soils report shall be submitted. The soils report shall be based on on-site boring logs or soil pit profiles. The number and location of required soil borings or soil sits shall be determined based on what is needed to determine the suitability and distribution of soil types present at the location of the control measure.

Exceptions

The following land-disturbing activities are excepted from the above requirements:

1. Any emergency activity that is immediately necessary for the protection of life, property, or natural resources
2. Existing nursery or agricultural operations conducted as a permitted main or accessory use.

Standards

An applicant for an erosion and sediment control permit must demonstrate compliance with the following standards:

1. The Soils affected by the proposal must be identified
2. Soils with a soil-erodibility factor of 0.15 or greater need special attention through the use of best management practices
3. Disturbed areas must be stabilized with vegetation within 14 days.
4. Adjacent properties must be protected from sediment deposition.
5. Sedimentation, skimming, and nutrient removal are to be provided to the maximum extent practical for stormwater runoff prior to discharge to waters of the District. It is understood that there are occasions when it may be necessary to use a portion of a protected basin to serve as a sediment

trap and to provide skimming facilities.

6. Plans and specifications must conform to the provisions of all pertinent Minnesota Pollution Control Agency Manuals
7. All erosion and sediment controls proposed for compliance must be in place before any land-disturbing activity begins.
8. Any area of land from which the natural vegetative cover has been either partially or wholly cleared or removed by development activities shall be revegetated within 14 days from the substantial completion of such clearing and construction. The following criteria shall apply to revegetation efforts:
    a) Reseeding must be done with an annual or perennial cover crop accompanied by placement of straw mulch or its equivalent of sufficient coverage to control erosion until such time as the cover crop is established over ninety percent (90%) of the seeded area.
    b) Replanting with native woody and herbaceous vegetation must be accompanied by placement of straw mulch or its equivalent of sufficient coverage to control erosion until the plantings are established and are capable of controlling erosion.
    c) Any area of revegetation must exhibit survival of a minimum of seventy-five percent (75%) of the cover crop throughout the year immediately following revegetation. Revegetation must be repeated in successive years until the minimum seventy-five percent (75%) survival for one (1) year is achieved.

Exhibits

The applicant must submit with its permit application the following:

1. A natural resource map identifying soils, forest cover, and resources protected under other provisions of this rule, city rule or state statute
2. A sequence or construction of the development site, including; clearing and grubbing, rough grading, construction of utilities, infrastructure, and buildings; and final grading and landscaping. Sequencing shall identify the expected date on which clearing will begin and the duration of exposure of cleared areas, areas of clearing, installation of temporary erosion and sediment control measures, and establishment of permanent vegetation.
3. All erosion and sediment control measures necessary to meet the objectives of this local regulation throughout all phases of construction and after completion of development of the site. Depending upon the complexity of the project, the drafting and implementation of intermediate plans may be required at

the close of each season.

4. Seeding mixtures and rates, types of sod, method of seed bed preparation, expected seeding dates, type and rate of fertilizer application, and kind and quantity of mulching for both temporary and permanent vegetative control measures
5. Provisions for maintenance of control facilities, including easements and estimates of the cost of maintenance.
6. Explanation of how the site will be stabilized after construction, but who will be responsible for the maintenance of vegetation at the site and what practices will be employed to ensure that adequate vegetative cover is preserved.

9.5 STORMWATER

Policy

It is the policy of the District to

1. To promote, preserve and enhance the water and related land resources of the Coon Creek Watershed.
2. To implement the nondegradation requirements of the NPDES program using 1988 as the baseline year and load allocation reductions or management practices noted in a District adopted Total Maximum Daily Loads (TMDLs) implementation plan
3. To protect water and related land resources of the Coon Creek Watershed from the adverse effects resulting from poor or incompatible land use activities.
4. To implement applicable TMDLs
5. To encourage compatibility between land use activities upstream and down stream and natural resource capacity.
6. To regulate land-disturbing activities affecting the course, current or cross section of ditches and water courses.
7. Regulate improvements by riparian property owners of the bed, banks, and shores of lakes, streams, and wetlands for preservation and beneficial use.

Scope and Applicability

This policy, regulation and standards apply to:

1. Land disturbing activities of 1 acre or greater of cumulative impact
2. Work adjacent to lakes or wetlands,
3. Activities upstream from land that is dependent upon removal of water from the soil profile for their continued use (Drainage Sensitive Land Uses)

Regulation

A person must submit a permit application and obtain a permit from the District incorporating a stormwater plan before commencing an activity described in the scope and applicability section above.

Unless determined by the District to be exempt or granted a waiver, the following shall be addressed for stormwater management at all sites:

1. All site designs shall establish stormwater management practices to control the peak flow rates of stormwater discharge associated with the 1, 10, 25, and 100 year design storms and reduce the generation of stormwater.
2. All stormwater management practices will be designed so that the specific storm frequency storage volumes (e.g. recharge, water quality, channel protection, 10 year and 100 year) as identified in the current Minnesota Pollution Control Agency Stormwater Design Manual are met, unless the District grants the applicant a waiver or the applicant is exempt from such requirements.
3. Stormwater volume management practices shall be the equivalent of infiltrating the first inch of precipitation
4. These practices should seek to utilize pervious areas for stormwater treatment and to infiltrate stormwater runoff from driveways, sidewalks, rooftops, parking lots and landscaped areas to the maximum extent practical to provide treatment for both water quantity and quality.
5. In addition, if regulatory, hydrologic, topographic or landscape conditions (e.g. drainage sensitive uses, TMDL or nondegradation requirements) warrant greater control than that provided by the minimum control requirements, the District reserves the right to impose additional requirements deemed necessary to control the volume, timing and rate of runoff.
6. Applicants shall consult the Minnesota Pollution Control Agency Stormwater Design Manual for guidance on the factors that determine site design feasibility when selecting a stormwater management practice. Stormwater management practices for a site shall be chosen based on the physical conditions of the site. Among the factors that should be considered:
    - Topography
    - Maximum Drainage Area
    - Depth to Water Table
    - Soils
    - Slopes
    - Terrain
    - Head
    - Location in relation to environmentally sensitive features or urban areas.

Standards

1. Stormwater leaving the site must be routed to a public

drainage system

2. Drainage sensitive uses downstream from the proposed site must be accounted for and their ability to discharge in a timely manner must be assured.
3. Stormwater plans must ensure that discharge rates from the proposal are controlled such that within Drainage-Sensitive Uses Areas the post-development 100-year peak flow rate shall not exceed predevelopment 25-year peak flow rate (by subwatershed)
4. In Non-Drainage Sensitive Uses Areas the post-development 100-year peak flow rate shall not exceed predevelopment 100-year peak flow rate (by subwatershed)
5. The proposal must infiltrate the first one inch of precipitation

Exhibits

The applicant must submit with its permit application the following:

1. Topographic Base Map: A 1" = 200' topographic base map of the site which extends a minimum of 50 feet beyond the limits of the proposed development and indicates existing surface water drainage including streams, ponds, culverts, ditches, and wetlands; current land use including all existing structures; locations of utilities, roads, and easements; and significant natural and manmade features not otherwise shown.
2. Calculations: Hydrologic and hydraulic design calculations for the pre-development and post-development conditions for the design storms specified in this rule. Such calculations shall include
    a. Description of the design storm frequency, intensity and duration,
    b. Time of concentration,
    c. Soil Curve Numbers or runoff coefficients,
    d. Peak runoff rates and total runoff volumes for each watershed area,
    e. Infiltration rates determined by site flooding or double ring infiltrometer, where applicable,
    f. Culvert capacities,
    g. Flow velocities,
    h. Data on the increase in rate and volume of runoff for the design storms referenced in the Stormwater Design Manual,
    i. Documentation of sources for all computation methods and field test results.
3. Soils Information: If a stormwater management control measure depends on the hydrologic properties of soils (e.g., infiltration basins), then a soils report shall be submitted. The

soils report shall be based on on-site boring logs or soil pit profiles. The number and location of required soil borings or soil sits shall be determined based on what is needed to determine the suitability and distribution of soil types present at the location of the control measure.

4. Maintenance Plan: The design and planning of all stormwater management facilities shall include detailed maintenance and repair plan as described in section 13 of these rules.
5. Landscaping plan: The applicant must present a detailed plan for management of vegetation at the site after construction is finished as described in section 13.2 of these rules
6. Maintenance Easements: The applicant must ensure access to all stormwater treatment practices at the site for the purpose of inspection and repair by securing all the maintenance easements needed on a permanent basis. These easements will be recorded with the plan and will remain in effect even with transfer of title to the property.
7. Erosion and Sediment Control Plans for Construction of Stormwater Management Measures: The applicant must prepare an erosion and sediment control plan for all construction activities related to implementing any on-site stormwater management practices.

9.6 WATER QUALITY

Policy

It is the policy of the District to

1. To control and minimize pollution caused by erosion and sedimentation.
2. To reduce siltation to, and the pollution of water bodies and streams.
3. To preserve and improve the quality of the lakes and wetlands within the watershed
4. Improve the quality of the surface and subsurface discharges to the lakes and wetlands within the watershed by limiting nutrients and other contaminants
5. To pursue non-degradation of the waters of the District

Scope and Applicability

This policy, regulation and standards apply to:

1. Land disturbing activities of 1 acre or more of cumulative disturbance. Projects containing greater than or equal to 1 acre of impervious surface shall contain storm-water detention, erosion and sediment control and pollution prevention BMPs.
2. Work adjacent to or discharging into wetlands, lakes or water courses

Regulation

A person must submit a permit application and obtain a permit

from the District incorporating a stormwater plan before commencing an activity described in the scope and applicability section above.

Unless determined by the District to be exempt or granted a waiver, the following shall be addressed for water quality management at all sites:

All discharges into wetlands and waterbodies must be pretreated by an appropriate best management practice.

Waterbody	**Hydrology**	**BMP**
1st 2nd order stream		Sedimentation basin or equivalent designed for 0.5 inch
Type 1,2 6,7 wetland	Temporarily flooded Saturated Seasonally flooded or saturated	
3rd, 4th 5th order stream		NURP/Walker/Wet Pond or equivalent sized for 2.5 inch rainfall
Type 3,4,5 wetland or Lake	Permanently flooded Artificially flooded	

The proposal shall not cause extreme fluctuations of water levels or temperature changes in wetlands or streams.

The proposal shall not detrimentally affect the existing water quality of the receiving water.

All stormwater management practices shall be designed to convey stormwater to allow for the maximum removal of pollutants and reduction of flow velocities. These shall include, but not be limited to:

a. Maximizing of flowpaths, where appropriate, from inflow points to outflow points
b. Protection of inlet and outfall structures
c. Elimination of erosive flow velocities
d. Providing of underdrain systems, where applicable

For new development, structural stormwater treatment practices shall be designed to remove **80%** of the average annual post development total suspended solids (TSS) unless otherwise specified by a TMDL or nondegradation requirement.

All stormwater treatment practices shall have an acceptable form

of water quality pretreatment, in accordance with the pretreatment requirements found in the current stormwater design manual.

All stormwater runoff generated from new development shall not discharge untreated stormwater directly into jurisdictional wetlands or local water bodies without adequate treatment. Where such discharges are proposed, the impact proposed on wetland function shall be assessed using a method acceptable to the District. In no case shall the impact on wetland function or value be allowed to degrade the current function as identified in the District's Comprehensive Water Management Plan.

Stormwater discharges to critical areas with sensitive resources or where a TMDL is in place may be subject to additional performance standards, or may need to utilize or restrict certain stormwater management practices.

Stormwater discharges from land uses or activities with higher potential pollutant loadings, may require the use of specific structural STPs and pollution prevention practices.

Standards

It is presumed that a Stormwater Treatment Practices (STP) complies with this performance standard if it is:

1. Sized to capture the prescribed water quality volume
2. Designed in accordance with specific design standards outline in an approved stormwater design manual
3. Constructed properly
4. Maintained properly

Exhibits

The applicant must submit with its permit application the exhibits for 9.5 Stormwater

9.7 WETLANDS

Policy

It is the policy of the District to

1. To provide for the protection, preservation, proper maintenance and use of wetlands.
2. To minimize the disturbance to wetlands and to prevent damage from excessive sedimentation, eutrophication or pollution.
3. To protect and enhance the ecological function of wetlands and the benefits and values they provide to society

Scope and Applicability

This policy, regulation and standards apply to:

All lands transitional between upland and lowland that is inundated or saturated by surface water or groundwater at a frequency and duration sufficient to support a prevalence of vegetation typically adapted for life in saturated soil conditions, commonly known as hydrophytic vegetation

Regulation

Any person proposing to impact wetland by draining, filling, or excavating must submit a permit application and obtain a permit from the District.

Stormwater drainage may be discharged to wetlands provided appropriate pretreatment of said discharge accomplished. Diversion of stormwater to wetlands shall be considered for existing or planned surface drainage provided such diversion is in compliance with state law and all necessary easements have been obtained. Wetlands used for stormwater shall provide for natural or artificial water level control.

Standards

The Minnesota Wetland Conservation Act (WCA), as amended, and its implementing rules contained in Minnesota Rules chapter 8420, as amended, are incorporated as part of this rule and govern all draining, filling and excavating in wetlands.

Any person proposing to impact a wetland in the District is subject to and must establish compliance with the Wetland Conservation Act, as amended, standards and criteria, including but not limited to sequencing and replacement.

Within area(s) delineated as wetland, the applicant and property owner shall not:

1. Fill or place materials, substances or other objects, nor erect or construct any type of structure, temporary or permanent, except as specified in the Wetland Conservation Act..
2. Drain or cause to be drained through ditching pumping or alteration of the wetlands water source or actions which adversely change the wetlands hydroperiod such that the wetland can become nonwetland, except as specified in the Wetland Conservation Act..
3. Excavate or dig except as specified in the Wetland Conservation Act..
4. Clear vegetation, pond water or alter the landscape position in a manner that results in adverse environmental impact

Discharges into wetlands should not cause extreme fluctuations of water levels. Discharges that exceed the standards below shall be considered and regulated as adverse impact

Wetland Type **Standard**	-Sedge Meadows -Type 8 -Seasonally Flooded Basins	Scrub-Shrub Wet-Meadows Type 4 &5	-Floodplain forests Type 4 &5	Cultivated hydric soil Sand/gravel pit
Storm Bounce	Existing	Existing + 0.5 ft	Existing + 1 ft	No limit
Discharge Rate	Existing	Existing	Existing or less	Existing or less
Inundation on 1-2yr event	Existing	Existing + 1 day	Existing + 2 days	Existing + 7 days
Inundation for 10 yr event	Existing	Existing + 7 days	Existing + 14 days	Existing + 21 days
Run out control	No change	No change	0'-1 ft above RO	0-4 ft above RO

RO= Run Out

Exhibits

The applicant must submit with its permit application the following:

1. A site plan showing property lines and delineation of lands in which the applicant has an ownership or legal interest; existing and proposed elevation contours, including existing runout elevation and flow capacity of the wetland outlet; and area of the wetland proposed to be filled, drained, or excavated
2. A complete delineation of all existing wetland(s), including data sheets with complete and detailed information on field indicators (soils, vegetation and hydrology) and summary report. Wetland delineations must be performed during the normal growing season for this part of Minnesota. Wetland boundaries must be staked in the field and easily identifiable.
3. The total wetland acres, wetland types and number of jurisdictional wetland basins on the property
4. Identification of existing and proposed watershed for each wetland basin and the depth and duration for all proposed stormwater discharges.
5. The size and nature of proposed impact to each wetlands and the reason the impact is unavoidable shall be identified
6. The wetland dependence of each proposed impact of the project shall be determined.

7. The nature and scope of the appropriate Wetland Conservation Act exemption shall be noted if applicable.
8. Alternatives to avoid and minimize each proposed impact.

9.8 WILDLIFE

Policy

It is the policy of the District to

1. To prevent loss of wildlife and vegetation and the habitats on which they depend.
2. To protect, preserve and manage unique resource areas and unique and/or endangered species of plants and animals that populate these areas from adverse impacts associated with land use change.

Scope and Applicability

This policy, regulation and standards apply to:

1. Endangered species,
2. Threatened species
3. Special concern species, elements or communities

Regulation

No person shall impact an endangered species, threatened species, special concern species <u>or elements</u>, or communities, without first obtaining a permit from the District.

Standards

Applicant must:

1. Establish the presence of endangered, threatened or special concern species or communities on-site and the source of that information.
2. Assess the potential effect on wildlife and vegetation and the habitats on which they depend.
3. The District may require applicant to provide a habitat management plan when the District determines applicant cannot avoid direct or indirect impacts on the habitat in question.

Assessment of significant adverse impacts should be based on the following factors:

1. The amount of vegetation/habitat removal and/or alteration within the development site
2. The amount of habitat of similar type and quality within the development site that remains contiguous
3. The existing and proposed amount of lot coverage
4. The existence of contiguous habitat of similar type and quality on adjoining land
5. Mitigation efforts that directly address the negative effects of the proposed land use on wildlife habitat.

10.0 PERMITS

10.1 Permit Required

All permits when issued shall be signed by the District Administrator, District Engineer or President of the Board

10.2 Permit Scope

A permit issued by the Coon Creek Watershed District shall be valid for a period of one year from the date of issuance unless otherwise suspended, revoked or extended as may be required for sand and gravel mining projects.

Construction work authorized under this permit shall be completed on or before the permits expiration date.

10.3 Permit Extensions

A permit issued under section 10.2 of these rules may be extended for a period of one year by the District Administrator, provided there has been no significant change in the policies, rules or laws of the State of Minnesota or the Coon Creek Watershed District.

To extend a permit as provided under this section, the permittee must apply to the District in writing prior to the permit expiration date, stating the reasons for extension

Permit extensions beyond one year are subject to a review of project progress, reasons for the project being incomplete as well as significant changes in the policies, rules or laws of the State of Minnesota or the Coon Creek Watershed District. In such cases the applicant may be required to reapply for a permit.

10.4 Permit Assignment

A permittee may assign a District permit only upon consent of the Board of Managers to the assignment. Permit assignment does not extend the permit term.

The Board of Managers may grant the assignment of an issued permit if it finds the following conditions have been met:

1. The proposed assignee in writing agrees to assume all the terms, conditions and obligations of the permit as originally issued to the permittee.
2. The proposed assignee is not changing the project as originally issued.
3. There are no violations of the permit conditions as originally issued
4. The District has received from the proposed assignee any required surety to secure performance of the assigned permit.

10.5 Permit

A permit from the Coon Creek Watershed District applies only to

Applicability

the project and the plans and calculations approved by the Board of Managers and cited on the permit._If the design, location or purpose of the project changes you shall contact the District to make sure the changes would not violate District Rules or applicable state law.

10.6 Permit Stipulations

Approval of a permit application by the Board of Managers may include certain stipulations that are required to either receive a permit or must be fulfilled for the proposed project to be in compliance with these rules.

10.7 General Permit Conditions

The following permit conditions are general and are required of all land disturbing activities within the District:

1. The permittee must maintain the activity authorized by this permit in good condition and in conformance with the terms and conditions of this permit.
2. The permittee shall grant access to the site at all reasonable times during and after construction to authorized representatives of the District for inspection of the work authorized hereunder.
3. The permittee shall utilize best management practices on the project site to minimize the potential for adverse impacts associated with erosion and sedimentation.
4. The District may reevaluate its decision on this permit at any time the circumstances warrant. Circumstances that could require a reevaluation include, but are not limited to, the following:
    a. You fail to comply with the terms and conditions of this permit.
    b. The information provided by you or in support of your permit application proves to have been false, incomplete, or inaccurate.
    c. Significant new information surfaces which this office did not consider in reaching the original public interest decision.
7. Permittee shall ensure that the contractor has received and thoroughly understands all conditions of this permit.

10.8 As Built Plans Required

All applicants are required to submit actual “as built” plans for any stormwater management practices or ditch repairs or an improvement located on site after final construction is completed. This includes, but is not limited to any changes to the course, current or cross section of public ditch, wetland mitigation sites and structural stormwater treatment practices.

The plan must show the final design specifications for all

stormwater management facilities, wetland mitigation, and modification of public ditches. A final inspection of the project by the District is required before release of any performance escrows can occur.

11.0 COMPLIANCE INSPECTIONS

11.1 Regular Compliance Inspection

Regular inspections of the project site shall be conducted by District personnel. Inspections may occur jointly with other agencies inspecting under other water resource, environmental or safety laws.

11.2 Frequency of Inspections

Inspections may occur:

1. During or immediately following installation of BMPs
2. Following severe storms/critical events
3. Prior to seeding deadlines, particularly in the fall
4. Prior to return of escrows
5. On report of issue or complaint

11.3 Scope of Inspections

Inspections may include, but are not limited to:

1. Reviewing maintenance and repair records;
2. Sampling discharges,
3. Surface water,
4. Groundwater,
5. Material or water in drainage control facilities; and
6. Evaluating the condition of erosion and drainage control facilities and other stormwater treatment practices

11.4 Notice of Inspection

Pursuant to an inspection by District staff, the applicant shall be notified of the findings of the inspection. The Notice of Inspection contain the following information:

1. Date of the inspection
2. Whether construction, or other land disturbing activities is in compliance with the issued permit, approved plan and/or District rules
3. Variation from the approved plans or activities
4. Any violations that exist

11.5 Violations Found During Inspection

If any violations of District rules are found, the permit applicant and contact shall be notified in writing of the nature of the violation and the required corrective actions. No additional work shall proceed until any violations are corrected and all work previously completed has received approval by the District and the appropriate municipality.

12.0 EASEMENTS

12.1 Ditch Easements

The applicant must dedicate easements on all new plats and developments where required as follows:

1. A 200 foot easement (100' either side of centerline) will be required on Coon Creek from the Mississippi River to Lexington Ave. (C.S.A.H. #17)
2. A 200 foot easement (100' either side of centerline) on Sand Creek from Coon Creek to Central Ave. (T.H. #65)
3. A 100 foot easement (50' either side of centerline) on designated county ditches within the watershed, including Coon Creek and Sand Creek upstream of the sections identified in 1 & 2 of this section.

12.2 Maintenance Easements

The applicant must ensure access to all stormwater treatment practices at the site for the purpose of inspection and repair by securing all the maintenance easements needed on a permanent basis. These easements will be recorded with the plan and will remain in effect even with transfer of title to the property.

12.3 Replacement Wetland Restrictions and Covenants

An applicant seeking approval of a replacement plan or bank plan under the Wetland Conservation Act, as amended, must record with the county recorder/registrar a declaration of restrictions and covenants for the replacement wetland, as required under the Wetland Conservation Act's implementing Rules, Chapter 8420, as amended. The Declarant must pay all costs associated with recording the Declaration, and provide proof of recording to the District

The restrictions and covenants shall be unlimited in duration.

Within the designated replacement wetland area the applicant and property owner shall:

1. Establish and maintain, at the applicant's expense, permanent vegetative cover, including any necessary planting or replanting thereof, and other conservation practices in accordance with the replacement plan and the intent of the Wetland Conservation Act, as amended.
2. Not produce agricultural crops on areas specified as wetland
3. Not graze livestock on the areas specified as wetland
4. Not place materials, substances or other objects, nor erect or construct any type of structure, temporary or permanent, except as specified in the replacement plan.
5. At, applicants expense, be responsible for weed control by complying with noxious weed control laws and emergency control of pests necessary to protect the public health.
6. Comply with any other requirements or restrictions specified

in this rule, local ordinance or state rule including but not limited to haying, mowing, timber management and other vegetative alterations that do not enhance or would degrade the ecological functions or the wetland.

13.0 MAINTENANCE

13.1 Policy

Every person owning property through which a ditch or watercourse passes, or such person's lessee, shall keep and maintain that part of the ditch or watercourse within the property, free of trash, debris, excessive vegetation, and other obstacles that would pollute, contaminate, obstruct or significantly retard the flow of water, or access for maintenance or repair of the watercourse.

In addition, the owner or lessee shall maintain existing privately owned structures within or adjacent to a watercourse, so that such structures will not become a hazard to the use, function, or physical integrity of the watercourse.

13.2 Maintenance Plan

A maintenance plan must be submitted for stormwater treatment ponds, outlet structures for such ponds, culverts, outfall structures, and all other stormwater facilities required under these rules.

Maintenance Plan: The design and planning of all stormwater management facilities shall include detailed maintenance and repair procedures to ensure their continued function. These plans will identify the parts or components of a stormwater management facility that need to be maintained and the equipment and skills or training necessary.

Provisions for the periodic review and evaluation of the effectiveness of the maintenance program and the need for revisions or additional maintenance procedures shall be included in the plan.

Landscaping plan: The applicant must present a detailed plan for management of vegetation at the site after construction is finished, including:

Who will be responsible for the maintenance of vegetation at the site and

2. What practices will be employed to ensure that adequate vegetative cover is preserved.

The maintenance plan must specify the

1. Parts or components of a stormwater management facility that need to be maintained
2. Methods (detailed maintenance and repair procedures to ensure continued function of the stormwater feature)
3. Schedule
4. Responsible parties for maintenance
5. Equipment and skills or training necessary
6. Provisions for the periodic review and evaluation of the effectiveness of the maintenance program
7. Need for revisions or additional maintenance procedures

13.3 Maintenance Agreement

A maintenance agreement is required for all stormwater facilities that will not be maintained as part of standard municipal public work activities. The maintenance agreement must include the elements required in the maintenance plan cited in section 13.1 of these rules.

13.4 Recording of the Maintenance Agreement

The applicant must record the maintenance agreement with the county recorder/registrar before any land-altering activity occurs on the site. Applicant/permittee must then provide the District a copy of the recorded document.

13.5 Failure to Maintain Practices

If a responsible party fails or refuses to meet the requirements of the maintenance agreement, the District, after reasonable notice, may correct a violation of the design standards or maintenance needs by performing necessary work to place the facility in proper working condition and charge the responsible party.

13.6 Annual Inspection of Stormwater Facilities

For all stormwater facilities that will not be maintained as part of standard municipal public work activities, the Responsible parties for maintenance shall inspect all stormwater management facilities under their jurisdiction by July 30 of each year. The purpose of the inspection will be to document maintenance and repair needs and ensure compliance with the requirements of this rule and accomplishment of its purposes.

These maintenance and repair needs may include; removal of silt, litter and other debris from all catch basins, inlets and drainage pipes, grass cutting and vegetation removal, and necessary replacement of landscape vegetation.

Any maintenance needs found must be addressed in a timely manner, as determined by the District, and the inspection and maintenance requirement may be increased as deemed necessary to ensure proper functioning of the stormwater management facility.

13.7 Right of Entry for Inspection

When any new drainage control facility is installed on private property, or when any new connection is made between private property and a public drainage control system, sanitary sewer or combined sewer, the property owner shall grant to the District the right to enter the property at reasonable times and in a reasonable manner for the purpose of inspection of the stormwater feature(s) on the property. This includes the right to enter a property when it has a reasonable basis to believe that a violation of this rule is occurring or has occurred, and to enter when necessary for abatement of a public nuisance or correction of a violation of this rule.

13.8 Records of Installation and Maintenance Activities

Parties responsible for the operation and maintenance of a stormwater management facility shall make records of the installation and of all maintenance and repairs, and shall retain the records for at least five years. These records shall be made available to the District during inspection of the facility and at other reasonable times upon request.

14.0 WAIVERS AND VARIANCES

14.1 Waivers

The District Board, Administrator or District Engineer may grant a waiver from the District requirements of this rule in whole or in part upon written request of the applicant, provided that at least one of the following conditions applies:

1. It can be demonstrated that the proposed project is not likely to impair attainment of the purpose and intent of this rule (eg. mill and overlay work for public roads).
2. Alternative minimum requirements for on-site management of water and related land resources have been established in a plan that has been approved by the District and the implementation of the plan is required by local ordinance.
3. Provisions are made to manage stormwater by an off-site facility, such as a regional pond or wetland bank. The off-site facility is required to:
    a. Be in place,
    b. Be designed and adequately sized to provide a level of control that is equal to or greater than that which would be afforded by on-site practices
    c. Have a legally obligated entity responsible for long-term operation and maintenance of the stormwater practice.
4. The District finds that meeting the minimum on-site management requirements is not feasible due to the natural or existing physical characteristics of a site.

14.2 Variances

The Board of Managers may grant a variance from the literal provisions of the District's rules, regulations, and policies where:

1. The strict enforcement of the rules would cause undue hardship because of circumstances unique to the property under consideration.
2. It is demonstrated that such action will be in keeping with the spirit and intent of the District rules, regulations and policies.
3. The proposed activity for which the variance is sought will not adversely affect the public health, safety or welfare.

14.3 Term of a Variance

A variance will expire on expiration of the District's approval or permit associated with the variance request.

14.4 Violation of a Variance

A violation of any condition set forth in a variance will be a violation of the District rules, and will automatically terminate the variance.

14.5 Conditions

The Board of Managers may require as a condition of the waiver, or variance:

1. Such dedication or construction, or agreement to dedicate or construct as may be necessary to adequately meet said standards and requirements.
2. An alternative analysis that clearly demonstrates that no other feasible alternatives exist and that minimal impact will occur as a result of the project or development.
3. Site design, landscape planting, fencing, signs, and water quality best management practices to reduce adverse impacts on water quality, streams, wetlands, and floodplains.

15.0 ENFORCEMENT AND PENALTIES

15.1 Violations

A violation of these rules is a misdemeanor subject to the penalties as provided by Minnesota law.

15.2 Notice of Violation

When the District determines that an activity is **not** being carried out in accordance with the requirements of these rules, the District shall issue a written 'Notice of Violation' to the owner of the property or permittee. The notice of violation shall contain:

1. The name and address of the owner or applicant
2. The address when available or a description of the land upon which the violation is occurring
3. A statement specifying the nature of the violation
4. A description of the remedial measures necessary to bring the activity into compliance with this rule and a time schedule for the completion of such remedial action

5. A statement of penalty that may be assessed

15.3 Remedial Methods

Remedial measures required to bring an activity into compliance may require without limitation:

1. The performance of monitoring, analysis and reporting;
2. The elimination of illicit connections and discharges;
3. That violating discharges, practices, or operations shall cease and desist
4. The abatement or remediation of storm water pollution or contamination hazards and the restoration of any affected property;
5. The implementation of source control or treatment BMPs

15.4 Appeal of Notice of Violation

A Notice of Violation may be appealed to the District by filing a written notice of appeal within 15 days of service.

Hearing of the appeal before the Board of Managers shall take place at the next regularly scheduled Board meeting that is at least 13 days from the date of receipt of the notice of appeal

15.5 Stop Work Orders

The District may issue a Stop Work Order when it finds that a proposed or initiated activity or project presents a serious threat of soil erosion, sedimentation, or an adverse effect upon water quality or quantity, or violates any District rule or permit condition. Persons receiving such an order will be required to halt all construction activities. This "stop work order" will be in effect until the District confirms that the activity is in compliance and the violation has been satisfactorily addressed.

15.6 Restoration of lands

Any violator may be required to restore land to its undisturbed condition. In the event that restoration is not undertaken within a reasonable time after notice, the District may take necessary corrective actions, the cost of which shall be paid by the responsible party

15.7 Attorney Fees and Costs

In any civil action arising from or related to these Rules, an order, agreement, permit issued or denied by the District, the court may award the prevailing party reasonable attorney fees and costs.

16.0 ILLICIT DISCHARGES

16.1 Illicit Discharge Prohibition

No person shall discharge or cause to be discharged into the drainage system, storm drain system or water courses of the District any materials, including but not limited to pollutants or waters containing any pollutants that cause or contribute to a violation of applicable water quality standards, other than

stormwater.

16.2 Exceptions

The commencement, conduct or continuance of any illegal discharge to the waters of the District is prohibited except as described as follows:

1. The following discharges are exempt from discharge prohibitions established by this rule:
    a. Water line flushing or other potable water sources
    b. Landscape irrigation or lawn watering
    c. Diverted stream flows
    d. Rising ground water
    e. Ground water infiltration to storm drains
    f. Uncontaminated pumped ground water
    g. Foundation and footing drains
    h. Fire fighting activities
    i. Other water sources not containing pollutants
2. Discharges specified in writing by the District, or other federal, state or local agency as being necessary to protect the public health and safety.
3. Dye testing is an allowable discharge, but requires a verbal notification to the District prior to the time of the test
4. The prohibition shall not apply to any non-storm water discharge permitted under an NPDES permit, waiver, or waste discharge order issued to the discharger and administered under the authority of the Federal Environmental Protection Agency, provided that the discharger is in full compliance with all requirements of the permit, waiver, or order and other applicable laws and regulations, and provided that written approval has been granted for any discharge to the storm drain system

16.3 Illicit Connections Prohibited

1. The construction, use, maintenance or continued existence of illicit connections to the public drainage system is prohibited.
2. This prohibition expressly includes, without limitation, illicit connections made in the past, regardless of whether the connection was permissible under law or practices applicable or prevailing at the time of connection.
3. A person is considered to be in violation of this rule if the person connects a line conveying sewage to the public drainage system, or allows such a connection to continue

17.0 ADOPTION OF RULE

17.1 Severability

If the provisions of any article, section, subsection, paragraph, subdivision or clause of this rule shall be judged invalid by a court of competent jurisdiction, such order of judgment shall not

affect or invalidate the remainder of any article, section, subsection, paragraph, subdivision or clause of this rule.

17.2 Compatibility with Other Requirements

This rule is not intended to interfere with, abrogate, or annul any other ordinance, rule or regulation, statute, or other provision of law. The requirements of this rule should be considered minimum requirements, and where any provision of this rule imposes restrictions different from those imposed by any other ordinance, rule or regulation, or other provision of law, whichever provisions are more restrictive or impose higher protective standards for human health or the environment shall be considered to take precedence.

17.3 Prior Rules And Regulations

All prior rules and parts of rules and amendments to rules in conflict with this rule are hereby repealed.

17.4 Effective Date

This rule shall be in full force and effect on the day of its final passage and adoption of the Board of Managers.

17.5 Adopted

Adopted by the Board of Managers of the Coon Creek Watershed District this 9th day of March, 2009.

17.6 Certification of the Rules

I**,** Ted Capra**,** Secretary of the Coon Creek Watershed District Board of Managers, certify that the attached is a true and correct copy of the Rules of the Coon Creek Watershed District having been properly adopted by the Board of Managers of the Coon Creek Watershed District.

Dated: March 9, 2009

_____

Secretary of the Coon Creek Watershed District

APPENDIX A: Definitions

Term	Definition
Adjacent	Bordering, contiguous, or neighboring. Wetlands separated from other waters of the District by man-made dikes or barriers, spoil banks, and the like are "adjacent wetlands."
Applicant	A property owner or agent of a property owner who has filed an application for a stormwater management permit
Aquifer	A geologic formation, group of formations or part of a formation composed of rock, sand or gravel capable of storing and yielding groundwater to wells and springs
Best Management Practice (BMP)	Structural device, measure, facility or activity that helps to achieve stormwater management control objectives at a designated site. Schedules of activities, prohibitions of practices, general good house keeping practices, pollution prevention and educational practices, maintenance procedures, and other management practices to prevent or reduce the discharge of pollutants directly or indirectly to stormwater, receiving waters, or stormwater conveyance systems. BMPs also include treatment practices, operating procedures, and practices to control site runoff, spillage or leaks, sludge or water disposal, or drainage from raw materials storage.
Board	The Board of Managers of the Coon Creek Watershed District
Buffer Strip	A vegetated area bordering a stream that exists or is established to protect a stream system. Alteration of this vegetated area is strictly limited. A natural buffer for a stream or ditch system shall consist of a natural strip of land extending along the side(s) of a stream or lake, wetlands, floodplains, or slopes. The natural buffer shall begin at the edge of the stream bank of the active channel.
Building	Any structure, either temporary or permanent, having walls and a roof, designed for the shelter of any person, animal, or property, and occupying more than 100 square feet of area.
Channel	A natural or artificial watercourse with a definite bed and banks that conducts continuously or periodically flowing water
Control Measure	A practice or combination of practices to control erosion and attendant pollution

Term	Definition
Dedication	The deliberate appropriation of property by its owner for general public use
Detention	The temporary storage of storm runoff in a stormwater management practice with the goals of controlling peak discharge rates and providing gravity settling of pollutants
Developer	A person who undertakes land disturbance activities
District	The Coon Creek Watershed District
Drainage Easement	A legal right granted by a landowner to a grantee allowing the use of private land for stormwater management purposes
Drainage sensitive uses	Drainage Sensitive Uses are those land uses that require less than saturated conditions to grow or for the land to be used and therefore are dependent upon the subsurface, lateral effect of drainage ditches to remove water.
Erosion and Sediment Control Plan	A plan that is designed to minimize the accelerated erosion and sediment runoff at a site during construction activities
Extreme Fluctuations	Means changes in the volume, elevation or timing of the discharge or storage of water that can result in adverse impact to the biogeochemical character of the receiving resource.
Floodplain	The area adjoining a watercourse, water basin or wetland that have been or may be covered by a regional flood
Floodway	The channel of a watercourse, the bed of water basins and wetlands, and those portions of the adjoining floodplains that are reasonably required to carry and discharge floodwater and provide water storage during a regional flood
Flow Velocities	A condition where the rate of volume of water flowing exceeds the design capability of the conveyance system.
Function	The biogeochemical processes that sustain the wetland at the site and landscape levels. Specifically the geomorphic setting, water source and hydrodynamics that contribute to sustaining wetlands.

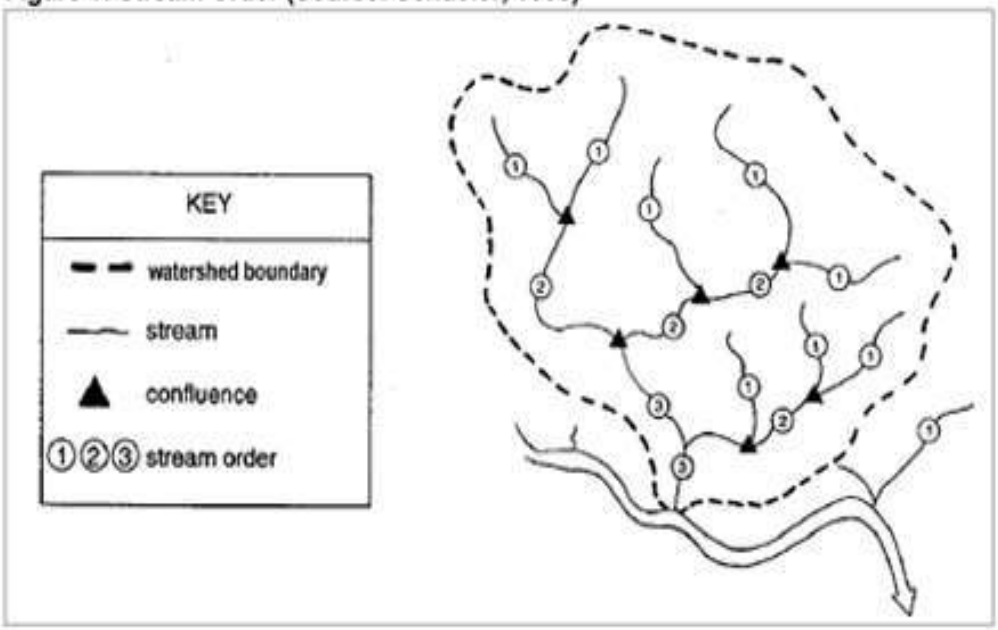
Term	Definition
High Infiltration Soils	Soils with infiltration rates greater than 6 inches per hour. These soils have high infiltration rates even when they are thoroughly wetted. These consist chiefly of deep, well to excessively drained sands and gravels. These soils have a high rate of water transmission, so water passes through them readily but the soils have low runoff potential.
Hydric Soil	Soils that are saturated, or ponded long enough during the growing season to develop anaerobic conditions in the upper part
Hydrologic Soil Group (HSG)	A Natural Resource Conservation Service classification system in which soils are categorized into four runoff potential groups. The groups range from A soils, with high permeability and little runoff production, to D soils, which have low permeability rates and produce much more runoff.
Illicit Connections	Any drain or conveyance, whether on the surface or subsurface, which allows an illegal discharge to enter the storm drain system including but not limited to any conveyances which allow any non-storm water discharge including sewage, process wastewater, and wash water to enter the storm drain system and any connections to the storm drain system from indoor drains and sinks, regardless of whether said drain or connection had been previously allowed, permitted, or approved by an authorized enforcement agency or, Any drain or conveyance connected from a commercial or industrial land use to the storm drain system which has not been documented in plans, maps, or equivalent records and approved by an authorized enforcement agency
Illicit Discharge	Any direct or indirect non-storm water discharge to the storm drain system, except as exempted. Illicit discharges may include discharges from illicit connections with measurable flow during dry weather containing pollutants or pathogens.
Improvement or Ditch Improvement	Any activity which deepens straightens or increases the "as constructed" capacity of a ditch. This may include the grading, digging, cutting, scraping, or excavating of soil, placement of fill materials, paving, construction, and substantial removal of vegetation.
Infiltration	The process of percolating stormwater into the subsoil.
Infiltration Facility	Any structure or device designed to infiltrate retained water to the subsurface. These facilities may be above grade or below grade.

Term	Definition
Land Disturbance Activity	Any activity which changes the volume or peak flow discharge rate of rainfall runoff from the land surface. This may include the grading, digging, cutting, scraping, or excavating of soil, placement of fill materials, paving, construction, substantial removal of vegetation, or any activity which bares soil or rock or involves the maintenance, repair, improvement, diversion or piping of any natural or man-made watercourse
Landowner	The legal or beneficial owner of land, including those holding the right to purchase or lease the land, or any other person holding proprietary rights in the land
Maintenance Agreements	A legally recorded document that acts as a property deed restriction, and which provides for long-term maintenance of storm water management practices
Managers	The Board of Managers of the Coon Creek Watershed District
Maximum Extent Practicable (MEP)	Within the limits of available technology and the practical and technical limits of a site and project, an applicant has reduced discharge of pollutants from stormwater to the maximum extent practicable (MEP) when the Board finds that he/she has made a good faith effort in meeting the following requirements: 1. The proposed plan is capable of being done from an engineering point of view. 2. The proposed plan is in accordance with accepted engineering standards and practices. 3. The proposed plan is consistent with reasonable requirements of the public health safety and welfare. 4. The proposed plan is environmentally preferred based on a review of social, economic and environmental impacts, and 5. It would create no unusual problems.
Municipality	City or township wholly or partly within the district
Nonpoint Source Pollution	Pollution from any source other than from any discernible, confined, and discrete conveyances, and shall include, but not be limited to, pollutants from agricultural, silvicultural, mining, construction, subsurface disposal and urban runoff sources
One Hundred-Year Floodplain	The area of land adjacent to a stream that is subject to inundation during a storm event that has a recurrence interval of 100 years, or a 1% chance of occurring in any given year. In Coon Creek Watershed it is equivalent to a 5.9 inch rainfall in a 24 hour period
One Year Event	A storm event that has a 99% chance of occurring in any given year. In Coon Creek Watershed it is equivalent to a 2.3 inch rainfall in a 24 hour period

<table>
<tr><th>Term</th><th>Definition</th></tr>
<tr><td>Person</td><td>Any individual, firm, corporation, partnership, franchisee, association, or governmental entity</td></tr>
<tr><td>Plan</td><td>A document approved at the site design phase that outlines the measures and practices used to control stormwater runoff at a site.</td></tr>
<tr><td>Pollutant</td><td>Anything which causes or contributes to pollution including nonpoint source pollution and discharges from illicit connections. Pollutants may include, but are not limited to: paints, varnishes, and solvents; oil and other automotive fluids; non-hazardous liquid and solid wastes and yard wastes; refuse, rubbish, garbage, litter, or other discarded or abandoned objects, rules, and accumulations, so that same may cause or contribute to pollution; floatables; pesticides, herbicides, and fertilizers; hazardous substances and wastes; sewage, fecal coliform and pathogens; dissolved and particulate metals; animal wastes; wastes and residues that result from constructing a building or structure; and noxious or offensive matter of any kind.</td></tr>
<tr><td>Public Waters</td><td>Waters of the state as defined in Minnesota statutes, section 103G.005, subdivision 15</td></tr>
<tr><td>Recharge</td><td>The replenishment of underground water reserves</td></tr>
<tr><td>Relevant Reach</td><td>That portion of the stream course and floodplain that would experience an increase in stage as a result of floodplain fill</td></tr>
<tr><td>Repair or Ditch Repair</td><td>Any activity which returns a ditch or conveyance system to its "as constructed" elevation or slope. This may include the grading, digging, cutting, scraping, or excavating of soil, placement of fill materials, paving, construction, or substantial removal of vegetation.</td></tr>
<tr><td>Retention Facility/Infiltration Basin</td><td>A permanent or man-made structure, including wetlands, that provides for the storage of stormwater runoff by means of a permanent pool of water. Retention facilities have no outlet structure and water is typically lost through infiltration to ground water or through evaporation and/or transpiration</td></tr>
<tr><td>Role</td><td>All public and private ditches within the watershed fulfill one or more of the following roles:
<table>
<tr><th>Role</th><th>Function</th><th>Definition</th></tr>
<tr><td>Agricultural drainage</td><td>To remove water from the soil profile to enable crop growth.</td><td>All first and second order ditches that serve agricultural purposes</td></tr>
<tr><td>Storm water conveyance</td><td>To route stormwater from urbanized</td><td>All first and second order ditches that</td></tr>
</table></td></tr>
</table>

Term	Definition
	<table><tr><td></td><td>areas, the public ditches will be preserved, repaired and maintained for conveying stormwater and potentially as greenways.</td><td>serve to route stormwater from urbanized areas.</td></tr><tr><td>Collector system</td><td>To serve as the outlet for other ditches (public and private) and extended hydrographs and/or increases in the duration of elevated flows occur the ditches</td><td>All third order streams within the watershed.</td></tr><tr><td>Trunk drainage system</td><td>To serve as the outlet for other ditches (public and private) and extended hydrographs and/or increases in the duration of elevated flows occur the ditches will be managed as a trunk drainage system</td><td>All fourth and fifth order streams</td></tr></table>
Sediment	Solid matter carried by water, sewage or other liquids
Shall	Is mandatory and not permissive
Shallow/Surficial Aquifer	An aquifer in which the permeable medial (sand and gravel) starts at the land surface or immediately below the soil profile
Significant Material Change	Changes to grading, drainage, erosion control or other plans reviewed by the Watershed District that 1 exhibit an identifiable or measurable change or difference from prior reviewed or submitted plans. The material change is significant if it results or can result in an adverse impact to property or resources not previously identified.

Term	Definition
Stop Work Order	An order issued which requires that all construction activity on a site be stopped
Stormwater	Any surface flow, runoff, and drainage consisting entirely of water from any form of natural precipitation, and resulting from such precipitation
Stormwater Management	The use of structural or non-structural practices that are designed to reduce storm water runoff pollutant loads, discharge volumes, and/or peak flow discharge rates
Stormwater Pollution Prevention Plan (SWPPP)	A document which describes the Best Management Practices and activities to be implemented by a person or business to identify sources of pollution or contamination at a site and the actions to eliminate or reduce pollutant discharges to Stormwater, Stormwater Conveyance Systems, and/or Receiving Waters to the Maximum Extent Practicable
Stormwater Runoff	Flow on the surface of the ground, resulting from precipitation
Stormwater Treatment Practices (STPs)	Measures, either structural or nonstructural, that are determined to be the most effective, practical means of preventing or reducing point source or nonpoint source pollution inputs to stormwater runoff and water bodies

Term	Definition
Stream Order or ordering	A classification system for streams based on stream hierarchy. The smaller the stream, the lower its numerical classification. For example, a first-order stream does not have tributaries and normally originates from springs and/or seeps. The approach consists of systematically ordering the branches and tributary streams. The extent of branching is an indication of the size and extent of the drainage network of the watershed. It influences the timing of peaks at a given point in the watershed as well as water quality. **Figure 1: Stream Order (Source: Schueler, 1995)** 
Streams	Perennial and intermittent watercourses identified through site inspection and US Geological Survey (USGS) maps. Perennial streams are those which are depicted on a USGS map with a solid blue line. Intermittent streams are those which are depicted on a USGS map with a dotted blue line.
Structure	Anything manufactured, constructed or erected which is normally attached to or positioned on the land, including portable structures, earthen structures, roads, parking lots and paved storage areas.
Total Maximum Daily Load (TMDL)	A Total Maximum Daily Load, or TMDL, is a regulation designed to improve water quality by controlling the amount of a pollutant entering a water body.
Undue hardship	The owner can not make reasonable use of their property

Term	Definition
Water Quality Volume (WQv)	The storage needed to capture and treat 90% of the average annual stormwater runoff volume. Numerically (WQv) will vary as a function of long term rainfall statistical data
Watercourse	A permanent or intermittent stream or other body of water, either natural or man-made, which gathers or carries surface water.
Watershed	An area of common drainage
Welfare	An act or thing that tends to improve, benefit, or contribute to the safety or well-being of the general public, or benefit the inhabitants of the watershed district
Wetland Functions	The biogeochemical processes that sustain the wetland at the site and landscape levels
Wetland or Jurisdictional Wetland	An area that is inundated or saturated by surface water or groundwater at a frequency and duration sufficient to support a prevalence of vegetation typically adapted for life in saturated soil conditions, commonly known as hydrophytic vegetation.

AFFIDAVIT

STATE OF MINNESOTA)
)ss.
COUNTY OF Anoka)

I, Tim Kelly, being duly sworn, deposes and says that on March 10, 2009, I served the attached Rules of the Coon Creek Watershed District upon the City of Andover, City of Blaine, City of Columbus, City of Coon Rapids, City of Ham Lake, respectively, by placing a true and correct copy thereof in an envelope addressed as follows:

Michelle Hartner, Deputy City Clerk, City of Andover
1685 Crosstown Boulevard NW
Andover, MN 55304

Jane Cross, City Clerk, City of Blaine
Blaine City Hall
10801 Town Square Drive NE
Blaine, MN 55449

Elizabeth Mursko, City Administrator/Clerk, City of Columbus
16319 Kettle River Boulevard
Columbus, MN 55025

Joni Anderson, City Clerk, City of Coon Rapids
11155 Robinson Drive
Coon Rapids, MN 55433

(cont.)

Sharon Ayshford, City Deputy Clerk, City of Ham Lake
Ham Lake City Hall
15544 Central Avenue NE
Ham Lake, MN 55304

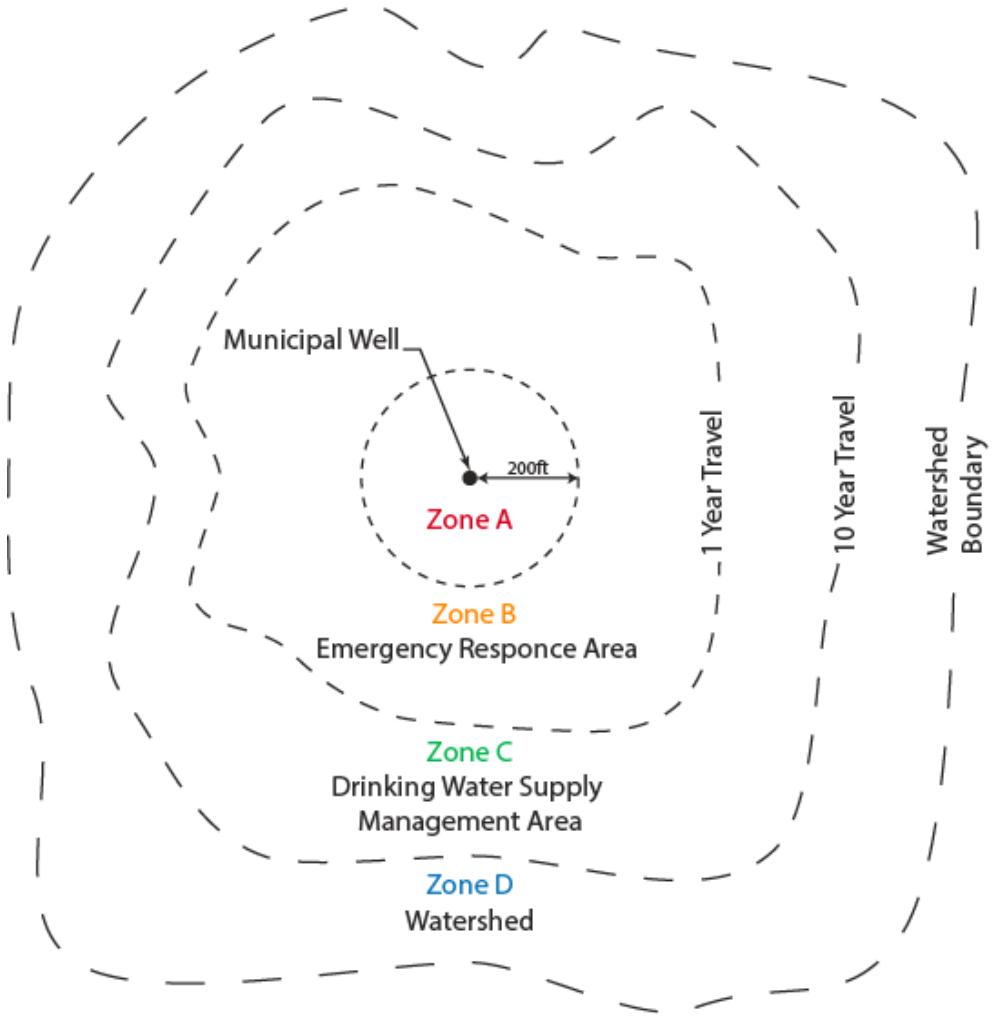
and depositing the same, with postage prepaid, in the United States mail at Coon Rapids, Minnesota.

_____
Tim Kelly
District Administrator
Coon Creek Watershed District

Subscribed and sworn to before me this 10th day of March, 2009.

_____
Notary Public

Infiltration Practices in Relation to a Drinking Water Supply Management Area



Zone A No Infiltration Allowed
Within 200 ft of a Municipal Well

Zone B Emergency Responce Area (ERA)

Roof Infriltration Allowed

All Other Hard Surfaces Must Filtrate Prior to Discharge to a Storm Sewer, Ditch or Creek

Zone C Drinking Water Supply Management Area (DWSMA)

Roof Infiltration Allowed

All Other Hard Surfaces Must Filtrate Prior to Infiltration

Zone D Watershed

All Hard Surfaces can be Infiltrated

Coon Creek Watershed District	Coon Creek Watershed District	WENCK ASSOCIATES Responsive partner. Exceptional outcomes.	May 2016
Infiltration Practices			Figure 1

Appendix J – Wellhead Protection Plan (WHPP)

City of Coon Rapids Wellhead Protection Plan Amendment

Part I:

Delineation of the Wellhead Protection Area (WHPA), Drinking Water Supply Management Area (DWSMA), and Assessments of Well and DWSMA Vulnerability

Prepared for

March 2016

City of Coon Rapids Wellhead Protection Plan Amendment

Part I:

Delineation of the Wellhead Protection Area (WHPA), Drinking Water Supply Management Area (DWSMA), and Assessments of Well and DWSMA Vulnerability

Prepared for

March 2016

4300 MarketPointe Drive, Suite 200
Minneapolis, MN 55435
Phone: 952.832.2600
Fax: 952.832.2601

City of Coon Rapids Wellhead Protection Plan Amendment

March 2016

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Certifications

I hereby certify that this plan, document, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Geologist under the laws of the state of Minnesota.

	March 2, 2016
John C. Greer	Date
PG #: 30347	

Public Water Supply Profile

The following persons are the contacts for the Coon Rapids Wellhead Protection Plan:

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Fax: 952-832-2601
E-mail: jgreer@barr.com

General Information

UNIQUE WELL NUMBER(S) Primary: 202932, 202931, 202930, 202965, 161413, 110460, 110461, 150357, 110475, 420956, 474384, 674478, 674479; Seasonal: 202926, 202929, 202972, 202951, 202937, 202943, 168721, 168720, 110469, 474385, 463020

SIZE OF POPULATION SERVED 61,476 (2010 Census)

COUNTY Anoka

1.0 Introduction

In compliance with the Minnesota Wellhead Protection Rules (MN Rules 4720.5100 through 4720.5590), wellhead protection areas (WHPAs) and Drinking Water Supply Management Areas (DWSMAs) were delineated for the City of Coon Rapids in 2003 (Wells 1-23) (MDH, 2003) and in 2006 (Wells 4, 7, 11, 12, 14, 15, 24, 25) (Bonestroo, 2006). Minnesota Rule 4720.5570 states that wellhead protection plans must be reviewed and amended at least every ten years. In addition, the Minnesota Department of Health (MDH) has instituted requirements for inclusion of fracture-flow analysis in the delineation of WHPAs since the last delineation of the City's WHPAs and DWSMAs.

As required by Minnesota Rule 4720.5570, new WHPAs and new DWSMAs have been delineated for the City of Coon Rapids. This report summarizes work completed to update the delineation of the Coon Rapids WHPAs and DWSMAs in compliance with the Minnesota Wellhead Protection Rules and to meet the current MDH requirements. Data elements used in preparation of the report are presented in Table 1.

The City of Coon Rapids currently has 13 primary municipal water supply wells. Wells 9, 24, and 25 (unique numbers 202931, 674478, and 674479, respectively) are completed in the Tunnel City Group-Wonewoc Sandstone (TCW) aquifer (formerly known as the Franconia-Ironton-Galesville, or FIG, aquifer). The open interval of Well 9 also extends into the Eau Claire Formation. Wells 8, 10, 11, 13, 14, and 15 (unique numbers 202932, 202930, 202965, 168720, 110460, and 110461, respectively) are completed in both the TCW and Mt. Simon Sandstone aquifers. Wells 17, 19, 20, and 21 (unique numbers 150357, 110475, 420956, and 474384, respectively) are completed in the confined Quaternary glacial drift aquifer.

The City also has 11 seasonal wells. Well 1 (unique number 202926) is completed in the Tunnel City-Wonewoc aquifer. Wells 2, 4, 5, 7, and 12 (unique numbers 202929, 202972, 202951, 202943, and 168721, respectively) are completed in both the TCW and Mt. Simon Sandstone aquifers. The open intervals of Wells 1 and 2 also intersect the St. Lawrence Formation, and the open interval of Well 1 also intersects the Eau Claire Formation. Well 6 (unique number 202937) is completed in the Tunnel City Group aquifer. Well 16 (unique number 161413) is completed in the Wonewoc Sandstone and Mt. Simon Sandstone aquifers. Well 18 (unique number 110469) is completed in the Mt. Simon Sandstone aquifer. Wells 22 and 23 (unique numbers 474385 and 463020, respectively) are completed in the confined Quaternary glacial drift aquifer.

Well locations are shown on Figure 1. Table 2 summarizes construction, use, and vulnerability information for the Coon Rapids water supply wells. Well logs for the City's wells are presented in Appendix A.

While compiling data for this report, a database discrepancy was identified for Wells 13 and 16. The Minnesota Well Index (MWI) listed unique numbers 168720 for Well 13 and 161413 for Well 16; the Minnesota Department of Natural Resources (MnDNR) Permitting And Reporting System (MPARS) database had unique numbers 161413 for Well 13 and 168720 for Well 16. A check of the unique number tags on the physical wells showed unique number 161413 on Well 13 and 168720 on Well 16; however, through discussions with the MDH and examination of their records it was determined that the unique

number tags for Wells 13 and 16 were transposed when they were installed on the wells (MDH, 2015a). The MWI database was correct; Well 13 is unique number 168720 and Well 16 is unique number 161413.

2.0 Criteria for Wellhead Protection Area Delineation

The following criteria were used to ensure accurate delineation of the WHPAs.

2.1 Time of Travel

A minimum 10-year groundwater time of travel criterion must be used to delineate a WHPA (MN Rule 4720.5510) so there is sufficient reaction time to remediate potential health impacts in the event of contamination of the aquifer. A groundwater time of travel of ten years was considered in this study. As required by the Wellhead Protection Rules, the one-year groundwater time of travel was also determined for each well addressed in this study.

2.2 Aquifer Transmissivity

For this study, transmissivities of the Quaternary glacial drift aquifer, the Tunnel City Group, the Wonewoc Sandstone, and the Mt. Simon Sandstone were estimated using pumping tests conducted at Coon Rapids Wells 19 and 20 (Quaternary), specific capacity data at Well 21 (Quaternary), specific capacity data at Coon Rapids Wells 24 and 25 (Tunnel City and Wonewoc), specific capacity data at Coon Rapids Well 18 (Mt. Simon, and pumping tests at Andover Well 3 (Mt. Simon). Summaries of the aquifer tests are included in Appendix B. See Section 2.5 below for details regarding how these transmissivity values were included in the groundwater model.

A pumping test conducted at Well 19 in 2002 estimated a range of transmissivities from 8,120 ft^2/day (754.4 m^2/day) to 9,420 ft^2/day (875.1 m^2/day) with a geometric mean of 8,700 ft^2/day (808.3 m^2/day) for the confined Quaternary glacial drift aquifer. Pumping tests conducted at Coon Rapids Well 20 in 1999 and 2002 estimated a range of transmissivities from 27,000 ft^2/day (2,508.4 m^2/day) to 66,700 ft^2/day (6,196.6 m^2/day) with a geometric mean of 45,210 ft^2/day (4,200.1 m^2/day) for the confined Quaternary glacial drift aquifer. Coon Rapids Well 21 is located far from the City's other Quaternary wells, and available Quaternary stratigraphy mapping (Meyer et al., 2013) appears to indicate that the confined Quaternary aquifer is not continuous throughout the City. Specific capacity data for Well 21 was used to estimate a transmissivity of 5,750 ft^2/day (534.2 m^2/day) for the confined Quaternary glacial drift aquifer near Well 21.

Analysis of specific capacity data for Wells 24 and 25 using the TGuess Method (Bradbury and Rothschild, 1985) estimated a range of transmissivities from 6,400 ft^2/day (594.6 m^2/day) to 9,400 ft^2/day (873.3 m^2/day) with a geometric mean of 7,700 ft^2/day (715.4 m^2/day) for the combined Tunnel City Group-Wonewoc Sandstone aquifer. The geometric mean value was allocated between the two formations using a ratio determined by comparing mean transmissivities for the two formations in the vicinity of Coon Rapids; see the aquifer test plan for the TCW aquifer in Appendix B for more details. A transmissivity of 5,470 ft^2/day (508.2 m^2/day) was used for the Tunnel City and a transmissivity of 2,230 ft^2/day (207.2 m^2/day) was used for the Wonewoc.

Four single-well pumping tests were conducted at Andover Well 3 in 1987. Mt. Simon Sandstone transmissivities estimated by these tests ranged from 1,600 ft^2/day (148.6 m^2/day) to 2,200 ft^2/day

(204.4 m^2/day). Analysis of specific capacity data at Coon Rapids Well 18 using the TGuess Method (Bradbury and Rothschild, 1985) estimated a transmissivity of 4,700 ft^2/day (436.6 m^2/day) for the Mt. Simon Sandstone. The geometric mean value of 2,310 ft^2/day (214.6 m^2/day) from these tests was used in the model.

2.3 Daily Volume of Water Pumped

Pumping data for the City of Coon Rapids for the period 2010 through 2014 are summarized in Table 3. The largest annual withdrawal for 2010-2014 was 2,959,153,000 gallons in 2012. The City's Comprehensive Water System Plan (Bolton & Menk, 2014) includes projected average daily demands of 8.11 and 8.67 million gallons per year (MGD) for 2019 and 2024, respectively. These values were used to interpolate a 2020 projected average daily demand of 8.22 MGD (3,001,030,000 gallons per year). Projected 2020 pumping rates for each well were calculated by multiplying the total 2020 projected demand by the 2010-2014 average percentage of total withdrawal for each well. The pumping rate used in the model for each Coon Rapids well for the WHPA delineation was either this 2020 projection or the historical maximum for the period 2010-2014, whichever was greater. The maximum 2010-2014 rates were greater than the 2020 projected rates for all wells. Table 3 summarizes the pumping rates used in the model for delineation of the WHPAs. Unaccounted water (the difference between the total volume pumped annually by the City's wells and the total amount billed to users) averaged 12% annually from 2004-2013 (Bolton & Menk, 2014).

2.4 Conceptual Hydrogeologic Model

The regional hydrogeologic conceptual model is presented in Metropolitan Council (2014). Additional geological information is included below, along with discussion of groundwater flow boundaries and flow directions specific to the Coon Rapids area.

2.4.1 Regional Bedrock Geology

A bedrock map derived from the Twin Cities ten-county metropolitan area geologic map (Mossler, 2013) is shown on Figure 1. Locations of three geologic cross sections through the study area are also shown on Figure 1. Geologic cross sections A-A' (Figure 2) and C-C' (Figure 4) are roughly parallel northwest to southeast sections that cross west to east cross section B-B' (Figure 3) at Coon Rapids Well 14 and Well 8, respectively.

The hydrostratigraphic units of importance for this study are described in more detail below.

Mt. Simon Sandstone

The Cambrian-aged Mt. Simon Sandstone consists of multiple beds of medium- to coarse-grained quartz sandstone intermixed with beds of siltstone and feldspathic sandstone (Mossler, 2012). The formation is 125-200 feet thick in Anoka County. The Mt. Simon Sandstone is overlain by the Eau Claire Formation (a confining unit) throughout Coon Rapids.

Eau Claire Formation

The Cambrian-aged Eau Claire Formation is comprised of very fine feldspathic sandstone, siltstone, and shale, and is 75-80 feet thick in Anoka County (Mossler, 2012). It is overlain by the Wonewoc Sandstone throughout Coon Rapids but is the uppermost bedrock just to the northwest of the City in Andover and Anoka. The Eau Claire Formation functions as a regional confining unit where present.

Wonewoc Sandstone (formerly Ironton and Galesville Sandstones)

The Cambrian-aged Wonewoc Sandstone is fine- to coarse-grained, quartzose sandstone, with its upper part coarser-grained than its lower part (Mossler, 2012). It is 50-60 feet thick in Anoka County and is the uppermost bedrock in far northwestern Coon Rapids.

Tunnel City Group (formerly Franconia Formation)

The Cambrian-aged Tunnel City Group is divided into two formations: the Mazomanie Formation and the Lone Rock Formation. The Mazomanie Formation is mostly a fine- to medium-grained friable, quartz sandstone. The Lone Rock Formation underlies the Mazomanie Formation and consists of fine grained glauconitic, feldspathic sandstone and shale with dolostone interclasts (Mossler, 2012). The Tunnel City Group is the uppermost bedrock in northern Coon Rapids and in the bedrock valleys in the central part of the City. It is 135 to 180 feet thick where not eroded. The Mazomanie Formation is present in the uppermost 60-80 feet of the unit.

Quaternary Glacial Drift

The Quaternary-aged sediments that overlie the bedrock in Coon Rapids were deposited by multiple glacial advances during the Pleistocene Epoch (Meyer et al., 2013) and vary in thickness from approximately 90 feet thick where the Jordan Sandstone is the uppermost bedrock to nearly 300 feet thick where the Tunnel City Group is the uppermost bedrock. As shown on Figures 2-4, the upper 30-50 feet of the Quaternary sediments are typically comprised of sand and gravel. The deeper sediments are comprised of discontinuous sequences of fine-grained sediments (i.e., clays and silts) and sands and gravels. Away from the Mississippi River in northeastern Coon Rapids, Figures 3 and 4 indicate a continuous clay unit separating the shallow sands and gravels from discontinuous deeper confined sand and gravel aquifers. Closer to the river, Figures 2 and 3 show a sandier profile overall with more discontinuous local confining units.

2.4.2 Flow Boundaries

The Mississippi River to the southwest of Coon Rapids is a groundwater flow boundary, though not necessarily for all of the hydrostratigraphic units detailed in the previous section. See Section 2.6 below for more discussion.

2.5 Model Description

To accurately delineate the WHPAs, it is necessary to assess how nearby wells, rivers, lakes, and variations in geologic conditions affect groundwater flow directions and velocities in the aquifer. A groundwater model constructed using the finite difference code MODFLOW-NWT (Niswonger, et al., 2011) was used

for this study to simulate groundwater flow in the hydrostratigraphic units from the Quaternary aquifer down to the Mt. Simon Sandstone. MODFLOW-NWT is public domain software that is available at no cost from the United States Geological Survey. The pre- and post-processor Groundwater Vistas (version 6) (Environmental Simulations, Inc., 2011) was used to create the model data files and evaluate the model results.

2.5.1 Base Model

Since the previous Coon Rapids Wellhead Protection Plan was prepared, the Twin Cities Metropolitan Area Regional Groundwater Flow Model, Version 3.0 (Metropolitan Council, 2014) was developed by Barr Engineering for the Metropolitan Council. This regional model includes Coon Rapids and, per discussions at the Pre-Delineation Meeting (MDH, 2015), Metro Model 3 was used as the base model for the new Coon Rapids WHPA delineations.

Metro Model 3 is divided into 9 layers to represent the major hydrostatigraphic units in the Twin Cities Metropolitan Area. In Coon Rapids, the model layers represent the following (ordered from youngest to oldest; i.e., shallowest to deepest):

- Layer 1: Quaternary glacial drift
- Layer 2: St. Peter Sandstone or Quaternary glacial drift (where present)
- Layer 3: Prairie du Chien Group or Quaternary glacial drift (where present)
- Layer 4: Jordan Sandstone or Quaternary glacial drift (where present)
- Layer 5: St. Lawrence Formation or Quaternary glacial drift (where present)
- Layer 6: Tunnel City Group or Quaternary glacial drift (where present)
- Layer 7: Wonewoc Sandstone
- Layer 8: Eau Claire Formation
- Layer 9: Mt. Simon Sandstone

Major rivers near Coon Rapids (i.e., the Mississippi and Rum Rivers) as well as lakes in the area are simulated using the River Package within MODFLOW-NWT. Baseflow measurements for rivers and streams in the area were used during calibration of Metro Model 3.

Recharge for the groundwater flow model was determined using the SWB recharge model (Westenbroek et al., 2010) for the Twin Cities metropolitan area as described in Metropolitan Council (2012).

Modifications made to Metro Model 3 for the Coon Rapids WHPA delineations are discussed in the following section.

2.5.2 Model Modifications and Updates

The following modifications and updates were made to the base model:

- A smaller sub-model centered on Coon Rapids was cut from the full Metro Model 3 using the telescopic mesh refinement (TMR) functionality in Groundwater Vistas. The boundaries of this model are approximately 10 miles from Coon Rapids in all directions. Constant-flux boundary conditions derived from the full Metro Model 3 results were applied to the outer boundaries of

the sub-model. A map of the sub-model domain is shown on Figure C1 in Appendix C. The sub-model will be referred to as "the model" hereafter in this report.

- It was determined at the Pre-delineation Meeting (MDH, 2015b) that several of the Coon Rapids well locations were incorrect in the County Well Index (CWI) (MGS, 2015). With information from the City, the locations of Wells 4, 5, 7, 8, 10, 15, 18, 19, 21, 24, and 25 were adjusted based on aerial photos to better reflect their actual locations (MDH, 2015a).
- The pumping rates for the City's wells were changed to the model input rates shown in Table 3.
- The model grid was refined from the 500-m square cells of the base model down to 125-m square cells within the Coon Rapids city limits. The grid was further refined to 7.81-m square cells in the immediate vicinity of the Coon Rapids wells.
- Edges of partially eroded bedrock units in Coon Rapids (e.g., Jordan Sandstone, St. Lawrence Formation, Tunnel City Group) were re-mapped onto the refined grid using boundaries from the Twin Cities Metro bedrock map (Mossler, 2013).
- Slight differences in model layer contact elevations versus well open intervals noted on the well logs resulted in some of the City's wells drawing water from inappropriate layers in the model. These issues were corrected for the following wells (well name followed by current open layer(s) in the model, followed in parentheses by the original open layers in the model):
    - Well 11, 5 through 9 (6 through 9)
    - Well 13, 7 through 9 (6 through 9)
    - Well 14, 7 through 9 (6 through 9)
    - Well 20, 4 (3 and 4)
    - Well 21, 4 (4 and 5)
    - Well 22, 3 (2 and 3)
    - Well 23, 4 (3 and 4)
- Horizontal hydraulic conductivity values (Kx) were updated so that model layer transmissivities in the vicinity of the Coon Rapids wells match aquifer test transmissivities (Section 2.2; Appendix B) as described below. The ratio of horizontal to vertical hydraulic conductivity (Kx/Kz) in the base Metro Model 3 was preserved when making these changes up to a maximum ratio of 1,000; i.e., new Kz values were calculated from the updated Kx values. (Values of Kx/Kz greater than 1,000 did not seem reasonable, except for the Layer 2 clay unit described below.) See Appendix C for maps of model hydraulic conductivity fields. Since several of Coon Rapids' wells are located close to the eastern city limits, some of the areas of updated hydraulic conductivity had to extend east into Blaine in order to encompass the entire well capture zones. This extended modification boundary has its eastern limit approximately 5 km to the east of the Coon Rapids/Blaine line.
    - <u>Quaternary</u>. Detailed mapping of sand and glacial till units from the Anoka County Geologic Atlas (Meyer et al., 2013) was utilized in the model edits.
        - <u>Layer 2</u>: Layer 2 represents a clayey glacial till unit at most Coon Rapids wells, but some of the Metro Model 3 K values were too high to represent this material. Till unit Ce from the Anoka County Atlas appeared to correspond to the till unit observed on the City's well logs, so the Kx and Kz values for cells representing this till within the extended boundary described above were set

to the Metro Model 3 values in Layer 2 at Well 21 - 2 ft/day and 0.001 ft/day (0.623 m/day and 0.00016 m/day), respectively – which are reasonable for the till.

- Layers 3 and 4: Sand unit Sr appeared to represent the aquifer in which Well 19 is screened. Sand unit Sr also appeared to represent the shallow portion of the sand aquifer in Layer 3 at Well 20. Layer 3 should be clay at Well 19, and till unit Xt appeared to represent this material. Wells 17, 22, and 23 appeared to be screened in sand unit Sx, which overlaped Sr and Sp in the area of the primary Coon Rapids Quaternary well field. Well 21 appeared to be screened in overlapping Sx and Sr units in Layer 4. This information was accounted for in the model as follows:
    - The Layer 3 Kx and Kz values within the till unit Xt extent were set to the values used for till unit Ce in Layer 2.
    - The transmissivity determined from the pumping test at Well 19 was 8,700 ft^2/day (808.3 m^2/day) and the model Layer 4 thickness at Well 19 was 37.4 feet (11.4 m), resulting in an effective Kx of 233 ft/day (71.1 m/day). The Layer 4 Kx values within the "hole" in sand unit Sp around Well 19 were set to this value.
    - Layer 3 Kx values in the sand unit Sr extents that did not overlap till unit Xt were set to 233 ft/day (71.1 m/day).
    - The transmissivity determined from the pumping test at Well 20 was 45,210 ft^2/day (4,200.1 m^2/day), the model Layer 3 thickness at Well 20 was 31.8 ft (9.7 m), and the model Layer 4 thickness at Well 20 was 36.7 ft (11.2 m). Combining this information with the Sr Kx of 71.1 m/day in Layer 3 resulted in an effective Layer 4 Kx of 1,030 ft/day (314.4 m/day) to match the Well 20 transmissivity in Layers 3 and 4. This K value was applied to the combined Sp and Sx extent in Layer 4 that includes Wells 17, 20, 22, and 23.
    - The transmissivity determined from the specific capacity measurement in Well 21 was 5,750 ft^2/day (534.2 m^2/day). The thickness of Layer 4 at Well 21 was 44.9 ft (13.7 m), resulting in an effective Layer 4 Kx of 128 ft/day (39.1 m/day). This value was uniformly assigned to Layer 4 cells within the combined Sr and Sx extents near Well 21.

- St. Lawrence. As noted above, Layer 5 represents the St. Lawrence formation, a regional confining unit, over much of Coon Rapids. Partially due to the remapping of bedrock units described above, some cells representing St. Lawrence Formation in the model ended up with horizontal hydraulic conductivities greater than the largest measured Kx value for the St. Lawrence (46 ft/day or 14 m/day) in Runkel et al. (2003). The Kx was set to 14 m/day in all St. Lawrence cells within the extended boundary described above with original Kx values greater than 14 m/day.
- Tunnel City and Wonewoc. As discussed above in Section 2.2, a transmissivity of 5,470 ft^2/day (508.2 m^2/day) was estimated for the Tunnel City Group and a

transmissivity of 2,230 ft^2/day (207.2 m^2/day) was estimated for the Wonewoc Sandstone. The model thicknesses at Well 24 in Layers 6 and 7 were 113 ft (34.4 m) and 61.0 ft (18.6 m), respectively. Dividing the pumping test T values by these model thicknesses gave effective K values of 48.6 ft/day (14.8 m/day) for the Tunnel City Group and 36.4 ft/day (11.1 m/day) for the Wonewoc sandstone. These K values were uniformly applied to cells representing the Tunnel City Group or Wonewoc Sandstone, respectively, within the extended boundary described above.

- Mt. Simon. Dividing the pumping test transmissivity value of 2,310 ft^2/day (214.6 m^2/day) by the model Layer 9 thickness at Well 18 of 195 ft (59.5 m) gave an effective Mt. Simon K of 11.8 ft/day (3.6 m/day). The Layer 9 Kx values within the extended boundary described above were uniformly set to the calculated effective K.

As discussed at the Pre-Delineation Meeting, no additional recalibration of the model was deemed necessary. Calibration summary plots for the updated model are included in Appendix C (Figures C9 and C10). Full discussion of the Metro Model 3 calibration is presented in Metropolitan Council (2014). MODFLOW files for the updated model are included in Appendix G.

2.6 Groundwater Flow Field

The groundwater flow field used for delineation of the WHPAs was determined by the groundwater flow model; modeled contours for the confined Quaternary glacial drift (model layers 3 and 4), Tunnel City Group, Wonewoc Sandstone, and Mt. Simon Sandstone are shown on Figures 5, 6, 7, 8, and 9, respectively.

In general, Figures 5-8 show southerly to westerly flow directions in the confined Quaternary and Tunnel City-Wonewoc aquifers. No published groundwater contours are known for these aquifers in Anoka County, but the modeled contours seem reasonable since they indicate groundwater flow towards the Mississippi River. Based on this modeled flow toward the regional groundwater discharge zones and the acceptable calibration of the groundwater model, the groundwater flow field was determined to be of acceptable accuracy.

As shown on Figures 5-8, the cones of depression from the western Coon Rapids well field extend under the Mississipppi River, which results in capture zones crossing the river into Champlin and Brooklyn Park (Figure 10). See Section 3.2 below for more discussion.

As expected due to the presence of the Eau Claire Formation aquitard, flow in the Mt. Simon Sandstone is less influenced by the Mississippi River and more dependent on high capacity pumping. Figure 9 shows flow in the Mt. Simon in Coon Rapids to be primarily directed towards the south and southwest. The southerly flow is consistent with the large cone of depression centered on southeastern Hennepin County depicted on the Mt. Simon groundwater contour map included in the Hennepin County Geologic Atlas (Kanivetsky, 1989). In northwestern Coon Rapids, flow directions in the Mt. Simon are influenced by the Champlin well field to the west.

3.0 Delineation of the Wellhead Protection Areas

Delineation of the WHPAs for the Coon Rapids wells involved the evaluation of porous media flow only. Per discussions at the Pre-Delineation Meeting (MDH, 2015b), a fracture flow evaluation was deemed unnecessary.

3.1 Porous Media Flow Evaluation

The groundwater flow model discussed above in Section 2 was used to simulate the groundwater flow field in the vicinity of Coon Rapids. The porous media capture zone for the Coon Rapids well field was delineated using the software program MODPATH (Version 5) with the modeled groundwater flow field. A minimum of 180 particles were tracked from each well. The particles were released from 6 vertical points in each layer along the open interval of each well. These particles were tracked backwards in time for both one and ten years. In plan view, the areas encompassed by the particle traces were then outlined as the 1-year and 10-year porous media time of travel zones for the well field.

Porosity values used for the porous media flow evaluation were as follows (Norvitch et al., 1974, Schwartz and Zhang, 2003):

- Quaternary Glacial Drift = 0.25
- Tunnel City Group = 0.2
- Wonewoc Sandstone = 0.2
- Mt. Simon Sandstone = 0.2

3.1.1 Sensitivity Analysis

A sensitivity analysis was performed to test the sensitivity of the model results to varying hydraulic conductivity in the confined Quaternary glacial drift, TCW, and Mt. Simon aquifers. The ranges of transmissivities estimated for the various aquifers by the pumping test analyses and specific capacity calculations (Appendix B) were used to calculate upper bounds on hydraulic conductivity for the model sensitivity analysis. The original Metro Model 3 hydraulic conductivities in these aquifers were smaller than the values calculated from the lower bounds of the transmissivity ranges, so the Metro Model 3 values were used as the lower bounds for the sensitivity analysis. The ratio of horizontal to vertical hydraulic conductivity in the base Metro Model 3 was preserved for each sensitivity run except where modified as discussed above in Section 2.5.2. The model was most sensitive to lowering the hydraulic conductivity of the TCW and confined Quaternary aquifers. A plot of the sensitivity analysis results is included in Appendix C.

Multiple particle tracking simulations were conducted to account for uncertainty in the groundwater flow model. In addition to the base model run, particle tracking simulations were conducted for the upper and lower conductivity bounds of each sensitivity run. Particle traces from all simulations were used to delineate the 1-year and 10-year porous media capture zones for each well (Figure 10).

3.2 WHPA Delineations

The composite 10-year porous media capture zones define the WHPAs. There are seven distinct WHPAs due to the spacing of the City's wells. The Emergency Response Area (ERA) is delineated for each well by the composite 1-year porous media capture zones. The WHPAs and ERAs are shown on Figure 10.

As mentioned above in Section 2.6, portions of the Coon Rapids WHPA extend under the Mississippi River into Champlin and Brooklyn Park. The particle traces that crossed beneath the River originated at confined Quaternary Wells 17, 20, and 23 and TCW-Mt. Simon Wells 7 and 11. While the traces from the Quaternary wells originated where Layer 4 represents Quaternary sediments, they crossed the River where Layer 4 represents the Jordan Sandstone. The degree of connection between the bedrock aquifers (Jordan and TCW) and the Mississippi River does not appear to be strong enough to prevent the aquifer stress from concentrated high-capacity pumping in Coon Rapids from extending to the west of the River.

3.3 Conjunctive Delineation

As discussed below in section 6.0, a region of High vulnerability is present within one of the Coon Rapids DWSMAs; however, there is no water quality data available that definitively indicates that groundwater pumped from this region is under the influence of surface water. Therefore, delineation of a surface water capture area (i.e., a conjunctive delineation) was not performed. Section 7.0 below discusses recommendations to address this data gap for the next WHPP amendment.

4.0 Delineation of the Drinking Water Supply Management Areas

The Coon Rapids DWSMAs encompass the WHPAs with boundaries that correspond to geographically identifiable features (e.g., roads, parcel boundaries, quarter-quarter section lines). Anoka County 2015 parcel data and Hennepin County 2011 parcel data were used to delineate the DWSMAs. There are three distinct DWSMAs: the West DWSMA encompasses the WHPAs for Wells 4, 6, 7, 11, 12, 14, 15, 17, 19, 20, 22, 23, 24, and 15; the Northeast DWSMA encompasses the WHPAs for Wells 1, 2, 8, 9, 10, 13, 16, 18, and 21; and the Southeast DWSMA encompasses the Well 5 WHPA. The Southeast DWSMA is contained entirely within the Coon Rapids city limits, while the Northeast DWSMA extends east into Blaine and the West DWSMA extends southwest into Champlin and Brooklyn Park. The Coon Rapids DWSMAs are shown on Figure 10. To satisfy Minnesota Rule 4720.5500, Subpart 2, 1:24,000 scale maps of the DWSMAs are included in Appendix D.

5.0 Well Vulnerability Assessment

MDH evaluated the vulnerability of the Coon Rapids municipal wells to contamination from contaminants released at the surface. The evaluation parameters include geology, well construction, pumping rate, and water quality. Coon Rapids Wells 6, 7, 11, 15, 17, 19, 20, 21, 22, 23, and 24 are classified as “vulnerable” and Wells 1, 2, 4, 5, 8, 9, 10, 12, 13, 14, 16, 18, and 25 are classified as “not vulnerable.” Copies of the MDH well vulnerability scoring sheets for the Coon Rapids wells are presented in Appendix E.

6.0 Drinking Water Supply Management Area Vulnerability Assessment

The vulnerabilities of the Quaternary glacial drift, Tunnel City Group, Wonewoc Sandstone, and Mt. Simon Sandstone within the DWSMAs associated with the Coon Rapids wells were evaluated in a manner consistent with MDH guidance for assessing aquifer vulnerability (MDH, 1997) using geologic sensitivities based on L scores computed from boring log data and water quality data for the Coon Rapids wells.

The first step in the assessment is to determine the geologic sensitivity rating of the aquifer. The Minnesota Department of Natural Resources (MnDNR) defines geologic sensitivity based on the travel time of water moving vertically from the surface to the aquifer of interest as follows (see MnDNR, 1991):

- Sensitivity = Very High: vertical travel time is hours to months
- Sensitivity = High: vertical travel time is weeks to years
- Sensitivity = Moderate: vertical travel time is years to decades
- Sensitivity = Low: vertical travel time is several decades to a century
- Sensitivity = Very Low: vertical travel time is more than a century

Geologic logs listed in the CWI for wells in the vicinity of the WHPAs were reviewed and "L scores" based on the thickness of low permeability units at each well location were assigned to each well. [See MnDNR (1991) for a discussion of how to determine L scores]. The MDH L score tool was used to compute the L scores and assign geologic sensitivity ratings. Well logs lacking detail in the Quaternary stratigraphy were excluded from the L score calculations. L score calculations were performed for the uppermost aquifer in each composite WHPA. Figure F1 in Appendix F shows geologic sensitivity for the regions of the WHPAs where the confined Quaternary aquifer is the uppermost aquifer, and Figure F2 shows geologic sensitivity for the regions of the WHPAs where bedrock aquifers (e.g., TCW, Mt. Simon) are the uppermost aquifers.

Quaternary geologic sensitivity in the Coon Rapids WHPAs is primarily Low or Moderate, though there is a region of High geologic sensitivity between Wells 15 and 25. Quaternary Wells 17, 22, and 23 are located in areas of Moderate geologic sensitivity, and Quaternary Wells 19, 20, and 21 are located in areas of Low geologic sensitivity.

Bedrock geologic sensitivity is Low except for approximately the northern two-thirds of the Well 6 WHPA where the geologic sensitivity of the TCW aquifer is Moderate.

The second step in the assessment is to refine the geologic sensitivity using water quality data from the water supply wells. Recent tritium sampling was conducted in summer 2010 at Coon Rapids Wells 11, 17, 20, 23, and 24 (see Appendix E) and in July 2015 at Wells 2, 5, 6, 9, 14, 18, and 21 (MDH, 2015c). Tritium (^3H), a radioactive isotope of hydrogen, has been used extensively to date groundwater. Tritium activities peaked during atmospheric hydrogen bomb testing of the 1950s and 1960s, and values of ^3H in precipitation reached a maximum of approximately 10,000 T.U. (tritium units) in 1963 (Mazor, 2004). Natural production of ^3H in the upper atmosphere introduces approximately 5 T.U. to precipitation each

year (Mazor, 2004). Because ^{3}H has a relatively short half-life of 12.43 years, radioactive decay since the bomb peak has reduced tritium activities to near background levels and ^{3}H is used mostly for relative age dating today. Groundwater that has little or no detectible ^{3}H is stated to be "vintage" or pre-bomb. Groundwater with detectable values of ^{3}H is stated to be "young" or post-bomb. The presence of tritium at concentrations above 1 tritium unit indicates the presence of a significant fraction of post-1954 (i.e., recently infiltrated) water in the groundwater sample. Table 4 summarizes the results of the 2010 and 2015 tritium sampling events. Tritium was not detected in the samples collected at Wells 5 and 18. Tritium was detected at similar concentrations of 2.6, 2.9, 2.7, 1.8, and 2.0 NTU at Wells 2, 9, 11, 14, and 17, respectively, and at higher concentrations of 6.8, 6.9, 8.6, 7.7, and 7.7 NTU at Wells 6, 20, 21, 23, and 24, respectively.

When water quality data does not indicate the presence of tritium or other constituents that are consistent with contamination from the surface the aquifer vulnerability classification and the geologic sensitivity rating can be the same. The presence of tritium in groundwater samples from a well suggests that the water traveled vertically from the ground surface to the aquifer in less than about 50 years. When tritium has been detected in a well, geologic sensitivity ratings of low or very low would not be consistent with water quality data, unless groundwater flow information would indicate a nearby connection to an area of rapid vertical movement of water (e.g., a buried bedrock valley filled with sand and gravel) where water could travel from the surface to the aquifer quickly enough that tritium could be detected in a well with a geologic sensitivity rating of low or very low. If there is no hydraulic connection to an area of rapid vertical movement of water the aquifer vulnerability would need to be classified as moderate to explain the presence of tritium in the well.

Figure 11 shows the final aquifer vulnerability map for the uppermost aquifer supplying water to municipal wells in each of the Coon Rapids DWSMAs. Within the West DWSMA, tritium was detected at Wells 6, 11, 14, 17, 20, 23, and 24. The parcels intersected by the Well 6 WHPA were assigned Moderate vulnerability; while the geologic sensitivity at Well 6 itself was Low, a Moderate vulnerability at minimum must be assigned to this region due to the tritium detection at Well 6. Wells 11, 14, 17, 23, 24, and 25 are located within regions of Moderate geologic sensitivity. The geologic sensitivity is Low at Well 20. Due to the tritium detections at multiple wells, most of the West DWSMA was assigned Moderate vulnerability. The area of High geologic sensitivity near Wells 15 and 25 was assigned High vulnerability; mapping of the boundaries of the High vulnerability area to correspond to geographically identifiable features resulted in Wells 14 and 25 being located in the High vulnerability area. In the absence of recent water quality data for Wells 4 and 12, Low geologic sensitivity was mapped to Low vulnerability where the Well 4 and Well 12 capture zone are the uppermost capture zones in the DWSMA.

The Southeast DWSMA was assigned Low vulnerability due to Low geologic sensitivity in the Well 5 WHPA and a tritium non-detect at Well 5.

Low vulnerability was assigned to the parcels within the Northeast DWSMA that intersect the Well 18 WHPA because the geologic sensitivity of the Mt. Simon Sandstone is Low and no tritium was detected at Well 18. The remainder of the Northeast DWSMA was assigned Moderate vulnerability. Although the geologic sensitivity of this region is primarily low, tritium was detected at Wells 2, 9, and 21, requiring a

minimum Moderate vulnerability. While the tritium value of 8.6 NTU at Well 21 is high, this value is not inconsistent with the definition of Moderate vulnerability (travel times from years to decades) and the Quaternary stratigraphy near Well 21 (Figures 3 and 4) includes some confining units.

7.0 Recommendations

It is recommended that the City work with the MDH to conduct tritium sampling of the municipal wells at least every ten years in order to have current data available when updating the aquifer vulnerability assessment as part of the required decennial wellhead protection plan amendments.

A conjunctive delineation was not performed due to the absence of water quality data that definitively indicate groundwater under the influence of surface water. Per current MDH policy, it is recommended that additional water quality sampling (e.g., oxygen isotopes) be conducted at the City wells nearest the region of High vulnerability and Quaternary wells whose capture zones extend under the Mississippi River (e.g., Wells 14, 15, 17, 20, 22, 23, and 25) during the life of this WHPP in order to assess the need for a conjunctive delineation in the next WHPP amendment.

8.0 Supporting Data Files

The groundwater model files and GIS files are included in Appendix G. (Appendix G can be found in the "Part1" folder on the CD.)

The groundwater model can be reviewed using MODFLOW-NWT (Niswonger et al., 2011). MODPATH files can be reviewed using MODPATH Version 5.

All coordinates in the modeling files are based on UTM NAD 83 Zone 15 N datum. Elevations are in meters above mean sea level (m MSL). Time units are days. Length units are meters.

The GIS files have been named according to the MDH conventions. Shapefiles are in UTM NAD83 Zone 15 N datum.

9.0 References

Bonestroo, Rosene, Anderlik & Associates (Bonestroo), 2006. City of Coon Rapids Wellhead Protection Plan, Part I, Amendment. Prepared for the City of Coon Rapids, February 2006.

Bradbury, K.B., and E.R. Rothschild, 1985. A computerized technique for estimating the hydraulic conductivity of aquifer from specific capacity data. *Ground Water* v. 23, no. 2, pp. 240-246.

Bolton & Menk, 2014. Comprehensive Water System Plan, City of Coon Rapids, Minnesota. Prepared for City of Coon Rapids, Bolton & Menk Project No. N21.107935, October 2014.

Environmental Simulations, Inc., 2011. Guide to using Groundwater Vistas, Version 6, Environmental Simulations Inc.

Kanivetsky, R., 1989. Bedrock Hydrogeology. Plate 6 of 9, *in* Geologic Atlas of Hennepin County, Minnesota: N.H. Balaban (ed.). Minnesota Geological Survey County Atlas Series, Atlas C-4. University of Minnesota, St. Paul.

Mazor, E, 2004. Chemical and Isotopic Groundwater Hydrology, 3rd ed., New York: Marcel Dekker Inc.

Metropolitan Council, 2014. Twin Cities Metropolitan Area Regional Groundwater Flow Model, Version 3.0. Prepared by Barr Engineering. Metropolitan Council: Saint Paul, MN.

Metropolitan Council, 2012. Using the soil water balance model (SWB) to estimate recharge for the Twin Cities Metropolitan Area Groundwater Model Version 3. Prepared by Barr Engineering. Metropolitan Council: Saint Paul, MN.

Meyer, G.N., Tipping, R.G., and R.S. Lively, 2013. Sand Distribution Model. Plate 5 of 6, *in* Geologic Atlas of Anoka County, Minnesota: D.R. Setterholm (ed.). Minnesota Geological Survey County Atlas Series, Atlas C-27. University of Minnesota, St. Paul.

Minnesota Department of Health (MDH), 2015a. *RE: Revised Coon Rapids Well Shapefile Corrected in CWI*. [email] Message from Amal Djerrari of the MDH to Adam Janzen of Barr Engineering and Sean Hunt of the MnDNR. Sent 8/13/2015.

Minnesota Department of Health (MDH), 2015b. Personal communication: Pre-Delineation Meeting with MDH, City of Coon Rapids, and Barr Engineering staffs held on August 11, 2015 at Barr Engineering Company, Edina, MN.

Minnesota Department of Health (MDH), 2015c. *RE: Coon Rapids Tritium*. [email] Message from Amal Djerrari of the MDH to Adam Janzen and John Greer of Barr Engineering. Sent 10/23/2015.

Minnesota Department of Health (MDH), 2003. Wellhead Protection Plan for the City of Coon Rapids, Part I, Delineation of Wellhead Protection Areas, Delineation of Drinking Water Supply Management Areas,

Assessment of Well and Aquifer Vulnerability. Prepared by Stephen W. Robertson of the MDH for the City of Coon Rapids, March 2003.

Minnesota Department of Natural Resources (MnDNR), Division of Waters. 1991. *Criteria and Guidelines for Assessing Geologic Sensitivity of Ground Water Resources in Minnesota*. Prepared for the Legislative Commission on Minnesota Resources, 122 p., June 1991.

Minnesota Geological Survey (MGS), 2015. Minnesota Well Index, update November 2015.

Mossler, J.H., 2012. Bedrock Geology. Plate 2 of 6, *in* Geologic Atlas of Anoka County, Minnesota: D.R. Setterholm (ed.). Minnesota Geological Survey County Atlas Series, Atlas C-27. University of Minnesota, St. Paul.

Mossler, J.H., 2013. Bedrock geology of the Twin Cities ten-county metropolitan area, Minnesota. Miscellaneous Map Series M-194, Minnesota Geological Survey.

Niswonger, R.G., Panday, S., and Ibaraki, M., 2011. MODFLOW-NWT, A Newton formulation for MODFLOW-2005. U.S. Geological Survey Techniques and Methods 6-A37, 44 p.

Norvitch, R.F., Ross, T.G., and A. Brietkrietz, 1974. Water resources outlook for the Minneapolis-St. Paul metropolitan area. Metropolitan Council of the Twin Cities area, 219pp.

Schwartz, F.W. and H. Zhang, 2003. *Fundamentals of Ground Water*. John Wiley and Sons, Inc. New York, New York.

Westenbroek, S.M., V.A. Kelson, W.R. Dripps, R.J. Hunt, and K.R. Bradbury, 2010. SWB – A Modified Thornthwaite-Mather Soil-Water-Balance Code for Estimating Groundwater Recharge, Techniques and Methods 6-A31, U.S. Geological Survey, Groundwater Resources Program, Reston, VA, 72 pp.

Tables

Table 1

Assessment of Data Elements
Coon Rapids WHPP Amendment

Data Element	Present and Future Implications				Data Source
	Use of the Well s	Delineation Criteria	Quality and Quantity of Well Water	Land and Groundwater Use in DWSMA	
Precipitation	M	L	M	M	Minnesota Climatology Working Group
Geology					
Maps and geologic descriptions	M	H	H	H	MGS, CWI
Subsurface data	M	H	H	H	MGS, MDH, CWI
Borehole geophysics	M	M	M	M	MGS
Surface geophysics	L	L	L	L	Not Available
Maps and soil descriptions	L	M	M	M	MGS, NRCS
Eroding lands					
Water Resources					
Watershed units	L	L	L	L	DNR
List of public waters	L	L	L	L	DNR
Shoreland classifications					
Wetlands map					
Floodplain map					
Land Use					
Parcel boundaries map	L	H	L	L	Metropolitan Council, Anoka County
Political boundaries map	L	L	L	L	MNGEO
PLS map	L	L	L	L	DNR
Land use map and inventory					
Comprehensive land use map					
Zoning map					
Public Utility Services					
Transportation routes and corridors	L	M	L	L	MNDOT
Storm/sanitary sewers and PWS system map	L	L	L	L	City of Coon Rapids
Oil and gas pipelines map					

Definitions Used for Assessing Data Elements:

High (H) - the data element has a direct impact
Moderate (M) - the data element has an indirect or marginal impact
Low (L) - the data element has little if any impact
Shaded - the data element was not required by MDH for preparing the WHP plan

CWI – Minnesota County Well Index
DNR – Minnesota Department of Natural Resources
MNGEO - Minnesota Geospatial Information Office
MDH – Minnesota Department of Health
MNDOT – Minnesota Department of Transportation
MPCA – Minnesota Pollution Control Agency
NRCS – Natural Resources Conservation Service
SSURGO – Soil Survey Geographic Database
USGS – United States Geological Survey

Table 1

Assessment of Data Elements (Continued)

Data Element	Present and Future Implications				Data Source
	Use of the Well s	Delineation Criteria	Quality and Quantity of Well Water	Land and Groundwater Use in DWSMA	
Public drainage systems map/lis	L	L	L	L	City of Coon Rapids
Records of well construction, maintenance, and use	H	H	L	L	City of Coon Rapids, CWI, MDH files
Surface Water Quantity					
Stream flow data	L	L	L	L	DNR
Ordinary high water mark data	L	L	L	L	DNR
Permitted withdrawals	L	L	L	L	DNR
Protected levels/flows	L	L	L	L	DNR
Water use conflicts	L	L	L	L	DNR
Groundwater Quantity					
Permitted withdrawals	H	H	H	H	DNR
Groundwater use conflicts	L	L	L	L	DNR
Water levels	H	H	H	H	CWI, MDH
Surface Water Quality					
Stream and lake water quality management classification					
Monitoring data summary	L	L	L	L	MPCA, MDH
Groundwater Quality					
Monitoring data	H	H	H	H	MDH
Isotopic data	H	H	H	H	MDH
Tracer studies	L	L	L	L	Not Available
Contamination site data	L	L	M	M	MPCA, MDH
Property audit data from contamination sites					
MPCA and MDA spills/release reports	L	L	L	L	MDH, MPCA

Definitions Used for Assessing Data Elements:

High (H) - the data element has a direct impact
Moderate (M) - the data element has an indirect or marginal impact
Low (L) - the data element has little if any impact
Shaded - the data element was not required by MDH for preparing the WHP plan

CWI – Minnesota County Well Index
DNR – Minnesota Department of Natural Resources
MNGEO - Minnesota Geospatial Information Office
MDH – Minnesota Department of Health
MNDOT – Minnesota Department of Transportation
MPCA – Minnesota Pollution Control Agency
NRCS – Natural Resources Conservation Service
SSURGO – Soil Survey Geographic Database
USGS – United States Geological Survey

Table 2

Water Supply Well Information
Coon Rapids WHPP Amendment

Local Well ID	Unique Number	Use/ Status[1]	Casing Diameter (in.)	Casing Depth (ft.)	Well Depth (ft.)	Year Constructed	Aquifer	Well Vulnerability
1	202926	S	12	220	462	1957	St. Lawrence – Eau Claire	Not Vulnerable
2	202929	S	12	226	788	1957	St. Lawrence – Mt. Simon	Not Vulnerable
4	202972	S	20 x 16	233	605	1960	Tunnel City – Mt. Simon	Not Vulnerable
5	202951	S	24 x 16	242	695	1961	Tunnel City – Mt. Simon	Not Vulnerable
6	202937	S	20	118	158	1960	Tunnel City	Vulnerable
7	202943	S	24 x 16	189	632	1964	Tunnel City – Mt. Simon	Vulnerable
8	202932	P	24 x 16	283	700	1965	Tunnel City – Mt. Simon	Not Vulnerable
9	202931	P	24 x 16	294	500	1969	Tunnel City – Eau Claire	Not Vulnerable
10	202930	P	30 x 24 x 16	272	684	1970	Tunnel City – Mt. Simon	Not Vulnerable
11	202965	P	24	157	627	1972	Tunnel City – Mt. Simon	Vulnerable
12	168721	S	24 x 16	208	604	1975	Tunnel City – Mt. Simon	Not Vulnerable
13	168720	P	24 x 16	395	693	1977	Tunnel City – Mt. Simon	Not Vulnerable
14	110460	P	30 x 20	328	613	1977	Tunnel City – Mt. Simon	Not Vulnerable
15	110461	P	30 x 20	225	615	1976	Tunnel City – Mt. Simon	Vulnerable
16	161413	S	30 x 24 x 18	395	653	1981	Wonewoc – Mt. Simon	Not Vulnerable

[1] P = Primary, S = Seasonal

Table 2

Water Supply Well Information (continued)
Coon Rapids WHPP Amendment

Local Well ID	Unique Number	Use/ Status[1]	Casing Diameter (in.)	Casing Depth (ft.)	Well Depth (ft.)	Year Constructed	Aquifer	Well Vulnerability
17	150357	P	30	81	121	1981	Confined Quaternary	Vulnerable
18	110469	S	36 x 30 x 24	575	637	1986	Mt. Simon	Not Vulnerable
19	110475	P	30 x 20	115	135	1987	Confined Quaternary	Vulnerable
20	420956	P	30 x 20	95	135	1988	Confined Quaternary	Vulnerable
21	474384	P	24 x 18	170	203	1990	Confined Quaternary	Vulnerable
22	474385	S	24	80	105	1990	Confined Quaternary	Vulnerable
23	463020	S	30 x 24	93	128	1991	Confined Quaternary	Vulnerable
24	674478	P	36 x 30 x 24	241	388	2003	Tunnel City – Wonewoc	Vulnerable
25	674479	P	36 x 24	229	388	2003	Tunnel City – Wonewoc	Vulnerable

[1] P = Primary, S = Seasonal

Table 3

Annual and Projected Pumping Rates for Coon Rapids Wells
Coon Rapids WHPP Amendment

		Total Annual Withdrawal (gal/yr)				
Unique Number	**Well Name**	**2010**	**2011**	**2012**	**2013**	**2014**
202926	1	2,474,000	2,056,000	5,603,000	11,794,000	3,625,000
202929	2	2,510,000	2,107,000	5,257,000	16,688,000	3,438,000
202972	4	454,000	237,000	328,000	4,995,000	2,330,000
202951	5	11,664,000	10,940,000	18,240,000	23,187,000	2,019,000
202937	6	11,404,000	14,692,000	18,891,000	28,209,000	2,022,000
202943	7	8,143,000	15,479,000	19,480,000	36,111,000	2,966,000
202932	8	266,464,000	146,631,000	124,262,000	87,333,000	153,358,000
202931	9	154,980,000	279,287,000	296,930,000	240,707,000	234,551,000
202930	10	289,927,000	321,549,000	329,619,000	260,648,000	48,304,000
202965	11	292,273,000	335,685,000	301,213,000	227,880,000	230,392,000
168721	12	8,107,000	13,305,000	19,113,000	26,242,000	1,961,000
168720	13	26,545,000	79,698,000	42,333,000	56,801,000	84,661,000
110460	14	82,530,000	65,386,000	104,955,000	97,452,000	89,025,000
110461	15	141,580,000	132,889,000	284,911,000	279,754,000	341,462,000
161413	16	6,637,000	268,000	1,340,000	1,462,000	859,000
150357	17	166,967,000	324,602,000	238,277,000	210,720,000	263,843,000
110469	18	1,461,000	1,264,000	1,103,000	3,664,000	2,340,000
110475	19	309,781,000	333,579,000	206,674,000	222,999,000	190,172,000
420956	20	348,896,000	275,096,000	157,449,000	146,620,000	161,888,000
474384	21	300,898,000	327,105,000	300,839,000	218,424,000	227,594,000
474385	22	2,315,000	33,171,000	34,297,000	23,168,000	45,768,000
463020	23	1,482,000	7,167,000	16,255,000	12,440,000	18,061,000
674478	24	229,680,000	20,193,000	218,647,000	220,698,000	160,699,000
674479	25	210,722,000	18,157,000	213,137,000	204,520,000	161,852,000
	Totals	2,877,894,000	2,760,543,000	2,959,153,000	2,662,516,000	2,433,190,000

Source: City water use records

Table 3

Annual and Projected Pumping Rates for Coon Rapids Wells
Coon Rapids WHPP Amendment

		Percentage of Annual Withdrawal					
Unique Number	Well Name	2010	2011	2012	2013	2014	Average Annual % of Withdrawal
202926	1	0.1%	0.1%	0.2%	0.4%	0.1%	0.2%
202929	2	0.1%	0.1%	0.2%	0.6%	0.1%	0.2%
202972	4	0.0%	0.0%	0.0%	0.2%	0.1%	0.1%
202951	5	0.4%	0.4%	0.6%	0.9%	0.1%	0.5%
202937	6	0.4%	0.5%	0.6%	1.1%	0.1%	0.5%
202943	7	0.3%	0.6%	0.7%	1.4%	0.1%	0.6%
202932	8	9.3%	5.3%	4.2%	3.3%	6.3%	5.7%
202931	9	5.4%	10.1%	10.0%	9.0%	9.6%	8.8%
202930	10	10.1%	11.6%	11.1%	9.8%	2.0%	8.9%
202965	11	10.2%	12.2%	10.2%	8.6%	9.5%	10.1%
168721	12	0.3%	0.5%	0.6%	1.0%	0.1%	0.5%
168720	13	0.9%	2.9%	1.4%	2.1%	3.5%	2.2%
110460	14	2.9%	2.4%	3.5%	3.7%	3.7%	3.2%
110461	15	4.9%	4.8%	9.6%	10.5%	14.0%	8.8%
161413	16	0.2%	0.0%	0.0%	0.1%	0.0%	0.1%
150357	17	5.8%	11.8%	8.1%	7.9%	10.8%	8.9%
110469	18	0.1%	0.0%	0.0%	0.1%	0.1%	0.1%
110475	19	10.8%	12.1%	7.0%	8.4%	7.8%	9.2%
420956	20	12.1%	10.0%	5.3%	5.5%	6.7%	7.9%
474384	21	10.5%	11.8%	10.2%	8.2%	9.4%	10.0%
474385	22	0.1%	1.2%	1.2%	0.9%	1.9%	1.0%
463020	23	0.1%	0.3%	0.5%	0.5%	0.7%	0.4%
674478	24	8.0%	0.7%	7.4%	8.3%	6.6%	6.2%
674479	25	7.3%	0.7%	7.2%	7.7%	6.7%	5.9%

Table 3

Annual and Projected Pumping Rates for Coon Rapids Wells
Coon Rapids WHPP Amendment

		Projected Water Use (2020)			Maximum Total Pumping for Model Input[3]		
Unique Number	Well Name	Total[1] (gal/yr)	% of Total Projected Water Use Well[2]	Projected Well Pumpage Based on % (gal/yr)	gal/yr	gal/day	m^3/day
202926	1		0.2%	6,002,060	11,794,000	32,312	122
202929	2		0.2%	6,002,060	16,688,000	45,721	173
202972	4		0.1%	3,001,030	4,995,000	13,685	52
202951	5		0.5%	15,005,150	23,187,000	63,526	240
202937	6		0.5%	15,005,150	28,209,000	77,285	293
202943	7		0.6%	18,006,180	36,111,000	98,934	375
202932	8		5.7%	171,058,710	266,464,000	730,038	2,764
202931	9		8.8%	264,090,640	296,930,000	813,507	3,080
202930	10		8.9%	267,091,670	329,619,000	903,066	3,419
202965	11		10.1%	303,104,030	335,685,000	919,685	3,482
168721	12		0.5%	15,005,150	26,242,000	71,896	272
168720	13		2.2%	66,022,660	84,661,000	231,948	878
110460	14		3.2%	96,032,960	104,955,000	287,548	1,089
110461	15		8.8%	264,090,640	341,462,000	935,512	3,542
161413	16		0.1%	3,001,030	6,637,000	18,184	69
150357	17		8.9%	267,091,670	324,602,000	889,321	3,367
110469	18		0.1%	3,001,030	3,664,000	10,038	38
110475	19		9.2%	276,094,760	333,579,000	913,915	3,460
420956	20		7.9%	237,081,370	348,896,000	955,879	3,619
474384	21		10.0%	300,103,000	327,105,000	896,178	3,393
474385	22		1.0%	30,010,300	45,768,000	125,392	475
463020	23		0.4%	12,004,120	18,061,000	49,482	187
674478	24		6.2%	186,063,860	229,680,000	629,260	2,382
674479	25		5.9%	177,060,770	213,137,000	583,937	2,211
	Totals	3,001,030,000		3,001,030,000	3,758,131,000	10,296,249	38,978

Appropriation 3,200,000,000

[1] 2020 projected average daily demand interpolated from land use-based projections in Coon Rapids Comprehensive Water System Plan (Bolton & Menk, 2014) for 2019 (8.11 MGD) and 2024 (8.67 MGD).

[2] Percentages for all wells are based the average % of annual withdrawal for the period 2010 through 2014

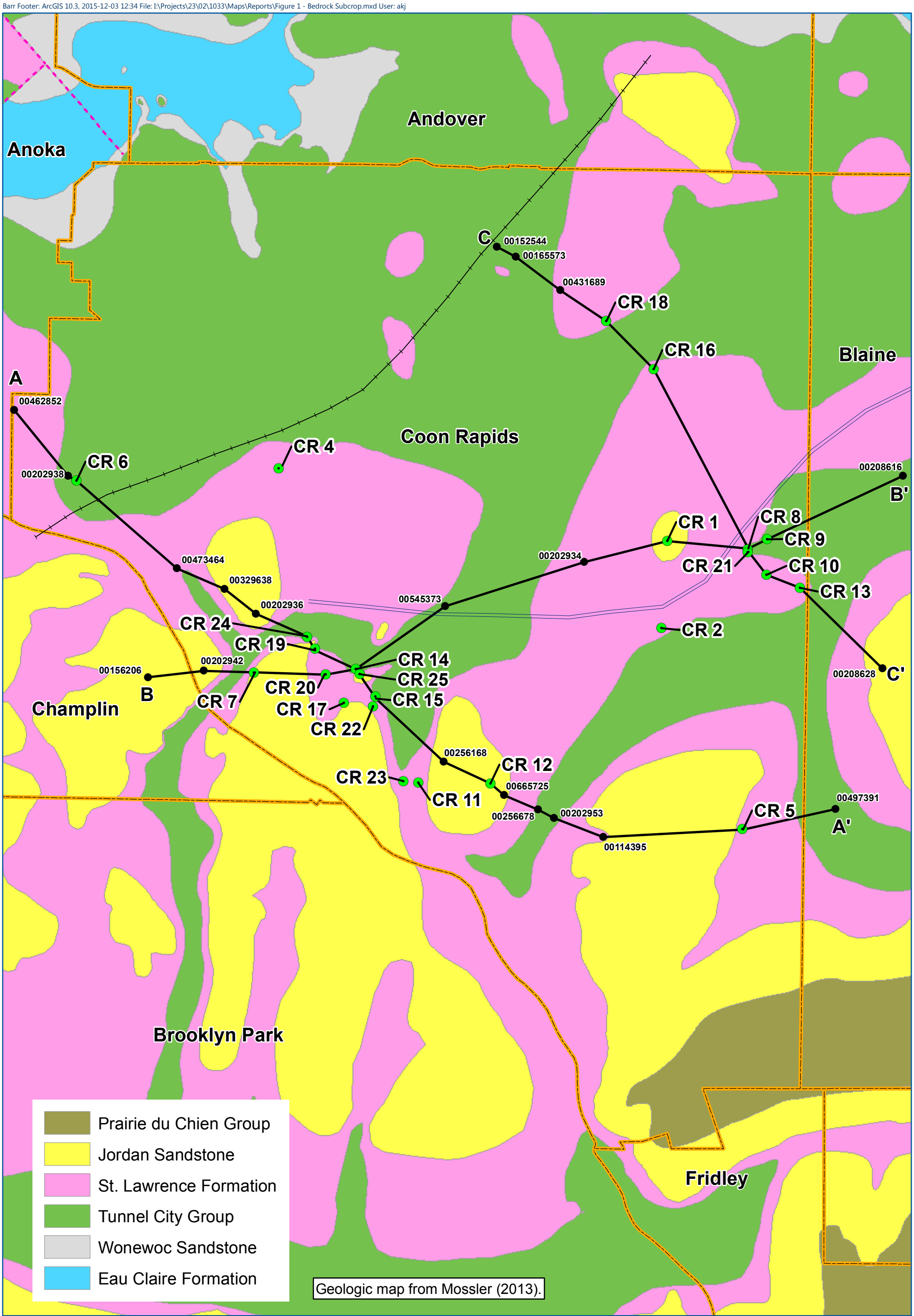
[3] For each well, the greater of the estimated pumpage based on projected 2020 withdrawal and actual annual pumpage for 2010 - 2014.

Table 4

Tritium Sampling Results
Coon Rapids WHPP Amendment

Local Well ID	Unique Number	Aquifer	Sample Date	Tritium Concentration (NTU)
2	202929	St. Lawrence – Mt. Simon	7/9/2015	2.6
5	202951	Tunnel City – Mt. Simon	7/9/2015	<.8
6	202937	Tunnel City	7/9/2015	6.8
9	202931	Tunnel City – Eau Claire	7/9/2015	2.9
11	202965	Tunnel City – Mt. Simon	6/8/2010	2.7
14	110460	Tunnel City – Mt. Simon	7/9/2015	1.8
17	150357	Confined Quaternary	6/8/2010	2.0
18	110469	Mt. Simon	7/9/2015	<.8
20	420956	Confined Quaternary	6/8/2010	6.9
21	474384	Confined Quaternary	7/9/2015	8.6
23	463020	Confined Quaternary	6/8/2010	7.7
24	674478	Tunnel City - Wonewoc	7/15/2010	7.7

Figures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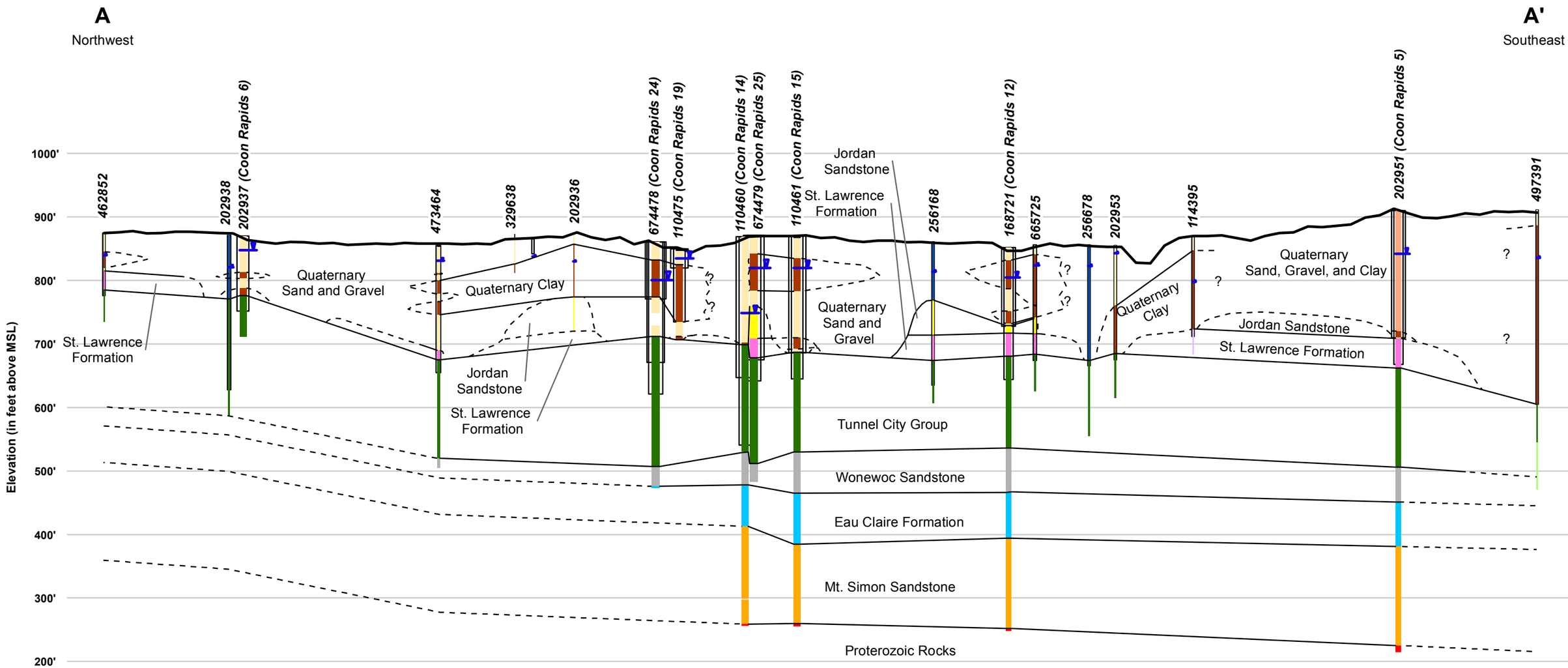
Anoka
Coon Rapids
Blaine
Champlin
Brooklyn Park
Fridley
A
A'
B
B'
C
C'
00462852
00202938
00473464
00329638
00202936
00156206
00202942
00545373
00202934
00152544
00165573
00431689
00208616
00208628
00256168
00665725
00256678
00202953
00114395
00497391
CR 1
CR 2
CR 4
CR 5
CR 6
CR 7
CR 8
CR 9
CR 10
CR 11
CR 12
CR 13
CR 14
CR 15
CR 16
CR 17
CR 18
CR 19
CR 20
CR 21
CR 22
CR 23
CR 24
CR 25
Prairie du Chien Group
Jordan Sandstone
St. Lawrence Formation
Tunnel City Group
Wonewoc Sandstone
Eau Claire Formation
Geologic map from Mossler (2013).
Coon Rapids Municipal Well
Cross Section Well
Cross Section Trace
Municipal Boundary
Monocline
Syncline
Fault
N
0
3,000
6,000
Feet
BARR
BEDROCK SUBCROP
Coon Rapids WHPP Amendment
City of Coon Rapids, MN
FIGURE 1



Static Water Level
Ground Surface
Well Casing

Quaternary Sand and Gravel
Quaternary Clay
Fill and Topsoil
Quaternary Sand, Gravel, and Clay
Undifferentiated Quaternary
Jordan Sandstone
St. Lawrence Formation

St. Lawrence Formation - Tunnel City Group
Tunnel City Group
Tunnel City Group - Wonewoc Sandstone
Wonewoc Sandstone
Eau Claire Formation
Mt. Simon Sandstone
Proterozoic Rocks

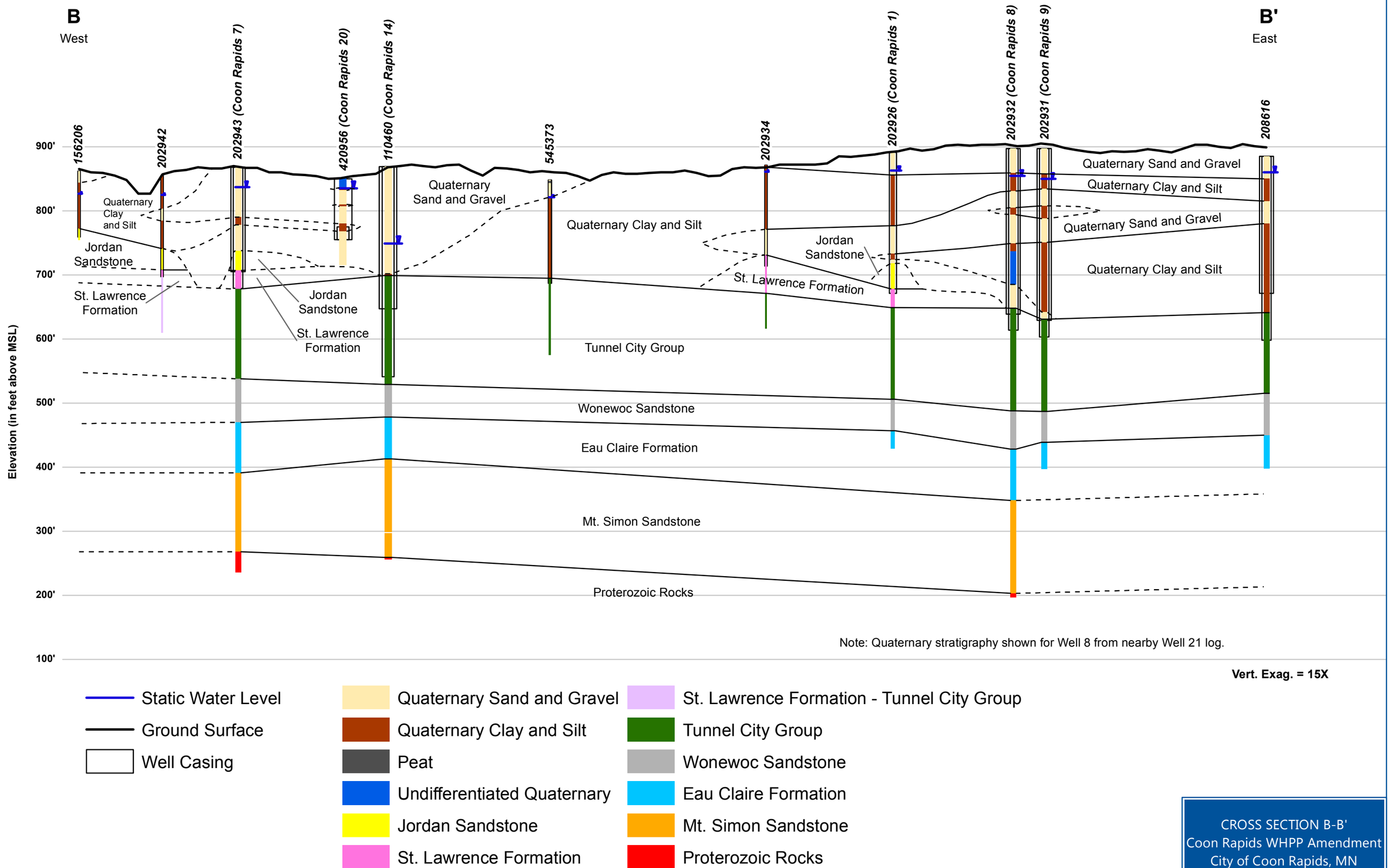
Vert. Exag. = 15X

BARR

CROSS SECTION A-A'
Coon Rapids WHPP Amendment
City of Coon Rapids, MN

FIGURE 2

Barr Footer: ArcGIS 10.3, 2015-12-02 08:08 File: I:\Projects\23\02\1033\Maps\Reports\Figure 2 - Cross Section A-A.mxd User: akj

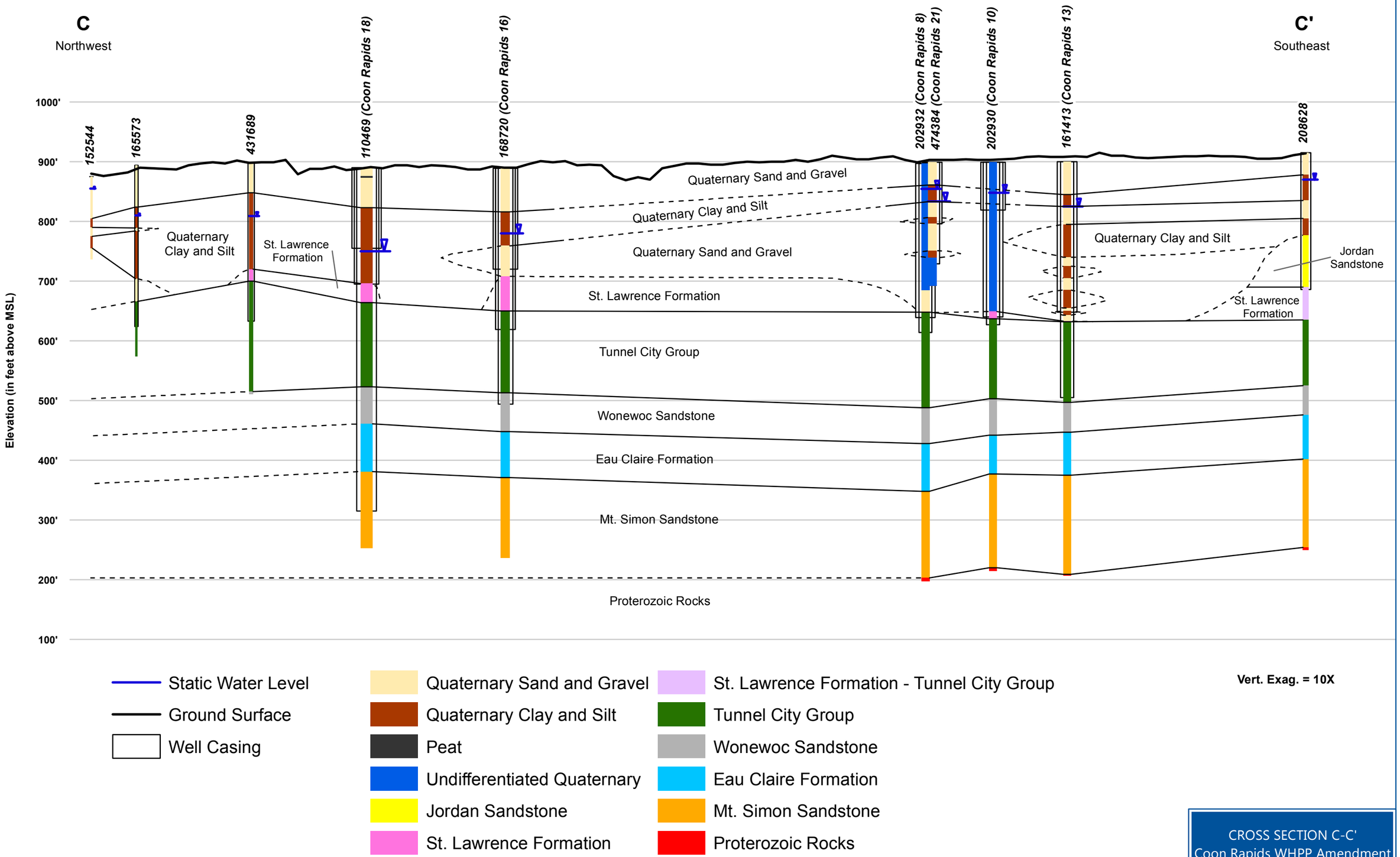


CROSS SECTION B-B'
Coon Rapids WHPP Amendment
City of Coon Rapids, MN

FIGURE 3

BARR

Barr Footer: ArcGIS 10.3, 2015-12-02 09:42 File: I:\Projects\23\02\1033\Maps\Reports\Figure 3 - Cross Section B-B.mxd User: akj

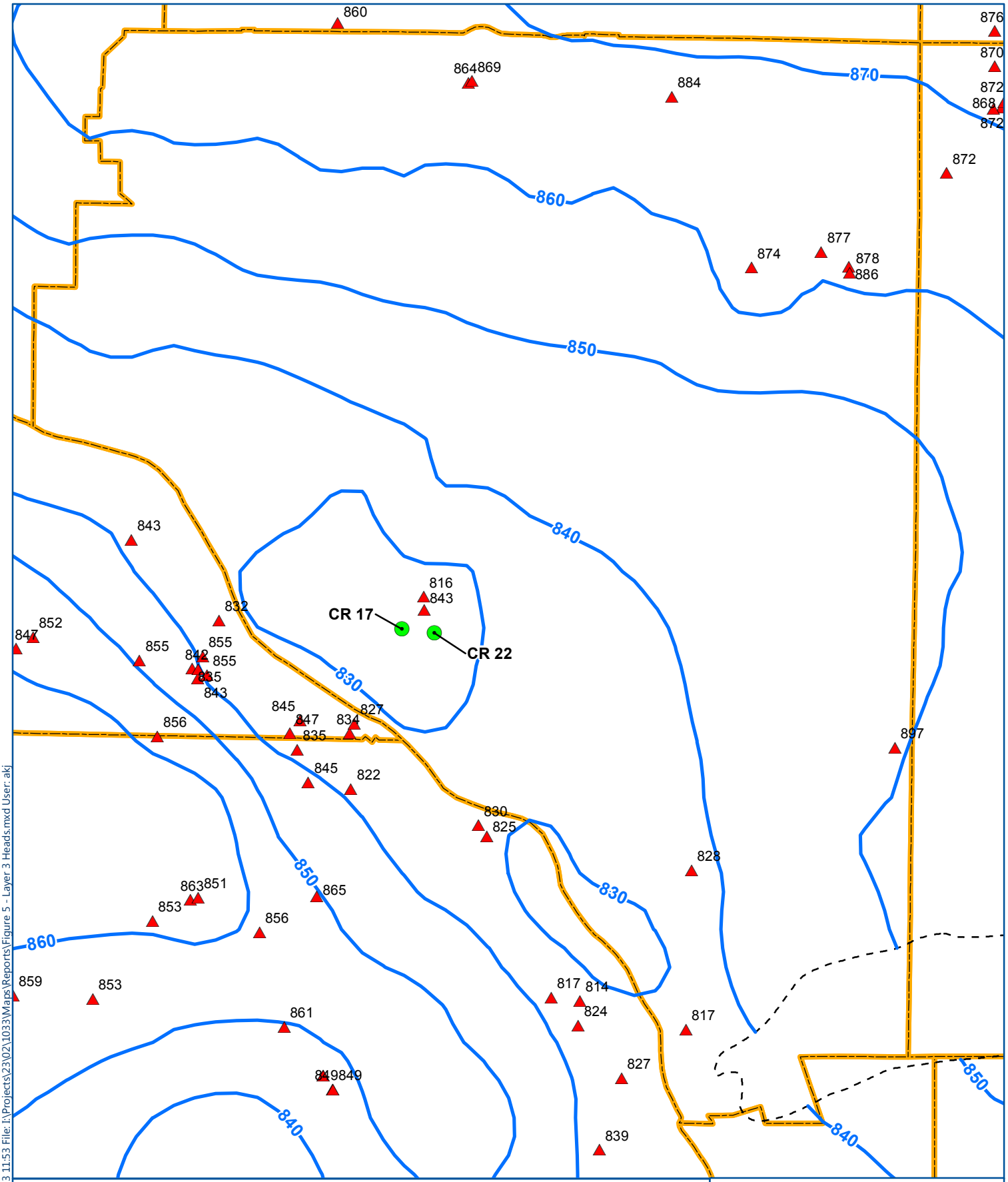


CROSS SECTION C-C'
Coon Rapids WHPP Amendment
City of Coon Rapids, MN

FIGURE 4

BARR

Barr Footer: ArcGIS 10.3, 2015-12-02 09:01 File: I:\Projects\23\02\1033\Maps\Reports\Figure 4 - Cross Section C-C.mxd User: akj



Coon Rapids Municipal Well open to Layer 3

Layer 3 Quaternary Target

Modeled Head (ft MSL)

Prairie du Chien Group Extent

Municipal Boundary

0 4,000

Feet

BARR

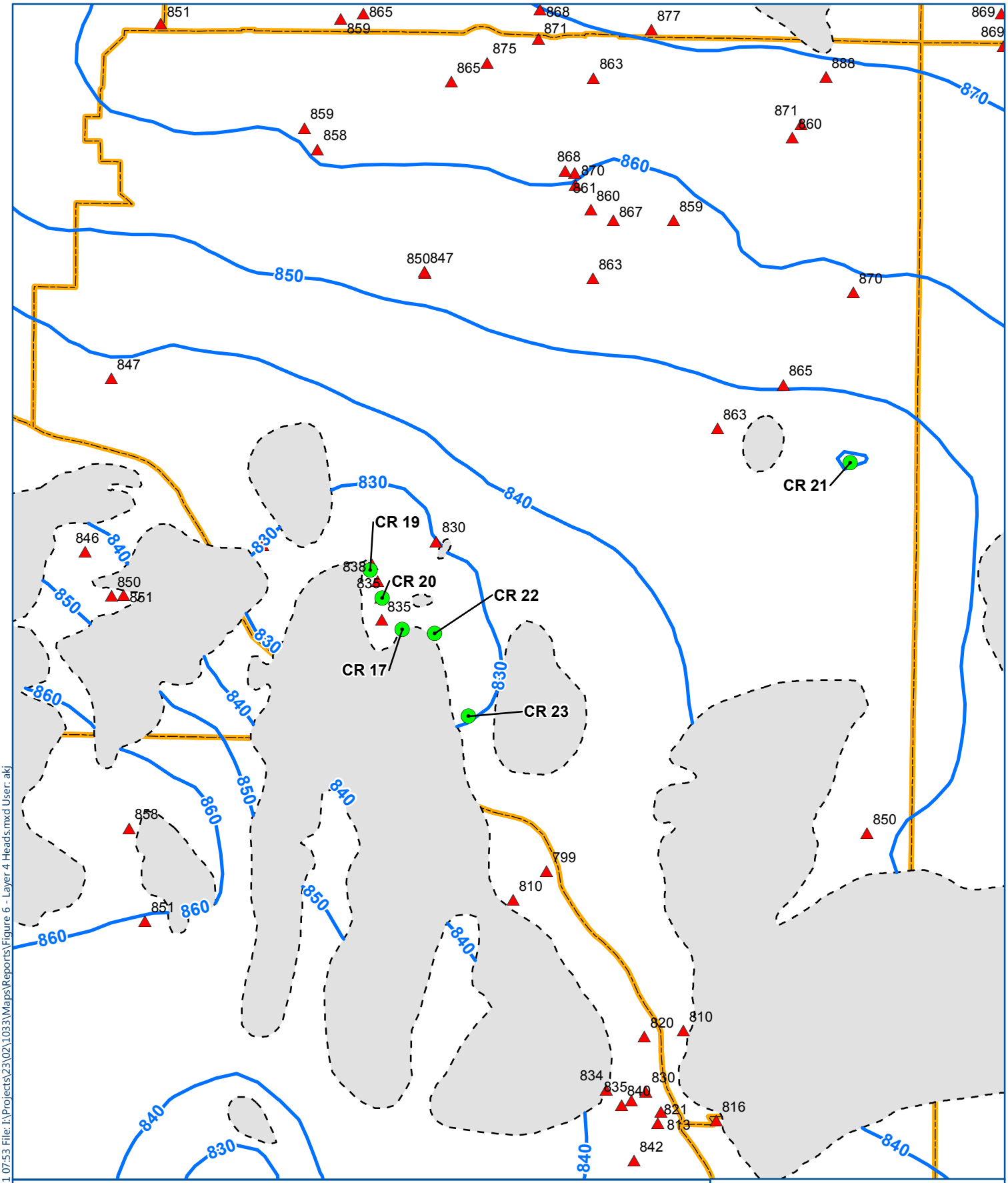
MODELED HEADS IN QUATERNARY GLACIAL DRIFT LAYER 3

Coon Rapids WHPP Amendment

City of Coon Rapids, MN

FIGURE 5

Barr Footer: ArcGIS 10.3, 2015-12-03 11:53 File: I:\Projects\23\02\1033\Maps\Reports\Figure 5 - Layer 3 Heads.mxd User: akj



Coon Rapids Municipal Well open to Layer 4

Layer 4 Quaternary Target

Modeled Head (ft MSL)

Jordan Sandstone Extent

Municipal Boundary

0 4,000 Feet

BARR

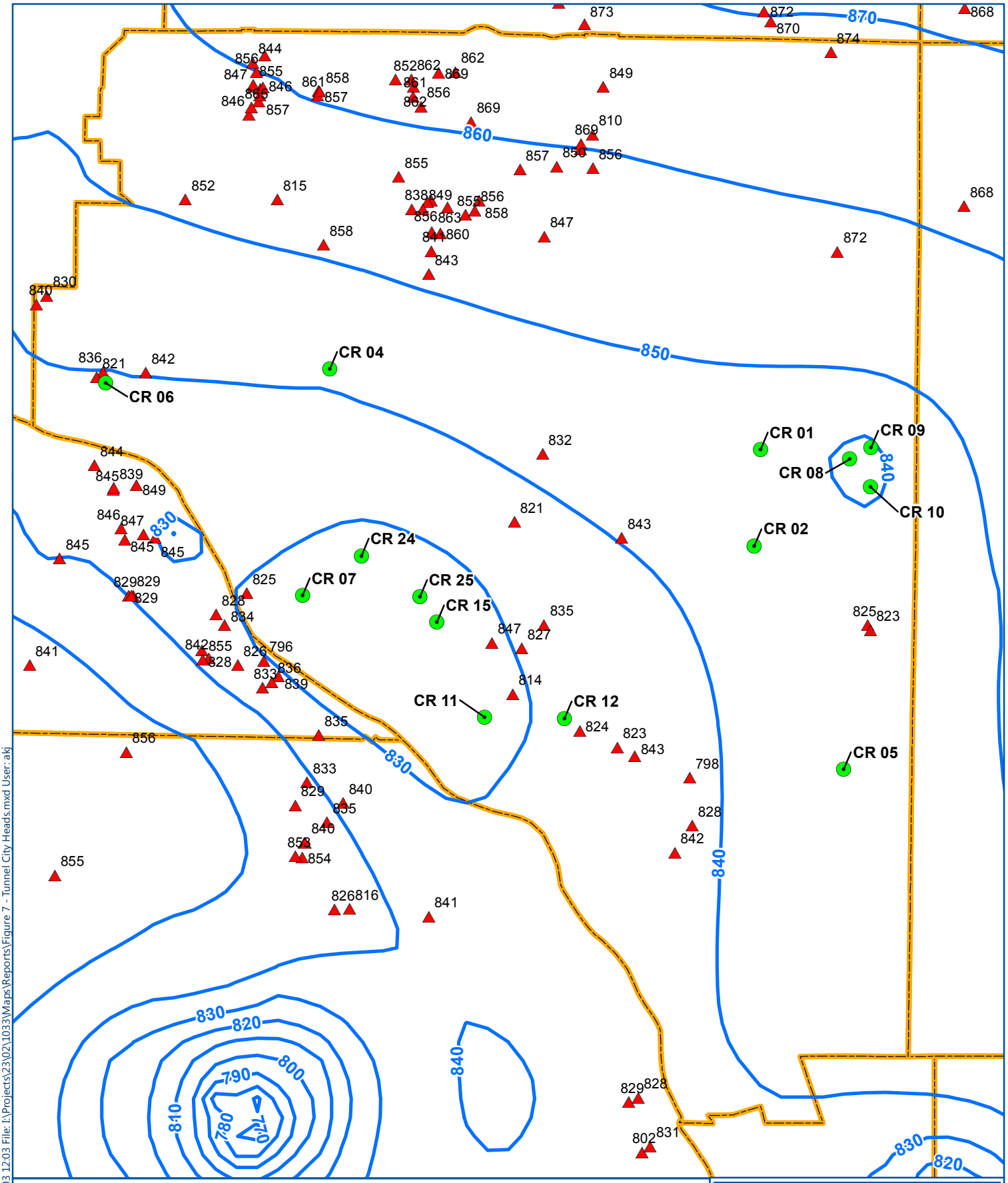
MODELED HEADS IN QUATERNARY GLACIAL DRIFT LAYER 4

Coon Rapids WHPP Amendment

City of Coon Rapids, MN

FIGURE 6

Barr Footer: ArcGIS 10.3, 2016-03-01 07:53 File: I:\Projects\23\02\1033\Maps\Reports\Figure 6 - Layer 4 Heads.mxd User: akj



Coon Rapids Municipal Well open to Tunnel City Group

Layer 6 Tunnel City Target

Modeled Head (ft MSL)

Municipal Boundary

0 4,000

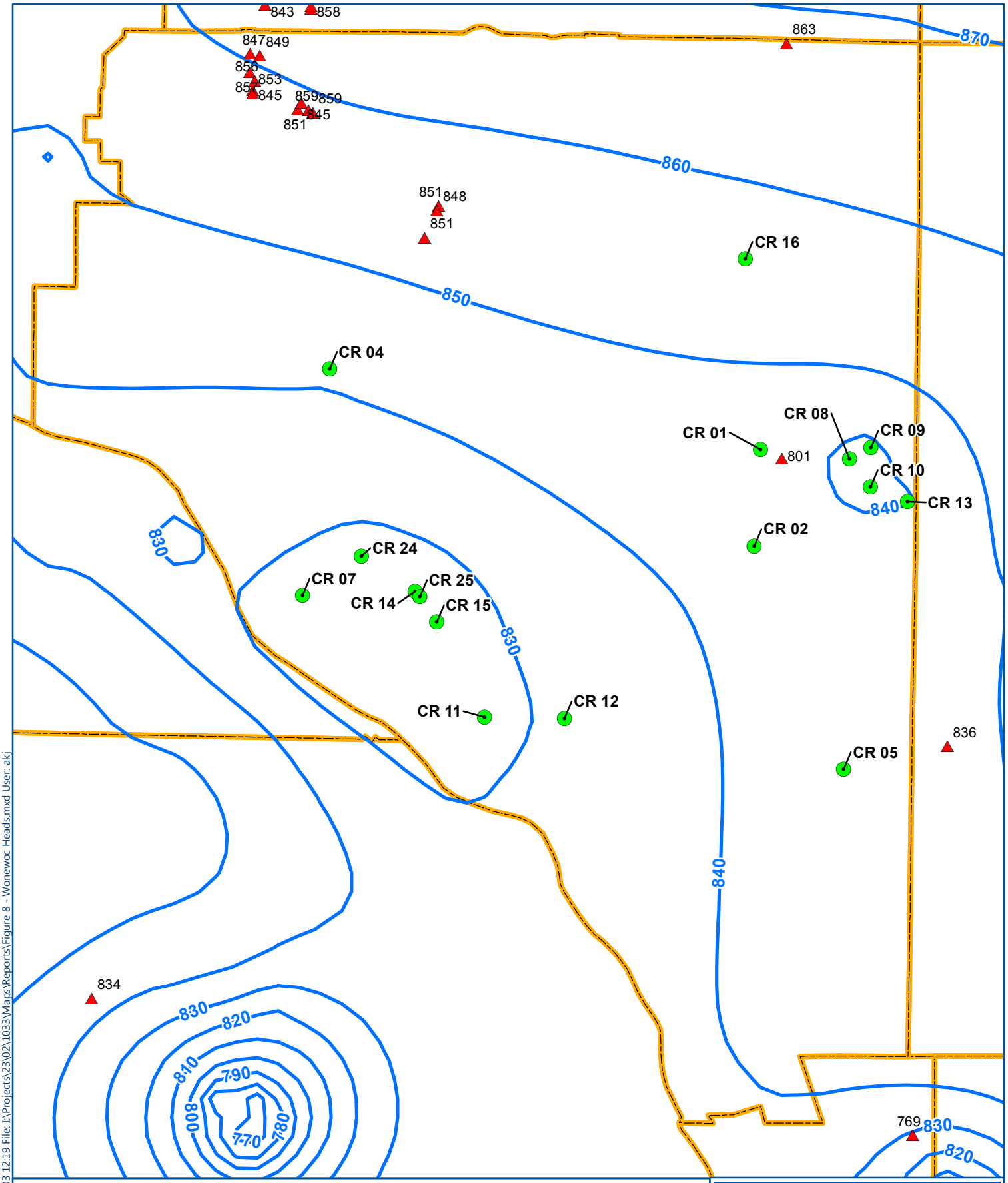
Feet

BARR

MODELED HEADS IN
TUNNEL CITY GROUP
LAYER 6
Coon Rapids WHPP Amendment
City of Coon Rapids, MN

FIGURE 7

Barr Footer: ArcGIS 10.3, 2015-12-03 12:03 File: I:\Projects\23\02\1033\Maps\Reports\Figure 7 - Tunnel City Heads.mxd User: akj



Coon Rapids Municipal Well open to Wonewoc Sandstone

Layer 7 Wonewoc Target

Modeled Head (ft MSL)

Municipal Boundary

0 4,000

Feet

BARR

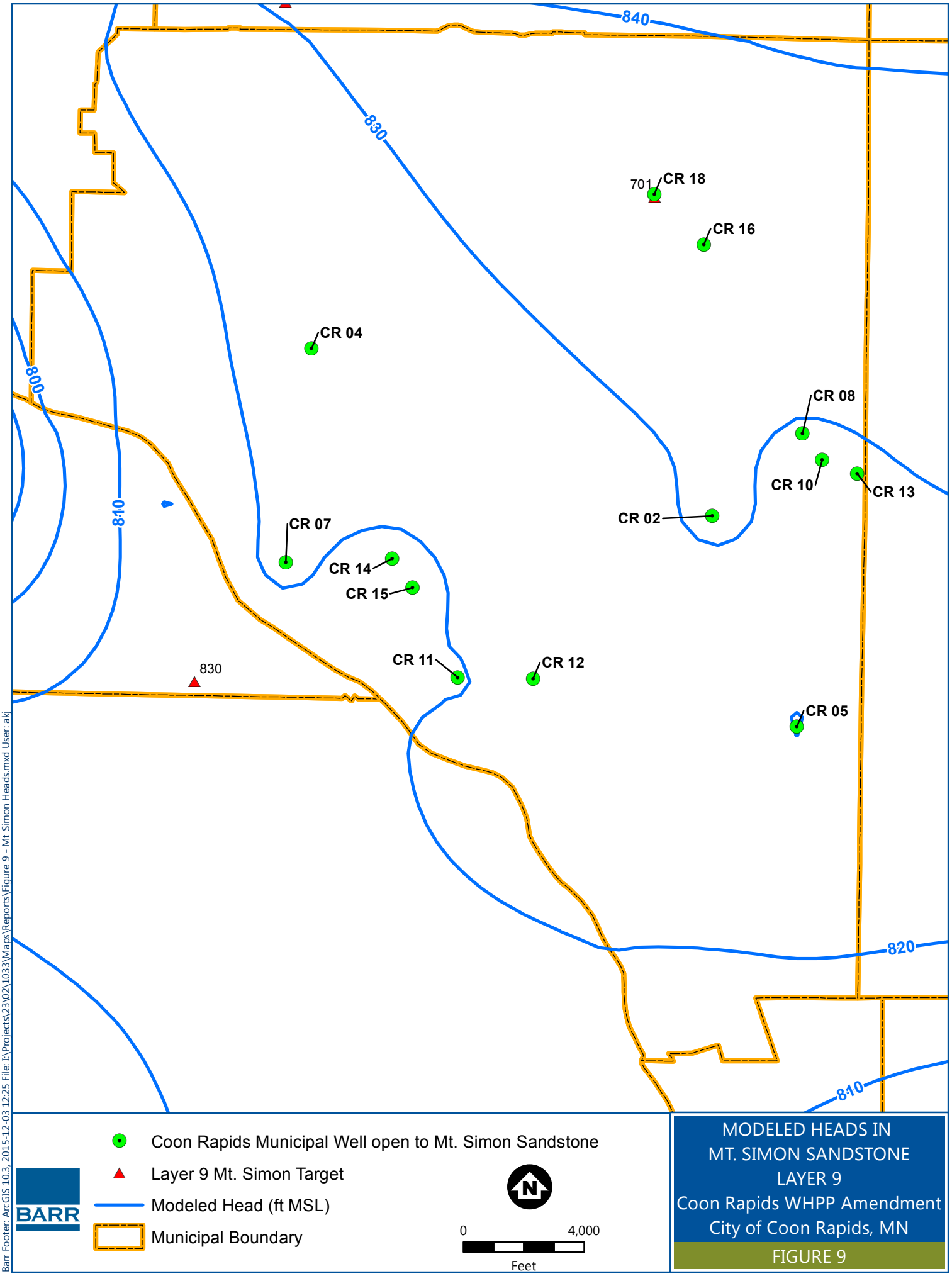
MODELED HEADS IN WONEWOC SANDSTONE LAYER 7

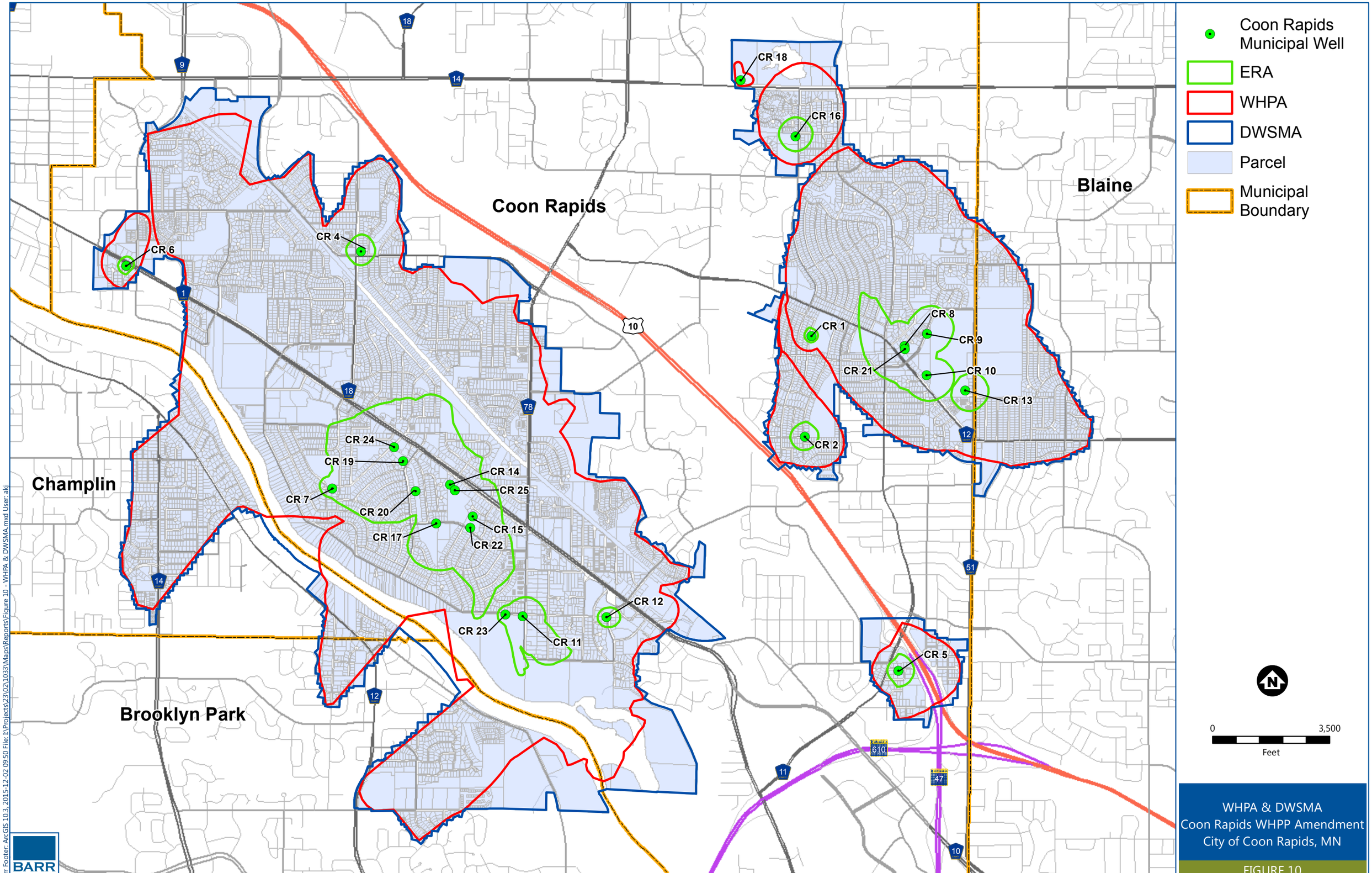
Coon Rapids WHPP Amendment

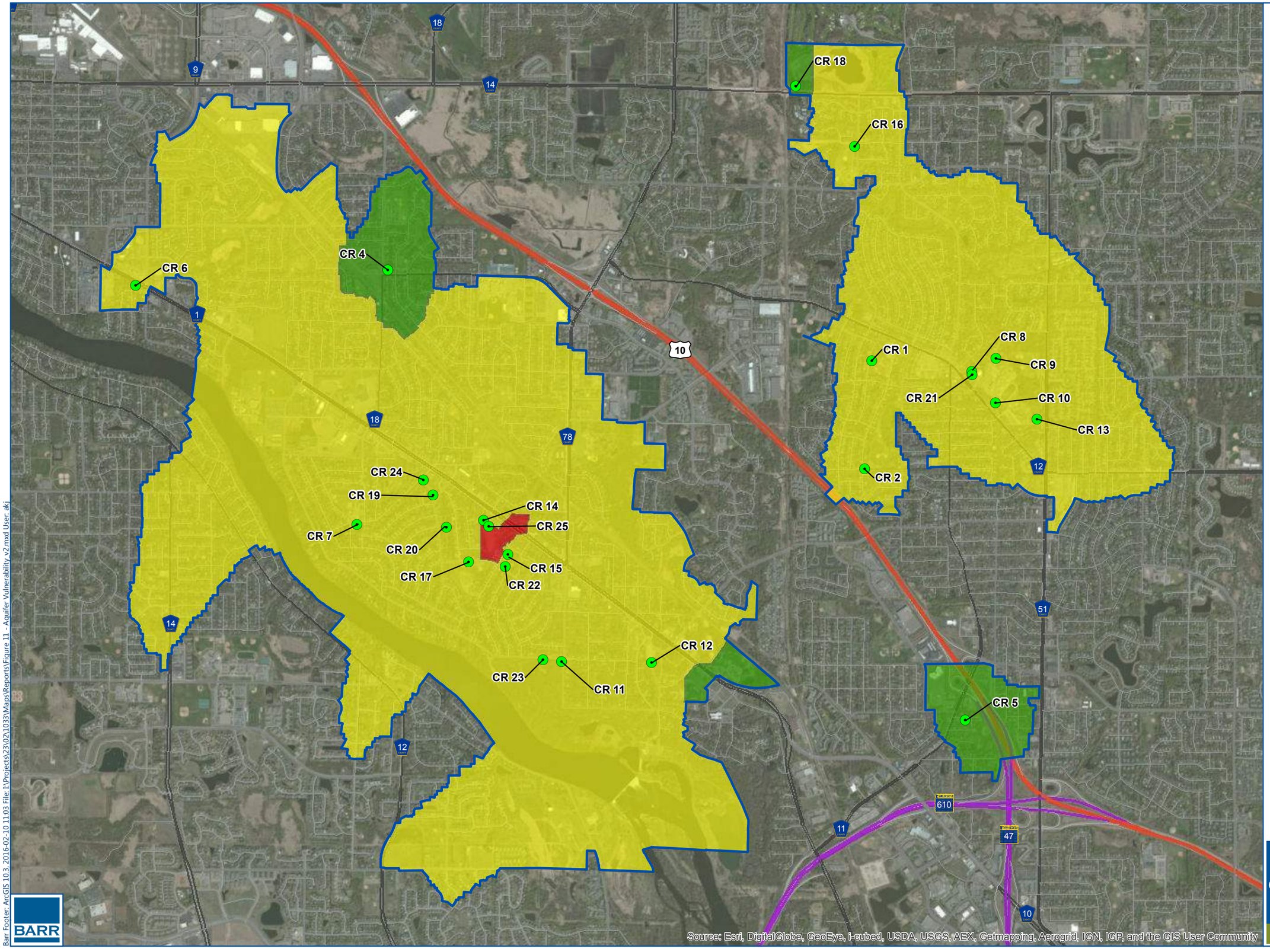
City of Coon Rapids, MN

FIGURE 8

Barr Footer: ArcGIS 10.3, 2015-12-03 12:19 File: I:\Projects\23\02\1033\Maps\Reports\Figure 8 - Wonewoc Heads.mxd User: akj


840
830
820
810
800
701
CR 18
CR 16
CR 04
CR 08
CR 10
CR 13
CR 02
CR 07
CR 14
CR 15
CR 11
CR 12
CR 05
830
Coon Rapids Municipal Well open to Mt. Simon Sandstone
Layer 9 Mt. Simon Target
Modeled Head (ft MSL)
Municipal Boundary
N
0
4,000
Feet
BARR
MODELED HEADS IN
MT. SIMON SANDSTONE
LAYER 9
Coon Rapids WHPP Amendment
City of Coon Rapids, MN
FIGURE 9
Barr Footer: ArcGIS 10.3, 2015-12-03 12:25 File: I:\Projects\23\02\1033\Maps\Reports\Figure 9 - Mt Simon Heads.mxd User: akj


Coon Rapids Municipal Well
ERA
WHPA
DWSMA
Parcel
Municipal Boundary
Coon Rapids
Blaine
Champlin
Brooklyn Park
CR 18
CR 16
CR 4
CR 6
CR 1
CR 8
CR 9
CR 21
CR 10
CR 13
CR 2
CR 24
CR 19
CR 14
CR 25
CR 7
CR 20
CR 15
CR 17
CR 22
CR 12
CR 23
CR 11
CR 5
0
3,500
Feet
WHPA & DWSMA
Coon Rapids WHPP Amendment
City of Coon Rapids, MN
FIGURE 10
BARR
Barr Footer: ArcGIS 10.3, 2015-12-02 09:50 File: I:\Projects\23\02\1033\Maps\Reports\Figure 10 - WHPA & DWSMA.mxd User: akj



Coon Rapids Municipal Well

DWSMA

Vulnerability

High

Moderate

Low

0 3,500

Feet

AQUIFER VULNERABILITY
Coon Rapids WHPP Amendment
City of Coon Rapids, MN

FIGURE 11

BARR

Barr Footer: ArcGIS 10.3, 2016-02-10 11:03 File: I:\Projects\23\02\1033\Maps\Reports\Figure 11 - Aquifer Vulnerability_v2.mxd User: akj

Appendix A

Well Construction Records

Unique No. 00202926	MINNESOTA DEPARTMENT OF HEALTH	Update Date 2007/02/06
County Name Anoka	**WELL AND BORING RECORD**	Entry Date 1991/04/15
	Minnesota Statutes Chapter 1031	

Township Name	Township	Range	Dir	Section	Subsection
	31	24	W	13	BCCABD

Well Depth	Depth Completed	Date Well Completed
462 ft.	462 ft.	1957/09/00

Well Name COON RAPIDS 1

Drilling Method Cable Tool

Well Owner's Name COON RAPIDS 1
11349 NORWAY NW ST
COON RAPIDS MN 55433

Drilling Fluid

Well Hydrofractured? ☐ Yes ☐ No
From ft. to ft.

Use Community Supply (municipal)

Contact's Name CITY OF COON RAPIDS
11155 ROBINSON NW DR
COON RAPIDS MN 55433

Casing **Drive Shoe?** ☐ Yes ☐ N

Hole Diameter
0 in. t 462 ft

Casing Diameter **Weight(lbs/ft)**
12 in. t 220 ft

GEOLOGICAL MATERIAL	COLOR	HARDNESS	FROM	TO
SAND			0	35
CLAY	BLUE		35	50
SANDY CLAY			50	91
HARDPAN			91	114
SAND			114	135
SAND & CLAY			135	138
SAND & GRAVEL			138	158
HARDPAN			158	167
SANDROCK		SOFT	167	173
SANDROCK		SOFT	173	197
SANDROCK & SHALE			197	213
SANDROCK & SHALE			213	242
SANDROCK & SHALE			242	355
CLAY RED			355	360
SHALE & SANDROCK			360	385
SHALE & SANDROCK			385	386
SANDROCK WITH SOME SH			386	398
SANDROCK VERY SOFT			398	434
SANDROCK WITH SOME SH			434	458
SHALE			458	462

Screen N

Open Hole From 220 ft. to 462 ft.

Make Type

Static Water Level 28 ft. from Land surface Date 1957/09/00

PUMPING LEVEL (below land surface)
78 ft. after hrs. pumping 880 g.p.m.

Well Head Completion
Pitless adapter mfr Model
Casing Protection ☐ 12 in. above grade
☐ At-grade(Environmental Wells and Borings ONLY)

Grouting Information Well grouted? ☐ Yes ☐ No

Nearest Known Source of Contamination
ft. direction type
Well disinfected upon completion? ☐ Yes ☐ No

Pump ☐ Not Installed Date Installed Y
Mfr nam FAIRBANKS MORSE
Model HP 50 Volts 220
Drop Pipe Length ft. Capacity 600 g.p.m
Type T

Any not in use and not sealed well(s) on property? ☐ Yes ☐ No

Was a variance granted from the MDH for this Well? ☐ Yes ☐ No

REMARKS, ELEVATION, SOURCE OF DATA, etc.

GAMMA LOGGED & TV 5-15-1995. LOGGED & TV BY GEOSHPERE.

USGS Quad Coon Rapids Elevation 891
Aquifer: MTPL Alt Id: 80-6139

Well CONTRACTOR CERTIFICATION Lic. Or Reg. No. 62012
License Business Name
Name of Driller BRANDON, J.

Report Copy

Unique No.	00202926	MINNESOTA DEPARTMENT OF HEALTH	Update Date	2007/02/06
County Name	Anoka	**WELL AND BORING RECORD** *Minnesota Statutes Chapter 1031*	Entry Date	1991/04/15

Township Name	Township	Range	Dir	Section	Subsection	Well Depth		Depth Completed		Date Well Completed
	31	24	W	13	BCCABD	462	ft.	462	ft.	1957/09/00

Well Name	COON RAPIDS 1	**Lic. Or Reg. No.**	62012	**Name of Driller**	BRANDON, J.		
USGS Quad	Coon Rapi	**Elevation**	891	**Aquifer**	MTPL	**Alternative Id**	80-6139

GEOLOGICAL MATERIAL	COLOR	HARDNESS	FROM	TO	STRAT	LITH PRIM	LITH SEC	LITH MINOR
SAND			0	35	QFUU	SAND		
QFUU = Sand	SAND = Sand							
CLAY	BLUE		35	50	QCUG	CLAY		
QCUG = Clay	CLAY = Clay							
SANDY CLAY			50	91	QLUU	CLAY	SAND	
QLUU = Clay & sand	CLAY = Clay		SAND = Sand					
HARDPAN			91	114	QPUU	HDPN		
QPUU = Pebbly sand/silt/clay	HDPN = Hardpan							
SAND			114	135	QFUU	SAND		
QFUU = Sand	SAND = Sand							
SAND & CLAY			135	138	QLUU	SAND	CLAY	
QLUU = Clay & sand	SAND = Sand		CLAY = Clay					
SAND & GRAVEL			138	158	QHUU	SAND	GRVL	
QHUU = Sand & larger	SAND = Sand		GRVL = Gravel					
HARDPAN			158	167	QPUU	HDPN		
QPUU = Pebbly sand/silt/clay	HDPN = Hardpan							
SANDROCK		SOFT	167	173	QFUU	SAND		
QFUU = Sand	SAND = Sand							
SANDROCK		SOFT	173	197	CJDN	SNDS		
CJDN = Jordan	SNDS = Sandstone							
SANDROCK & SHALE			197	213	CJDN	SNDS		
CJDN = Jordan	SNDS = Sandstone							
SANDROCK & SHALE			213	242	CSTL	SLSN	DLMT	
CSTL = St.Lawrence	SLSN = Siltstone		DLMT = Dolomite					
SANDROCK & SHALE			242	355	CFRN	SNDS	SHLE	DLMT
CFRN = Franconia	SNDS = Sandstone		SHLE = Shale			DLMT = Dolomite		
CLAY RED			355	360	CFRN	SNDS	SHLE	DLMT
CFRN = Franconia	SNDS = Sandstone		SHLE = Shale			DLMT = Dolomite		

Unique No.	00202926	MINNESOTA DEPARTMENT OF HEALTH	Update Date	2007/02/06
County Name	Anoka	**WELL AND BORING RECORD** *Minnesota Statutes Chapter 1031*	Entry Date	1991/04/15

Township Name	Township	Range	Dir	Section	Subsection	Well Depth		Depth Completed		Date Well Completed
	31	24	W	13	BCCABD	462	ft.	462	ft.	1957/09/00

Well Name	COON RAPIDS 1	**Lic. Or Reg. No.**	62012	**Name of Driller**	BRANDON, J.		
USGS Quad	Coon Rapi	**Elevation**	891	**Aquifer**	MTPL	**Alternative Id**	80-6139

GEOLOGICAL MATERIAL	COLOR	HARDNESS	FROM	TO	STRAT	LITH PRIM	LITH SEC	LITH MINOR
SHALE & SANDROCK			360	385	CFRN	SNDS	SHLE	DLMT
CFRN = Franconia	SNDS = Sandstone		SHLE = Shale			DLMT = Dolomite		
SHALE & SANDROCK			385	386	CIGL	SNDS		
CIGL = Ironton-Galesville	SNDS = Sandstone							
SANDROCK WITH SOME SHALE			386	398	CIGL	SNDS		
CIGL = Ironton-Galesville	SNDS = Sandstone							
SANDROCK VERY SOFT			398	434	CIGL	SNDS		
CIGL = Ironton-Galesville	SNDS = Sandstone							
SANDROCK WITH SOME SHALE			434	458	CECR	SHLE	SNDS	
CECR = Eau Claire	SHLE = Shale		SNDS = Sandstone					
SHALE			458	462	CECR	SHLE	SNDS	
CECR = Eau Claire	SHLE = Shale		SNDS = Sandstone					

Unique No. 00202929

County Name Anoka

MINNESOTA DEPARTMENT OF HEALTH

WELL AND BORING RECORD

Minnesota Statutes Chapter 1031

Update Date 2007/02/06

Entry Date 1991/04/15

Township Name	Township	Range	Dir	Section	Subsection
	31	24	W	13	CCCCAD

Well Depth	Depth Completed	Date Well Completed
788 ft.	788 ft.	1957/06/00

Well Name COON RAPIDS 2

Drilling Method Cable Tool

Contact's Name CITY OF COON RAPIDS
11155 ROBINSON NW DR
COON RAPIDS MN 55433

Drilling Fluid

Well Hydrofractured? ☐ Yes ☐ No
From ft. to ft.

Well Owner's Name COON RAPIDS 2
10911 MAGNOLIA ST
COON RAPIDS MN 55433

Use Community Supply (municipal)

Casing **Drive Shoe?** ☐ Yes ☐ N

Hole Diameter
in. t 704 ft
in. t 788 ft

Casing Diameter **Weight(lbs/ft)**
12 in. t 226 ft

GEOLOGICAL MATERIAL	COLOR	HARDNESS	FROM	TO
SAND			0	36
CLAY			36	48
CLAY & GRAVEL			48	136
HARDPAN			136	145
CLAY & SAND			145	163
SAND			163	175
SAND & GRAVEL			175	218
SHALE			218	219
LIMEROCK & SHALE			219	221
LIMEROCK & SHALE			221	243
LIMEROCK & SHALE			243	258
SANDROCK & SHALE			258	391
SANDROCK & SHALE			391	439
SANDROCK & SHALE			439	472
SHALE			472	498
SANDROCK & SHALE			498	545
SANDROCK & SHALE			545	594
SANDROCK			594	670
CAVING RED SHALE			670	704
RED ROCK & SHALE			704	726
RED ROCK			726	770
SHALE			770	778
RED ROCK			778	788

Screen N

Open Hole From 226 ft. to 788 ft.

Make Type

Static Water Level 24 ft. from Land surface Date 1957/06/00

PUMPING LEVEL (below land surface)
33.5 ft. after hrs. pumping 302 g.p.m.

Well Head Completion
Pitless adapter mfr Model
Casing Protection ☑ 12 in. above grade
☐ At-grade(Environmental Wells and Borings ONLY)

Grouting Information Well grouted? ☐ Yes ☐ No

Nearest Known Source of Contamination
ft. direction type
Well disinfected upon completion? ☐ Yes ☐ No

Pump ☐ Not Installed Date Installed Y
Mfr nam FAIRBANKS MORSE
Model HP 30 Volts 220
Drop Pipe Length 187 ft. Capacity 500 g.p.m
Type T

Any not in use and not sealed well(s) on property? ☐ Yes ☐ No

Was a variance granted from the MDH for this Well? ☐ Yes ☐ No

REMARKS, ELEVATION, SOURCE OF DATA, etc.

TWO OTHER PUM TESTS AT DEPTHS OF 673 & 466 FT.

PUMPING TEST NO. 3 RECORDED AT 685 FT.

M.G.S. NO. 156. GAMMA LOGGED & TV 5-15-1995. OLD PA. NO. 61-0225.

WELL WAS BACK FILLED TO 685 FT.

LOGGED & TV BY GEOSPHERE.

USGS Quad	Coon Rapids	Elevation	885
Aquifer:	MTPL	Alt Id:	80-6139

Report Copy

Well CONTRACTOR CERTIFICATION Lic. Or Reg. No. 62012

License Business Name

Name of Driller BRANDON, J.

HE-01205-06 (Rev. 9/96)

Unique No.	00202929	MINNESOTA DEPARTMENT OF HEALTH	Update Date	2007/02/06
County Name	Anoka	**WELL AND BORING RECORD** *Minnesota Statutes Chapter 1031*	Entry Date	1991/04/15

Township Name	Township	Range	Dir	Section	Subsection	Well Depth		Depth Completed		Date Well Completed
	31	24	W	13	CCCCAD	788	ft.	788	ft.	1957/06/00

Well Name	COON RAPIDS 2	**Lic. Or Reg. No.**	62012	**Name of Driller**	BRANDON, J.		
USGS Quad	Coon Rapi	**Elevation**	885	**Aquifer**	MTPL	**Alternative Id**	80-6139

GEOLOGICAL MATERIAL	COLOR	HARDNESS	FROM	TO	STRAT	LITH PRIM	LITH SEC	LITH MINOR
SAND			0	36	QFUU	SAND		
QFUU = Sand	SAND = Sand							
CLAY			36	48	QCUU	CLAY		
QCUU = Clay	CLAY = Clay							
CLAY & GRAVEL			48	136	QPUU	CLAY	GRVL	
QPUU = Pebbly sand/silt/clay	CLAY = Clay		GRVL = Gravel					
HARDPAN			136	145	QPUU	HDPN		
QPUU = Pebbly sand/silt/clay	HDPN = Hardpan							
CLAY & SAND			145	163	QLUU	CLAY	SAND	
QLUU = Clay & sand	CLAY = Clay		SAND = Sand					
SAND			163	175	QFUU	SAND		
QFUU = Sand	SAND = Sand							
SAND & GRAVEL			175	218	QHUU	SAND	GRVL	
QHUU = Sand & larger	SAND = Sand		GRVL = Gravel					
SHALE			218	219	QCUU	CLAY		
QCUU = Clay	CLAY = Clay							
LIMEROCK & SHALE			219	221	QUUU	DRFT		
QUUU = Unknown deposit type	DRFT = Drift							
LIMEROCK & SHALE			221	243	CSTL	DLMT	SLSN	
CSTL = St.Lawrence	DLMT = Dolomite		SLSN = Siltstone					
LIMEROCK & SHALE			243	258	CFRN	SNDS	SHLE	DLMT
CFRN = Franconia	SNDS = Sandstone		SHLE = Shale				DLMT = Dolomite	
SANDROCK & SHALE			258	391	CFRN	SNDS	SHLE	DLMT
CFRN = Franconia	SNDS = Sandstone		SHLE = Shale				DLMT = Dolomite	
SANDROCK & SHALE			391	439	CIGL	SNDS		
CIGL = Ironton-Galesville	SNDS = Sandstone							
SANDROCK & SHALE			439	472	CECR	SHLE	SNDS	
CECR = Eau Claire	SHLE = Shale		SNDS = Sandstone					

Unique No.	00202929	MINNESOTA DEPARTMENT OF HEALTH	Update Date	2007/02/06
County Name	Anoka	**WELL AND BORING RECORD** *Minnesota Statutes Chapter 1031*	Entry Date	1991/04/15

Township Name	Township	Range	Dir	Section	Subsection	Well Depth		Depth Completed		Date Well Completed
	31	24	W	13	CCCCAD	788	ft.	788	ft.	1957/06/00

Well Name	COON RAPIDS 2	**Lic. Or Reg. No.**	62012	**Name of Driller**	BRANDON, J.		
USGS Quad	Coon Rapi	**Elevation**	885	**Aquifer**	MTPL	**Alternative Id**	80-6139

GEOLOGICAL MATERIAL	COLOR	HARDNESS	FROM	TO	STRAT	LITH PRIM	LITH SEC	LITH MINOR
SHALE			472	498	CECR	SHLE	SNDS	
CECR = Eau Claire	SHLE = Shale		SNDS = Sandstone					
SANDROCK & SHALE			498	545	CECR	SHLE	SNDS	
CECR = Eau Claire	SHLE = Shale		SNDS = Sandstone					
SANDROCK & SHALE			545	594	CMTS	SNDS		
CMTS = Mt.Simon	SNDS = Sandstone							
SANDROCK			594	670	CMTS	SNDS		
CMTS = Mt.Simon	SNDS = Sandstone							
CAVING RED SHALE			670	704	PMSC	SHLE		
PMSC = Solor Church Formation	SHLE = Shale							
RED ROCK & SHALE			704	726	PMSC	SHLE		
PMSC = Solor Church Formation	SHLE = Shale							
RED ROCK			726	770	PMSC	SHLE		
PMSC = Solor Church Formation	SHLE = Shale							
SHALE			770	778	PMSC	SHLE		
PMSC = Solor Church Formation	SHLE = Shale							
RED ROCK			778	788	PMSC	SHLE		
PMSC = Solor Church Formation	SHLE = Shale							

Unique No. 00202972	MINNESOTA DEPARTMENT OF HEALTH	Update Date 2007/03/12
County Name Anoka	**WELL AND BORING RECORD**	Entry Date 1991/04/15
	Minnesota Statutes Chapter 1031	

Township Name	Township	Range	Dir	Section	Subsection
	31	24	W	9	DCCCCD

Well Depth	Depth Completed	Date Well Completed
605 ft.	605 ft.	1960/08/19

Well Name COON RAPIDS 4

Drilling Method Cable Tool

Well Owner's Name COON RAPIDS 4
2731 NORTHDALE BL
COON RAPIDS MN 55433

Drilling Fluid

Well Hydrofractured? ☐ Yes ☐ No
From ft. to ft.

Use Community Supply (municipal)

Contact's Name CITY OF COON RAPIDS
11155 ROBINSON NW DR
COON RAPIDS MN 55433

Casing **Drive Shoe?** ☐ Yes ☐ N

Hole Diameter

Casing Diameter **Weight(lbs/ft)**

20	in. t	158	ft
16	in. t	233	ft

GEOLOGICAL MATERIAL	COLOR	HARDNESS	FROM	TO
DRIFT			0	158
DOLOMITE		HARD	158	170
JORDAN SANDSTONE			170	220
SHALE	GREE		220	310
SANDSTONE WITH THIN SH			310	369
SANDY SHALE			369	425
HARD SANDSTONE, SHALE			425	435
HARD SANDSTONE, SHALE			435	475
SHALEY SANDSTONE			475	520
HARD SANDSTONE, COARS			520	587
SHALE			587	605

Screen N

Open Hole From 233 ft. to 605 ft.

Make Type

Static Water Level 23 ft. from Land surface Date 1960/08/19

PUMPING LEVEL (below land surface)
142 ft. after 24 hrs. pumping 1000 g.p.m.

Well Head Completion
Pitless adapter mfr Model
Casing Protection ☑ 12 in. above grade
☐ At-grade(Environmental Wells and Borings ONLY)

Grouting Information Well grouted? ☑ Yes ☐ No

Material	From	To (ft.)	Amount(yds/bags)
	0	233	

Nearest Known Source of Contamination
ft. direction type
Well disinfected upon completion? ☐ Yes ☐ No

Pump ☐ Not Installed Date Installed Y
Mfr nam FAIRBANKS MORSE
Model 6977 HP 100 Volts 240
Drop Pipe Length 180 ft. Capacity g.p.m
Type T

Any not in use and not sealed well(s) on property? ☐ Yes ☐ No

Was a variance granted from the MDH for this Well? ☐ Yes ☐ No

REMARKS, ELEVATION, SOURCE OF DATA, etc.

M.G.S. NO. 168. GAMMA LOGGED 3-31-1998. LOGGED BY JIM TRAEN.

OLD PA. NO. 60-0350.

USGS Quad Coon Rapids Elevation 869
Aquifer: CFMS Alt Id: 80-6139

Well CONTRACTOR CERTIFICATION Lic. Or Reg. No. 27118
License Business Name
Name of Driller BENEKE, R.

Report Copy

Unique No.	00202972	MINNESOTA DEPARTMENT OF HEALTH	Update Date	2007/03/12
County Name	Anoka	**WELL AND BORING RECORD** *Minnesota Statutes Chapter 1031*	Entry Date	1991/04/15

Township Name	Township	Range	Dir	Section	Subsection	Well Depth		Depth Completed		Date Well Completed
	31	24	W	9	DCCCCD	605	ft.	605	ft.	1960/08/19

Well Name	COON RAPIDS 4	**Lic. Or Reg. No.**	27118	**Name of Driller**	BENEKE, R.		
USGS Quad	Coon Rapi	**Elevation**	869	**Aquifer**	CFMS	**Alternative Id**	80-6139

GEOLOGICAL MATERIAL	COLOR	HARDNESS	FROM	TO	STRAT	LITH PRIM	LITH SEC	LITH MINOR
DRIFT			0	158	QUUU	DRFT		
QUUU = Unknown deposit type	DRFT = Drift							
DOLOMITE		HARD	158	170	CSTL	DLMT	SNDS	
CSTL = St.Lawrence	DLMT = Dolomite		SNDS = Sandstone					
JORDAN SANDSTONE			170	220	CFRN	SNDS	SHLE	
CFRN = Franconia	SNDS = Sandstone		SHLE = Shale					
SHALE	GREEN		220	310	CFRN	SHLE	SNDS	DLMT
CFRN = Franconia	SHLE = Shale		SNDS = Sandstone				DLMT = Dolomite	
SANDSTONE WITH THIN SHALE LENSES			310	369	CIGL	SNDS		
CIGL = Ironton-Galesville	SNDS = Sandstone							
SANDY SHALE			369	425	CECR	SHLE	SNDS	
CECR = Eau Claire	SHLE = Shale		SNDS = Sandstone					
HARD SANDSTONE, SHALE LENSES			425	435	CECR	SHLE	SNDS	
CECR = Eau Claire	SHLE = Shale		SNDS = Sandstone					
HARD SANDSTONE, SHALE LENSES			435	475	CMTS	SNDS		
CMTS = Mt.Simon	SNDS = Sandstone							
SHALEY SANDSTONE			475	520	CMTS	SNDS		
CMTS = Mt.Simon	SNDS = Sandstone							
HARD SANDSTONE, COARSE			520	587	CMTS	SNDS		
CMTS = Mt.Simon	SNDS = Sandstone							
SHALE			587	605	PMRC	SHLE		
PMRC = Red Clastic Series	SHLE = Shale							

Unique No. 00202951

County Name Anoka

MINNESOTA DEPARTMENT OF HEALTH

WELL AND BORING RECORD

Minnesota Statutes Chapter 1031

Update Date 2007/02/07

Entry Date 1991/04/15

Township Name	Township	Range	Dir	Section	Subsection
	31	24	W	25	ACBBDD

Well Depth 695 ft. **Depth Completed** 695 ft. **Date Well Completed** 1961/09/00

Well Name COON RAPIDS 5

Drilling Method Cable Tool

Well Owner's Name COON RAPIDS 5
99TH NW LA
COON RAPIDS MN 55433

Drilling Fluid

Well Hydrofractured? ☐ Yes ☐ No
From ft. to ft.

Contact's Name CITY OF COON RAPIDS
11155 ROBINSON NW DR
COON RAPIDS MN 55433

Use Community Supply (municipal)

Casing **Drive Shoe?** ☐ Yes ☐ N

Hole Diameter
0 in. t 695 ft

Casing Diameter **Weight(lbs/ft)**
24 in. t 200 ft
16 in. t 242 ft

GEOLOGICAL MATERIAL	COLOR	HARDNESS	FROM	TO
SAND, GRAVEL, SHALE			0	190
SHALE, SANDROCK			190	200
SANDROCK		HARD	200	201
SANDROCK		HARD	201	215
SHALE			215	225
HARD SANDROCK & SHALE			225	248
HARD SANDROCK & SHALE			248	255
HARD SHALE & LIMEROCK			255	279
SANDROCK			279	293
LIMEROCK			293	295
HARD GREEN SHALE & LIM			295	374
SHALE			374	387
LIMEROCK			387	390
SHALE, LAYERS OF LIME	GREE	HARD	390	404
SHALE, LAYERS OF LIME	GREE	HARD	404	410
SANDROCK & SHALE			410	424
SANDROCK			424	449
HARD SANDROCK & SHALE			449	454
HARD SHALE, LAYERS OF L			454	459
HARD SHALE, LAYERS OF L			459	465
STICK GREEN SHALE			465	477
SHALE	RED		477	497
BLUE-GREEN SHALE			497	525
HARD GRAY SHALE, SOME			525	529
HARD GRAY SHALE, SOME			529	555
HARD SHALE & SANDROCK			555	625
SANDROCK			625	685
RED CLASTICS			685	695
GNEISS AT 695'			695	695

Screen N

Open Hole From 242 ft. to 695 ft.

Make Type

Static Water Level 68 ft. from Land surface Date 1961/07/11

PUMPING LEVEL (below land surface)
188 ft. after 26 hrs. pumping 1200 g.p.m.

Well Head Completion
Pitless adapter mfr Model
Casing Protection ☑ 12 in. above grade
☐ At-grade(Environmental Wells and Borings ONLY)

Grouting Information Well grouted? ☐ Yes ☐ No

Nearest Known Source of Contamination
ft. direction type
Well disinfected upon completion? ☐ Yes ☐ No

Pump ☐ Not Installed Date Installed
Mfr name
Model HP Volts

Drop Pipe Length ft. Capacity g.p.m
Type

REMARKS, ELEVATION, SOURCE OF DATA, etc.

SAMPLES INDICATE BASALT AT 695 FT.

Any not in use and not sealed well(s) on property? ☐ Yes ☐ No

M.G.S. NO. 199. 190-203 FT. LOOKS LIKE REWORKED JORDAN.

GAMMA LOGGED 2-13-2006 TO 580 FT BY JIM TRAEN.

USGS Quad	Coon Rapids	Elevation	910
Aquifer:	CFMS	Alt Id:	80-6139

Report Copy

Was a variance granted from the MDH for this Well? ☐ Yes ☐ No

Well CONTRACTOR CERTIFICATION Lic. Or Reg. No. 27058

License Business Name

Name of Driller

HE-01205-06 (Rev. 9/96)

Unique No.	00202951	MINNESOTA DEPARTMENT OF HEALTH	Update Date	2007/02/07
County Name	Anoka	**WELL AND BORING RECORD** *Minnesota Statutes Chapter 1031*	Entry Date	1991/04/15

Township Name	Township	Range	Dir	Section	Subsection	Well Depth		Depth Completed		Date Well Completed
	31	24	W	25	ACBBDD	695	ft.	695	ft.	1961/09/00

Well Name	COON RAPIDS 5	**Lic. Or Reg. No.**	27058	**Name of Driller**			
USGS Quad	Coon Rapi	**Elevation**	910	**Aquifer**	CFMS	**Alternative Id**	80-6139

GEOLOGICAL MATERIAL	COLOR	HARDNESS	FROM	TO	STRAT	LITH PRIM	LITH SEC	LITH MINOR
SAND, GRAVEL, SHALE			0	190	QPUU	SAND	GRVL	CLAY
QPUU = Pebbly sand/silt/clay	SAND = Sand		GRVL = Gravel				CLAY = Clay	
SHALE, SANDROCK			190	200	QLUU	CLAY	SAND	
QLUU = Clay & sand	CLAY = Clay		SAND = Sand					
SANDROCK		HARD	200	201	QFUU	SAND		
QFUU = Sand	SAND = Sand							
SANDROCK		HARD	201	215	CSTL	DLMT	SNDS	
CSTL = St.Lawrence	DLMT = Dolomite		SNDS = Sandstone					
SHALE			215	225	CSTL	SHLE	SLSN	
CSTL = St.Lawrence	SHLE = Shale		SLSN = Siltstone					
HARD SANDROCK & SHALE			225	248	CSTL	DLMT	SNDS	
CSTL = St.Lawrence	DLMT = Dolomite		SNDS = Sandstone					
HARD SANDROCK & SHALE			248	255	CFRN	SNDS	SHLE	DLMT
CFRN = Franconia	SNDS = Sandstone		SHLE = Shale				DLMT = Dolomite	
HARD SHALE & LIMEROCK			255	279	CFRN	SNDS	SHLE	DLMT
CFRN = Franconia	SNDS = Sandstone		SHLE = Shale				DLMT = Dolomite	
SANDROCK			279	293	CFRN	SNDS		
CFRN = Franconia	SNDS = Sandstone							
LIMEROCK			293	295	CFRN	DLMT		
CFRN = Franconia	DLMT = Dolomite							
HARD GREEN SHALE & LIMEROCK			295	374	CFRN	SHLE	DLMT	
CFRN = Franconia	SHLE = Shale		DLMT = Dolomite					
SHALE			374	387	CFRN	SHLE		
CFRN = Franconia	SHLE = Shale							
LIMEROCK			387	390	CFRN	DLMT		
CFRN = Franconia	DLMT = Dolomite							
SHALE, LAYERS OF LIME	GREEN	HARD	390	404	CFRN	SHLE	DLMT	
CFRN = Franconia	SHLE = Shale		DLMT = Dolomite					

Unique No.	00202951	MINNESOTA DEPARTMENT OF HEALTH	Update Date	2007/02/07
County Name	Anoka	**WELL AND BORING RECORD** *Minnesota Statutes Chapter 1031*	Entry Date	1991/04/15

Township Name	Township	Range	Dir	Section	Subsection	Well Depth		Depth Completed		Date Well Completed
	31	24	W	25	ACBBDD	695	ft.	695	ft.	1961/09/00

Well Name	COON RAPIDS 5	Lic. Or Reg. No.	27058	Name of Driller	
USGS Quad	Coon Rapi	Elevation	910	Aquifer	CFMS	Alternative Id	80-6139

GEOLOGICAL MATERIAL	COLOR	HARDNESS	FROM	TO	STRAT	LITH PRIM	LITH SEC	LITH MINOR
SHALE, LAYERS OF LIME	GREEN	HARD	404	410	CIGL	SNDS		
CIGL = Ironton-Galesville	SNDS = Sandstone							
SANDROCK & SHALE			410	424	CIGL	SNDS	SHLE	
CIGL = Ironton-Galesville	SNDS = Sandstone		SHLE = Shale					
SANDROCK			424	449	CIGL	SNDS		
CIGL = Ironton-Galesville	SNDS = Sandstone							
HARD SANDROCK & SHALE			449	454	CIGL	SNDS	SHLE	
CIGL = Ironton-Galesville	SNDS = Sandstone		SHLE = Shale					
HARD SHALE, LAYERS OF LIME			454	459	CIGL	SNDS		
CIGL = Ironton-Galesville	SNDS = Sandstone							
HARD SHALE, LAYERS OF LIME			459	465	CECR	SHLE	SNDS	DLMT
CECR = Eau Claire	SHLE = Shale		SNDS = Sandstone			DLMT = Dolomite		
STICK GREEN SHALE			465	477	CECR	SHLE	SNDS	
CECR = Eau Claire	SHLE = Shale		SNDS = Sandstone					
SHALE	RED		477	497	CECR	SHLE	SNDS	
CECR = Eau Claire	SHLE = Shale		SNDS = Sandstone					
BLUE-GREEN SHALE			497	525	CECR	SHLE	SNDS	
CECR = Eau Claire	SHLE = Shale		SNDS = Sandstone					
HARD GRAY SHALE, SOME SANDROCK			525	529	CECR	SHLE	SNDS	
CECR = Eau Claire	SHLE = Shale		SNDS = Sandstone					
HARD GRAY SHALE, SOME SANDROCK			529	555	CMTS	SHLE	SNDS	
CMTS = Mt.Simon	SHLE = Shale		SNDS = Sandstone					
HARD SHALE & SANDROCK			555	625	CMTS	SHLE	SNDS	
CMTS = Mt.Simon	SHLE = Shale		SNDS = Sandstone					
SANDROCK			625	685	CMTS	SNDS		
CMTS = Mt.Simon	SNDS = Sandstone							
RED CLASTICS			685	695	PMRC	SHLE	SNDS	
PMRC = Red Clastic Series	SHLE = Shale		SNDS = Sandstone					

Unique No.	00202951	MINNESOTA DEPARTMENT OF HEALTH	Update Date	2007/02/07
County Name	Anoka	**WELL AND BORING RECORD** *Minnesota Statutes Chapter 1031*	Entry Date	1991/04/15

Township Name	Township	Range	Dir	Section	Subsection	Well Depth		Depth Completed		Date Well Completed
	31	24	W	25	ACBBDD	695	ft.	695	ft.	1961/09/00

Well Name	COON RAPIDS 5	**Lic. Or Reg. No.**	27058	**Name of Driller**			
USGS Quad	Coon Rapi	**Elevation**	910	**Aquifer**	CFMS	**Alternative Id**	80-6139

GEOLOGICAL MATERIAL	COLOR	HARDNESS	FROM	TO	STRAT	LITH PRIM	LITH SEC	LITH MINOR
GNEISS AT 695'			695	695	PAUD	BSLT		

PAUD = Archean Rocks Undivided BSLT = Basalt

Unique No. 00202937

County Name Anoka

MINNESOTA DEPARTMENT OF HEALTH

WELL AND BORING RECORD

Minnesota Statutes Chapter 1031

Update Date 2010/03/15

Entry Date 1991/04/15

Township Name	Township	Range	Dir	Section	Subsection
	31	24	W	17	BBAACC

Well Depth	Depth Completed	Date Well Completed
158 ft.	158 ft.	1960/11/00

Well Name COON RAPIDS 6

Drilling Method Cable Tool

Well Owner's Name COON RAPIDS 6
11611 YUCCA NW ST
COON RAPIDS MN 55433

Drilling Fluid

Well Hydrofractured? ☐ Yes ☐ No
From ft. to ft.

Contact's Name CITY OF COON RAPIDS
11155 ROBINSON NW DR
COON RAPIDS MN 55433

Use Community Supply (municipal)

Casing **Drive Shoe?** ☐ Yes ☐ N

Hole Diameter
0 in. t 158 ft

Casing Diameter **Weight(lbs/ft)**
20 in. t 118 ft

GEOLOGICAL MATERIAL	COLOR	HARDNESS	FROM	TO
SAND & GRAVEL			0	57
CLAY			57	67
SAND & GRAVEL			67	82
HARDPAN			82	94
HARDPAN			94	102
SANDROCK			102	158

Screen N

Open Hole From 118 ft. to 158 ft.

Make Type

Static Water Level 22 ft. from Land surface Date 1960/11/00

PUMPING LEVEL (below land surface)
24.5 ft. after hrs. pumping 151 g.p.m.

Well Head Completion
Pitless adapter mfr Model
Casing Protection ☑ 12 in. above grade
☐ At-grade(Environmental Wells and Borings ONLY)

Grouting Information Well grouted? ☐ Yes ☐ No

Nearest Known Source of Contamination
ft. direction type
Well disinfected upon completion? ☐ Yes ☐ No

Pump ☐ Not Installed Date Installed
Mfr name
Model HP Volts
Drop Pipe Length ft. Capacity g.p.m
Type

Any not in use and not sealed well(s) on property? ☐ Yes ☐ No

Was a variance granted from the MDH for this Well? ☐ Yes ☐ No

REMARKS, ELEVATION, SOURCE OF DATA, etc.

BASED ON SAMPLES AIR LIFTED FROM WELL 5-6-1993 FRANCONIA FM. PRESENT.

GAMMA LOGGED 12-1-1992.

GAMMA LOGGED 5-6-1993. LOGGED BY GEOSPHERE.

OLD P.A. 60-0743.

USGS Quad Coon Rapids Elevation 870
Aquifer: CFRN Alt Id: 80-6139

Well CONTRACTOR CERTIFICATION Lic. Or Reg. No. 62012
License Business Name
Name of Driller KEMPER, R

Report Copy

Unique No.	00202937	MINNESOTA DEPARTMENT OF HEALTH	Update Date	2010/03/15
County Name	Anoka	**WELL AND BORING RECORD** *Minnesota Statutes Chapter 1031*	Entry Date	1991/04/15

Township Name	Township	Range	Dir	Section	Subsection	Well Depth		Depth Completed		Date Well Completed
	31	24	W	17	BBAACC	158	ft.	158	ft.	1960/11/00

Well Name	COON RAPIDS 6	**Lic. Or Reg. No.**	62012	**Name of Driller**	KEMPER, R.		
USGS Quad	Coon Rapi	**Elevation**	870	**Aquifer**	CFRN	**Alternative Id**	80-6139

GEOLOGICAL MATERIAL	COLOR	HARDNESS	FROM	TO	STRAT	LITH PRIM	LITH SEC	LITH MINOR
SAND & GRAVEL			0	57	QHUU	SAND	GRVL	
QHUU = Sand & larger	SAND = Sand		GRVL = Gravel					
CLAY			57	67	QCUU	CLAY		
QCUU = Clay	CLAY = Clay							
SAND & GRAVEL			67	82	QHUU	SAND	GRVL	
QHUU = Sand & larger	SAND = Sand		GRVL = Gravel					
HARDPAN			82	94	QPUU	HDPN		
QPUU = Pebbly sand/silt/clay	HDPN = Hardpan							
HARDPAN			94	102	CFRN	SNDS	SHLE	
CFRN = Franconia	SNDS = Sandstone		SHLE = Shale					
SANDROCK			102	158	CFRN	SNDS	SHLE	DLMT
CFRN = Franconia	SNDS = Sandstone		SHLE = Shale				DLMT = Dolomite	

Unique No. 00202943

County Name Anoka

MINNESOTA DEPARTMENT OF HEALTH

WELL AND BORING RECORD

Minnesota Statutes Chapter 1031

Update Date 2008/12/30

Entry Date 1991/04/15

Township Name	Township	Range	Dir	Section	Subsection
	31	24	W	21	BDACBB

Well Depth	Depth Completed	Date Well Completed
632 ft.	632 ft.	1964/04/00

Well Name COON RAPIDS 7

Drilling Method Cable Tool

Well Owner's Name COON RAPIDS 7
10617 DIRECT RIVER DR
COON RAPIDS MN 55433

Drilling Fluid

Well Hydrofractured? ☐ Yes ☐ No
From ft. to ft.

Contact's Name CITY OF COON RAPIDS
11155 ROBINSON NW DR
COON RAPIDS MN 55433

Use Community Supply (municipal)

Casing **Drive Shoe?** ☐ Yes ☐ N

Hole Diameter

Casing Diameter **Weight(lbs/ft)**

24 in. t 163 ft

16 in. t 189 ft

GEOLOGICAL MATERIAL	COLOR	HARDNESS	FROM	TO
SAND & CLAY			0	78
CLAY			78	90
FINE SAND			90	130
SANDSTONE			130	161
GREENSHALE	GREE		161	165
DOLOMITIC CLAY			165	190
SHALE & SANDSTONE			190	295
GRAY SHALE	GRAY		295	300
BROWN SHALE	BROW		300	315
SHALE	RED		315	325
SHALE	GRAY		325	330
SHALE	GRAY		330	345
SANDSTONE	GRAY		345	380
GRAY SHALE	GRAY		380	398
SHALE	GRAY		398	400
RED ROCK	RED		400	425
GRAY & RED SHALE	GRY/R		425	440
GRAY & BROWN ROCK	GRY/B		440	475
COARSE SAND	GRAY		475	477
COARSE SAND	GRAY		477	480
FINE SAND	GRAY		480	520
FINE SAND	GRAY		520	560
COARSE SAND	WHITE		560	590
HARD GOLD GRAINS COAR	WHITE		590	600
SHALE	RED		600	610
RED & GRAY SHALE	RED/G		610	615
SHALE	RED		615	632

Screen N

Open Hole From 189 ft. to 632 ft.

Make Type

Static Water Level 31 ft. from Land surface Date 1964/04/00

PUMPING LEVEL (below land surface)

71 ft. after hrs. pumping 1600 g.p.m.

Well Head Completion

Pitless adapter mfr Model

Casing Protection ☑ 12 in. above grade

☐ At-grade(Environmental Wells and Borings ONLY)

Grouting Information Well grouted? ☐ Yes ☐ No

Nearest Known Source of Contamination

ft. direction type

Well disinfected upon completion? ☐ Yes ☐ No

Pump ☐ Not Installed Date Installed

Mfr name

Model HP Volts

Drop Pipe Length ft. Capacity g.p.m

Type

REMARKS, ELEVATION, SOURCE OF DATA, etc.

JIM TRAEN HAS TWO DATES ON LOG 1-18-04 AND 1-18-05.

GAMMA LOGGED 1-18-04 BY JIM TRAEN

Any not in use and not sealed well(s) on property? ☐ Yes ☐ No

Was a variance granted from the MDH for this Well? ☐ Yes ☐ No

USGS Quad Coon Rapids Elevation 868

Aquifer: CFMS Alt Id: 80-6139

Well CONTRACTOR CERTIFICATION Lic. Or Reg. No. 96460

Unique No.	00202943	MINNESOTA DEPARTMENT OF HEALTH	Update Date	2008/12/30
County Name	Anoka	**WELL AND BORING RECORD** *Minnesota Statutes Chapter 1031*	Entry Date	1991/04/15

Township Name	Township	Range	Dir	Section	Subsection	Well Depth		Depth Completed		Date Well Completed
	31	24	W	21	BDACBB	632	ft.	632	ft.	1964/04/00

Well Name	COON RAPIDS 7	**Lic. Or Reg. No.**	96460	**Name of Driller**			
USGS Quad	Coon Rapi	**Elevation**	868	**Aquifer**	CFMS	**Alternative Id**	80-6139

GEOLOGICAL MATERIAL	COLOR	HARDNESS	FROM	TO	STRAT	LITH PRIM	LITH SEC	LITH MINOR
SAND & CLAY			0	78	QLUU	SAND	CLAY	
QLUU = Clay & sand	SAND = Sand		CLAY = Clay					
CLAY			78	90	QCUU	CLAY		
QCUU = Clay	CLAY = Clay							
FINE SAND			90	130	QFUU	SAND		
QFUU = Sand	SAND = Sand							
SANDSTONE			130	161	CJDN	SNDS		
CJDN = Jordan	SNDS = Sandstone							
GREENSHALE	GREEN		161	165	CSTL	SHLE	SLSN	
CSTL = St.Lawrence	SHLE = Shale		SLSN = Siltstone					
DOLOMITIC CLAY			165	190	CSTL	DLMT	SLSN	
CSTL = St.Lawrence	DLMT = Dolomite		SLSN = Siltstone					
SHALE & SANDSTONE			190	295	CFRN	SHLE	SNDS	
CFRN = Franconia	SHLE = Shale		SNDS = Sandstone					
GRAY SHALE	GRAY		295	300	CFRN	SHLE	SNDS	DLMT
CFRN = Franconia	SHLE = Shale		SNDS = Sandstone				DLMT = Dolomite	
BROWN SHALE	BROWN		300	315	CFRN	SHLE	SNDS	DLMT
CFRN = Franconia	SHLE = Shale		SNDS = Sandstone				DLMT = Dolomite	
SHALE	RED		315	325	CFRN	SHLE	SNDS	DLMT
CFRN = Franconia	SHLE = Shale		SNDS = Sandstone				DLMT = Dolomite	
SHALE	GRAY		325	330	CFRN	SHLE	SNDS	DLMT
CFRN = Franconia	SHLE = Shale		SNDS = Sandstone				DLMT = Dolomite	
SHALE	GRAY		330	345	CIGL	SNDS		
CIGL = Ironton-Galesville	SNDS = Sandstone							
SANDSTONE	GRAY		345	380	CIGL	SNDS		
CIGL = Ironton-Galesville	SNDS = Sandstone							
GRAY SHALE	GRAY		380	398	CIGL	SNDS		
CIGL = Ironton-Galesville	SNDS = Sandstone							

Unique No.	00202943	MINNESOTA DEPARTMENT OF HEALTH	Update Date	2008/12/30
County Name	Anoka	**WELL AND BORING RECORD** *Minnesota Statutes Chapter 1031*	Entry Date	1991/04/15

Township Name	Township	Range	Dir	Section	Subsection	Well Depth		Depth Completed		Date Well Completed
	31	24	W	21	BDACBB	632	ft.	632	ft.	1964/04/00

Well Name	COON RAPIDS 7	**Lic. Or Reg. No.**	96460	**Name of Driller**			
USGS Quad	Coon Rapi	**Elevation**	868	**Aquifer**	CFMS	**Alternative Id**	80-6139

GEOLOGICAL MATERIAL	COLOR	HARDNESS	FROM	TO	STRAT	LITH PRIM	LITH SEC	LITH MINOR
SHALE	GRAY		398	400	CECR	SHLE	SNDS	
CECR = Eau Claire	SHLE = Shale			SNDS = Sandstone				
RED ROCK	RED		400	425	CECR	SHLE	SNDS	
CECR = Eau Claire	SHLE = Shale			SNDS = Sandstone				
GRAY & RED SHALE	GRY/RED		425	440	CECR	SHLE	SNDS	
CECR = Eau Claire	SHLE = Shale			SNDS = Sandstone				
GRAY & BROWN ROCK	GRY/BRN		440	475	CECR	SHLE	SNDS	
CECR = Eau Claire	SHLE = Shale			SNDS = Sandstone				
COARSE SAND	GRAY		475	477	CECR	SHLE	SNDS	
CECR = Eau Claire	SHLE = Shale			SNDS = Sandstone				
COARSE SAND	GRAY		477	480	CMTS	SNDS		
CMTS = Mt.Simon	SNDS = Sandstone							
FINE SAND	GRAY		480	520	CMTS	SNDS		
CMTS = Mt.Simon	SNDS = Sandstone							
FINE SAND	GRAY		520	560	CMTS	SNDS		
CMTS = Mt.Simon	SNDS = Sandstone							
COARSE SAND	WHITE		560	590	CMTS	SNDS		
CMTS = Mt.Simon	SNDS = Sandstone							
HARD GOLD GRAINS COARSE SAND	WHITE		590	600	CMTS	SNDS		
CMTS = Mt.Simon	SNDS = Sandstone							
SHALE	RED		600	610	PMSU	SHLE		
PMSU = Mid.Proterozoic Sedimentary	SHLE = Shale							
RED & GRAY SHALE	RED/GRY		610	615	PMSU	SHLE		
PMSU = Mid.Proterozoic Sedimentary	SHLE = Shale							
SHALE	RED		615	632	PMSU	SHLE		
PMSU = Mid.Proterozoic Sedimentary	SHLE = Shale							

Unique No. 00202932	MINNESOTA DEPARTMENT OF HEALTH	Update Date 2007/02/06
County Name Anoka	**WELL AND BORING RECORD**	Entry Date 1991/04/15
	Minnesota Statutes Chapter 1031	

Township Name	Township	Range	Dir	Section	Subsection
	31	24	W	13	ACCDBD

Well Depth	Depth Completed	Date Well Completed
700 ft.	700 ft.	1965/05/07

Well Name COON RAPIDS 8

Drilling Method Cable Tool

Well Owner's Name COON RAPIDS 8
269 NORTHDALE BL
COON RAPIDS MN 55433

Drilling Fluid

Well Hydrofractured? ☐ Yes ☐ No
From ft. to ft.

Contact's Name CITY OF COON RAPIDS
11155 ROBINSON NW DR
COON RAPIDS MN 55433

Use Community Supply (municipal)

Casing **Drive Shoe?** ☐ Yes ☐ N

Hole Diameter
in. t 700 ft

Casing Diameter **Weight(lbs/ft)**
24 in. t 258 ft
16 in. t 283 ft

GEOLOGICAL MATERIAL	COLOR	HARDNESS	FROM	TO
DRIFT			0	212
SANDROCK, SHALE, GRAV			212	243
LIMEROCK, SHALE			243	249
LIMEROCK, SHALE			249	263
SANDROCK, SHALE			263	409
SANDROCK, SHALE			409	418
SANDROCK			418	445
SHALEY SANDROCK			445	469
SHALEY SANDROCK			469	473
SHALE			473	518
SHALE & SANDROCK			518	533
SHALEY SANDROCK			533	545
SHALE			545	549
SANDROCK			549	594
SHALE			594	598
SANDROCK			598	694
SHALE			694	700

Screen N

Open Hole From 283 ft. to 700 ft.

Make Type

Static Water Level 42 ft. from Land surface Date 1965/05/07

PUMPING LEVEL (below land surface)
132.3 ft. after hrs. pumping 922 g.p.m.

Well Head Completion
Pitless adapter mfr Model
Casing Protection ☑ 12 in. above grade
☐ At-grade(Environmental Wells and Borings ONLY)

Grouting Information Well grouted? ☑ Yes ☐ No

Material	From	To (ft.)	Amount(yds/bags)	
G	0	283	24	Y

Nearest Known Source of Contamination
ft. direction type
Well disinfected upon completion? ☐ Yes ☐ No

Pump ☐ Not Installed Date Installed
Mfr nam
Model HP Volts
Drop Pipe Length ft. Capacity g.p.m
Type

Any not in use and not sealed well(s) on property? ☐ Yes ☐ No

Was a variance granted from the MDH for this Well? ☐ Yes ☐ No

REMARKS, ELEVATION, SOURCE OF DATA, etc.

OLD PA. NO. 65-0095.

GAMMA LOGGED 2-6-2004 BY JIM TRAEN

USGS Quad Coon Rapids Elevation 897
Aquifer: CFMS Alt Id: 80-6139

Well CONTRACTOR CERTIFICATION Lic. Or Reg. No. 62012
License Business Name
Name of Driller O'BRIEN, F.

Report Copy

Unique No.	00202932	MINNESOTA DEPARTMENT OF HEALTH	Update Date	2007/02/06
County Name	Anoka	**WELL AND BORING RECORD** *Minnesota Statutes Chapter 1031*	Entry Date	1991/04/15

Township Name	Township	Range	Dir	Section	Subsection	Well Depth		Depth Completed		Date Well Completed
	31	24	W	13	ACCDBD	700	ft.	700	ft.	1965/05/07

Well Name	COON RAPIDS 8	**Lic. Or Reg. No.**	62012	**Name of Driller**	O'BRIEN, F.		
USGS Quad	Coon Rapi	**Elevation**	897	**Aquifer**	CFMS	**Alternative Id**	80-6139

GEOLOGICAL MATERIAL	COLOR	HARDNESS	FROM	TO	STRAT	LITH PRIM	LITH SEC	LITH MINOR
DRIFT			0	212	QUUU	DRFT		
QUUU = Unknown deposit type	DRFT = Drift							
SANDROCK, SHALE, GRAVEL			212	243	QPUU	SAND	CLAY	GRVL
QPUU = Pebbly sand/silt/clay	SAND = Sand		CLAY = Clay				GRVL = Gravel	
LIMEROCK, SHALE			243	249	QUUU	COBL		
QUUU = Unknown deposit type	COBL = Cobble							
LIMEROCK, SHALE			249	263	CFRN	SHLE	DLMT	SNDS
CFRN = Franconia	SHLE = Shale		DLMT = Dolomite				SNDS = Sandstone	
SANDROCK, SHALE			263	409	CFRN	SNDS	SHLE	DLMT
CFRN = Franconia	SNDS = Sandstone		SHLE = Shale				DLMT = Dolomite	
SANDROCK, SHALE			409	418	CIGL	SNDS		
CIGL = Ironton-Galesville	SNDS = Sandstone							
SANDROCK			418	445	CIGL	SNDS		
CIGL = Ironton-Galesville	SNDS = Sandstone							
SHALEY SANDROCK			445	469	CIGL	SNDS	SHLE	
CIGL = Ironton-Galesville	SNDS = Sandstone		SHLE = Shale					
SHALEY SANDROCK			469	473	CECR	SNDS	SHLE	
CECR = Eau Claire	SNDS = Sandstone		SHLE = Shale					
SHALE			473	518	CECR	SHLE		
CECR = Eau Claire	SHLE = Shale							
SHALE & SANDROCK			518	533	CECR	SHLE	SNDS	
CECR = Eau Claire	SHLE = Shale		SNDS = Sandstone					
SHALEY SANDROCK			533	545	CECR	SNDS		
CECR = Eau Claire	SNDS = Sandstone							
SHALE			545	549	CECR	SHLE	SLSN	
CECR = Eau Claire	SHLE = Shale		SLSN = Siltstone					
SANDROCK			549	594	CMTS	SNDS		
CMTS = Mt.Simon	SNDS = Sandstone							

Unique No.	00202932	MINNESOTA DEPARTMENT OF HEALTH	Update Date	2007/02/06
County Name	Anoka	**WELL AND BORING RECORD** *Minnesota Statutes Chapter 1031*	Entry Date	1991/04/15

Township Name	Township	Range	Dir	Section	Subsection	Well Depth		Depth Completed		Date Well Completed
	31	24	W	13	ACCDBD	700	ft.	700	ft.	1965/05/07

Well Name	COON RAPIDS 8	**Lic. Or Reg. No.**	62012	**Name of Driller**	O'BRIEN, F.		
USGS Quad	Coon Rapi	**Elevation**	897	**Aquifer**	CFMS	**Alternative Id**	80-6139

GEOLOGICAL MATERIAL	COLOR	HARDNESS	FROM	TO	STRAT	LITH PRIM	LITH SEC	LITH MINOR
SHALE			594	598	CMTS	SHLE	SNDS	
CMTS = Mt.Simon	SHLE = Shale		SNDS = Sandstone					
SANDROCK			598	694	CMTS	SNDS		
CMTS = Mt.Simon	SNDS = Sandstone							
SHALE			694	700	PMRC	SLSN	SHLE	
PMRC = Red Clastic Series	SLSN = Siltstone		SHLE = Shale					

Unique No.	00202931	MINNESOTA DEPARTMENT OF HEALTH	Update Date	2008/12/30
County Name	Anoka	**WELL AND BORING RECORD** *Minnesota Statutes Chapter 1031*	Entry Date	1991/04/15

Township Name	Township	Range	Dir	Section	Subsection
	31	24	W	13	ACDAAB

Well Depth	Depth Completed	Date Well Completed
500 ft.	500 ft.	1969/04/07

Well Name COON RAPIDS 9

Drilling Method Cable Tool

Well Owner's Name COON RAPIDS 9
11399 DOGWOOD NW ST
COON RAPIDS MN 55433

Drilling Fluid

Well Hydrofractured? ☐ Yes ☐ No
From ft. to ft.

Contact's Name CITY OF COON RAPIDS
11155 ROBINSON NW DR
COON RAPIDS MN 55433

Use Community Supply (municipal)

Casing **Drive Shoe?** ☐ Yes ☐ N

Hole Diameter

Casing Diameter **Weight(lbs/ft)**

24 in. t 268 ft
16 in. t 294 ft

GEOLOGICAL MATERIAL	COLOR	HARDNESS	FROM	TO
SAND			0	20
SAND	RED		20	39
CLAY	BLUE		39	63
SAND	RED		63	83
SAND	RED		83	89
CLAY	GREE		89	98
CLAY	BLUE		98	109
GRAVEL			109	123
GRAVEL	GRAY		123	135
GRAVEL & ROCKS			135	140
SAND	GREE		140	146
CLAY & ROCKS			146	166
GREEN CLAY & ROCKS			166	173
CLAY	RED		173	235
RED CLAY & ROCK	RED		235	245
RED CLAY & SAND	RED		245	250
RED CLAY & SAND	RED		250	252
SHALE	GREE		252	255
LIMEROCK & SHALE			255	263
LIMEROCK & SHALE			263	265
LIMEROCK & SHALE			265	266
LIMEROCK & SHALE			266	271
SANDSTONE & SHALE			271	275
HARD SHALE & SAND			275	302
HARD SHALE & SAND			302	316
SANDSTONE		HARD	316	320
SANDSTONE & SHALE			320	353
SANDSTONE			353	356
SHALE SOME SAND			356	371
SHALE & SANDSTONE			371	388
SHALE			388	396
SHALE & SANDSTONE			396	405

Screen N

Open Hole From 294 ft. to 500 ft.

Make Type

Static Water Level 47 ft. from Land surface Date 1969/04/07

PUMPING LEVEL (below land surface)

ft. after hrs. pumping g.p.m.

Well Head Completion

Pitless adapter mfr Model

Casing Protection ☑ 12 in. above grade

☐ At-grade(Environmental Wells and Borings ONLY)

Grouting Information Well grouted? ☑ Yes ☐ No

Material	From	To (ft.)	Amount(yds/bags)	
G			24	Y

Nearest Known Source of Contamination

ft. direction type

Well disinfected upon completion? ☐ Yes ☐ No

Pump ☐ Not Installed Date Installed

Mfr nam

Model HP Volts

SANDY SHALE	405	410
SANDY SHALE	410	415
SANDY SHALE	415	425
SANDY SHALE	425	454
SANDY SHALE	454	458
SANDY SHALE	458	462
BLUE & RED SHALE	462	475
SANDY SHALE	475	478
SANDY SHALE	478	482
SANDY SHALE	482	492
RED & GREEN SHALE	492	500

REMARKS, ELEVATION, SOURCE OF DATA, etc.

M.G.S. NO. 459.

GAMMA LOGGED 2-13-2004. LOGGED BY JIM TRAEN.

USGS Quad	Coon Rapids	Elevation	897
Aquifer:	CFIE	Alt Id:	80-6139

Report Copy

Drop Pipe Length ft. Capacity g.p.m

Type

Any not in use and not sealed well(s) on property? ☐ Yes ☐ No

Was a variance granted from the MDH for this Well? ☐ Yes ☐ No

Well CONTRACTOR CERTIFICATION Lic. Or Reg. No. 27010

License Business Name

Name of Driller OLZESKE, T.

HE-01205-06 (Rev. 9/96)

Unique No.	00202931	MINNESOTA DEPARTMENT OF HEALTH	Update Date	2008/12/30
County Name	Anoka	**WELL AND BORING RECORD** *Minnesota Statutes Chapter 1031*	Entry Date	1991/04/15

Township Name	Township	Range	Dir	Section	Subsection	Well Depth		Depth Completed		Date Well Completed
	31	24	W	13	ACDAAB	500	ft.	500	ft.	1969/04/07

Well Name	COON RAPIDS 9	**Lic. Or Reg. No.**	27010	**Name of Driller**	OLZESKE, T.		
USGS Quad	Coon Rapi	**Elevation**	897	**Aquifer**	CFIE	**Alternative Id**	80-6139

GEOLOGICAL MATERIAL	COLOR	HARDNESS	FROM	TO	STRAT	LITH PRIM	LITH SEC	LITH MINOR
SAND			0	20	QFUU	SAND		
QFUU = Sand	SAND = Sand							
SAND	RED		20	39	QFUR	SAND		
QFUR = Sand	SAND = Sand							
CLAY	BLUE		39	63	QCUG	CLAY		
QCUG = Clay	CLAY = Clay							
SAND	RED		63	83	QFUR	SAND		
QFUR = Sand	SAND = Sand							
SAND	RED		83	89	QFUR	SAND		
QFUR = Sand	SAND = Sand							
CLAY	GREEN		89	98	QCUL	CLAY		
QCUL = Clay	CLAY = Clay							
CLAY	BLUE		98	109	QCUG	CLAY		
QCUG = Clay	CLAY = Clay							
GRAVEL			109	123	QGUU	GRVL		
QGUU = Gravel (+larger)	GRVL = Gravel							
GRAVEL	GRAY		123	135	QGUG	GRVL		
QGUG = Gravel (+larger)	GRVL = Gravel							
GRAVEL & ROCKS			135	140	QGUU	GRVL	COBL	
QGUU = Gravel (+larger)	GRVL = Gravel		COBL = Cobble					
SAND	GREEN		140	146	QFUL	SAND		
QFUL = Sand	SAND = Sand							
CLAY & ROCKS			146	166	QPUU	CLAY	COBL	
QPUU = Pebbly sand/silt/clay	CLAY = Clay		COBL = Cobble					
GREEN CLAY & ROCKS			166	173	QPUL	CLAY	COBL	
QPUL = Pebbly sand/silt/clay	CLAY = Clay		COBL = Cobble					
CLAY	RED		173	235	QCUR	CLAY		
QCUR = Clay	CLAY = Clay							

Unique No.	00202931	MINNESOTA DEPARTMENT OF HEALTH	Update Date	2008/12/30
County Name	Anoka	**WELL AND BORING RECORD** *Minnesota Statutes Chapter 1031*	Entry Date	1991/04/15

Township Name	Township	Range	Dir	Section	Subsection	Well Depth		Depth Completed		Date Well Completed
	31	24	W	13	ACDAAB	500	ft.	500	ft.	1969/04/07

Well Name	COON RAPIDS 9	**Lic. Or Reg. No.**	27010	**Name of Driller**	OLZESKE, T.		
USGS Quad	Coon Rapi	**Elevation**	897	**Aquifer**	CFIE	**Alternative Id**	80-6139

GEOLOGICAL MATERIAL	COLOR	HARDNESS	FROM	TO	STRAT	LITH PRIM	LITH SEC	LITH MINOR
RED CLAY & ROCK	RED		235	245	QPUR	CLAY	COBL	
QPUR = Pebbly sand/silt/clay	CLAY = Clay		COBL = Cobble					
RED CLAY & SAND	RED		245	250	QLUR	CLAY	SAND	
QLUR = Clay & sand	CLAY = Clay		SAND = Sand					
RED CLAY & SAND	RED		250	252	QLUR	CLAY	SAND	
QLUR = Clay & sand	CLAY = Clay		SAND = Sand					
SHALE	GREEN		252	255	QCUL	CLAY		
QCUL = Clay	CLAY = Clay							
LIMEROCK & SHALE			255	263	QPUU	COBL	CLAY	
QPUU = Pebbly sand/silt/clay	COBL = Cobble		CLAY = Clay					
LIMEROCK & SHALE			263	265	QPUU	COBL	CLAY	
QPUU = Pebbly sand/silt/clay	COBL = Cobble		CLAY = Clay					
LIMEROCK & SHALE			265	266	QPUU	COBL	CLAY	
QPUU = Pebbly sand/silt/clay	COBL = Cobble		CLAY = Clay					
LIMEROCK & SHALE			266	271	CFRN	DLMT	SHLE	SNDS
CFRN = Franconia	DLMT = Dolomite		SHLE = Shale				SNDS = Sandstone	
SANDSTONE & SHALE			271	275	CFRN	SNDS	SHLE	DLMT
CFRN = Franconia	SNDS = Sandstone		SHLE = Shale				DLMT = Dolomite	
HARD SHALE & SAND			275	302	CFRN	SHLE	SNDS	DLMT
CFRN = Franconia	SHLE = Shale		SNDS = Sandstone				DLMT = Dolomite	
HARD SHALE & SAND			302	316	CFRN	SHLE	SNDS	DLMT
CFRN = Franconia	SHLE = Shale		SNDS = Sandstone				DLMT = Dolomite	
SANDSTONE		HARD	316	320	CFRN	SNDS	DLMT	
CFRN = Franconia	SNDS = Sandstone		DLMT = Dolomite					
SANDSTONE & SHALE			320	353	CFRN	SNDS	SHLE	DLMT
CFRN = Franconia	SNDS = Sandstone		SHLE = Shale				DLMT = Dolomite	
SANDSTONE			353	356	CFRN	SNDS	SHLE	
CFRN = Franconia	SNDS = Sandstone		SHLE = Shale					

Unique No.	00202931	MINNESOTA DEPARTMENT OF HEALTH	Update Date	2008/12/30
County Name	Anoka	**WELL AND BORING RECORD** *Minnesota Statutes Chapter 1031*	Entry Date	1991/04/15

Township Name	Township	Range	Dir	Section	Subsection	Well Depth		Depth Completed		Date Well Completed
	31	24	W	13	ACDAAB	500	ft.	500	ft.	1969/04/07

Well Name	COON RAPIDS 9	**Lic. Or Reg. No.**	27010	**Name of Driller**	OLZESKE, T.		
USGS Quad	Coon Rapi	**Elevation**	897	**Aquifer**	CFIE	**Alternative Id**	80-6139

GEOLOGICAL MATERIAL	COLOR	HARDNESS	FROM	TO	STRAT	LITH PRIM	LITH SEC	LITH MINOR
SHALE SOME SAND			356	371	CFRN	SHLE	SNDS	DLMT
CFRN = Franconia	SHLE = Shale		SNDS = Sandstone			DLMT = Dolomite		
SHALE & SANDSTONE			371	388	CFRN	SHLE	SNDS	DLMT
CFRN = Franconia	SHLE = Shale		SNDS = Sandstone			DLMT = Dolomite		
SHALE			388	396	CFRN	SHLE	SNDS	
CFRN = Franconia	SHLE = Shale		SNDS = Sandstone					
SHALE & SANDSTONE			396	405	CFRN	SHLE	SNDS	
CFRN = Franconia	SHLE = Shale		SNDS = Sandstone					
SANDY SHALE			405	410	CFRN	SNDS	SHLE	DLMT
CFRN = Franconia	SNDS = Sandstone		SHLE = Shale			DLMT = Dolomite		
SANDY SHALE			410	415	CIGL	SNDS		
CIGL = Ironton-Galesville	SNDS = Sandstone							
SANDY SHALE			415	425	CIGL	SNDS		
CIGL = Ironton-Galesville	SNDS = Sandstone							
SANDY SHALE			425	454	CIGL	SNDS		
CIGL = Ironton-Galesville	SNDS = Sandstone							
SANDY SHALE			454	458	CIGL	SNDS		
CIGL = Ironton-Galesville	SNDS = Sandstone							
SANDY SHALE			458	462	CECR	SHLE	SNDS	
CECR = Eau Claire	SHLE = Shale		SNDS = Sandstone					
BLUE & RED SHALE			462	475	CECR	SHLE	SNDS	
CECR = Eau Claire	SHLE = Shale		SNDS = Sandstone					
SANDY SHALE			475	478	CECR	SHLE	SNDS	
CECR = Eau Claire	SHLE = Shale		SNDS = Sandstone					
SANDY SHALE			478	482	CECR	SHLE	SNDS	
CECR = Eau Claire	SHLE = Shale		SNDS = Sandstone					
SANDY SHALE			482	492	CECR	SHLE	SNDS	
CECR = Eau Claire	SHLE = Shale		SNDS = Sandstone					

Unique No.	00202931	MINNESOTA DEPARTMENT OF HEALTH	Update Date	2008/12/30
County Name	Anoka	**WELL AND BORING RECORD** *Minnesota Statutes Chapter 1031*	Entry Date	1991/04/15

Township Name	Township	Range	Dir	Section	Subsection	Well Depth		Depth Completed		Date Well Completed
	31	24	W	13	ACDAAB	500	ft.	500	ft.	1969/04/07

Well Name	COON RAPIDS 9	**Lic. Or Reg. No.**	27010	**Name of Driller**	OLZESKE, T.		
USGS Quad	Coon Rapi	**Elevation**	897	**Aquifer**	CFIE	**Alternative Id**	80-6139

GEOLOGICAL MATERIAL	COLOR	HARDNESS	FROM	TO	STRAT	LITH PRIM	LITH SEC	LITH MINOR
RED & GREEN SHALE			492	500	CECR	SHLE	SNDS	

CECR = Eau Claire SHLE = Shale SNDS = Sandstone

Unique No.	00202930	MINNESOTA DEPARTMENT OF HEALTH	Update Date	2007/02/07
County Name	Anoka	**WELL AND BORING RECORD**	Entry Date	1991/04/15

Minnesota Statutes Chapter 1031

Township Name	Township	Range	Dir	Section	Subsection
	31	24	W	13	DBADDC

Well Depth	Depth Completed	Date Well Completed
684 ft.	684 ft.	1970/05/05

Well Name COON RAPIDS 10

Drilling Method Cable Tool

Well Owner's Name COON RAPIDS 10
203 NORTHDALE BL
COON RAPIDS MN 55433

Drilling Fluid

Well Hydrofractured? ☐ Yes ☐ No
From ft. to ft.

Contact's Name CITY OF COON RAPIDS
11155 ROBINSON NW DR
COON RAPIDS MN 55433

Use Community Supply (municipal)

Casing **Drive Shoe?** ☐ Yes ☐ N

Hole Diameter

Casing Diameter		Weight(lbs/ft)	
30 in. t	80 ft		
24 in. t	259 ft		
16 in. t	272 ft		

GEOLOGICAL MATERIAL	COLOR	HARDNESS	FROM	TO
GLACIAL DRIFT			0	250
SANDY LIMESTONE			250	262
SANDY LIMESTONE			262	295
SANDSTONE WITH BEDS O			295	375
SANDSTONE SLATE	BROW		375	396
SANDSTONE SLATE	BROW		396	442
SANDSTONE SLATE BROW	BROW		442	455
HARD RED SHALE			455	457
HARD RED SHALE			457	495
SANDSTONE, SLATE	BROW		495	522
SANDSTONE, SLATE	BROW		522	662
SANDSTONE			662	679
RED SHALE			679	684

Screen N

Open Hole From 272 ft. to 684 ft.

Make Type

Static Water Level 51 ft. from Land surface Date 1970/05/05

PUMPING LEVEL (below land surface)
185 ft. after 49 hrs. pumping 1875 g.p.m.

Well Head Completion
Pitless adapter mfr Model
Casing Protection ☑ 12 in. above grade
☐ At-grade(Environmental Wells and Borings ONLY)

Grouting Information Well grouted? ☑ Yes ☐ No

Material	From	To (ft.)	Amount(yds/bags)
G	0	272	

Nearest Known Source of Contamination
ft. direction type
Well disinfected upon completion? ☐ Yes ☐ No

Pump ☐ Not Installed Date Installed Y
Mfr nam
Model HP 100 Volts
Drop Pipe Length ft. Capacity g.p.m
Type T

Any not in use and not sealed well(s) on property? ☐ Yes ☐ No

Was a variance granted from the MDH for this Well? ☐ Yes ☐ No

REMARKS, ELEVATION, SOURCE OF DATA, etc.

M.G.S. NO. 558. OLD PA. NO. 71-0825.

GAMMA LOGGED 5-3-2004. LOGGED BY JIM TRAEN.

USGS Quad Coon Rapids Elevation 899
Aquifer: CFMS Alt Id: 80-6139

Well CONTRACTOR CERTIFICATION Lic. Or Reg. No. 27118
License Business Name
Name of Driller BENEKE, R.

Report Copy

Unique No.	00202930	MINNESOTA DEPARTMENT OF HEALTH	Update Date	2007/02/07
County Name	Anoka	**WELL AND BORING RECORD** *Minnesota Statutes Chapter 1031*	Entry Date	1991/04/15

Township Name	Township	Range	Dir	Section	Subsection	Well Depth		Depth Completed		Date Well Completed
	31	24	W	13	DBADDC	684	ft.	684	ft.	1970/05/05

Well Name	COON RAPIDS 10	**Lic. Or Reg. No.**	27118	**Name of Driller**	BENEKE, R.		
USGS Quad	Coon Rapi	**Elevation**	899	**Aquifer**	CFMS	**Alternative Id**	80-6139

GEOLOGICAL MATERIAL	COLOR	HARDNESS	FROM	TO	STRAT	LITH PRIM	LITH SEC	LITH MINOR
GLACIAL DRIFT			0	250	QUUU	DRFT		
QUUU = Unknown deposit type	DRFT = Drift							
SANDY LIMESTONE			250	262	CSTL	SLSN	DLMT	
CSTL = St.Lawrence	SLSN = Siltstone		DLMT = Dolomite					
SANDY LIMESTONE			262	295	CFRN	SNDS	SHLE	DLMT
CFRN = Franconia	SNDS = Sandstone		SHLE = Shale				DLMT = Dolomite	
SANDSTONE WITH BEDS OF GREEN SHAL			295	375	CFRN	SNDS	SHLE	DLMT
CFRN = Franconia	SNDS = Sandstone		SHLE = Shale				DLMT = Dolomite	
SANDSTONE SLATE	BROWN		375	396	CFRN	SNDS	SHLE	DLMT
CFRN = Franconia	SNDS = Sandstone		SHLE = Shale				DLMT = Dolomite	
SANDSTONE SLATE	BROWN		396	442	CIGL	SNDS		
CIGL = Ironton-Galesville	SNDS = Sandstone							
SANDSTONE SLATE BROWN	BROWN		442	455	CIGL	SNDS		
CIGL = Ironton-Galesville	SNDS = Sandstone							
HARD RED SHALE			455	457	CIGL	SNDS		
CIGL = Ironton-Galesville	SNDS = Sandstone							
HARD RED SHALE			457	495	CECR	SHLE	SNDS	
CECR = Eau Claire	SHLE = Shale		SNDS = Sandstone					
SANDSTONE, SLATE	BROWN		495	522	CECR	SHLE	SNDS	
CECR = Eau Claire	SHLE = Shale		SNDS = Sandstone					
SANDSTONE, SLATE	BROWN		522	662	CMTS	SNDS		
CMTS = Mt.Simon	SNDS = Sandstone							
SANDSTONE			662	679	CMTS	SNDS		
CMTS = Mt.Simon	SNDS = Sandstone							
RED SHALE			679	684	PMRC	SHLE		
PMRC = Red Clastic Series	SHLE = Shale							

Unique No. 00202965	MINNESOTA DEPARTMENT OF HEALTH	Update Date 2008/12/30
County Name Anoka	**WELL AND BORING RECORD**	Entry Date 1991/04/15
	Minnesota Statutes Chapter 1031	

Township Name	Township	Range	Dir	Section	Subsection
	31	24	W	27	BAAAAA

Well Depth	Depth Completed	Date Well Completed
627 ft.	627 ft.	1972/05/11

Well Name COON RAPIDS 11

Drilling Method Non-specified Rotary

Well Owner's Name COON RAPIDS 11

COON RAPIDS MN 55433

Drilling Fluid

Well Hydrofractured? ☐ Yes ☐ No

From ft. to ft.

Contact's Name CITY OF COON RAPIDS

11155 ROBINSON NW DR

COON RAPIDS MN 55433

Use Community Supply (municipal)

Casing **Drive Shoe?** ☐ Yes ☐ N

Hole Diameter

in. t 157 ft

in. t 627 ft

Casing Diameter **Weight(lbs/ft)**

24 in. t 157 ft

GEOLOGICAL MATERIAL	COLOR	HARDNESS	FROM	TO
SAND			0	18
SANDY CLAY			18	58
SAND, GRAVEL & BOULDE			58	142
SAND, GRAVEL & BOULDE			142	146
LIME, SHALE			146	199
LIME, SHALE			199	305
SHALEY SANDSTONE			305	318
SHALEY SANDSTONE			318	352
SANDSTONE		SOFT	352	362
SANDSTONE		HARD	362	410
SANDSTONE		HARD	410	423
SHALE			423	434
SANDSTONE-SOME SHALE			434	478
SANDSTONE-SOME SHALE			478	530
SANDSTONE			530	622
SHALE			622	627

Screen N

Open Hole From 157 ft. to 627 ft.

Make Type

Static Water Level 25 ft. from Land surface Date 1972/05/11

PUMPING LEVEL (below land surface)

110 ft. after hrs. pumping 1820 g.p.m.

Well Head Completion

Pitless adapter mfr Model

Casing Protection ☑ 12 in. above grade

☐ At-grade(Environmental Wells and Borings ONLY)

Grouting Information Well grouted? ☑ Yes ☐ No

Material	From	To (ft.)	Amount(yds/bags)	
G	0	157	20	Y

Nearest Known Source of Contamination

ft. direction type

Well disinfected upon completion? ☐ Yes ☐ No

Pump ☐ Not Installed Date Installed

Mfr nam

Model HP Volts

Drop Pipe Length ft. Capacity g.p.m

Type

REMARKS, ELEVATION, SOURCE OF DATA, etc.

M.G.S. NO. 776

GAMMA LOGGED 9-12-1983 BY MGS AND 4-26-2002. LOGGED BY JIM TRAEN.

USGS Quad Coon Rapids Elevation 860

Aquifer: CFMS Alt Id: 80-6139

Any not in use and not sealed well(s) on property? ☐ Yes ☐ No

Was a variance granted from the MDH for this Well? ☐ Yes ☐ No

Well CONTRACTOR CERTIFICATION Lic. Or Reg. No. 62012

License Business Name

Name of Driller GIBSON, E.

Report Copy

Unique No.	00202965	MINNESOTA DEPARTMENT OF HEALTH	Update Date	2008/12/30
County Name	Anoka	**WELL AND BORING RECORD** *Minnesota Statutes Chapter 1031*	Entry Date	1991/04/15

Township Name	Township	Range	Dir	Section	Subsection	Well Depth		Depth Completed		Date Well Completed
	31	24	W	27	BAAAAA	627	ft.	627	ft.	1972/05/11

Well Name	COON RAPIDS 11	Lic. Or Reg. No.	62012	Name of Driller	GIBSON, E.
USGS Quad	Coon Rapi	Elevation	860	Aquifer	CFMS	Alternative Id	80-6139

GEOLOGICAL MATERIAL	COLOR	HARDNESS	FROM	TO	STRAT	LITH PRIM	LITH SEC	LITH MINOR
SAND			0	18	QFUU	SAND		
QFUU = Sand	SAND = Sand							
SANDY CLAY			18	58	QLUU	CLAY	SAND	
QLUU = Clay & sand	CLAY = Clay		SAND = Sand					
SAND, GRAVEL & BOULDERS			58	142	QHUU	SAND	GRVL	BLDR
QHUU = Sand & larger	SAND = Sand		GRVL = Gravel				BLDR = Boulder	
SAND, GRAVEL & BOULDERS			142	146	CSTL	DLMT	SLSN	
CSTL = St.Lawrence	DLMT = Dolomite		SLSN = Siltstone					
LIME, SHALE			146	199	CSTL	DLMT	SLSN	
CSTL = St.Lawrence	DLMT = Dolomite		SLSN = Siltstone					
LIME, SHALE			199	305	CFRN	SNDS	SHLE	DLMT
CFRN = Franconia	SNDS = Sandstone		SHLE = Shale				DLMT = Dolomite	
SHALEY SANDSTONE			305	318	CFRN	SNDS	SHLE	DLMT
CFRN = Franconia	SNDS = Sandstone		SHLE = Shale				DLMT = Dolomite	
SHALEY SANDSTONE			318	352	CIGL	SNDS		
CIGL = Ironton-Galesville	SNDS = Sandstone							
SANDSTONE		SOFT	352	362	CIGL	SNDS		
CIGL = Ironton-Galesville	SNDS = Sandstone							
SANDSTONE		HARD	362	410	CIGL	SNDS		
CIGL = Ironton-Galesville	SNDS = Sandstone							
SANDSTONE		HARD	410	423	CECR	SHLE	SNDS	
CECR = Eau Claire	SHLE = Shale		SNDS = Sandstone					
SHALE			423	434	CECR	SHLE	SNDS	
CECR = Eau Claire	SHLE = Shale		SNDS = Sandstone					
SANDSTONE-SOME SHALE			434	478	CECR	SHLE	SNDS	
CECR = Eau Claire	SHLE = Shale		SNDS = Sandstone					
SANDSTONE-SOME SHALE			478	530	CMTS	SNDS		
CMTS = Mt.Simon	SNDS = Sandstone							

Unique No.	00202965	MINNESOTA DEPARTMENT OF HEALTH	Update Date	2008/12/30
County Name	Anoka	**WELL AND BORING RECORD** *Minnesota Statutes Chapter 1031*	Entry Date	1991/04/15

Township Name	Township	Range	Dir	Section	Subsection	Well Depth		Depth Completed		Date Well Completed
	31	24	W	27	BAAAAA	627	ft.	627	ft.	1972/05/11

Well Name	COON RAPIDS 11	**Lic. Or Reg. No.**	62012	**Name of Driller**	GIBSON, E.		
USGS Quad	Coon Rapi	**Elevation**	860	**Aquifer**	CFMS	**Alternative Id**	80-6139

GEOLOGICAL MATERIAL	COLOR	HARDNESS	FROM	TO	STRAT	LITH PRIM	LITH SEC	LITH MINOR
SANDSTONE			530	622	CMTS	SNDS		
CMTS = Mt.Simon	SNDS = Sandstone							
SHALE			622	627	PMRC	SHLE		
PMRC = Red Clastic Series	SHLE = Shale							

Unique No. 00168721

County Name Anoka

MINNESOTA DEPARTMENT OF HEALTH

WELL AND BORING RECORD

Minnesota Statutes Chapter 1031

Update Date 2007/02/07

Entry Date 1991/04/15

Township Name	Township	Range	Dir	Section	Subsection
	31	24	W	27	AAAAAD

Well Depth		Depth Completed		Date Well Completed
604	ft.	604	ft.	1975/05/14

Well Name COON RAPIDS 12

Drilling Method Cable Tool

Well Owner's Name COON RAPIDS 12

COON RAPIDS MN 55433

Drilling Fluid

Well Hydrofractured? ☐ Yes ☐ No

From ft. to ft.

Contact's Name CITY OF COON RAPIDS

11155 ROBINSON NW DR

COON RAPIDS MN 55433

Use Community Supply (municipal)

Casing **Drive Shoe?** ☐ Yes ☐ N

Hole Diameter

Casing Diameter		Weight(lbs/ft)		
24	in. t	124	ft	94.62
16	in. t	208	ft	62.58

GEOLOGICAL MATERIAL	COLOR	HARDNESS	FROM	TO
SAND FILL	YELLO		0	9
SAND	GRAY		9	20
CLAY	GRAY		20	30
CLAY	RED/B		30	65
SANDY MUCK	BROW		65	100
SHALE	GRAY		100	120
JORDAN SANDROCK	WHITE		120	123
JORDAN SANDROCK	WHITE		123	135
ST. LAWRANCE SANDSTON	YELLO		135	140
ST. LAWRANCE SANDSTON	WHITE		140	170
ST. LAWRENCE SANDSTON	BLU/G		170	171
ST. LAWRANCE SANDSTON	BLU/G		171	180
ST. LAWRANCE SANDSTON	BLU/G		180	185
ST. LAWRANCE SANDSTON	PINK		185	195
ST. LAWRANCE SANDSTON	VARIE		195	208
ST. LAWRANCE SANDSTON	GREE		208	264
HARD LAYER OF SHALE	GREE		264	270
SHALE ROCK	GREE		270	286
SHALE SANDROCK	GREE		286	300
SANDROCK	TAN/G		300	316
SANDROCK	TAN/G		316	385
SHALE SANDSTONE	LIGHT		385	386
SHALE SANDSTONE	LIGHT		386	407
SHALE ROCK	TAN/B		407	420
SHALE	BRN/G		420	458
SHALE	BRN/G		458	480
SHALEY SANDSTONE	WHITE		480	550
SANDSTONE	TAN		550	600
SHALE	RED		600	604

Screen N

Open Hole From 208 ft. to 604 ft.

Make

Type

Static Water Level 47 ft. from Land surface Date 1975/05/14

PUMPING LEVEL (below land surface)

146 ft. after 8 hrs. pumping 1800 g.p.m.

Well Head Completion

Pitless adapter mfr Model

Casing Protection ☑ 12 in. above grade

☐ At-grade(Environmental Wells and Borings ONLY)

Grouting Information Well grouted? ☑ Yes ☐ No

Material	From	To (ft.)	Amount(yds/bags)
G			

Nearest Known Source of Contamination

ft. direction type

Well disinfected upon completion? ☑ Yes ☐ No

Pump ☐ Not Installed Date Installed

Mfr name

Model HP Volts

Drop Pipe Length ft. Capacity g.p.m

Type

REMARKS, ELEVATION, SOURCE OF DATA, etc.

M.G.S. NO.985.

GAMMA LOGGED 1-18-05. LOGGED BY JIM TRAEN.

Any not in use and not sealed well(s) on property? ☐ Yes ☐ No

USGS Quad	Coon Rapids	Elevation	852
Aquifer:	CFMS	Alt Id:	80-6139

Was a variance granted from the MDH for this Well? ☐ Yes ☐ No

Well CONTRACTOR CERTIFICATION Lic. Or Reg. No. 02015

License Business Name

Name of Driller SIGAFOOS, G.

Report Copy

HE-01205-06 (Rev. 9/96)

Unique No.	00168721	MINNESOTA DEPARTMENT OF HEALTH	Update Date	2007/02/07
County Name	Anoka	**WELL AND BORING RECORD** *Minnesota Statutes Chapter 1031*	Entry Date	1991/04/15

Township Name	Township	Range	Dir	Section	Subsection	Well Depth		Depth Completed		Date Well Completed
	31	24	W	27	AAAAAD	604	ft.	604	ft.	1975/05/14

Well Name	COON RAPIDS 12	**Lic. Or Reg. No.**	02015	**Name of Driller**	SIGAFOOS, G.		
USGS Quad	Coon Rapi	**Elevation**	852	**Aquifer**	CFMS	**Alternative Id**	80-6139

GEOLOGICAL MATERIAL	COLOR	HARDNESS	FROM	TO	STRAT	LITH PRIM	LITH SEC	LITH MINOR
SAND FILL	YELLOW		0	9	RMMF	SAND	FILL	
RMMF = Man-made fill	SAND = Sand		FILL = Fill					
SAND	GRAY		9	20	QFUG	SAND		
QFUG = Sand	SAND = Sand							
CLAY	GRAY		20	30	QCUG	CLAY		
QCUG = Clay	CLAY = Clay							
CLAY	RED/BRN		30	65	QCUU	CLAY		
QCUU = Clay	CLAY = Clay							
SANDY MUCK	BROWN		65	100	QNUB	SAND	MUCK	
QNUB = Sand & silt	SAND = Sand		MUCK = Muck					
SHALE	GRAY		100	120	QCUG	CLAY		
QCUG = Clay	CLAY = Clay							
JORDAN SANDROCK	WHITE		120	123	QFUU	SAND		
QFUU = Sand	SAND = Sand							
JORDAN SANDROCK	WHITE		123	135	CJDN	SNDS		
CJDN = Jordan	SNDS = Sandstone							
ST. LAWRANCE SANDSTONE	YELLOW		135	140	CSTL	SLSN	DLMT	SNDS
CSTL = St.Lawrence	SLSN = Siltstone		DLMT = Dolomite				SNDS = Sandstone	
ST. LAWRANCE SANDSTONE	WHITE		140	170	CSTL	SLSN	DLMT	SNDS
CSTL = St.Lawrence	SLSN = Siltstone		DLMT = Dolomite				SNDS = Sandstone	
ST. LAWRENCE SANDSTONE	BLU/GRN		170	171	CSTL	SLSN	DLMT	SNDS
CSTL = St.Lawrence	SLSN = Siltstone		DLMT = Dolomite				SNDS = Sandstone	
ST. LAWRANCE SANDSTONE	BLU/GRN		171	180	CFRN	SNDS	SHLE	DLMT
CFRN = Franconia	SNDS = Sandstone		SHLE = Shale				DLMT = Dolomite	
ST. LAWRANCE SANDSTONE	BLU/GRN		180	185	CFRN	SNDS	SHLE	DLMT
CFRN = Franconia	SNDS = Sandstone		SHLE = Shale				DLMT = Dolomite	
ST. LAWRANCE SANDSTONE	PINK		185	195	CFRN	SNDS	SHLE	DLMT
CFRN = Franconia	SNDS = Sandstone		SHLE = Shale				DLMT = Dolomite	

Unique No.	00168721	MINNESOTA DEPARTMENT OF HEALTH	Update Date	2007/02/07
County Name	Anoka	**WELL AND BORING RECORD** *Minnesota Statutes Chapter 1031*	Entry Date	1991/04/15

Township Name	Township	Range	Dir	Section	Subsection	Well Depth		Depth Completed		Date Well Completed
	31	24	W	27	AAAAAD	604	ft.	604	ft.	1975/05/14

Well Name	COON RAPIDS 12	**Lic. Or Reg. No.**	02015	**Name of Driller**	SIGAFOOS, G.		
USGS Quad	Coon Rapi	**Elevation**	852	**Aquifer**	CFMS	**Alternative Id**	80-6139

GEOLOGICAL MATERIAL	COLOR	HARDNESS	FROM	TO	STRAT	LITH PRIM	LITH SEC	LITH MINOR
ST. LAWRANCE SANDSTONE	VARIED		195	208	CFRN	SNDS	SHLE	DLMT
CFRN = Franconia	SNDS = Sandstone		SHLE = Shale			DLMT = Dolomite		
ST. LAWRANCE SANDSTONE	GREEN		208	264	CFRN	SNDS	SHLE	DLMT
CFRN = Franconia	SNDS = Sandstone		SHLE = Shale			DLMT = Dolomite		
HARD LAYER OF SHALE	GREEN		264	270	CFRN	SNDS	SHLE	DLMT
CFRN = Franconia	SNDS = Sandstone		SHLE = Shale			DLMT = Dolomite		
SHALE ROCK	GREEN		270	286	CFRN	SNDS	SHLE	DLMT
CFRN = Franconia	SNDS = Sandstone		SHLE = Shale			DLMT = Dolomite		
SHALE SANDROCK	GREEN		286	300	CFRN	SNDS	SHLE	DLMT
CFRN = Franconia	SNDS = Sandstone		SHLE = Shale			DLMT = Dolomite		
SANDROCK	TAN/GRN		300	316	CFRN	SNDS	SHLE	DLMT
CFRN = Franconia	SNDS = Sandstone		SHLE = Shale			DLMT = Dolomite		
SANDROCK	TAN/GRN		316	385	CIGL	SNDS		
CIGL = Ironton-Galesville	SNDS = Sandstone							
SHALE SANDSTONE	LIGHT		385	386	CIGL	SNDS		
CIGL = Ironton-Galesville	SNDS = Sandstone							
SHALE SANDSTONE	LIGHT		386	407	CECR	SHLE	SNDS	
CECR = Eau Claire	SHLE = Shale		SNDS = Sandstone					
SHALE ROCK	TAN/BRN		407	420	CECR	SHLE	SNDS	
CECR = Eau Claire	SHLE = Shale		SNDS = Sandstone					
SHALE	BRN/GRN		420	458	CECR	SHLE	SNDS	
CECR = Eau Claire	SHLE = Shale		SNDS = Sandstone					
SHALE	BRN/GRN		458	480	CMTS	SNDS		
CMTS = Mt.Simon	SNDS = Sandstone							
SHALEY SANDSTONE	WHITE		480	550	CMTS	SNDS		
CMTS = Mt.Simon	SNDS = Sandstone							
SANDSTONE	TAN		550	600	CMTS	SNDS		
CMTS = Mt.Simon	SNDS = Sandstone							

Unique No.	00168721	MINNESOTA DEPARTMENT OF HEALTH	Update Date	2007/02/07
County Name	Anoka	**WELL AND BORING RECORD** *Minnesota Statutes Chapter 1031*	Entry Date	1991/04/15

Township Name	Township	Range	Dir	Section	Subsection	Well Depth		Depth Completed		Date Well Completed
	31	24	W	27	AAAAAD	604	ft.	604	ft.	1975/05/14

Well Name	COON RAPIDS 12	**Lic. Or Reg. No.**	02015	**Name of Driller**	SIGAFOOS, G.		
USGS Quad	Coon Rapi	**Elevation**	852	**Aquifer**	CFMS	**Alternative Id**	80-6139

GEOLOGICAL MATERIAL	COLOR	HARDNESS	FROM	TO	STRAT	LITH PRIM	LITH SEC	LITH MINOR
SHALE	RED		600	604	PMSU	SHLE		

PMSU = Mid.Proterozoic Sedimentary SHLE = Shale

Unique No. 00168720

County Name Anoka

MINNESOTA DEPARTMENT OF HEALTH

WELL AND BORING RECORD

Minnesota Statutes Chapter 1031

Update Date 2007/02/07

Entry Date 1991/04/15

Township Name	Township	Range	Dir	Section	Subsection
	31	24	W	13	DADDBC

Well Depth	Depth Completed	Date Well Completed
693 ft.	693 ft.	1977/03/25

Well Name COON RAPIDS 13

Drilling Method Cable Tool

Well Owner's Name COON RAPIDS 13
11100 UNIVERSITY AV
COON RAPIDS MN 55433

Drilling Fluid

Well Hydrofractured? ☐ Yes ☐ No
From ft. to ft.

Contact's Name CITY OF COON RAPIDS
11155 ROBINSON NW DR
COON RAPIDS MN 55433

Use Community Supply (municipal)

Casing **Drive Shoe?** ☑ Yes ☐ N

Hole Diameter

Casing Diameter		Weight(lbs/ft)
24 in. t	252 ft	94.62
16 in. t	395 ft	62.58

GEOLOGICAL MATERIAL	COLOR	HARDNESS	FROM	TO
SAND	BROW		0	55
SANDY CLAY	GRAY		55	75
FINE SAND	GRAY	HARD	75	85
FINE SAND	RED		85	105
CLAY STICKY	RED		105	135
CLAY & STONE	GRAY	HARD	135	160
FINE SAND	RED		160	175
CLAY	GRAY		175	195
SAND & STONES & CLAY	GRAY		195	205
STONES & SAND	DARK		205	215
SHALE & STONES	TAN		215	220
SHALE	TAN		220	245
SANDSTONE SHALE	GRAY		245	250
SHALE	RED		250	257
ST. LAWRANCE GREEN, RE	VARIE		257	260
HARDROCK	TAN		260	267
HARDROCK	TAN		267	268
SANDROCK	LIGHT	HARD	268	298
SANDY ROCK, SHALE	GREE		298	312
SANDROCK, SHALE	LIGHT		312	338
SANDSTONE GREEN-GRAY-			338	403
SANDSTONE GREEN-GRAY-			403	453
SANDSTONE GREEN-GRAY-			453	525
SANDSTONE GREEN-GRAY-			525	672
HINCKLEY SANDSTONE	RED		672	691
HINCKLEY SANDSTONE			691	693

Screen N

Open Hole From 395 ft. to 693 ft.

Make Type

Static Water Level 75 ft. from Land surface Date 1977/03/25

PUMPING LEVEL (below land surface)
158 ft. after 10 hrs. pumping 1000 g.p.m.

Well Head Completion
Pitless adapter mfr Model
Casing Protection ☑ 12 in. above grade
☐ At-grade(Environmental Wells and Borings ONLY)

Grouting Information Well grouted? ☑ Yes ☐ No

Material	From	To (ft.)	Amount(yds/bags)
G			

Nearest Known Source of Contamination
ft. direction type
Well disinfected upon completion? ☐ Yes ☐ No

Pump ☐ Not Installed Date Installed
Mfr name
Model HP Volts

Drop Pipe Length ft. Capacity g.p.m
Type

Any not in use and not sealed well(s) on property? ☐ Yes ☐ No

Was a variance granted from the MDH for this Well? ☐ Yes ☐ No

REMARKS, ELEVATION, SOURCE OF DATA, etc.

M.G.S. NO.1124.

GAMMA LOGGED 2-6-04. LOGGED BY JIM TRAEN.

USGS Quad Coon Rapids Elevation 900
Aquifer: CFMS Alt Id: 80-6139

Well CONTRACTOR CERTIFICATION Lic. Or Reg. No. 02015
License Business Name

Report Copy

Unique No.	00168720	MINNESOTA DEPARTMENT OF HEALTH	Update Date	2007/02/07
County Name	Anoka	**WELL AND BORING RECORD** *Minnesota Statutes Chapter 1031*	Entry Date	1991/04/15

Township Name	Township	Range	Dir	Section	Subsection	Well Depth		Depth Completed		Date Well Completed
	31	24	W	13	DADDBC	693	ft.	693	ft.	1977/03/25

Well Name	COON RAPIDS 13	**Lic. Or Reg. No.**	02015	**Name of Driller**	SIGAFOOS, G.		
USGS Quad	Coon Rapi	**Elevation**	900	**Aquifer**	CFMS	**Alternative Id**	80-6139

GEOLOGICAL MATERIAL	COLOR	HARDNESS	FROM	TO	STRAT	LITH PRIM	LITH SEC	LITH MINOR
SAND	BROWN		0	55	QFUB	SAND		
QFUB = Sand	SAND = Sand							
SANDY CLAY	GRAY		55	75	QLUG	CLAY	SAND	
QLUG = Clay & sand	CLAY = Clay			SAND = Sand				
FINE SAND	GRAY	HARD	75	85	QFUG	SAND		
QFUG = Sand	SAND = Sand							
FINE SAND	RED		85	105	QFUR	SAND		
QFUR = Sand	SAND = Sand							
CLAY STICKY	RED		105	135	QCUR	CLAY		
QCUR = Clay	CLAY = Clay							
CLAY & STONE	GRAY	HARD	135	160	QPUG	CLAY	PEBL	
QPUG = Pebbly sand/silt/clay	CLAY = Clay			PEBL = Pebbles				
FINE SAND	RED		160	175	QFUR	SAND		
QFUR = Sand	SAND = Sand							
CLAY	GRAY		175	195	QCUG	CLAY		
QCUG = Clay	CLAY = Clay							
SAND & STONES & CLAY	GRAY		195	205	QPUG	SAND	PEBL	CLAY
QPUG = Pebbly sand/silt/clay	SAND = Sand			PEBL = Pebbles			CLAY = Clay	
STONES & SAND	DARK		205	215	QHUU	PEBL	SAND	
QHUU = Sand & larger	PEBL = Pebbles			SAND = Sand				
SHALE & STONES	TAN		215	220	QPUU	CLAY	PEBL	
QPUU = Pebbly sand/silt/clay	CLAY = Clay			PEBL = Pebbles				
SHALE	TAN		220	245	QCUU	CLAY		
QCUU = Clay	CLAY = Clay							
SANDSTONE SHALE	GRAY		245	250	QLUG	SAND	CLAY	
QLUG = Clay & sand	SAND = Sand			CLAY = Clay				
SHALE	RED		250	257	QCUR	CLAY		
QCUR = Clay	CLAY = Clay							

Unique No.	00168720	MINNESOTA DEPARTMENT OF HEALTH	Update Date	2007/02/07
County Name	Anoka	**WELL AND BORING RECORD** *Minnesota Statutes Chapter 1031*	Entry Date	1991/04/15

Township Name	Township	Range	Dir	Section	Subsection	Well Depth		Depth Completed		Date Well Completed
	31	24	W	13	DADDBC	693	ft.	693	ft.	1977/03/25

Well Name	COON RAPIDS 13			**Lic. Or Reg. No.**	02015	**Name of Driller**	SIGAFOOS, G.
USGS Quad	Coon Rapi	**Elevation**	900	**Aquifer**	CFMS	**Alternative Id**	80-6139

GEOLOGICAL MATERIAL	COLOR	HARDNESS	FROM	TO	STRAT	LITH PRIM	LITH SEC	LITH MINOR
ST. LAWRANCE GREEN, RED, BLACK	VARIED		257	260	QUUU	SAND	CLAY	COBL
QUUU = Unknown deposit type	SAND = Sand		CLAY = Clay				COBL = Cobble	
HARDROCK	TAN		260	267	QBUU	BLDR		
QBUU = Boulder or boulders	BLDR = Boulder							
HARDROCK	TAN		267	268	CSTL	DLMT	SLSN	
CSTL = St.Lawrence	DLMT = Dolomite		SLSN = Siltstone					
SANDROCK	LIGHT	HARD	268	298	CFRN	SNDS	SHLE	DLMT
CFRN = Franconia	SNDS = Sandstone		SHLE = Shale				DLMT = Dolomite	
SANDY ROCK, SHALE	GREEN		298	312	CFRN	SNDS	SHLE	DLMT
CFRN = Franconia	SNDS = Sandstone		SHLE = Shale				DLMT = Dolomite	
SANDROCK, SHALE	LIGHT		312	338	CFRN	SNDS	SHLE	DLMT
CFRN = Franconia	SNDS = Sandstone		SHLE = Shale				DLMT = Dolomite	
SANDSTONE GREEN-GRAY-RED			338	403	CFRN	SNDS	SHLE	DLMT
CFRN = Franconia	SNDS = Sandstone		SHLE = Shale				DLMT = Dolomite	
SANDSTONE GREEN-GRAY-RED			403	453	CIGL	SNDS		
CIGL = Ironton-Galesville	SNDS = Sandstone							
SANDSTONE GREEN-GRAY-RED			453	525	CECR	SHLE	SNDS	
CECR = Eau Claire	SHLE = Shale		SNDS = Sandstone					
SANDSTONE GREEN-GRAY-RED			525	672	CMTS	SNDS		
CMTS = Mt.Simon	SNDS = Sandstone							
HINCKLEY SANDSTONE	RED		672	691	CMTS	SNDS		
CMTS = Mt.Simon	SNDS = Sandstone							
HINCKLEY SANDSTONE			691	693	PMRC	SHLE		
PMRC = Red Clastic Series	SHLE = Shale							

Unique No. 00110460	MINNESOTA DEPARTMENT OF HEALTH	Update Date 2007/02/07
County Name Anoka	**WELL AND BORING RECORD**	Entry Date 1991/04/15
	Minnesota Statutes Chapter 1031	

Township Name	Township	Range	Dir	Section	Subsection
	31	24	W	22	BCBBDD

Well Depth	Depth Completed	Date Well Completed
613 ft.	613 ft.	1977/03/22

Well Name COON RAPIDS 14

Drilling Method Cable Tool

Well Owner's Name COON RAPIDS 14
2344 COON RAPIDS BL
COON RAPIDS MN 55433

Drilling Fluid

Well Hydrofractured? ☐ Yes ☐ No
From ft. to ft.

Contact's Name CITY OF COON RAPIDS
11155 ROBINSON NW DR
COON RAPIDS MN 55433

Use Community Supply (municipal)

Casing **Drive Shoe?** ☑ Yes ☐ N

Hole Diameter

Casing Diameter **Weight(lbs/ft)**

30 in. t 222 ft

20 in. t 328 ft

GEOLOGICAL MATERIAL	COLOR	HARDNESS	FROM	TO
SAND & GRAVEL			0	60
SAND	LT. BR		60	130
SAND W/SHALE STREAKS	GREE		130	167
SHALE-SANDY	GREE		167	170
SHALE-SANDY	GREE		170	218
SANDSTONE			218	250
SANDY SHALE			250	305
DOLOMITE/SHALE			305	330
SHALE	RED		330	339
SHALE	RED		339	340
SAND	WHITE		340	385
SHALE W/LIMESTONE SEA	VARIE		385	391
SHALE W/LIMESTONE SEA	VARIE		391	450
SANDSTONE W/SHALE	VARIE		450	456
SANDSTONE W/SHALE	VARIE		456	520
SHALE-STICKY			520	570
SHALE W/SAND LAYERS			572	610
SHALE	RED		610	613

Screen N

Open Hole From 328 ft. to 613 ft.

Make Type

Static Water Level 120 ft. from Land surface Date 1977/03/21

PUMPING LEVEL (below land surface)

196 ft. after 8 hrs. pumping 1600 g.p.m.

Well Head Completion

Pitless adapter mfr Model

Casing Protection ☑ 12 in. above grade

☐ At-grade(Environmental Wells and Borings ONLY)

Grouting Information Well grouted? ☑ Yes ☐ No

Material	From	To (ft.)	Amount(yds/bags)	
G	0	328	28	Y

Nearest Known Source of Contamination

ft. direction type

Well disinfected upon completion? ☑ Yes ☐ No

Pump ☐ Not Installed Date Installed Y

Mfr nam

Model HP Volts

Drop Pipe Length ft. Capacity g.p.m

Type T

Any not in use and not sealed well(s) on property? ☐ Yes ☐ No

Was a variance granted from the MDH for this Well? ☐ Yes ☐ No

REMARKS, ELEVATION, SOURCE OF DATA, etc.

GAMMA LOGGED 2-6-1997 & 10-17-2001. M.G.S. NO. 1108.

LOGGED BOTH TIMES BY JIM TRAEN.

USGS Quad Coon Rapids Elevation 869

Aquifer: CFMS Alt Id: 80-6139

Well CONTRACTOR CERTIFICATION Lic. Or Reg. No. 27010

License Business Name

Name of Driller LINDEKE, W.

Report Copy

Unique No.	00110460	MINNESOTA DEPARTMENT OF HEALTH	Update Date	2007/02/07
County Name	Anoka	**WELL AND BORING RECORD** *Minnesota Statutes Chapter 1031*	Entry Date	1991/04/15

Township Name	Township	Range	Dir	Section	Subsection	Well Depth		Depth Completed		Date Well Completed
	31	24	W	22	BCBBDD	613	ft.	613	ft.	1977/03/22

Well Name	COON RAPIDS 14	**Lic. Or Reg. No.**	27010	**Name of Driller**	LINDEKE, W.		
USGS Quad	Coon Rapi	**Elevation**	869	**Aquifer**	CFMS	**Alternative Id**	80-6139

GEOLOGICAL MATERIAL	COLOR	HARDNESS	FROM	TO	STRAT	LITH PRIM	LITH SEC	LITH MINOR
SAND & GRAVEL			0	60	QHUU	SAND	GRVL	
QHUU = Sand & larger	SAND = Sand		GRVL = Gravel					
SAND	LT. BRN		60	130	QFUB	SAND		
QFUB = Sand	SAND = Sand							
SAND W/SHALE STREAKS	GREEN		130	167	QLUL	SAND	CLAY	
QLUL = Clay & sand	SAND = Sand		CLAY = Clay					
SHALE-SANDY	GREEN		167	170	QLUL	CLAY	SAND	
QLUL = Clay & sand	CLAY = Clay		SAND = Sand					
SHALE-SANDY	GREEN		170	218	CFRN	SNDS	SHLE	DLMT
CFRN = Franconia	SNDS = Sandstone		SHLE = Shale				DLMT = Dolomite	
SANDSTONE			218	250	CFRN	SNDS	SHLE	
CFRN = Franconia	SNDS = Sandstone		SHLE = Shale					
SANDY SHALE			250	305	CFRN	SNDS	SLSN	DLMT
CFRN = Franconia	SNDS = Sandstone		SLSN = Siltstone				DLMT = Dolomite	
DOLOMITE/SHALE			305	330	CFRN	SNDS	DLMT	SHLE
CFRN = Franconia	SNDS = Sandstone		DLMT = Dolomite				SHLE = Shale	
SHALE	RED		330	339	CFRN	SHLE	SNDS	DLMT
CFRN = Franconia	SHLE = Shale		SNDS = Sandstone				DLMT = Dolomite	
SHALE	RED		339	340	CIGL	SNDS		
CIGL = Ironton-Galesville	SNDS = Sandstone							
SAND	WHITE		340	385	CIGL	SNDS		
CIGL = Ironton-Galesville	SNDS = Sandstone							
SHALE W/LIMESTONE SEAMS	VARIED		385	391	CIGL	SNDS		
CIGL = Ironton-Galesville	SNDS = Sandstone							
SHALE W/LIMESTONE SEAMS	VARIED		391	450	CECR	SLSN	SHLE	
CECR = Eau Claire	SLSN = Siltstone		SHLE = Shale					
SANDSTONE W/SHALE	VARIED		450	456	CECR	SNDS	SLSN	
CECR = Eau Claire	SNDS = Sandstone		SLSN = Siltstone					

Unique No.	00110460	MINNESOTA DEPARTMENT OF HEALTH	Update Date	2007/02/07
County Name	Anoka	**WELL AND BORING RECORD** *Minnesota Statutes Chapter 1031*	Entry Date	1991/04/15

Township Name	Township	Range	Dir	Section	Subsection	Well Depth		Depth Completed		Date Well Completed
	31	24	W	22	BCBBDD	613	ft.	613	ft.	1977/03/22

Well Name	COON RAPIDS 14	**Lic. Or Reg. No.**	27010	**Name of Driller**	LINDEKE, W.		
USGS Quad	Coon Rapi	**Elevation**	869	**Aquifer**	CFMS	**Alternative Id**	80-6139

GEOLOGICAL MATERIAL	COLOR	HARDNESS	FROM	TO	STRAT	LITH PRIM	LITH SEC	LITH MINOR
SANDSTONE W/SHALE	VARIED		456	520	CMTS	SNDS	SLSN	
CMTS = Mt.Simon	SNDS = Sandstone		SLSN = Siltstone					
SHALE-STICKY			520	570	CMTS	SNDS		
CMTS = Mt.Simon	SNDS = Sandstone							
SHALE W/SAND LAYERS			572	610	CMTS	SNDS		
CMTS = Mt.Simon	SNDS = Sandstone							
SHALE	RED		610	613	PMRC	SHLE		
PMRC = Red Clastic Series	SHLE = Shale							

Unique No.	00110461	MINNESOTA DEPARTMENT OF HEALTH	Update Date	2007/02/07
County Name	Anoka	**WELL AND BORING RECORD**	Entry Date	1991/04/15

Minnesota Statutes Chapter 1031

Township Name	Township	Range	Dir	Section	Subsection
	31	24	W	22	BCDDCA

Well Depth	Depth Completed	Date Well Completed
615 ft.	615 ft.	1976/09/13

Well Name COON RAPIDS 15

Drilling Method Cable Tool

Well Owner's Name COON RAPIDS 15
2231 105TH AV
COON RAPIDS MN 55433

Drilling Fluid

Well Hydrofractured? ☐ Yes ☐ No
From ft. to ft.

Contact's Name CITY OF COON RAPIDS
11155 ROBINSON NW DR
COON RAPIDS MN 55433

Use Community Supply (municipal)

Casing **Drive Shoe?** ☑ Yes ☐ N

Hole Diameter

Casing Diameter **Weight(lbs/ft)**

30 in. t 184 ft
20 in. t 225 ft

GEOLOGICAL MATERIAL	COLOR	HARDNESS	FROM	TO
DIRT	BLACK		0	3
FINE SAND			3	25
SAND & ROCKS			25	35
CLAY		HARD	35	40
CLAY & FINE SAND			40	87
SAND, TRACE OF CLAY			87	97
SAND/GRAVEL/TRACES OF			97	121
FINE SAND, TRACE OF CLA			121	145
SANDSTONE		SOFT	145	160
SHALE	BLUE		160	170
RED SHALE & SANDROCK	RED		170	178
SAND/GRAVEL/TRACE OF S	GREE		178	183
GREEN SHALE & ROCK	GREE		183	194
FRANCONIA SANDSTONE			194	295
FRANCONIA SHALE STREA			295	340
FRANCONIA SHALE STREA			340	348
RED & BLUE SHALE STREA			348	352
IRONTON GALESVILLE SAN			352	405
EAU CLAIRE SHALE			405	485
MT. SIMON			485	510
MT. SIMON, TRACE OF SHA			510	540
MT. SIMON		HARD	540	610
SHALE	RED		610	615

Screen N

Open Hole From 225 ft. to 615 ft.

Make Type

Static Water Level 50 ft. from Land surface Date 1976/09/10

PUMPING LEVEL (below land surface)
148 ft. after 15 hrs. pumping 2400 g.p.m.

Well Head Completion
Pitless adapter mfr Model
Casing Protection ☐ 12 in. above grade
☐ At-grade(Environmental Wells and Borings ONLY)

Grouting Information Well grouted? ☑ Yes ☐ No

Material	From	To (ft.)	Amount(yds/bags)	
G			15	Y

Nearest Known Source of Contamination
ft. direction type
Well disinfected upon completion? ☐ Yes ☐ No

Pump ☐ Not Installed Date Installed
Mfr nam
Model HP Volts
Drop Pipe Length ft. Capacity g.p.m
Type

Any not in use and not sealed well(s) on property? ☐ Yes ☐ No

Was a variance granted from the MDH for this Well? ☐ Yes ☐ No

REMARKS, ELEVATION, SOURCE OF DATA, etc.

GAMMA LOGGED 4-26-2002. M.G.S. NO. 1105. LOGGED BY JIM TRAEN.

USGS Quad Coon Rapids Elevation 870
Aquifer: CFMS Alt Id: 80-6139

Well CONTRACTOR CERTIFICATION Lic. Or Reg. No. 27010
License Business Name
Name of Driller HOLLEN, G.

Report Copy

Unique No.	00110461	MINNESOTA DEPARTMENT OF HEALTH	Update Date	2007/02/07
County Name	Anoka	**WELL AND BORING RECORD** *Minnesota Statutes Chapter 1031*	Entry Date	1991/04/15

Township Name	Township	Range	Dir	Section	Subsection	Well Depth		Depth Completed		Date Well Completed
	31	24	W	22	BCDDCA	615	ft.	615	ft.	1976/09/13

Well Name	COON RAPIDS 15	**Lic. Or Reg. No.**	27010	**Name of Driller**	HOLLEN, G.		
USGS Quad	Coon Rapi	**Elevation**	870	**Aquifer**	CFMS	**Alternative Id**	80-6139

GEOLOGICAL MATERIAL	COLOR	HARDNESS	FROM	TO	STRAT	LITH PRIM	LITH SEC	LITH MINOR
DIRT	BLACK		0	3	RUUK	SOIL	ORGD	
RUUK = Recent Deposit	SOIL = Soil			ORGD = Organic Deposits				
FINE SAND			3	25	QFUU	SAND		
QFUU = Sand	SAND = Sand							
SAND & ROCKS			25	35	QHUU	SAND	COBL	
QHUU = Sand & larger	SAND = Sand			COBL = Cobble				
CLAY		HARD	35	40	QCUU	CLAY		
QCUU = Clay	CLAY = Clay							
CLAY & FINE SAND			40	87	QLUU	CLAY	SAND	
QLUU = Clay & sand	CLAY = Clay			SAND = Sand				
SAND, TRACE OF CLAY			87	97	QLUU	SAND	CLAY	
QLUU = Clay & sand	SAND = Sand			CLAY = Clay				
SAND/GRAVEL/TRACES OF CLAY			97	121	QPUU	SAND	GRVL	CLAY
QPUU = Pebbly sand/silt/clay	SAND = Sand			GRVL = Gravel			CLAY = Clay	
FINE SAND, TRACE OF CLAY			121	145	QLUU	SAND	CLAY	
QLUU = Clay & sand	SAND = Sand			CLAY = Clay				
SANDSTONE		SOFT	145	160	QFUU	SAND		
QFUU = Sand	SAND = Sand							
SHALE	BLUE		160	170	QCUG	CLAY		
QCUG = Clay	CLAY = Clay							
RED SHALE & SANDROCK	RED		170	178	QLUR	CLAY	SAND	
QLUR = Clay & sand	CLAY = Clay			SAND = Sand				
SAND/GRAVEL/TRACE OF SHALE	GREEN		178	183	QHUU	SAND	GRVL	
QHUU = Sand & larger	SAND = Sand			GRVL = Gravel				
GREEN SHALE & ROCK	GREEN		183	194	CFRN	SHLE	DLMT	
CFRN = Franconia	SHLE = Shale			DLMT = Dolomite				
FRANCONIA SANDSTONE			194	295	CFRN	SNDS	SHLE	
CFRN = Franconia	SNDS = Sandstone			SHLE = Shale				

Unique No.	00110461	MINNESOTA DEPARTMENT OF HEALTH	Update Date	2007/02/07
County Name	Anoka	**WELL AND BORING RECORD** *Minnesota Statutes Chapter 1031*	Entry Date	1991/04/15

Township Name	Township	Range	Dir	Section	Subsection	Well Depth		Depth Completed		Date Well Completed
	31	24	W	22	BCDDCA	615	ft.	615	ft.	1976/09/13

Well Name	COON RAPIDS 15	**Lic. Or Reg. No.**	27010	**Name of Driller**	HOLLEN, G.		
USGS Quad	Coon Rapi	**Elevation**	870	**Aquifer**	CFMS	**Alternative Id**	80-6139

GEOLOGICAL MATERIAL	COLOR	HARDNESS	FROM	TO	STRAT	LITH PRIM	LITH SEC	LITH MINOR
FRANCONIA SHALE STREAKS			295	340	CFRN	SNDS	SHLE	DLMT
CFRN = Franconia	SNDS = Sandstone		SHLE = Shale			DLMT = Dolomite		
FRANCONIA SHALE STREAKS			340	348	CIGL	SNDS		
CIGL = Ironton-Galesville	SNDS = Sandstone							
RED & BLUE SHALE STREAKS			348	352	CIGL	SNDS		
CIGL = Ironton-Galesville	SNDS = Sandstone							
IRONTON GALESVILLE SANDSTONE			352	405	CIGL	SNDS		
CIGL = Ironton-Galesville	SNDS = Sandstone							
EAU CLAIRE SHALE			405	485	CECR	SHLE	SNDS	
CECR = Eau Claire	SHLE = Shale		SNDS = Sandstone					
MT. SIMON			485	510	CMTS	SNDS		
CMTS = Mt.Simon	SNDS = Sandstone							
MT. SIMON, TRACE OF SHALE			510	540	CMTS	SNDS		
CMTS = Mt.Simon	SNDS = Sandstone							
MT. SIMON		HARD	540	610	CMTS	SNDS		
CMTS = Mt.Simon	SNDS = Sandstone							
SHALE	RED		610	615	PMRC	SHLE		
PMRC = Red Clastic Series	SHLE = Shale							

Unique No.	00161413	MINNESOTA DEPARTMENT OF HEALTH	Update Date	2007/02/06
County Name	Anoka	**WELL AND BORING RECORD**	Entry Date	1991/04/15

Minnesota Statutes Chapter 1031

Township Name	Township	Range	Dir	Section	Subsection
	31	24	W	11	ADAAAA

Well Depth	Depth Completed	Date Well Completed
653 ft.	653 ft.	1981/04/10

Well Name COON RAPIDS 16

Drilling Method Cable Tool

Well Owner's Name COON RAPIDS 16
12280 OLIVE ST
COON RAPIDS MN 55433

Drilling Fluid

Well Hydrofractured? ☐ Yes ☐ No
From ft. to ft.

Contact's Name CITY OF COON RAPID
11155 ROBINSON NW DR
COON RAPIDS MN 55433

Use Community Supply (municipal)

Casing **Drive Shoe?** ☑ Yes ☐ N

Hole Diameter

Casing Diameter				Weight(lbs/ft)
30	in. t	169	ft	118
24	in. t	270	ft	94.62
18	in. t	395	ft	70.59

GEOLOGICAL MATERIAL	COLOR	HARDNESS	FROM	TO
SAND			0	73
CLAY SAND & GRAVEL			73	112
CLAY & SAND			112	130
WATER, SAND & GRAVEL			130	166
BOULDERS			166	176
GRAVEL W/SANDROCK			176	181
GRAVEL W/SANDROCK			181	187
SHALE			187	239
SHALE			239	252
SANDROCK		SOFT	252	270
SHALE & SANDROCK			270	376
SHALE & SANDROCK			376	435
SANDROCK			435	441
SANDROCK			441	455
SHALE (EAU CLAIRE)			455	517
SANDROCK			517	518
SANDROCK			518	653

Screen N

Open Hole From 395 ft. to 653 ft.

Make Type

Static Water Level 109 ft. from Land surface Date 1981/04/10

PUMPING LEVEL (below land surface)
190 ft. after 34 hrs. pumping 2000 g.p.m.

Well Head Completion
Pitless adapter mfr Model
Casing Protection ☑ 12 in. above grade
☐ At-grade(Environmental Wells and Borings ONLY)

Grouting Information Well grouted? ☑ Yes ☐ No

Material	From	To (ft.)	Amount(yds/bags)
G	0	395	

Nearest Known Source of Contamination
ft. direction type
Well disinfected upon completion? ☑ Yes ☐ No

Pump ☐ Not Installed Date Installed
Mfr nam
Model HP Volts
Drop Pipe Length ft. Capacity g.p.m
Type

Any not in use and not sealed well(s) on property? ☐ Yes ☐ No

Was a variance granted from the MDH for this Well? ☐ Yes ☐ No

REMARKS, ELEVATION, SOURCE OF DATA, etc.

M.G.S. NO. 1608 & 1705. GAMMA LOGGED10-17-2001 BY SUMMIT ENVIRON.

USGS Quad Coon Rapids Elevation 889
Aquifer: CIGM Alt Id: 80-6187

Well CONTRACTOR CERTIFICATION Lic. Or Reg. No. 27058
License Business Name
Name of Driller

Report Copy

Unique No.	00161413	MINNESOTA DEPARTMENT OF HEALTH	Update Date	2007/02/06
County Name	Anoka	**WELL AND BORING RECORD** *Minnesota Statutes Chapter 1031*	Entry Date	1991/04/15

Township Name	Township	Range	Dir	Section	Subsection	Well Depth		Depth Completed		Date Well Completed
	31	24	W	11	ADAAAA	653	ft.	653	ft.	1981/04/10

Well Name	COON RAPIDS 16	**Lic. Or Reg. No.**	27058	**Name of Driller**			
USGS Quad	Coon Rapi	**Elevation**	889	**Aquifer**	CIGM	**Alternative Id**	80-6187

GEOLOGICAL MATERIAL	COLOR	HARDNESS	FROM	TO	STRAT	LITH PRIM	LITH SEC	LITH MINOR
SAND			0	73	QFUU	SAND		
QFUU = Sand	SAND = Sand							
CLAY SAND & GRAVEL			73	112	QPUU	CLAY	SAND	GRVL
QPUU = Pebbly sand/silt/clay	CLAY = Clay		SAND = Sand				GRVL = Gravel	
CLAY & SAND			112	130	QLUU	CLAY	SAND	
QLUU = Clay & sand	CLAY = Clay		SAND = Sand					
WATER, SAND & GRAVEL			130	166	QHUU	SAND	GRVL	
QHUU = Sand & larger	SAND = Sand		GRVL = Gravel					
BOULDERS			166	176	QBUU	BLDR		
QBUU = Boulder or boulders	BLDR = Boulder							
GRAVEL W/SANDROCK			176	181	QGUU	SAND	COBL	
QGUU = Gravel (+larger)	SAND = Sand		COBL = Cobble					
GRAVEL W/SANDROCK			181	187	CSTL	SHLE	DLMT	SNDS
CSTL = St.Lawrence	SHLE = Shale		DLMT = Dolomite				SNDS = Sandstone	
SHALE			187	239	CSTL	SHLE	DLMT	SNDS
CSTL = St.Lawrence	SHLE = Shale		DLMT = Dolomite				SNDS = Sandstone	
SHALE			239	252	CFRN	SNDS	SHLE	DLMT
CFRN = Franconia	SNDS = Sandstone		SHLE = Shale				DLMT = Dolomite	
SANDROCK		SOFT	252	270	CFRN	SNDS	SHLE	DLMT
CFRN = Franconia	SNDS = Sandstone		SHLE = Shale				DLMT = Dolomite	
SHALE & SANDROCK			270	376	CFRN	SNDS	SHLE	DLMT
CFRN = Franconia	SNDS = Sandstone		SHLE = Shale				DLMT = Dolomite	
SHALE & SANDROCK			376	435	CIGL	SNDS		
CIGL = Ironton-Galesville	SNDS = Sandstone							
SANDROCK			435	441	CIGL	SNDS		
CIGL = Ironton-Galesville	SNDS = Sandstone							
SANDROCK			441	455	CECR	SHLE	SNDS	
CECR = Eau Claire	SHLE = Shale		SNDS = Sandstone					

Unique No.	00161413	MINNESOTA DEPARTMENT OF HEALTH	Update Date	2007/02/06
County Name	Anoka	**WELL AND BORING RECORD** *Minnesota Statutes Chapter 1031*	Entry Date	1991/04/15

Township Name	Township	Range	Dir	Section	Subsection	Well Depth		Depth Completed		Date Well Completed
	31	24	W	11	ADAAAA	653	ft.	653	ft.	1981/04/10

Well Name	COON RAPIDS 16	**Lic. Or Reg. No.**	27058	**Name of Driller**			
USGS Quad	Coon Rapi	**Elevation**	889	**Aquifer**	CIGM	**Alternative Id**	80-6187

GEOLOGICAL MATERIAL	COLOR	HARDNESS	FROM	TO	STRAT	LITH PRIM	LITH SEC	LITH MINOR
SHALE (EAU CLAIRE)			455	517	CECR	SHLE	SNDS	
CECR = Eau Claire	SHLE = Shale		SNDS = Sandstone					
SANDROCK			517	518	CECR	SHLE	SNDS	
CECR = Eau Claire	SHLE = Shale		SNDS = Sandstone					
SANDROCK			518	653	CMTS	SNDS		
CMTS = Mt.Simon	SNDS = Sandstone							

Unique No. 00150357

County Name Anoka

MINNESOTA DEPARTMENT OF HEALTH

WELL AND BORING RECORD

Minnesota Statutes Chapter 1031

Update Date 2007/02/07

Entry Date 1991/04/15

Township Name	Township	Range	Dir	Section	Subsection
	31	24	W	21	DAAAAA

Well Depth	Depth Completed	Date Well Completed
121 ft.	121 ft.	1981/12/18

Well Name COON RAPIDS 17

Drilling Method Cable Tool

Well Owner's Name COON RAPIDS 17
2400 105TH NW AV
COON RAPIDS MN 55433

Drilling Fluid

Well Hydrofractured? ☐ Yes ☐ No
From ft. to ft.

Contact's Name CITY OF COON RAPIDS
11155 ROBINSON NW DR
COON RAPIDS MN 55433

Use Community Supply (municipal)

Casing **Drive Shoe?** ☑ Yes ☐ N

Hole Diameter
in. t 121 ft

Casing Diameter **Weight(lbs/ft)**
30 in. t 81 ft 118.6

GEOLOGICAL MATERIAL	COLOR	HARDNESS	FROM	TO
DIRT	BLACK		0	3
SAND & GRAVEL & SOME C			3	59
SANDY CLAY		SOFT	59	70
CLEAN COARSE GRAVEL &	RED		70	98
CLEAN COARSE SAND & G			98	108
MEDIUM GRAVEL SAND &			108	113
COARSE SAND & GRAVEL			113	121

Screen Y

Open Hole From ft. to ft.

Make JOHNSON Type L

Diameter	Slot	Length	Set		Fitting
30	20	40	81	ft. to 121 ft	

Static Water Level 15 ft. from Land surface Date 1981/12/18

PUMPING LEVEL (below land surface)
72 ft. after 4 hrs. pumping 2000 g.p.m.

Well Head Completion
Pitless adapter mfr Model
Casing Protection ☑ 12 in. above grade
☐ At-grade(Environmental Wells and Borings ONLY)

Grouting Information Well grouted? ☐ Yes ☑ No

Nearest Known Source of Contamination
ft. direction type
Well disinfected upon completion? ☑ Yes ☐ No

Pump ☑ Not Installed Date Installed N
Mfr nam
Model HP Volts
Drop Pipe Length ft. Capacity g.p.m
Type

Any not in use and not sealed well(s) on property? ☐ Yes ☐ No

Was a variance granted from the MDH for this Well? ☐ Yes ☐ No

REMARKS, ELEVATION, SOURCE OF DATA, etc.

GAMMA LOGGED 10-23-2001 BY SUMMIT ENVIR.

USGS Quad Coon Rapids Elevation 855
Aquifer: QBAA Alt Id: 80-6139

Well CONTRACTOR CERTIFICATION Lic. Or Reg. No. 27010
License Business Name
Name of Driller KAUITSON, K.

Report Copy

Unique No.	00150357	MINNESOTA DEPARTMENT OF HEALTH	Update Date	2007/02/07
County Name	Anoka	**WELL AND BORING RECORD** *Minnesota Statutes Chapter 1031*	Entry Date	1991/04/15

Township Name	Township	Range	Dir	Section	Subsection	Well Depth		Depth Completed		Date Well Completed
	31	24	W	21	DAAAAA	121	ft.	121	ft.	1981/12/18

Well Name	COON RAPIDS 17			**Lic. Or Reg. No.**	27010	**Name of Driller**	KAUITSON, K.
USGS Quad	Coon Rapi	**Elevation**	855	**Aquifer**	QBAA	**Alternative Id**	80-6139

GEOLOGICAL MATERIAL	COLOR	HARDNESS	FROM	TO	STRAT	LITH PRIM	LITH SEC	LITH MINOR
DIRT	BLACK		0	3	RUUK	SOIL	ORGD	
RUUK = Recent Deposit	SOIL = Soil			ORGD = Organic Deposits				
SAND & GRAVEL & SOME CLAY			3	59	QPUU	SAND	GRVL	CLAY
QPUU = Pebbly sand/silt/clay	SAND = Sand			GRVL = Gravel			CLAY = Clay	
SANDY CLAY		SOFT	59	70	QLUU	CLAY	SAND	
QLUU = Clay & sand	CLAY = Clay			SAND = Sand				
CLEAN COARSE GRAVEL & SAND	RED		70	98	QHUR	GRVL	SAND	
QHUR = Sand & larger	GRVL = Gravel			SAND = Sand				
CLEAN COARSE SAND & GRAVEL			98	108	QHUU	SAND	GRVL	
QHUU = Sand & larger	SAND = Sand			GRVL = Gravel				
MEDIUM GRAVEL SAND & GRAVEL			108	113	QHUU	GRVL	SAND	
QHUU = Sand & larger	GRVL = Gravel			SAND = Sand				
COARSE SAND & GRAVEL			113	121	QHUU	SAND	GRVL	
QHUU = Sand & larger	SAND = Sand			GRVL = Gravel				

Unique No. 00110469	MINNESOTA DEPARTMENT OF HEALTH	Update Date 2008/12/29
County Name Anoka	**WELL AND BORING RECORD**	Entry Date 1991/04/15
	Minnesota Statutes Chapter 1031	

Township Name	Township	Range	Dir	Section	Subsection	Well Depth	Depth Completed	Date Well Completed
	31	24	W	2	DCDCDB	637 ft.	637 ft.	1986/05/00

Well Name COON RAPIDS 18

Drilling Method Cable Tool

Well Owner's Name COON RAPIDS

COON RAPIDS MN 55448

Drilling Fluid

Well Hydrofractured? ☐ Yes ☐ No

From ft. to ft.

Use Community Supply (municipal)

Contact's Name CITY OF COON RAPIDS
11155 ROBINSON NW DR
COON RAPIDS MN 55433

Casing **Drive Shoe?** ☑ Yes ☐ N

Hole Diameter

Casing Diameter **Weight(lbs/ft)**

36 in. t 135 ft

30 in. t 195 ft

24 in. t 575 ft

GEOLOGICAL MATERIAL	COLOR	HARDNESS	FROM	TO
SAND	BROW		0	14
PEAT	BLK/B		14	17
SAND MEDIUM	BROW		17	67
CLAY			67	120
CLAY-SHALE	RED		120	142
CLAY & SAND	RED		142	194
CLAY & SAND	RED		194	198
SHALE & SAND	GRN/G		198	226
SHALE & SAND			226	228
FRANCONIA	GREE		228	367
GALESVILLE			367	429
GALESVILLE			429	432
SHALE			432	486
MT. SIMON			486	509
MT. SIMON			509	593
SHALEY SANDSTON			593	616
MIXED SHALE & SANDSTO			616	631
SANDSTONE	RED		631	637

Screen N

Open Hole From 575 ft. to 637 ft.

Make Type

Static Water Level 140 ft. from Land surface Date 1986/05/00

PUMPING LEVEL (below land surface)

248 ft. after 36 hrs. pumping 1400 g.p.m.

Well Head Completion

Pitless adapter mfr Model

Casing Protection ☑ 12 in. above grade

☐ At-grade(Environmental Wells and Borings ONLY)

Grouting Information Well grouted? ☑ Yes ☐ No

Material	From	To (ft.)	Amount(yds/bags)	
G	0	575	67.5	Y

Nearest Known Source of Contamination

ft. direction type

Well disinfected upon completion? ☐ Yes ☐ No

Pump ☑ Not Installed Date Installed N

Mfr nam

Model HP Volts

Drop Pipe Length ft. Capacity g.p.m

Type

Any not in use and not sealed well(s) on property? ☐ Yes ☐ No

Was a variance granted from the MDH for this Well? ☐ Yes ☐ No

REMARKS, ELEVATION, SOURCE OF DATA, etc.

M.G.S. NO.2048. GAMMA LOGGED 8-28-1985.

GAMMA LOGGED 1-11-2005 BY JIM TRAEN.

USGS Quad Coon Rapids Elevation 890

Aquifer: CMTS Alt Id: 80-6139

Well CONTRACTOR CERTIFICATION Lic. Or Reg. No. 27010

License Business Name

Name of Driller HOLLEN, G.

Report Copy

Unique No.	00110469	MINNESOTA DEPARTMENT OF HEALTH	Update Date	2008/12/29
County Name	Anoka	**WELL AND BORING RECORD** *Minnesota Statutes Chapter 1031*	Entry Date	1991/04/15

Township Name	Township	Range	Dir	Section	Subsection	Well Depth		Depth Completed		Date Well Completed
	31	24	W	2	DCDCDB	637	ft.	637	ft.	1986/05/00

Well Name	COON RAPIDS 18	**Lic. Or Reg. No.**	27010	**Name of Driller**	HOLLEN, G.		
USGS Quad	Coon Rapi	**Elevation**	890	**Aquifer**	CMTS	**Alternative Id**	80-6139

GEOLOGICAL MATERIAL	COLOR	HARDNESS	FROM	TO	STRAT	LITH PRIM	LITH SEC	LITH MINOR
SAND	BROWN		0	14	QFUB	SAND		
QFUB = Sand	SAND = Sand							
PEAT	BLK/BRN		14	17	QSUU	PEAT		
QSUU = Peat	PEAT = Peat							
SAND MEDIUM	BROWN		17	67	QFUB	SAND		
QFUB = Sand	SAND = Sand							
CLAY			67	120	QCUU	CLAY		
QCUU = Clay	CLAY = Clay							
CLAY-SHALE	RED		120	142	QCUR	CLAY		
QCUR = Clay	CLAY = Clay							
CLAY & SAND	RED		142	194	QLUR	CLAY	SAND	
QLUR = Clay & sand	CLAY = Clay		SAND = Sand					
CLAY & SAND	RED		194	198	CSTL	DLMT	SLSN	SHLE
CSTL = St.Lawrence	DLMT = Dolomite		SLSN = Siltstone			SHLE = Shale		
SHALE & SAND	GRN/GRY		198	226	CSTL	DLMT	SLSN	SHLE
CSTL = St.Lawrence	DLMT = Dolomite		SLSN = Siltstone			SHLE = Shale		
SHALE & SAND			226	228	CFRN	SHLE	DLMT	SNDS
CFRN = Franconia	SHLE = Shale		DLMT = Dolomite			SNDS = Sandstone		
FRANCONIA	GREEN		228	367	CFRN	SHLE	DLMT	SNDS
CFRN = Franconia	SHLE = Shale		DLMT = Dolomite			SNDS = Sandstone		
GALESVILLE			367	429	CIGL	SNDS		
CIGL = Ironton-Galesville	SNDS = Sandstone							
GALESVILLE			429	432	CECR	SHLE	SNDS	
CECR = Eau Claire	SHLE = Shale		SNDS = Sandstone					
SHALE			432	486	CECR	SHLE	SNDS	DLMT
CECR = Eau Claire	SHLE = Shale		SNDS = Sandstone			DLMT = Dolomite		
MT. SIMON			486	509	CECR	SHLE	SNDS	DLMT
CECR = Eau Claire	SHLE = Shale		SNDS = Sandstone			DLMT = Dolomite		

Unique No.	00110469	MINNESOTA DEPARTMENT OF HEALTH	Update Date	2008/12/29
County Name	Anoka	**WELL AND BORING RECORD** *Minnesota Statutes Chapter 1031*	Entry Date	1991/04/15

Township Name	Township	Range	Dir	Section	Subsection	Well Depth		Depth Completed		Date Well Completed
	31	24	W	2	DCDCDB	637	ft.	637	ft.	1986/05/00

Well Name	COON RAPIDS 18	**Lic. Or Reg. No.**	27010	**Name of Driller**	HOLLEN, G.		
USGS Quad	Coon Rapi	**Elevation**	890	**Aquifer**	CMTS	**Alternative Id**	80-6139

GEOLOGICAL MATERIAL	COLOR	HARDNESS	FROM	TO	STRAT	LITH PRIM	LITH SEC	LITH MINOR
MT. SIMON			509	593	CMTS	SNDS		
CMTS = Mt.Simon	SNDS = Sandstone							
SHALEY SANDSTON			593	616	CMTS	SNDS	SHLE	
CMTS = Mt.Simon	SNDS = Sandstone		SHLE = Shale					
MIXED SHALE & SANDSTONE			616	631	CMTS	SNDS	SHLE	
CMTS = Mt.Simon	SNDS = Sandstone		SHLE = Shale					
SANDSTONE	RED		631	637	CMTS	SNDS		
CMTS = Mt.Simon	SNDS = Sandstone							

Unique No. 00110475

County Name Anoka

MINNESOTA DEPARTMENT OF HEALTH

WELL AND BORING RECORD

Minnesota Statutes Chapter 1031

Update Date 2009/07/16

Entry Date 1991/04/15

Township Name	Township	Range	Dir	Section	Subsection
	31	24	W	21	AACBDB

Well Depth	Depth Completed	Date Well Completed
143 ft.	135 ft.	1987/10/14

Well Name COON RAPIDS 19

Drilling Method Cable Tool

Well Owner's Name COON RAPIDS 19

COON RAPIDS MN 55433

Drilling Fluid

Well Hydrofractured? ☐ Yes ☐ No

From ft. to ft.

Use Community Supply (municipal)

Contact's Name CITY OF COON RAPIDS

11155 ROBINSON NW DR

COON RAPIDS MN 55433

Casing **Drive Shoe?** ☑ Yes ☐ N

Hole Diameter

Casing Diameter **Weight(lbs/ft)**

30 in. t 30 ft

20 in. t 115 ft

GEOLOGICAL MATERIAL	COLOR	HARDNESS	FROM	TO
TOPSOIL	BLACK		0	3
FINE SAND	BROW		3	25
CLAY & SAND MIX	BROW		25	35
CLAY WITH GRAVEL	BROW		35	83
STICKY CLAY	BLUE		83	105
STICKY CLAY	RED	HARD	105	115
COARSE SAND/GRAVEL			115	138
CLAY		HARD	138	143

Screen Y

Open Hole From ft. to ft.

Make JOHNSON Type L

Diameter	Slot	Length	Set		Fitting
20	70	20	115	ft. to 135	ft

Static Water Level 15 ft. from Land surface Date 1987/10/14

PUMPING LEVEL (below land surface)

84 ft. after 24 hrs. pumping 1200 g.p.m.

Well Head Completion

Pitless adapter mfr Model

Casing Protection ☑ 12 in. above grade

☐ At-grade(Environmental Wells and Borings ONLY)

Grouting Information Well grouted? ☑ Yes ☐ No

Material	From	To (ft.)	Amount(yds/bags)
G	6	25	0

Nearest Known Source of Contamination

ft. direction type

Well disinfected upon completion? ☐ Yes ☐ No

Pump ☑ Not Installed Date Installed N

Mfr nam

Model HP Volts

Drop Pipe Length ft. Capacity g.p.m

Type

Any not in use and not sealed well(s) on property? ☐ Yes ☐ No

Was a variance granted from the MDH for this Well? ☐ Yes ☐ No

REMARKS, ELEVATION, SOURCE OF DATA, etc.

M.G.S. NO.2878.

USGS Quad Coon Rapids Elevation 850

Aquifer: QBAA Alt Id: 80-6139

Well CONTRACTOR CERTIFICATION Lic. Or Reg. No. 27010

License Business Name

Name of Driller HOLLEN, G.

Report Copy

Unique No.	00110475	MINNESOTA DEPARTMENT OF HEALTH	Update Date	2009/07/16
County Name	Anoka	**WELL AND BORING RECORD** *Minnesota Statutes Chapter 1031*	Entry Date	1991/04/15

Township Name	Township	Range	Dir	Section	Subsection	Well Depth		Depth Completed		Date Well Completed
	31	24	W	21	AACBDB	143	ft.	135	ft.	1987/10/14

Well Name	COON RAPIDS 19	**Lic. Or Reg. No.**	27010	**Name of Driller**	HOLLEN, G.		
USGS Quad	Coon Rapi	**Elevation**	850	**Aquifer**	QBAA	**Alternative Id**	80-6139

GEOLOGICAL MATERIAL	COLOR	HARDNESS	FROM	TO	STRAT	LITH PRIM	LITH SEC	LITH MINOR
TOPSOIL	BLACK		0	3	RUUK	SOIL	ORGD	
RUUK = Recent Deposit	SOIL = Soil			ORGD = Organic Deposits				
FINE SAND	BROWN		3	25	QFUB	SAND		
QFUB = Sand	SAND = Sand							
CLAY & SAND MIX	BROWN		25	35	QLUB	CLAY	SAND	
QLUB = Clay & sand	CLAY = Clay			SAND = Sand				
CLAY WITH GRAVEL	BROWN		35	83	QPUB	CLAY	GRVL	
QPUB = Pebbly sand/silt/clay	CLAY = Clay			GRVL = Gravel				
STICKY CLAY	BLUE		83	105	QCUG	CLAY		
QCUG = Clay	CLAY = Clay							
STICKY CLAY	RED	HARD	105	115	QCUR	CLAY		
QCUR = Clay	CLAY = Clay							
COARSE SAND/GRAVEL			115	138	QHUU	SAND	GRVL	
QHUU = Sand & larger	SAND = Sand			GRVL = Gravel				
CLAY		HARD	138	143	QCUU	CLAY		
QCUU = Clay	CLAY = Clay							

Unique No. 00420956

County Name Anoka

MINNESOTA DEPARTMENT OF HEALTH

WELL AND BORING RECORD

Minnesota Statutes Chapter 1031

Update Date 2008/12/30

Entry Date 1991/04/15

Township Name	Township	Range	Dir	Section	Subsection
	31	24	W	21	ADBDAB

Well Depth	Depth Completed	Date Well Completed
135 ft.	135 ft.	1988/04/26

Well Name COON RAPIDS 20

Drilling Method Cable Tool

Well Owner's Name COON RAPIDS 20
XAVIS NW ST
COON RAPIDS MN 55433

Drilling Fluid

Well Hydrofractured? ☐ Yes ☐ No
From ft. to ft.

Contact's Name CITY OF COON RAPIDS
11155 ROBINSON NW DR
COON RAPIDS MN 55433

Use Community Supply (municipal)

Casing **Drive Shoe?** ☑ Yes ☐ N

Hole Diameter
0 in. t 135 ft

Casing Diameter **Weight(lbs/ft)**
30 in. t 95 ft
20 in. t 95 ft

GEOLOGICAL MATERIAL	COLOR	HARDNESS	FROM	TO
TOPSOIL-SAND	BROW		0	14
CLAY WITH GRAVEL	RED		14	18
MIXED LAYERS SAND & CL	BROW		18	40
CLAY	GRAY		40	43
LAYERED SAND & CLAY	GRAY		43	70
STICKY CLAY	BLUE		70	82
COARSE SAND	YELLO		82	93
SAND/GRAVEL	YELLO		93	135

Screen Y

Open Hole From ft. to ft.

Make JOHNSON Type L

Diameter	Slot	Length	Set		Fitting
20		40.8	95	ft. to 135 ft	

Static Water Level 15 ft. from Land surface Date 1988/04/26

PUMPING LEVEL (below land surface)
90 ft. after 8 hrs. pumping 1560 g.p.m.

Well Head Completion
Pitless adapter mfr Model
Casing Protection ☑ 12 in. above grade
☐ At-grade(Environmental Wells and Borings ONLY)

Grouting Information Well grouted? ☑ Yes ☐ No

Material	From	To (ft.)	Amount(yds/bags)	
G	0	40	6	Y

Nearest Known Source of Contamination
ft. direction type
Well disinfected upon completion? ☐ Yes ☐ No

Pump ☑ Not Installed Date Installed N
Mfr nam
Model HP Volts
Drop Pipe Length ft. Capacity g.p.m
Type

Any not in use and not sealed well(s) on property? ☐ Yes ☐ No

Was a variance granted from the MDH for this Well? ☐ Yes ☐ No

REMARKS, ELEVATION, SOURCE OF DATA, etc.

SAME AS NO.420957. 420957 PAPERS ARE LOST.

GAMMA LOGGED 11-14-2002. LOGGED BY JIM TRAEN.

USGS Quad Coon Rapids Elevation 850
Aquifer: QBAA Alt Id: 80-6139

Well CONTRACTOR CERTIFICATION Lic. Or Reg. No. 27010
License Business Name
Name of Driller HOLLEN, G.

Report Copy

Unique No.	00420956	MINNESOTA DEPARTMENT OF HEALTH	Update Date	2008/12/30
County Name	Anoka	**WELL AND BORING RECORD** *Minnesota Statutes Chapter 1031*	Entry Date	1991/04/15

Township Name	Township	Range	Dir	Section	Subsection	Well Depth		Depth Completed		Date Well Completed
	31	24	W	21	ADBDAB	135	ft.	135	ft.	1988/04/26

Well Name	COON RAPIDS 20	**Lic. Or Reg. No.**	27010	**Name of Driller**	HOLLEN, G.		
USGS Quad	Coon Rapi	**Elevation**	850	**Aquifer**	QBAA	**Alternative Id**	80-6139

GEOLOGICAL MATERIAL	COLOR	HARDNESS	FROM	TO	STRAT	LITH PRIM	LITH SEC	LITH MINOR
TOPSOIL-SAND	BROWN		0	14	RUUB	SOIL	ORGD	SAND
RUUB = Recent Deposit-brown	SOIL = Soil			ORGD = Organic Deposits			SAND = Sand	
CLAY WITH GRAVEL	RED		14	18	QPUR	CLAY	GRVL	
QPUR = Pebbly sand/silt/clay	CLAY = Clay			GRVL = Gravel				
MIXED LAYERS SAND & CLAY	BROWN		18	40	QLUB	SAND	CLAY	
QLUB = Clay & sand	SAND = Sand			CLAY = Clay				
CLAY	GRAY		40	43	QCUG	CLAY		
QCUG = Clay	CLAY = Clay							
LAYERED SAND & CLAY	GRAY		43	70	QLUG	SAND	CLAY	
QLUG = Clay & sand	SAND = Sand			CLAY = Clay				
STICKY CLAY	BLUE		70	82	QCUG	CLAY		
QCUG = Clay	CLAY = Clay							
COARSE SAND	YELLOW		82	93	QFUY	SAND		
QFUY = Sand	SAND = Sand							
SAND/GRAVEL	YELLOW		93	135	QHUY	SAND	GRVL	
QHUY = Sand & larger	SAND = Sand			GRVL = Gravel				

Unique No. 00474384	MINNESOTA DEPARTMENT OF HEALTH	Update Date 2007/02/06
County Name Anoka	**WELL AND BORING RECORD**	Entry Date 1992/06/22
	Minnesota Statutes Chapter 1031	

Township Name	Township	Range	Dir	Section	Subsection
	31	24	W	13	ACCDDD

Well Depth	Depth Completed	Date Well Completed
207 ft.	203 ft.	1990/01/26

Well Name COON RAPIDS 21

Drilling Method Cable Tool

Well Owner's Name COON RAPIDS 21
269 NORTHDALE BL
COON RAPIDS MN 55433

Drilling Fluid

Well Hydrofractured? ☐ Yes ☐ No
From ft. to ft.

Use Community Supply (municipal)

Contact's Name CITY OF COON RAPIDS
11155 ROBINSON NW DR
COON RAPIDS MN 55433

Casing **Drive Shoe?** ☐ Yes ☐ N

Hole Diameter

Casing Diameter **Weight(lbs/ft)**

24	in. t	103	ft
18	in. t	170	ft

GEOLOGICAL MATERIAL	COLOR	HARDNESS	FROM	TO
FINE SAND	BROW	SOFT	0	25
FINE SAND	GRAY	SOFT	25	30
SAND & CLAY	GRAY	SOFT	30	32
FINE SAND	BROW	SOFT	32	35
FINE SAND	GRAY	SOFT	35	38
SANDY CLAY	GRAY	SOFT	38	50
CLAY	GRY/B	MEDIUM	50	66
ROCKS & GRAVEL	GRAY	HARD	66	69
FINE SAND & CLAY	BROW	MEDIUM	69	92
CLAY/TRACES OF GRAVEL	BROW	SOFT	92	103
FINE SAND	BROW	SOFT	103	105
COARSE GRAVEL & CLAY	BRN/R	MEDIUM	105	110
MEDIUM GRAVEL & CLAY	BROW	MEDIUM	110	127
MEDIUM TO FINE SAND	BROW	SOFT	127	136
GRAVEL & CLAY	GRAY	SOFT	136	148
CLAY AND ROCKS	LT. YE	SFT-MED	148	150
CLAY/GRAVEL & ROCKS	BLUE	SOFT	150	160
NO RECORD			160	207
CLAY			207	207

Screen Y **Open Hole** From ft. to ft.

Make JOHNSON Type L

Diameter	Slot	Length	Set		Fitting
12	70	33	170	ft. to 203	ft

Static Water Level 66 ft. from Land surface Date 1990/01/26

PUMPING LEVEL (below land surface)
126 ft. after hrs. pumping 1300 g.p.m.

Well Head Completion
Pitless adapter mfr Model
Casing Protection ☑ 12 in. above grade
☐ At-grade(Environmental Wells and Borings ONLY)

Grouting Information Well grouted? ☑ Yes ☐ No

Material	From	To (ft.)	Amount(yds/bags)
G	0	103	

Nearest Known Source of Contamination
ft. direction type
Well disinfected upon completion? ☑ Yes ☐ No

Pump ☐ Not Installed Date Installed
Mfr nam
Model HP Volts
Drop Pipe Length ft. Capacity g.p.m
Type

REMARKS, ELEVATION, SOURCE OF DATA, etc.

GAMMA LOGGED 1-11-04. LOGGED BY JIM TRAEN

Any not in use and not sealed well(s) on property? ☐ Yes ☑ No

Was a variance granted from the MDH for this Well? ☐ Yes ☐ No

USGS Quad Coon Rapids Elevation 899
Aquifer: QBAA Alt Id: 80-6139

Well CONTRACTOR CERTIFICATION Lic. Or Reg. No. 71536
License Business Name
Name of Driller TOM/ROGER

Report Copy

Unique No.	00474384	MINNESOTA DEPARTMENT OF HEALTH	Update Date	2007/02/06
County Name	Anoka	**WELL AND BORING RECORD** *Minnesota Statutes Chapter 1031*	Entry Date	1992/06/22

Township Name	Township	Range	Dir	Section	Subsection	Well Depth		Depth Completed		Date Well Completed
	31	24	W	13	ACCDDD	207	ft.	203	ft.	1990/01/26

Well Name	COON RAPIDS 21			**Lic. Or Reg. No.**	71536	**Name of Driller**	TOM/ROGER
USGS Quad	Coon Rapi	**Elevation**	899	**Aquifer**	QBAA	**Alternative Id**	80-6139

GEOLOGICAL MATERIAL	COLOR	HARDNESS	FROM	TO	STRAT	LITH PRIM	LITH SEC	LITH MINOR
FINE SAND	BROWN	SOFT	0	25	QFUB	SAND		
QFUB = Sand	SAND = Sand							
FINE SAND	GRAY	SOFT	25	30	QFUG	SAND		
QFUG = Sand	SAND = Sand							
SAND & CLAY	GRAY	SOFT	30	32	QLUG	SAND	CLAY	
QLUG = Clay & sand	SAND = Sand			CLAY = Clay				
FINE SAND	BROWN	SOFT	32	35	QFUB	SAND		
QFUB = Sand	SAND = Sand							
FINE SAND	GRAY	SOFT	35	38	QFUG	SAND		
QFUG = Sand	SAND = Sand							
SANDY CLAY	GRAY	SOFT	38	50	QLUG	CLAY	SAND	
QLUG = Clay & sand	CLAY = Clay			SAND = Sand				
CLAY	GRY/BLU	MEDIUM	50	66	QCUG	CLAY		
QCUG = Clay	CLAY = Clay							
ROCKS & GRAVEL	GRAY	HARD	66	69	QGUG	GRVL	COBL	
QGUG = Gravel (+larger)	GRVL = Gravel			COBL = Cobble				
FINE SAND & CLAY	BROWN	MEDIUM	69	92	QLUB	SAND	CLAY	
QLUB = Clay & sand	SAND = Sand			CLAY = Clay				
CLAY/TRACES OF GRAVEL	BROWN	SOFT	92	103	QPUB	CLAY	GRVL	
QPUB = Pebbly sand/silt/clay	CLAY = Clay			GRVL = Gravel				
FINE SAND	BROWN	SOFT	103	105	QFUB	SAND		
QFUB = Sand	SAND = Sand							
COARSE GRAVEL & CLAY	BRN/RED	MEDIUM	105	110	QPUU	GRVL	CLAY	
QPUU = Pebbly sand/silt/clay	GRVL = Gravel			CLAY = Clay				
MEDIUM GRAVEL & CLAY	BROWN	MEDIUM	110	127	QPUB	GRVL	CLAY	
QPUB = Pebbly sand/silt/clay	GRVL = Gravel			CLAY = Clay				
MEDIUM TO FINE SAND	BROWN	SOFT	127	136	QFUB	SAND		
QFUB = Sand	SAND = Sand							

Unique No.	00474384	MINNESOTA DEPARTMENT OF HEALTH	Update Date	2007/02/06
County Name	Anoka	**WELL AND BORING RECORD** *Minnesota Statutes Chapter 1031*	Entry Date	1992/06/22

Township Name	Township	Range	Dir	Section	Subsection	Well Depth		Depth Completed		Date Well Completed
	31	24	W	13	ACCDDD	207	ft.	203	ft.	1990/01/26

Well Name	COON RAPIDS 21	**Lic. Or Reg. No.**	71536	**Name of Driller**	TOM/ROGER		
USGS Quad	Coon Rapi	**Elevation**	899	**Aquifer**	QBAA	**Alternative Id**	80-6139

GEOLOGICAL MATERIAL	COLOR	HARDNESS	FROM	TO	STRAT	LITH PRIM	LITH SEC	LITH MINOR
GRAVEL & CLAY	GRAY	SOFT	136	148	QPUG	GRVL	CLAY	
QPUG = Pebbly sand/silt/clay	GRVL = Gravel			CLAY = Clay				
CLAY AND ROCKS	LT. YEL	SFT-MED	148	150	QPUY	CLAY	COBL	
QPUY = Pebbly sand/silt/clay	CLAY = Clay			COBL = Cobble				
CLAY/GRAVEL & ROCKS	BLUE	SOFT	150	160	QPUG	CLAY	GRVL	COBL
QPUG = Pebbly sand/silt/clay	CLAY = Clay			GRVL = Gravel			COBL = Cobble	
NO RECORD			160	207	QUUU	DRFT		
QUUU = Unknown deposit type	DRFT = Drift							
CLAY			207	207	QCUU	CLAY		
QCUU = Clay	CLAY = Clay							

Unique No. 00474385

County Name Anoka

MINNESOTA DEPARTMENT OF HEALTH

WELL AND BORING RECORD

Minnesota Statutes Chapter 1031

Update Date 2008/12/30

Entry Date 1992/06/22

Township Name	Township	Range	Dir	Section	Subsection
	31	24	W	22	CBABAD

Well Depth	Depth Completed	Date Well Completed
108 ft.	105 ft.	1990/03/15

Well Name COON RAPIDS 22

Drilling Method Cable Tool

Well Owner's Name COON RAPIDS 22
2220 105TH NW AV
COON RAPIDS MN 55433

Drilling Fluid

Well Hydrofractured? ☐ Yes ☐ No
From ft. to ft.

Use Community Supply (municipal)

Contact's Name CITY OF COON RAPIDS
11155 ROBINSON NW DR
COON RAPIDS MN 55433

Casing **Drive Shoe?** ☐ Yes ☐ N

Hole Diameter

Casing Diameter **Weight(lbs/ft)**
24 in. t 80 ft

GEOLOGICAL MATERIAL	COLOR	HARDNESS	FROM	TO
SAND	BROW	SOFT	0	19
ROCKS & BOULDERS	BROW	HARD	19	21
SANDY CLAY	BROW	MEDIUM	21	28
SANDY CLAY/GRAVEL	GRAY	SOFT	28	57
GRAVEL & CLAY	BROW	SOFT	57	70
SANDY CLAY	BROW	SOFT	70	73
FINE SAND	BROW	SOFT	73	83
COARSE SAND	BROW	SOFT	83	93
SAND & GRAVEL	BROW	SOFT	93	98
GRAVEL	BROW	SOFT	98	105
CLAY	BROW	SOFT	105	108

Screen Y

Open Hole From ft. to ft.

Make JOHNSON Type L

Diameter	Slot	Length	Set		Fitting
18	120	25	80	ft. to 105 ft	

Static Water Level 32 ft. from Land surface Date 1990/03/15

PUMPING LEVEL (below land surface)
105 ft. after 1 hrs. pumping 250 g.p.m.

Well Head Completion
Pitless adapter mfr Model
Casing Protection ☑ 12 in. above grade
☐ At-grade(Environmental Wells and Borings ONLY)

Grouting Information Well grouted? ☑ Yes ☐ No

Material	From	To (ft.)	Amount(yds/bags)	
G	0	20	1.5	Y

Nearest Known Source of Contamination
ft. direction type
Well disinfected upon completion? ☑ Yes ☐ No

Pump ☑ Not Installed Date Installed N
Mfr nam
Model HP Volts
Drop Pipe Length ft. Capacity g.p.m
Type

REMARKS, ELEVATION, SOURCE OF DATA, etc.

GAMMA LOGGED 11-14-2002. LOGGED BY JIM TRAEN.

Any not in use and not sealed well(s) on property? ☐ Yes ☐ No

Was a variance granted from the MDH for this Well? ☐ Yes ☐ No

USGS Quad Coon Rapids Elevation 869
Aquifer: QBAA Alt Id: 80-6139

Well CONTRACTOR CERTIFICATION Lic. Or Reg. No. 71536
License Business Name
Name of Driller TOM/ROGER

Report Copy

Unique No.	00474385	MINNESOTA DEPARTMENT OF HEALTH	Update Date	2008/12/30
County Name	Anoka	**WELL AND BORING RECORD** *Minnesota Statutes Chapter 1031*	Entry Date	1992/06/22

Township Name	Township	Range	Dir	Section	Subsection	Well Depth		Depth Completed		Date Well Completed
	31	24	W	22	CBABAD	108	ft.	105	ft.	1990/03/15

Well Name	COON RAPIDS 22	**Lic. Or Reg. No.**	71536	**Name of Driller**	TOM/ROGER		
USGS Quad	Coon Rapi	**Elevation**	869	**Aquifer**	QBAA	**Alternative Id**	80-6139

GEOLOGICAL MATERIAL	COLOR	HARDNESS	FROM	TO	STRAT	LITH PRIM	LITH SEC	LITH MINOR
SAND	BROWN	SOFT	0	19	QFUB	SAND		
QFUB = Sand	SAND = Sand							
ROCKS & BOULDERS	BROWN	HARD	19	21	QBUB	COBL	BLDR	
QBUB = Boulder or boulders	COBL = Cobble			BLDR = Boulder				
SANDY CLAY	BROWN	MEDIUM	21	28	QLUB	CLAY	SAND	
QLUB = Clay & sand	CLAY = Clay			SAND = Sand				
SANDY CLAY/GRAVEL	GRAY	SOFT	28	57	QPUG	CLAY	SAND	GRVL
QPUG = Pebbly sand/silt/clay	CLAY = Clay			SAND = Sand			GRVL = Gravel	
GRAVEL & CLAY	BROWN	SOFT	57	70	QPUB	GRVL	CLAY	
QPUB = Pebbly sand/silt/clay	GRVL = Gravel			CLAY = Clay				
SANDY CLAY	BROWN	SOFT	70	73	QLUB	CLAY	SAND	
QLUB = Clay & sand	CLAY = Clay			SAND = Sand				
FINE SAND	BROWN	SOFT	73	83	QFUB	SAND		
QFUB = Sand	SAND = Sand							
COARSE SAND	BROWN	SOFT	83	93	QFUB	SAND		
QFUB = Sand	SAND = Sand							
SAND & GRAVEL	BROWN	SOFT	93	98	QHUB	SAND	GRVL	
QHUB = Sand & larger	SAND = Sand			GRVL = Gravel				
GRAVEL	BROWN	SOFT	98	105	QGUB	GRVL		
QGUB = Gravel (+larger)	GRVL = Gravel							
CLAY	BROWN	SOFT	105	108	QCUB	CLAY		
QCUB = Clay	CLAY = Clay							

Unique No. 00463020

County Name Anoka

MINNESOTA DEPARTMENT OF HEALTH

WELL AND BORING RECORD

Minnesota Statutes Chapter 1031

Update Date 2007/02/07

Entry Date 1992/06/22

Township Name	Township	Range	Dir	Section	Subsection
	31	24	W	27	BAABBB

Well Depth		Depth Completed		Date Well Completed
151	ft.	128	ft.	1991/12/16

Well Name COON RAPIDS 23

Well Owner's Name COON RAPIDS, CITY OF
2100 COON RAPIDS NW BL
COON RAPIDS MN 55433

Contact's Name CITY OF COON RAPIDS
11155 ROBINSON DR
COON RAPIDS MN 55433

GEOLOGICAL MATERIAL	COLOR	HARDNESS	FROM	TO
SAND	BROW		0	10
CLAY/SAND	BROW		10	34
SAND/GRAVEL	GRAY		34	38
SANDY CLAY	GRAY		38	67
SAND	BROW		67	95
GRAVEL	BROW		95	122
CLAY	GRAY		122	123
GRAVEL	BROW		123	126
SAND	BROW		126	151
CLAY	BROW		151	151

Drilling Method Cable Tool

Drilling Fluid Water

Well Hydrofractured? ☐ Yes ☐ No
From ft. to ft.

Use Community Supply (municipal)

Casing **Drive Shoe?** ☑ Yes ☐ N

Hole Diameter

Casing Diameter				Weight(lbs/ft)
30	in. t	92	ft	118.6
24	in. t	93	ft	94.6

Screen Y

Open Hole From ft. to ft.

Make JOHNSON Type L

Diameter	Slot	Length	Set		Fitting
24	50		94	ft. to	ft
16	70			ft. to 123	ft

Static Water Level 24 ft. from Land surface Date 1991/12/16

PUMPING LEVEL (below land surface)
70 ft. after 8 hrs. pumping 500 g.p.m.

Well Head Completion
Pitless adapter mfr Model
Casing Protection ☑ 12 in. above grade
☐ At-grade(Environmental Wells and Borings ONLY)

Grouting Information Well grouted? ☑ Yes ☐ No

Material	From	To (ft.)	Amount(yds/bags)
G		91	114 S

Nearest Known Source of Contamination
ft. direction type
Well disinfected upon completion? ☑ Yes ☐ No

Pump ☑ Not Installed Date Installed N
Mfr nam
Model HP Volts
Drop Pipe Length ft. Capacity g.p.m
Type

Any not in use and not sealed well(s) on property? ☐ Yes ☑ No

Was a variance granted from the MDH for this Well? ☐ Yes ☐ No

REMARKS, ELEVATION, SOURCE OF DATA, etc.

GAMMA LOGGED 11-14-2002 BY DOWNHOLE WELL SERVICES.

USGS Quad Coon Rapids Elevation 855
Aquifer: QBAA Alt Id: 1020017S24

Well CONTRACTOR CERTIFICATION Lic. Or Reg. No. 71015
License Business Name
Name of Driller FULTON, W.

Report Copy

Unique No.	00463020	MINNESOTA DEPARTMENT OF HEALTH	Update Date	2007/02/07
County Name	Anoka	**WELL AND BORING RECORD** *Minnesota Statutes Chapter 1031*	Entry Date	1992/06/22

Township Name	Township	Range	Dir	Section	Subsection	Well Depth		Depth Completed		Date Well Completed
	31	24	W	27	BAABBB	151	ft.	128	ft.	1991/12/16

Well Name	COON RAPIDS 23	**Lic. Or Reg. No.**	71015	**Name of Driller**	FULTON, W.		
USGS Quad	Coon Rapi	**Elevation**	855	**Aquifer**	QBAA	**Alternative Id**	1020017S24

GEOLOGICAL MATERIAL	COLOR	HARDNESS	FROM	TO	STRAT	LITH PRIM	LITH SEC	LITH MINOR
SAND	BROWN		0	10	QFUB	SAND		
QFUB = Sand	SAND = Sand							
CLAY/SAND	BROWN		10	34	QLUB	SAND	CLAY	
QLUB = Clay & sand	SAND = Sand			CLAY = Clay				
SAND/GRAVEL	GRAY		34	38	QHUG	SAND	GRVL	
QHUG = Sand & larger	SAND = Sand			GRVL = Gravel				
SANDY CLAY	GRAY		38	67	QLUG	CLAY	SAND	
QLUG = Clay & sand	CLAY = Clay			SAND = Sand				
SAND	BROWN		67	95	QFUB	SAND		
QFUB = Sand	SAND = Sand							
GRAVEL	BROWN		95	122	QGUB	GRVL		
QGUB = Gravel (+larger)	GRVL = Gravel							
CLAY	GRAY		122	123	QCUG	CLAY		
QCUG = Clay	CLAY = Clay							
GRAVEL	BROWN		123	126	QGUB	GRVL		
QGUB = Gravel (+larger)	GRVL = Gravel							
SAND	BROWN		126	151	QFUB	SAND		
QFUB = Sand	SAND = Sand							
CLAY	BROWN		151	151	QCUB	CLAY		
QCUB = Clay	CLAY = Clay							

Unique No.	00674478	MINNESOTA DEPARTMENT OF HEALTH	Update Date	2007/05/18
County Name	Anoka	**WELL AND BORING RECORD**	Entry Date	/ / 0

Minnesota Statutes Chapter 1031

Township Name	Township	Range	Dir	Section	Subsection
	31	24	W	21	ABADAB

Well Depth	Depth Completed	Date Well Completed
388 ft.	388 ft.	2003/12/19

Well Name COON RAPIDS 24

Drilling Method Cable Tool

Well Owner's Name COON RAPIDS 24
10845 DIRECT RIVER DR
COON RAPIDS MN 55433

Drilling Fluid Bentonite

Well Hydrofractured? ☐ Yes ☑ No
From ft. to ft.

Contact's Name CITY OF COON RAPIDS
11155 ROBINSON DR
COON RAPIDS MN 55433

Use Community Supply (municipal)

Casing **Drive Shoe?** ☑ Yes ☐ N

Hole Diameter

in. t	85	ft	
in. t	388	ft	
in. t	323	ft	

Casing Diameter **Weight(lbs/ft)**

30	in. t	191	ft	118.65
24	in. t	241	ft	94.62
36	in. t	90	ft	142.68

Screen N

Open Hole From 232 ft. to 388 ft.

Make Type

GEOLOGICAL MATERIAL	COLOR	HARDNESS	FROM	TO
SAND & GRAVEL	BROW	SOFT	0	29
CLAY & GRAVEL	BROW	HARD	29	82
SANDY CLAY	BROW	SOFT	82	87
SAND	BROW	SOFT	87	112
JORDAN S.S.	TAN	MEDIUM	132	149
FRANCONIA S.S.	GRN/B	MED-HRD	149	354
IRONTON/GALESVILLE	GRAY	MEDIUM	354	385
EAU CLAIRE SHALE	GRY/G	HARD	385	388

Static Water Level 60 ft. from Land surface Date 2003/09/18

PUMPING LEVEL (below land surface)
112 ft. after 8 hrs. pumping 1560 g.p.m.

Well Head Completion
Pitless adapter mfr BAKER Model 12.5PS2426
Casing Protection ☑ 12 in. above grade
☐ At-grade(Environmental Wells and Borings ONLY)

Grouting Information Well grouted? ☑ Yes ☐ No

Material	From	To (ft.)	Amount(yds/bags)	
G		85	10	Y
G		232.5	10	Y

Nearest Known Source of Contamination
200 ft. direction N type SDF
Well disinfected upon completion? ☑ Yes ☐ No

Pump ☐ Not Installed Date Installed
Mfr nam GOULD
Model 14RLJC-7 HP 75 Volts 480
Drop Pipe Length 165 ft. Capacity E+03 g.p.m
Type S

Any not in use and not sealed well(s) on property? ☐ Yes ☑ No

Was a variance granted from the MDH for this Well? ☐ Yes ☑ No

REMARKS, ELEVATION, SOURCE OF DATA, etc.

GAMMA LOGGED 6-17-2003. M.G.S. NO. 4242. LOGGED BY JIM TRAEN.

ROGER E. RENNER, MGWC, N-291.

MR. CHRIS CATLIN (651)644-4389.

USGS Quad Coon Rapids Elevation 861
Aquifer: CFIG Alt Id: 4242

Well CONTRACTOR CERTIFICATION Lic. Or Reg. No. 71015
License Business Name
Name of Driller COX, A.

Report Copy

Unique No.	00674478	MINNESOTA DEPARTMENT OF HEALTH	Update Date	2007/05/18
County Name	Anoka	**WELL AND BORING RECORD** *Minnesota Statutes Chapter 1031*	Entry Date	/ / 0

Township Name	Township	Range	Dir	Section	Subsection	Well Depth		Depth Completed		Date Well Completed
	31	24	W	21	ABADAB	388	ft.	388	ft.	2003/12/19

Well Name	COON RAPIDS 24	**Lic. Or Reg. No.**	71015	**Name of Driller**	COX, A.		
USGS Quad	Coon Rapi	**Elevation**	861	**Aquifer**	CFIG	**Alternative Id**	4242

GEOLOGICAL MATERIAL	COLOR	HARDNESS	FROM	TO	STRAT	LITH PRIM	LITH SEC	LITH MINOR
SAND & GRAVEL	BROWN	SOFT	0	29	QHUB	SAND	GRVL	
QHUB = Sand & larger	SAND = Sand			GRVL = Gravel				
CLAY & GRAVEL	BROWN	HARD	29	82	QPUB	CLAY	GRVL	
QPUB = Pebbly sand/silt/clay	CLAY = Clay			GRVL = Gravel				
SANDY CLAY	BROWN	SOFT	82	87	QLUB	CLAY	SAND	
QLUB = Clay & sand	CLAY = Clay			SAND = Sand				
SAND	BROWN	SOFT	87	112	QFUB	SAND		
QFUB = Sand	SAND = Sand							
JORDAN S.S.	TAN	MEDIUM	132	149	QFUB	SAND		
QFUB = Sand	SAND = Sand							
FRANCONIA S.S.	GRN/BRN	MED-HRD	149	354	CFRN	SNDS	SHLE	DLMT
CFRN = Franconia	SNDS = Sandstone			SHLE = Shale			DLMT = Dolomite	
IRONTON/GALESVILLE	GRAY	MEDIUM	354	385	CIGL	SNDS		
CIGL = Ironton-Galesville	SNDS = Sandstone							
EAU CLAIRE SHALE	GRY/GRN	HARD	385	388	CECR	SHLE	SNDS	
CECR = Eau Claire	SHLE = Shale			SNDS = Sandstone				

Unique No. 00674479

County Name Anoka

MINNESOTA DEPARTMENT OF HEALTH

WELL AND BORING RECORD

Minnesota Statutes Chapter 1031

Update Date 2007/01/09

Entry Date 2004/10/11

Township Name	Township	Range	Dir	Section	Subsection
	31	24	W	22	BCBDBA

Well Depth	Depth Completed	Date Well Completed
388 ft.	388 ft.	2003/12/19

Well Name COON RAPIDS 25

Drilling Method Cable Tool

Well Owner's Name COON RAPIDS 25
2324 COON RAPIDS NW BL
COON RAPIDS MN 55433

Drilling Fluid Bentonite

Well Hydrofractured? ☐ Yes ☐ No
From ft. to ft.

Contact's Name CITY OF COON RAPIDS
11155 ROBINSON DR
COON RAPIDS MN 55433

Use Community Supply (municipal)

Casing **Drive Shoe?** ☑ Yes ☐ N

Hole Diameter
in. t 388 ft
in. t 227 ft

Casing Diameter **Weight(lbs/ft)**
36 in. t 196 ft 142.68
24 in. t 229 ft 94.62

GEOLOGICAL MATERIAL	COLOR	HARDNESS	FROM	TO
SAND & GRAVEL	BROW	SOFT	0	29
CLAY & GRAVEL	BROW	HARD	29	82
SANDY CLAY	BROW	SOFT	82	87
SAND	BROW	SOFT	87	112
JORDAN S.S.	TAN	MEDIUM	112	162
ST. LAWRENCE	BRN/G	MEDIUM	162	193
FRANCONIA S.S.	GRN/B	MED-HRD	193	359
IRONTON/GALESVILLE	GRAY	MEDIUM	359	388

Screen N

Open Hole From 225 ft. to 388 ft.

Make Type

Static Water Level 51 ft. from Land surface Date 2003/12/01

PUMPING LEVEL (below land surface)
121.37 ft. after 48 hrs. pumping 1560 g.p.m.

Well Head Completion
Pitless adapter mfr BAKER Model 9.5PS2426
Casing Protection ☑ 12 in. above grade
☐ At-grade(Environmental Wells and Borings ONLY)

Grouting Information Well grouted? ☑ Yes ☐ No

Material	From	To (ft.)	Amount(yds/bags)
G		225	45 Y

Nearest Known Source of Contamination
200 ft. direction N type SDF
Well disinfected upon completion? ☑ Yes ☐ No

Pump ☐ Not Installed Date Installed
Mfr nam GOULDS
Model 14RLJC-7 HP 75 Volts 480
Drop Pipe Length 165 ft. Capacity E+03 g.p.m
Type S

Any not in use and not sealed well(s) on property? ☐ Yes ☑ No

Was a variance granted from the MDH for this Well? ☐ Yes ☑ No

REMARKS, ELEVATION, SOURCE OF DATA, etc.

GAMMA LOGGED 8-29-2003. M.G.S. NO. 4280. LOGGED BY JIM TRAEN.

USGS Quad Coon Rapids Elevation 871
Aquifer: CFIG Alt Id: 80-6137

Well CONTRACTOR CERTIFICATION Lic. Or Reg. No. 71015
License Business Name
Name of Driller COX, A.

Report Copy

Unique No.	00674479	MINNESOTA DEPARTMENT OF HEALTH	Update Date	2007/01/09
County Name	Anoka	**WELL AND BORING RECORD** *Minnesota Statutes Chapter 1031*	Entry Date	2004/10/11

Township Name	Township	Range	Dir	Section	Subsection	Well Depth		Depth Completed		Date Well Completed
	31	24	W	22	BCBDBA	388	ft.	388	ft.	2003/12/19

Well Name	COON RAPIDS 25	**Lic. Or Reg. No.**	71015	**Name of Driller**	COX, A.		
USGS Quad	Coon Rapi	**Elevation**	871	**Aquifer**	CFIG	**Alternative Id**	80-6137

GEOLOGICAL MATERIAL	COLOR	HARDNESS	FROM	TO	STRAT	LITH PRIM	LITH SEC	LITH MINOR
SAND & GRAVEL	BROWN	SOFT	0	29	QHUB	SAND	GRVL	
QHUB = Sand & larger	SAND = Sand			GRVL = Gravel				
CLAY & GRAVEL	BROWN	HARD	29	82	QPUB	CLAY	GRVL	
QPUB = Pebbly sand/silt/clay	CLAY = Clay			GRVL = Gravel				
SANDY CLAY	BROWN	SOFT	82	87	QLUB	CLAY	SAND	
QLUB = Clay & sand	CLAY = Clay			SAND = Sand				
SAND	BROWN	SOFT	87	112	QFUB	SAND		
QFUB = Sand	SAND = Sand							
JORDAN S.S.	TAN	MEDIUM	112	162	CJDN	SNDS		
CJDN = Jordan	SNDS = Sandstone							
ST. LAWRENCE	BRN/GRN	MEDIUM	162	193	CSTL	SLSN	DLMT	
CSTL = St.Lawrence	SLSN = Siltstone			DLMT = Dolomite				
FRANCONIA S.S.	GRN/BRN	MED-HRD	193	359	CFRN	SNDS	SHLE	DLMT
CFRN = Franconia	SNDS = Sandstone			SHLE = Shale			DLMT = Dolomite	
IRONTON/GALESVILLE	GRAY	MEDIUM	359	388	CIGL	SNDS		
CIGL = Ironton-Galesville	SNDS = Sandstone							

Appendix B

Aquifer Test Data and Analysis

MINNESOTA MDH DEPARTMENT of HEALTH
Environmental Health Division
Drinking Water Protection Section
Source Water Protection Unit
P.O. Box 64975
St. Paul, Minnesota 55164-0975

Determination of Aquifer Properties and Aquifer Test Plan (DAP-ATP) Form

Public Water Supply ID:	1020017	PWS Name:	Coon Rapids

Contact Information for Person Completing this Form

Name:	John Greer
Address:	Barr Engineering Company
	4700 West 77th Street, Suite 200
City, State, Zip:	Edina, MN 55435
Phone, Fax, e-mail:	(952) 832-2691

Aquifer Properties Determination Methods

- [x] 1) An existing pumping test that meets the requirements of wellhead protection rule part 4720.5520 and that was previously conducted on a well connected to the public water supply system.
- [ ] 2) An existing pumping test that meets the requirements of wellhead protection rule part 4720.5520 and that was previously conducted on another well in a hydrogeologic setting determined by the department to be equivalent.
- [ ] 3) A proposed new test to be conducted on a new or existing well connected to the public water supply system and that meets the requirements for larger-sized water systems (wellhead protection rule part 4720.5520). A test plan must be approved before conducting the test.
- [ ] 4) A proposed new test to be conducted on a new or existing public well connected to the public water supply system and that meets the requirements for smaller-sized water systems (wellhead protection rule part 4720.5530). A test plan must be approved before conducting the test.
- [ ] 5) An existing pumping test that does not meet the requirements of wellhead protection rule part 4720.5520 and that was previously conducted on: 1) a public water supply well or 2) another well in a hydrogeologic setting determined by the department to be equivalent.
- [ ] 6) Existing specific capacity test(s) conducted on the public water supply well(s) or specific capacity tests conducted on other wells in a hydrogeologic setting determined by the department to be equivalent.
- [ ] 7) An existing published transmissivity value.

- Include all test data and analysis documentation with the estimated transmissivity, ft^2/day, when the aquifer properties determination method is; 1, 2, 5, 6, or 7, listed above.
- Attach detailed aquifer test plan for methods 3 or 4.

Submitted by: John Greer	Prof. License: 30347	Date: 7/31/2015

To request this document in another format, please call our Section Receptionist (651/201-4700) or Division TTY (651/201-5797).

Rationale for: 1) Aquifer Properties Determination or 2) Proposed New Test

Briefly describe the rationale for: 1) selected method to determine aquifer properties from existing data, **or** 2) a new aquifer test to be conducted on the pumped well referenced below. Include unique well numbers of all wells that were (or will be) monitored during data collection. How does the existing or proposed test deviate from the ideal. (e.g. rate, duration, no. of obwells, interfering wells, etc.) Attach documentation as necessary.

Aquifer Name:	Confined Quaternary Aquifer	☑ Confined	☐ Unconfined	☐ Fractured Rock

The MDH conducted a 24.3-hour pumping test at Coon Rapids Well 20 (Unique Number 420956) on March 11-12, 1999. The pumping rate was 1,150 gallons per minute (gpm). Coon Rapids Well 17 (Unique Number 150357) was used as an observation well. Analysis of the pumping and recovery data from the observation well using the Theis and Jacob methods produced a range of transmissivities from 31,800 ft**2/day to 66,700 ft**2/day (see attached).

The MDH conducted pumping tests at Wells 19 (Unique Number 110475) and Well 20 on August 29 - September 2, 2002. Wells 673418 and 673420 were used as observation wells. Well 19 was pumped for approximately 24 hours at 1,220 gpm followed by an approximately 24-hour recovery period, and then Well 20 was pumped at 1,000 gpm for approximately 24 hours followed by a second 24-hour recovery period. Data were analyzed using the Theis and Hantush-Jacob methods. The analysis concluded that the Quaternary aquifer is less transmissive near Well 19 and observation well 673418 (T range 8,120 ft**2day to 9,420 ft**2/day) than near Well 20 and 673420 (T range 27,000 ft**2/day to 55,000 ft**2/day) (see attached).

T values for groundwater model:

Region including Well 19 (2002 test data for 673418):
Geometric mean T = 8,700 ft**2/day
Sensitivity analysis range = 8,120 - 9,420 ft**2/day

Region including Well 20 (1999 data from 150357 and 2002 data from 673418 and 673420):
Geometric mean T = 45,210 ft**2/day
Sensitivity analysis range = 27,000 - 66,700 ft**2/day

Proposed New Test Information Summary

Pumped Well Name (Unique Number):	420956, 110475	**Test Duration (Hours):**	24
Location: X, Y (meters) UTM-Z15N or Lat-Lon (decimal degrees) datum: NAD83	473997, 5001192 (420956) 473885, 5001449 (110475)	**Pump Type:**	unknown
		Discharge Rate:	1150, 1220, 1000 gpm
Number of Observation Wells:	3	**Flow Rate Measuring Device Type:**	flowmeter

- A map showing the location of the pumping well and observation well(s) must be included.

List the unique number of each public water supply well to which this DAP-ATP Form applies

150357					
110475					
420956					
474384					
474385					
463020					

Reviewed by: Amal Djerrari	**Approved:** ◉ Yes ○ No	**Approval Date:** 8/3/2015

Analysis of the Coon Rapids #20 (420956) Aquifer Test
March 11, 1999
Confined Drift Aquifer

Introduction

The MDH is assisting in the delineation of wellhead protection areas by the City of Coon Rapids, Minnesota, around the public water supply wells serving the community. An important part of the delineation process is to determine aquifer properties at the well site as accurately as possible. This is normally accomplished by performing a pumping test.

The pumping test at the Coon Rapids Well #20 was conducted by the MDH as described below. The results were analyzed using standard nonequilibrium and semisteady-state methods, cited in references. Data plots are included in Appendix 1, field data sheets in Appendix2, well logs in Appendix 3, and test results are summarized on Table 1. The analysis shows that the aquifer responds as generally expected from the geologic setting.

Description of the Test

A pressure transducer was placed in the pumping well on March 10, 1999 at about 15:30 to collect background readings prior to the test. The well was pumping at the time the transducer was installed and was turned off at about 22:00 providing an eighteen hour resting period before the start of the test. There were no other nearby wells to cause interference for this test. A transducer was installed in a nearby public water supply well, #17 (150357), to serve as an observation well.

The test started at 11:49:53 on March 11, 1999. Well #20 was pumped at an average rate of 1150 gallons per minute. The flowmeter on the well was used to monitor the discharge. The pumping rate remained fairly constant through out the test. However, there were three short periods of time, possibly one minute or so in length, that the pump discharge decreased or even stopped during the test. This caused small variations in water level that did not cause the data to be unusable.

The pump was turned off at 12:09:00.2 on March 12, 1999 to start the recovery period. The recovery period was carried out 1450 minutes and the wells recovered above static levels caused by recharge from snow melt. There also was an anomalous flattening of the water levels during very early recovery possibly the result of pressure surge prevention equipment.

Summary of Results

A transmissivity value of 38,300 ft^2/day and a storativity value of 0.00094 are chosen as being representative of aquifer properties in the area of these two wells for the capture zone analysis. The aquifer is semi-confined but the leakiness is not large and was obscured by recharge during late recovery.

The test results are fairly consistent between the pumping and observation wells, particularly during the late-time pumping period. The results are also consistent with the conceptual model of a leaky confined drift aquifer.

Problems with the Analysis

Problems not withstanding, the data acquired for this test are of high quality and the results are consistent and representative of the aquifer in the area of the well.

References:

Jacob, C. E. and Lohman, S. W., (1952) Nonsteady Flow to a Well of Constant Drawdown in an Extensive Aquifer, Trans. American Geophysical Union, Vol. 33, No. 4, August, 1952, pp. 559-69.

Theis, C. V., (1935) The Relation Between the Lowering of the Piezometric Surface and the Rate and Duration of Discharge of a Well Using Ground-Water Storage, Trans. American Geophysical Union, 16th Annual Meeting, April, 1935, pp. 519-24.

Table 1.

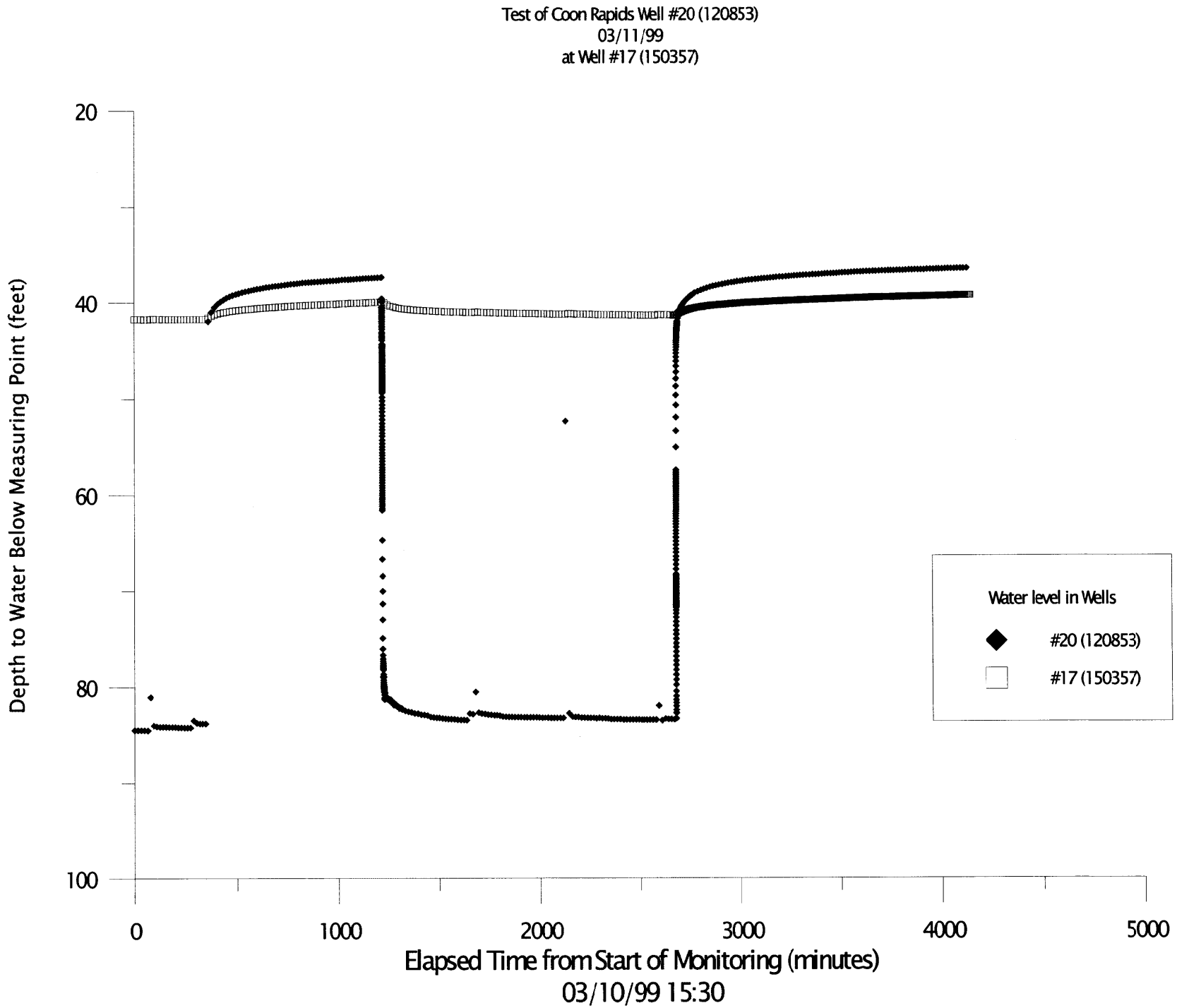
Coon Rapids #20 Aquifer Test
March 11, 1999

	Transmisivity T (ft^2/day)	Storage Coefficient S	Time Period Emphasized	Analysis Method
Pumping Well #20 (420956)	1,470	NA	Early Pumping	Theis
	60,700	NA	Late Pumping	Jacob
	1,470	NA	Early Recovery	Theis
	15,400	NA	Late Recovery	Jacob t/t'
Observation Well #17 (150357)	47,600	1.08e-3	Early Pumping	Theis
	66,700	6.32e-4	Late Pumping	Jacob
	38,300	9.4e-4	Early Recovery	Theis
	31,800	1.5e-4	Late Recovery	Jacob t/t'

Representative aquifer values are best shown by the early-time recovery values for the observation well, giving an average T of 38,300 and S of 0.00094.

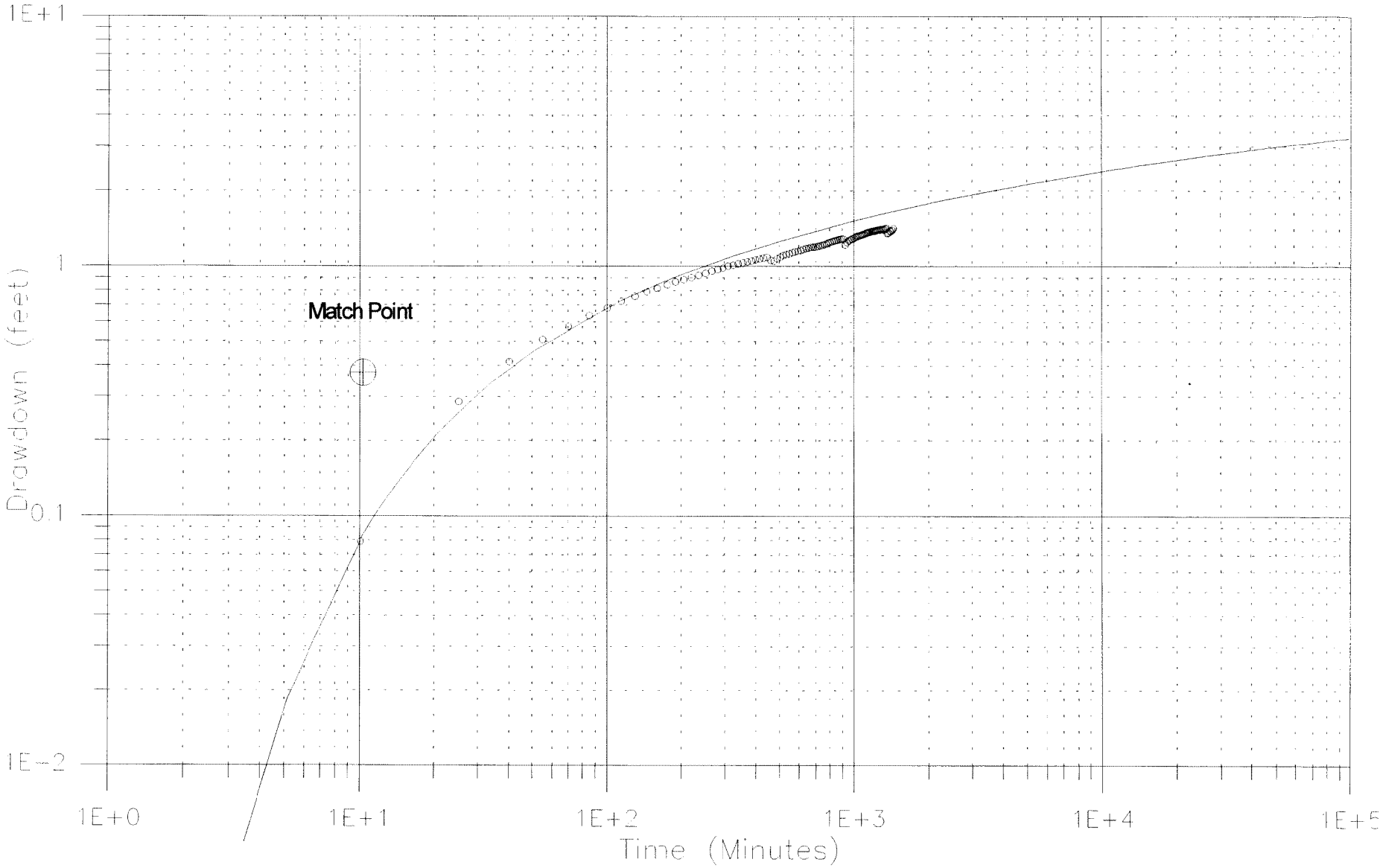
Appendix 1.

Graphical Analysis


Test of Coon Rapids Well #20 (120853)
03/11/99
at Well #17 (150357)
Depth to Water Below Measuring Point (feet)
20
40
60
80
100
0
1000
2000
3000
4000
5000
Elapsed Time from Start of Monitoring (minutes)
03/10/99 15:30
Water level in Wells
#20 (120853)
#17 (150357)

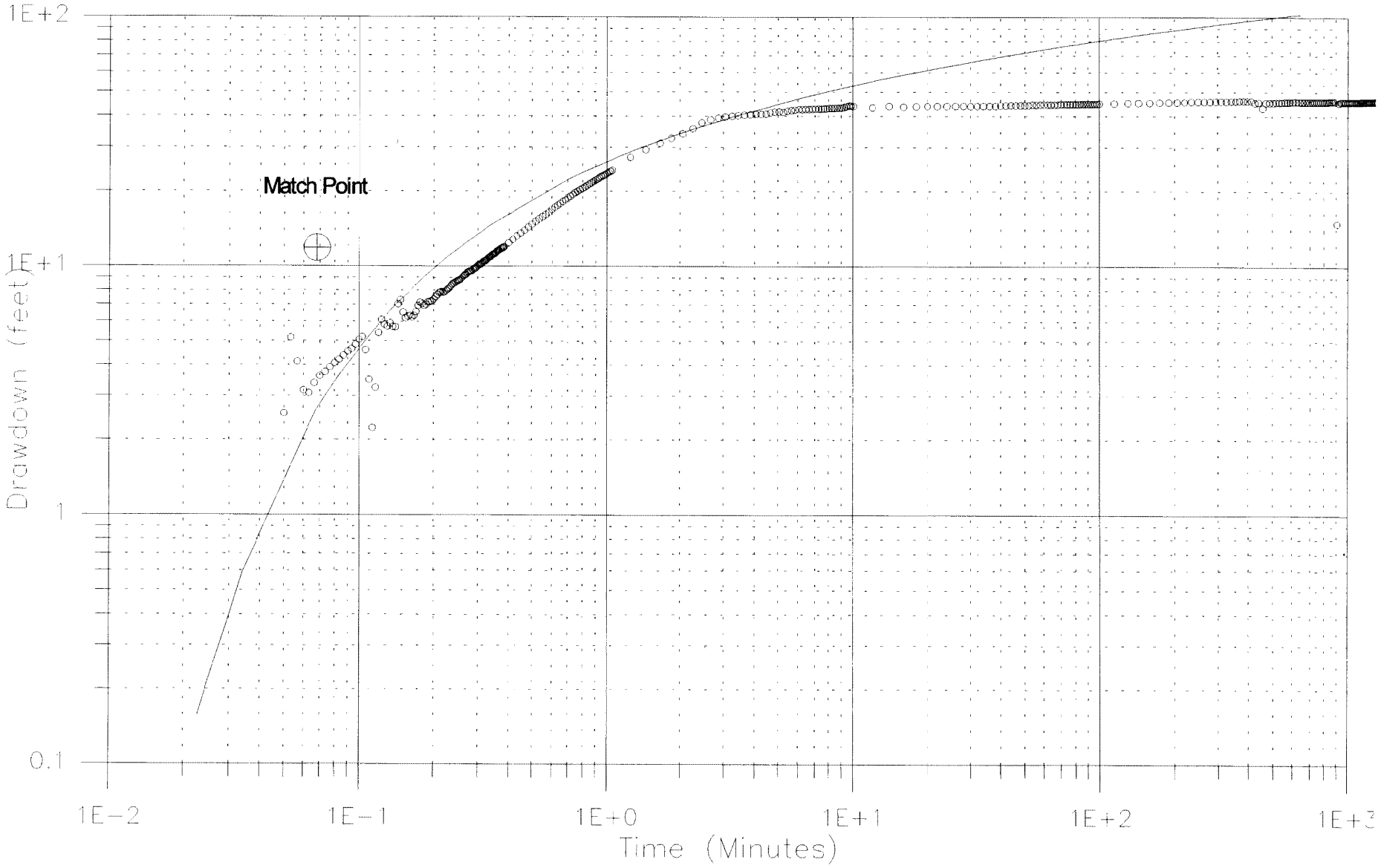
Test of Coon Rapids Well #20 (120853)
03/11/99
at Well #17 (150357)
Pumping

T = 15.3 1152 / 0.37 = 47,600 ft^2/day
S = 47,600 11 / 1163^2 360 = 1.08e-3



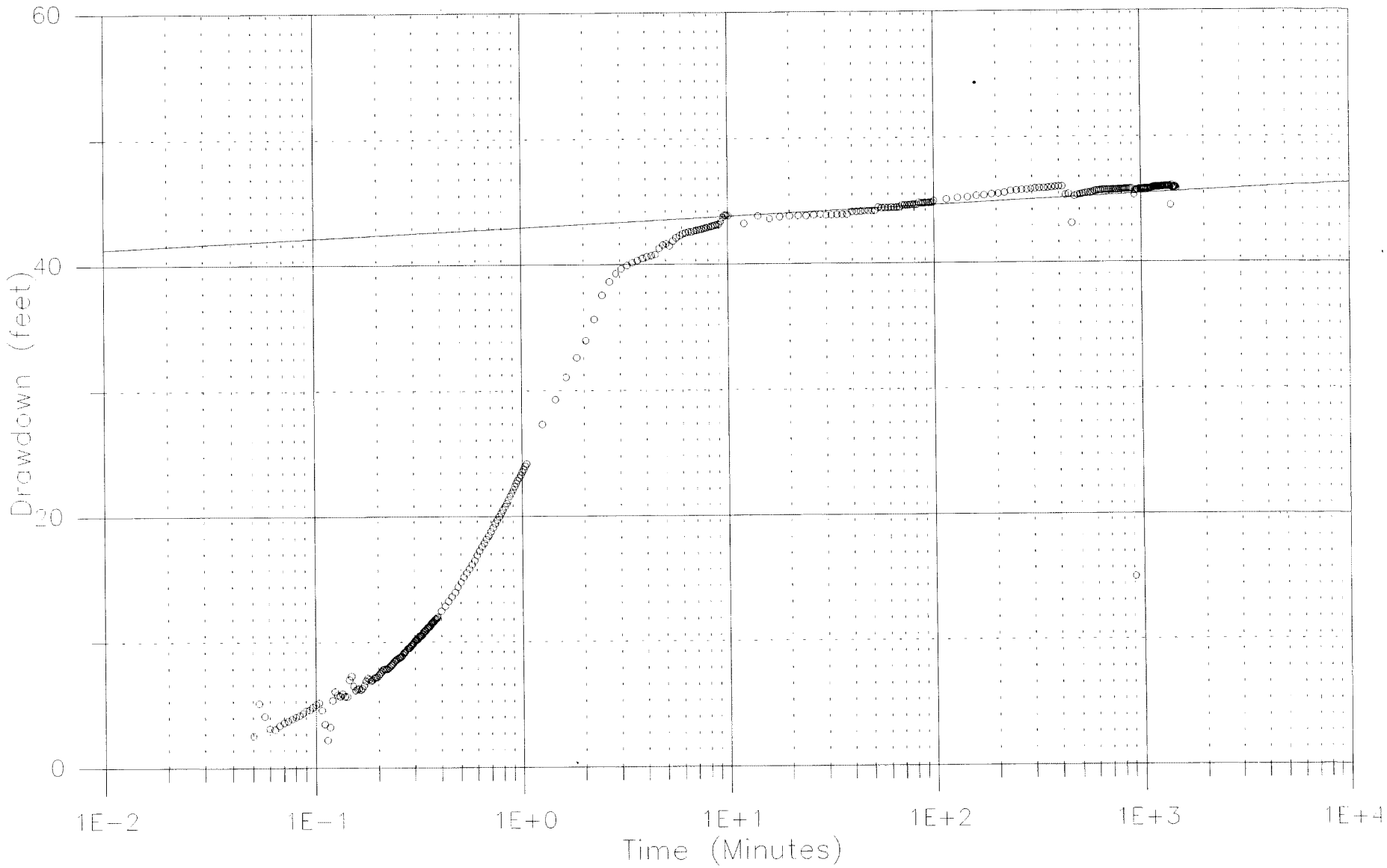
Test of Coon Rapids Well #20 (120853)
03/11/99
Pumping

T = 15.3 1152 / 12 = 1,470 ft^2/day



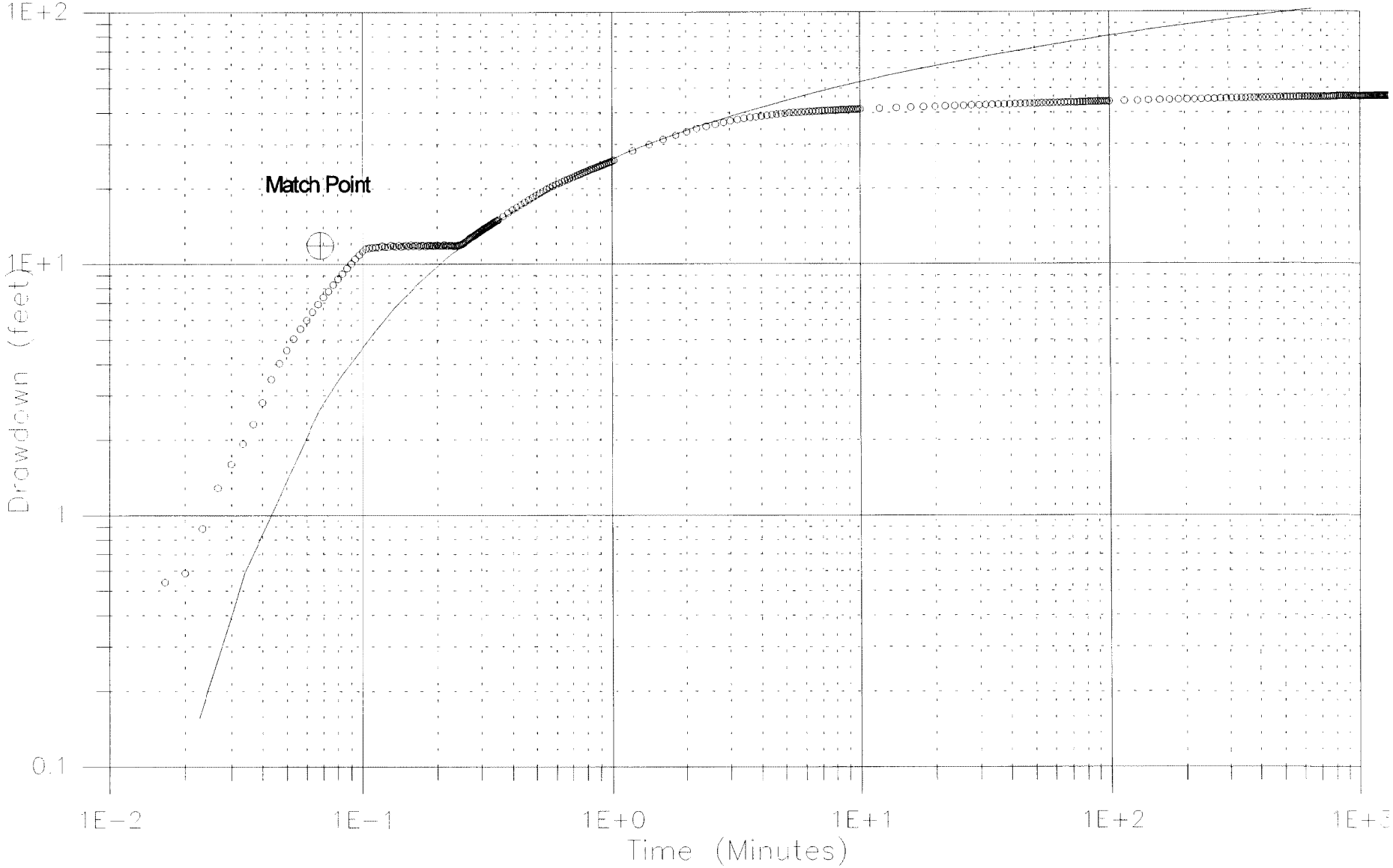
Test of Coon Rapids Well #20 (120853)
03/11/99
Pumping

T = 35.3 1152 / 0.67 = 60,700 ft^2/day



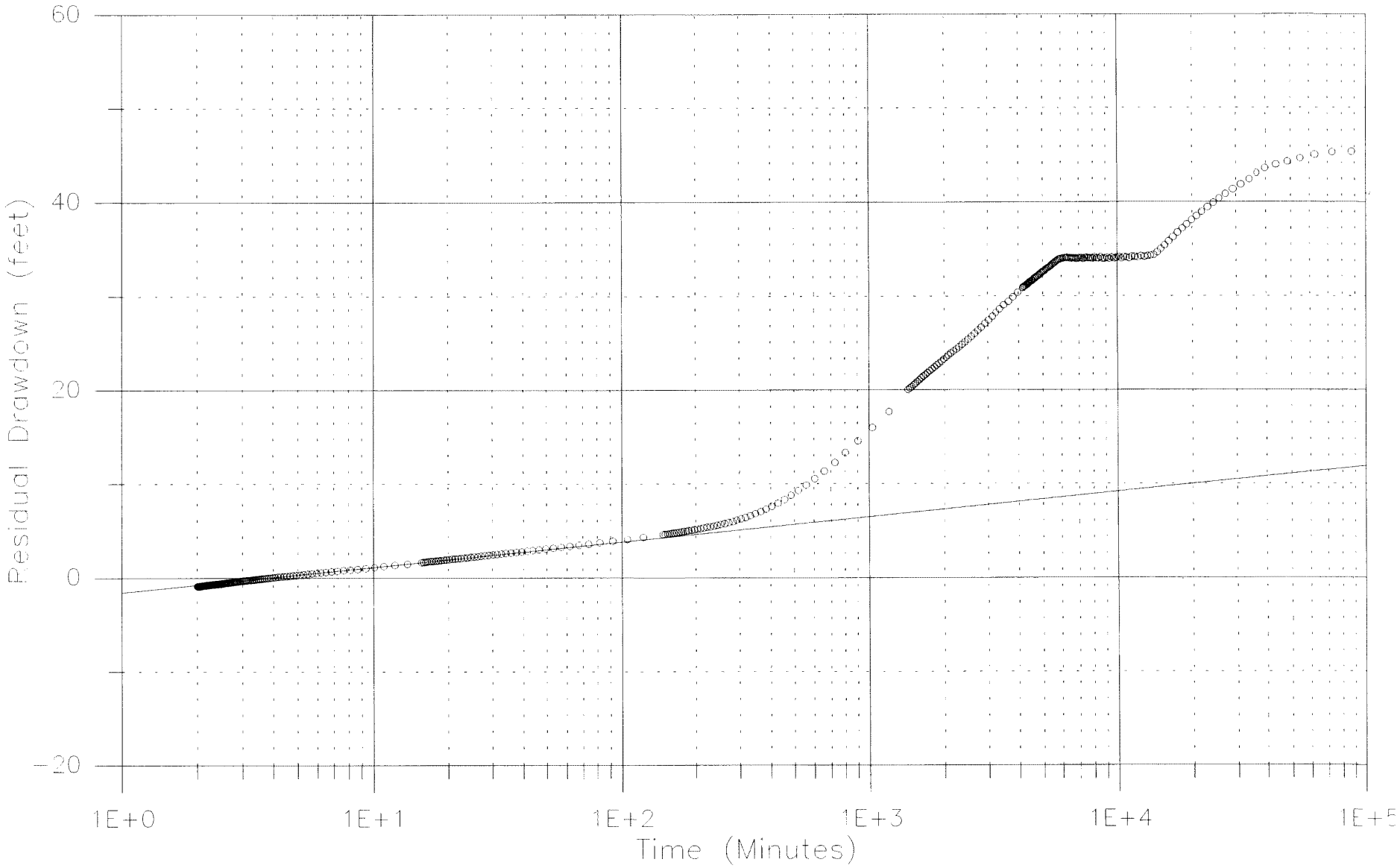
Test of Coon Rapids Well #20 (120853)
03/11/99
Recovery

T = 15.3 1152 / 12 = 1,470 ft^2/day



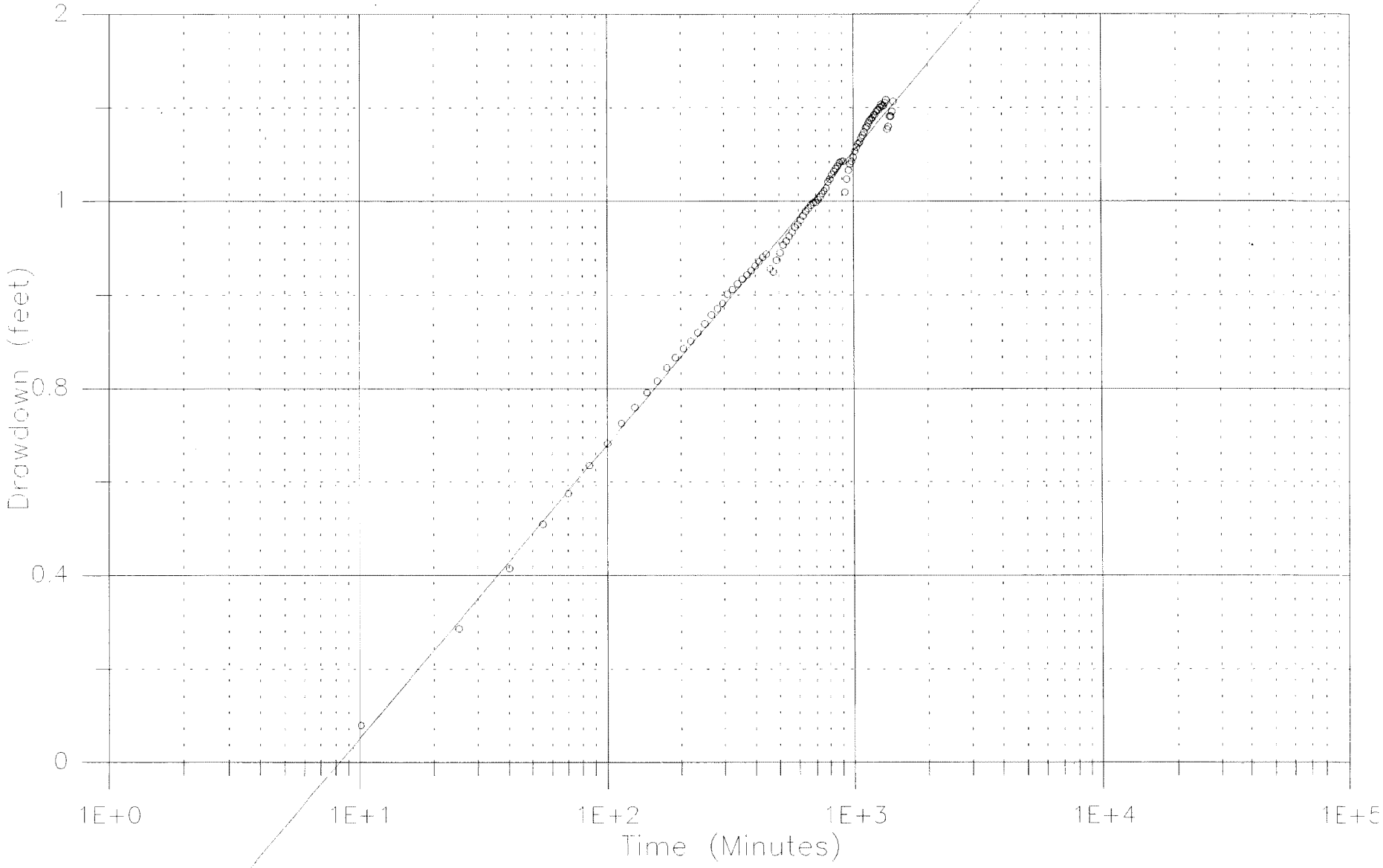
Test of Coon Rapids Well #20 (120853)
03/11/99
Recovery

T = 35.3 1152 / 2.64 = 15,400 ft^2/day



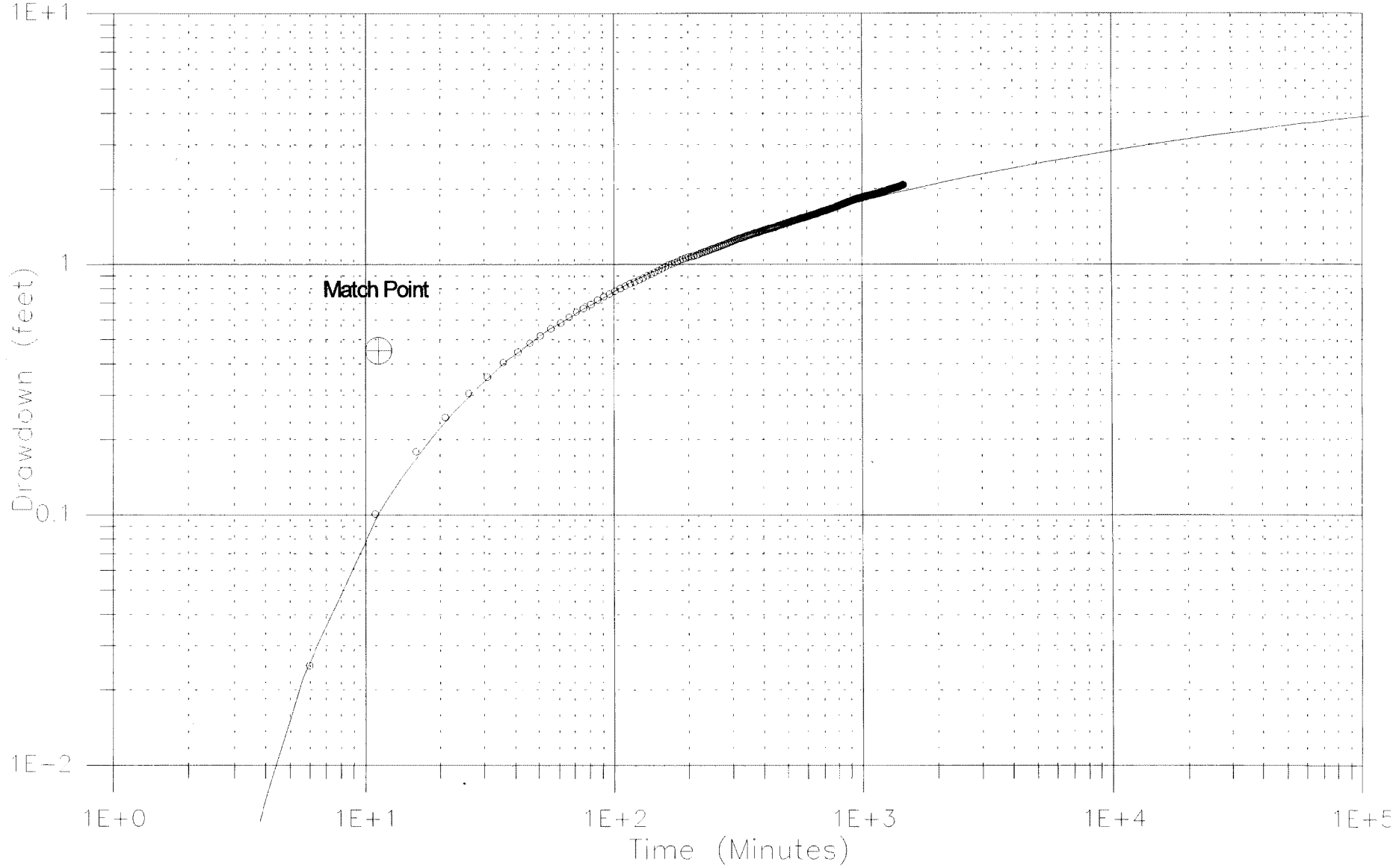
Test of Coon Rapids Well #20 (120853)
03/11/99
at Well #17 (150357)
Pumping

T = 35.3 1152 / 0.61 = 66,700 ft^2/day
S = 66,700 8.2 / 1163^2 640 = 6.32e-4



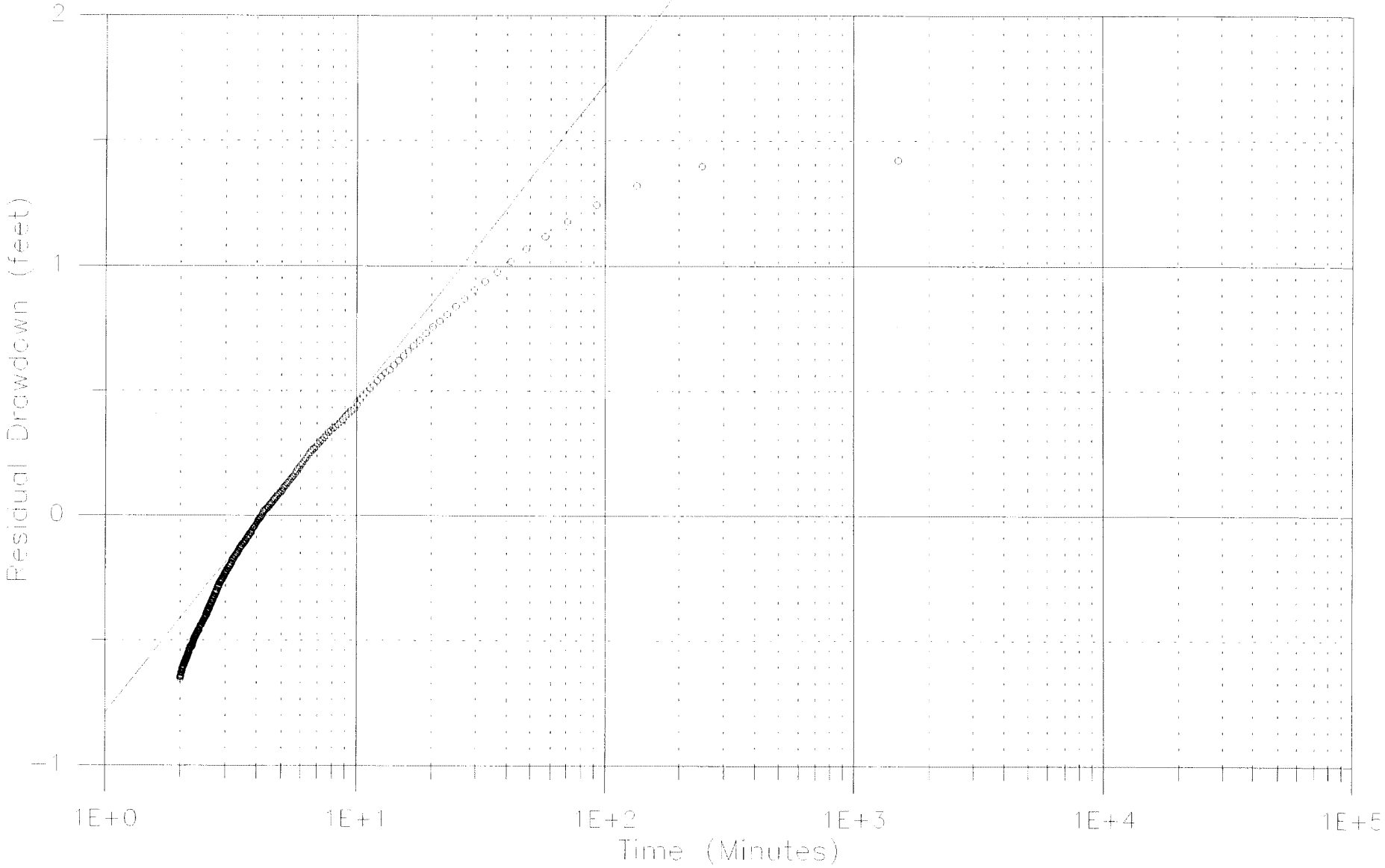
Test of Coon Rapids Well #20 (120853)
03/11/99
at Well #17 (150357)
Recovery

T = 15.3 1152 / 0.46 = 38,300 ft^2/day
S = 38,300 12 / 1163^2 360 = 9.44e-4



Test of Coon Rapids Well #20 (120853)
03/11/99
at Well #17 (150357)
Recovery

T = 35.3 1152 / 1.28 = 31,800 ft^2/day
S = 31,800 4.1 / 1163^2 640 = 1.5e-4



Appendix 2.

Field Data Sheets

Minnesota Department of Health
Special Services Unit
Drinking Water Protection Section
P.O. Box 64975
St. Paul, Minnesota 55164-0975

Test No.

Aquifer Test Information

Test Location Coon Rapids # 20	Well Owner City of Coon Rapids	Test Conducted By J. Blum
Date/Time Test Start 3/11/99 11:49:53.0	Flow Rate (Units) 1152 gpm	Pump Type Turbine
Date/Time Recovery Start 3/12/99 12:09:02	Flow Rate Measuring Device Flowmeter	Pump Intake Depth
Date/Time Test Finish 3/13/99 12:35	Totalizer: End 711442.4 X 1000	Pumped Well Inner Casing Diameter
Notes pre lube ~ 90 sec.	Totalizer: Start 709762	Confined/Unconfined semi confined
	Total Pumped (Units) 1680,400 gallons	Quad Sheet Name/Number 120A Coon Rapids

Unique Well Numbers	Location T, R, S, Quarters	Location N, E	Radial Distance	Open Depth	Transducer Setting	Measuring Point Location	Elevation, Datum
Pumped Well #20 (120853)		N E			~91 ft XD 4.23	vent pipe	
Observation Wells #17 (150357)		N E	1163'		51.85 XD 10.12		
		N E					
		N E					
		N E					
		N E					

Sketch Map of Well Locations

Aquifer Test Data Form

Test: Coon Rapids #20	By: J. Blum	Test Date: 3/11/99	Page 2 of 3

Location (Unique Well No.)	Date Month	Date Day	Date Year	Time Hour	Time Minute	Time Sec.	Elapsed Time (Minutes)	Depth to Water	Drawdown/ Recovery	Discharge	Remarks
#17 (150357)	03	10	99	14	15			41.73			XD 10.12
#20 (120853)				14	20			87.32			on ~ 925 gpm
											XD 4.23
#17	03	11	99					41.36			
#20											XD 81.17
#20	03	13	99	12	30			39.44			XD 36.46
~~#17~~				12	40			39.30			XD 39.28

Minnesota Department of Health
Special Services Unit
Drinking Water Protection Section
P.O. Box 64975
St. Paul, Minnesota 55164-0975

Notes:

IC #140-0523 (5/96)

Aquifer Test Data Form

Test: Coon Rapids #20	By: J. Blim	Test Date: 3/11/99	Page 3 of 3

Location (Unique Well No.)	Date Month	Date Day	Date Year	Time Hour	Time Minute	Time Sec.	Elapsed Time (Minutes)	Depth to Water	Drawdown/ Recovery	Discharge	Remarks
#20 (120853)	03	11	99	11	49	53	0			0	709,762,000
					55		5			1230	768.1
				12			10			1230	774.0
					05		15			1190	780.0
					10		20			1200	- 786.9
					15		25			1190	793.05
					20		30			1180	- 797.8
					25		35			1180	- 803.6
					30		40			1180	- 809.5
					35		45			1180	815.4
					40		50			1180	821.3
					45		55			1170	827.3
					50		60			1180	833.0
				13	50		120			1180	905.1
				14	50		180			1180	977.7
				17	50		360			1180	710018.9
	03	12	99	07	50		1140			1160	711149.9
				12	04		1454			1160	711436.6
				12	09	02	1459			1160	711442.4

Notes:

Minnesota Department of Health
Special Services Unit
Drinking Water Protection Section
P.O. Box 64975
St. Paul, Minnesota 55164-0975

IC #140-0523 (5/96)

Coon Rapids #19
Coon Rapids #14
Coon Rapids #7
Coon Rapids #20
Coon Rapids #15
Coon Rapids #17
Coon Rapids #22

SF-00006-05 (4/86)

DEPARTMENT :Health

STATE OF MINNESOTA

Office Memorandum

DATE : October 8, 2002

TO : City of Coon Rapids WHP File

FROM : Steve Robertson, Source Water Protection Unit, MDH

PHONE : 651-215-1322

SUBJECT : Aquifer Tests at Coon Rapids Well Nos. 19 (110475) and 20 (420956): August 29 - September 3, 2002

INTRODUCTION

The Minnesota Department of Health (MDH) assisted the City of Coon Rapids, Minnesota, by helping to conduct aquifer tests to determine aquifer properties near proposed new well sites. The results of these aquifer tests can be used for many purposes, including providing some of the aquifer characterization information required by MDH for wellhead protection planning.

The pumping test at Coon Rapids Well Nos. 19 and 20 were conducted by the City of Coon Rapids with assistance from H.R. Green and MDH as described below. The results were analyzed using standard nonequilibrium methods, cited in the references. Data plots and associated quantitative analyses are included in Appendix A, field data sheets in Appendix B, well logs in Appendix C. Table 1 summarizes the pumping schedule during the monitoring period and analysis results are summarized on Table 2.

The analysis shows that the aquifer responds in a manner consistent with the geologic setting.

DESCRIPTION OF THE TEST

Water level readings were monitored using pressure transducers in Wells 673418 and 673420 (monitoring wells installed during summer of 2002 for the City). Municipal Well Nos. 17, 19, and 20 are completed in deep buried Quaternary materials, as are the two monitoring wells.

Scheduling prevented gathering pre-test monitoring data over a long period. Collection of monitoring data began on August 29, 2002 and ended September 3, 2002. The test pumping program was conducted using a constant pumping rate, allowing MDH to use the collected data for quantitative aquifer analysis. Figure 1 shows the effects of the pumping on water levels in Well Nos. 673418 and 673420 over the duration of the monitoring period.

Monitoring Wells 673418 and 673420 are located about 551 and 1860 feet, respectively, from Well No. 19. Likewise, Well No. 673418 is 1493 feet and Well No. 673420 is 1289 feet from Coon Rapids Well No. 20. Locations of all wells were established using GPS technology.

The test started at 11:00:32 on August 29, 2002. Well No. 19 was pumped at an average rate of 1218.8 gallons per minute. A flowmeter on the discharge line was used to monitor the discharge. City staff maintained the pumping rate at a relatively constant rate for the duration of the test. Well discharge was pumped into the municipal distribution system.

The pump in Well No. 19 was turned off at 11:04:25 on August 30, 2002, to start the recovery period. After initiating recovery, water levels had mostly recovered after 52 minutes. After a recovery period of approximately 24 hours, pumping commenced in Coon Rapids Well No. 20, which was pumped for 24 hours starting at about 11 a.m. on August 31, 2002. Well No. 20 was also pumped for approximately 24 hours, ending at about 11 a.m. on September 1, 2002. A 24-hour recovery period followed this pumping, after which Well Nos. 17, 19, 20, and 22 were pumped simultaneously. Table 1 presents the pumping chronology.

SUMMARY OF RESULTS

The principal tests of the series were conducted for a period of 24 hours. The available geologic record and static water level information from Well No. 19, Well No. 20, and the test wells indicate the aquifer in the area of these wells is likely confined (Appendix C), although there may be nearby areas in which the deep Quaternary Aquifer is unconfined (i.e., near Coon Rapids Well No. 14 *cf.* 110460; H.R. Green Company, August, 2002).

Pumping Test of Coon Rapids Well No. 19 (110475)

Coon Rapids Well No. 19: No water levels were recorded in the pumping well.

Test Well No. 673418: The water levels in test Well No. 673418 dropped by more than 8 feet during the pumping portion of the Coon Rapids Well No. 19 test. A log-log plot of the response from this well during pumping is shown in Appendix A. The Theis drawdown analysis method was applied to the drawdown data from this well. Data emphasized in the analysis are those collected early in the pumping phase of the test because the late time data appear to be affected by leakage. The Hantush-Jacob method (Hantush, 1956), which accounts for leakage, was also applied to the drawdown data collected in the test well. The results of these analyses are presented in Table 2.

Recovery data from test Well No. 673418 also provide estimates of transmissivity. Water levels during recovery rebounded above the levels observed prior to pumping, probably because antecedent hydraulic conditions in the aquifer probably had not equilibrated prior to the start of the test. Portions of the response curve that were subjected to the Theis recovery analysis are the portions of the curve with T/T' values in the range of 2 to 20. The recovery data analysis is shown on the figures in Appendix A. Table 2 summarizes the quantitative analysis of the results from Well No. 673418.

Test Well No. 473420: The water level data from this well show virtually no response to pumping at Well No. 19 (Figure 1, Appendix A). This could be a result of antecedent pumping conditions, but will be difficult to establish given that background monitoring data are lacking. Data from this well do, however, show a measurable recovery response. Portions of the response curve that were subjected to the Theis recovery analysis are the portions of the curve with T/T' values of 2.5 to 6. Attempts to quantify the recovery data yield results that do not agree with those obtained from the other test well (Table 2), not surprising given the greater radial distance to the pumping well and the leaky conditions in the aquifer. The recovery analysis method does not account for leaky conditions, the presence of which can give rise to overestimates of T at large radial distances. The recovery data analysis are shown on the figure presented in Appendix A. Table 2 summarizes the quantitative analysis of the results from Well No. 673420.

Pumping Test of Coon Rapids Well No. 20 (420956)

Coon Rapids Well No. 20: No water levels were recorded in the pumping well.

Test Well No. 673418: The water levels in test Well No. 673418 dropped by a little less than 1 foot during the pumping portion of the Coon Rapids Well No. 20 test. A log-log plot of the response from this well during pumping is shown in Appendix A. The Theis drawdown analysis method was applied to the drawdown data from this well. Data emphasized in the analysis are those collected early in the pumping phase of the test (i.e., minutes 10 to 200) because the late time data appear to be affected by leakage. The Hantush-Jacob method (Hantush, 1956), which accounts for leakage, was also applied to the drawdown data collected in the test well. The results of these analyses are presented in Table 2.

Recovery data from test Well No. 673418 also provide estimates of transmissivity. Water levels during recovery rebounded above the levels observed prior to pumping, as observed in the test of Coon Rapids Well No. 19. Antecedent hydraulic conditions in the aquifer probably had not equilibrated prior to the start of the test, although it is also possible that the recovery data could reflect external influences that changed during the pumping. Portions of the response curve that were subjected to the Theis recovery analysis are the portions of the curve with T/T' values in the range of 4.2 to 18. The recovery data analysis are shown on the figure in Appendix A. Table 2 summarizes the quantitative analysis of the results from Well No. 673418.

Test Well No. 673420: Unlike during the test of Well No. 19, this test well showed a definite response to pumping of Well No. 20 (Figure 1, Appendix A). A log-log plot of the response from this well during pumping is shown in Appendix A. The Theis drawdown analysis method was applied to the drawdown data from this well. Data emphasized in the analysis are those collected early in the pumping phase of the test (i.e., minutes 40 to 250) because the late time data appear to be affected by leakage. The Hantush-Jacob method (Hantush, 1956), which accounts for leakage, was also applied to the drawdown data collected in the test well. The results of these analyses are presented in Table 2.

Recovery data from test Well No. 673420 also provide estimates of transmissivity. Water levels during recovery rebounded above the levels observed prior to pumping, as observed in Well No. 673418 during both tests. Portions of the response curve that were subjected to the Theis recovery analysis are the portions of the curve with T/T' values of 5.5 to 10. Attempts to quantify the recovery data yield results that do not agree with those obtained from the other test well (Table 2), not surprising given the greater radial distance to the pumping well and the leaky conditions in the aquifer. The recovery data analysis are shown on the figure in Appendix A. Table 2 summarizes the quantitative analysis of the results from Well No. 673420.

Discussion

The principal reason for collecting water level data from the wells was to assess qualitatively the aquifer response to various pumping conditions. That the data could be subjected to quantitative analysis to estimate aquifer hydraulic properties is an incidental benefit. While the results of these analyses are generally fair to good, they suffer from a few problems. First, it is likely that equilibrium hydraulic conditions did not exist prior to the onset of pumping at Coon Rapids Well Nos. 19 and 20. The lack of background data do not allow this to be established conclusively, but the recovery data infer it. Second, the water level data, especially those collected in Well No. 673420, are noisy, suggesting other aquifer

influences nearby. Each of these problems may contribute uncertainty to the analysis results, but the drawdown and recovery responses from the municipal pumping are generally large in comparison to the other influences. Improved results could be obtained by instrumenting the pumping wells and arranging for stable antecedent hydraulic conditions in the aquifer. Moreover, should other monitoring wells exist in the area, it may be worthwhile to measure water level responses during future pumping tests to get a good sense of variations over the scale of the well field and the likely capture zone of the wells.

H.R. Green (2002) and earlier reports prepared for the city of Coon Rapids (i.e., Hickok and Associates, 1986, 1989; Donahue and Associates, 1991) discuss the complex stratigraphic relationships within the unconsolidated materials above bedrock in the Coon Rapids area. The general relationship is of shallow sands, below which there is a fine-grained till which, in turn, covers deep sand and gravel materials. The deep sand and gravel comprise the deep Quaternary materials in which many of the Coon Rapids Quaternary wells are completed. It is clear from the information presented in Hickok (1986, 1989), Donahue (1991) and H.R. Green (2002) that the composition, distribution and geometry of the deep Quaternary Aquifer system is quite variable. From the data presented in those reports, it appears that Well No. 20 (420956), and Well No. 14 (110460) are in the area in which the deep Quaternary Aquifer is at its thickest, but that Well No. 19 (110475) and test Well No. 673418 are in areas where the aquifer begins to thin. This variability likely affected the results obtained in the pumping tests.

The analysis results (Table 2) show that the estimated T values for the aquifer vary from about 8000 to 110,000 ft^2/day. Previous MDH tests on Coon Rapids Well No. 20 (MDH, 1999) concluded the aquifer transmissivity is on the order of 38,300 ft^2/day (and S=0.00094), while Hickok (1989) reports results of 5080 ft^2/day in an area further north in Coon Rapids. For the current tests,, the Hantush-Jacob method, which accounts for leaky conditions in the pumped aquifer, gives transmissivity estimates that are on the low end of the range of the results using other techniques but that are likely the most reliable. The lower T values obtained from Well No. 673418 relative to those estimated from the data collected in Well No. 473420 suggest that the hydraulic properties of the aquifer vary, becoming less transmissive to the northwest. Storage values range from 0.00025 to 0.001. Leakage values from the Hantush-Jacob analyses suggest leakage factors of 725 to 900 feet.

The monitoring period also captured over 10 and nearly 20 feet of drawdown in Well Nos. 673418 and 673420, respectively, during concurrent pumping of Coon Rapids Well Nos. 17, 19, 20 and 22. No recovery from this pumping was recorded.

CONCLUSION

Transmissivity values of the aquifer likely vary over the study area. Evidence suggests the area to the northwest near Well No. 673418 is less transmissive than areas to the east and south. Accordingly, transmissivity values in the range of 8120 ft^2/day to 9420 ft^2/day are probably appropriate for the aquifer in the northwest near Coon Rapids Well No. 19 and testwell 673418, while values of 27,000 ft^2/day to 55,000 ft^2/day may be appropriate near Coon Rapids Well No. 20 and test Well No. 673420. These results compare well with the pumping test results obtained in 1999 from Coon Rapids Well No. 20. Storativity values are about 0.00025 to 0.0007.

References:

Donahue and Associates, 1991, letter to Scott Erickson, P.E., from Stephen D. Pettit, March 4, 1991.

Hantush, M.S., 1956, "Analysis of Data from Pumping Tests in Leaky Aquifers," American Geophysical Union Trans., v. 37, pp. 702-714.

Hickok and Associates, 1986, "Background Hydrogeological Report for the City of Coon Rapids," technical memorandum prepared for the city of Coon Rapids.

Hickok and Associates, 1989, "Coon Rapids Community Water Supply," letter to Tom Marthison, P.E., from Stephen D. Pettit, April 5, 1989.

H.R. Green Company, 2002, (Draft) "Well Siting Report Proposal for the City of Coon Rapids."

Kruseman, G.P. and N.A. de Ridder, 1991, *Analysis and Evaluation of Pumping Test Data*, International Institute for Land Reclamation and Improvement, Wageningen, The Netherlands, p. 377.

Minnesota Department of Health, 1999, "Analysis of the Coon Rapids No. 20 (420956) Aquifer Test."

Theis, C. V., 1935, "The Relation Between the Lowering of the Piezometric Surface and the Rate and Duration of Discharge of a Well Using Ground-Water Storage," Trans. American Geophysical Union, 16th Annual Meeting, April, 1935, pp. 519-24.

Figure 1. Groundwater Fluctuations, August 29 - Sept. 3, 2002
Coon Rapids Test Wells 673418, 673420

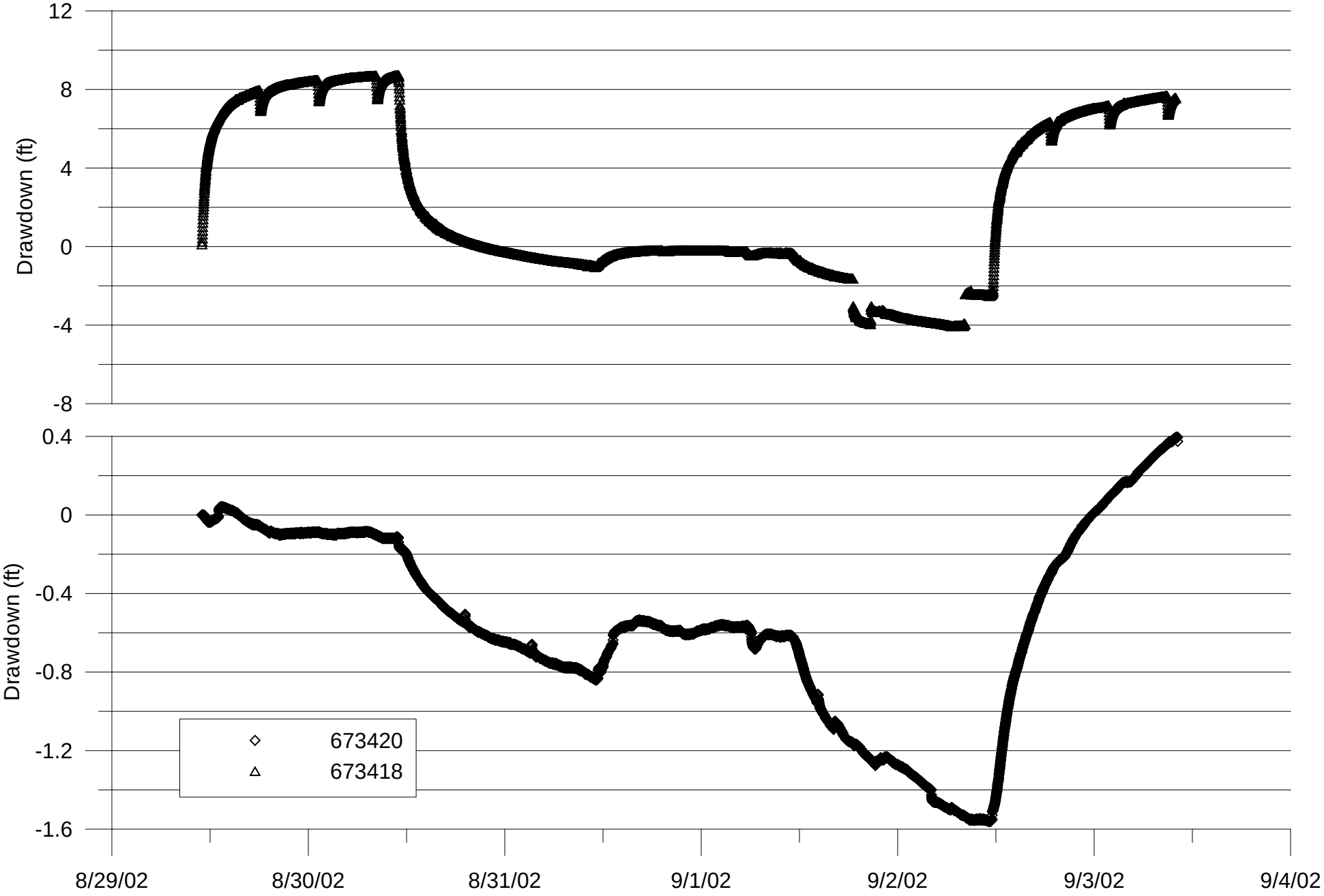


Table 1. Pumping Chronology
(Times approximate)

Date	Time	Action
August 29, 2002	11 am	Coon Rapids Well No 19 (110475) started. Beginning meter reading 201,963,000.
August 30, 2002	11 am	Coon Rapids Well No 19 (110475) stopped. Ending meter reading 203,718,000.
August 31, 2002	11 am	Coon Rapids Well No 20 (420956) started. Beginning meter reading 184,074,000.
September 1, 2002	11 am	Coon Rapids Well No 20 (420956) stopped. Ending meter reading 185,520,000.
September 2, 2002	11 am	Coon Rapids Well Nos. 17 (150357), 19 (110475), 20 (420956), and 22 (474385) started. Beginning meter readings of 90,970,000, 203,728,000, and 185,834,000 in Well Nos. 17, 19, and 20, respectively. No readings for Well No. 22.
September 3, 2002	11 am	Coon Rapids Well Nos. 17 (150357), 19 (110475), 20 (420956), and 22 (474385) stopped. Ending meter readings of 92,745,000, 205,437,000, and 187,521,000 in wells 17, 19, and 20, respectively. No readings for Well No. 22. Well No. 22 reportedly pumps at about 300 gpm.

Note: Information per Dick Dwyer, City of Coon Rapids.

Table 2. Pumping Test Results

Coon Rapids No. 19 (110475) Aquifer Test
August 29-31, 2002

	Transmissivity T (ft^2/day)	Storage Coefficient S	Time Period Emphasized	Analysis Method
	---	---	---	---
Test Well	8,120	0.00026	Minutes 4 - 140	Theis
No. 673418	9,420	NA	T/T' 2-10	Theis Recovery
	8,610	0.00025	Late pumping	Hantush-Jacob
Test Well				
No. 673420	66,000	NA	Minutes 1.5-6	Theis Recovery

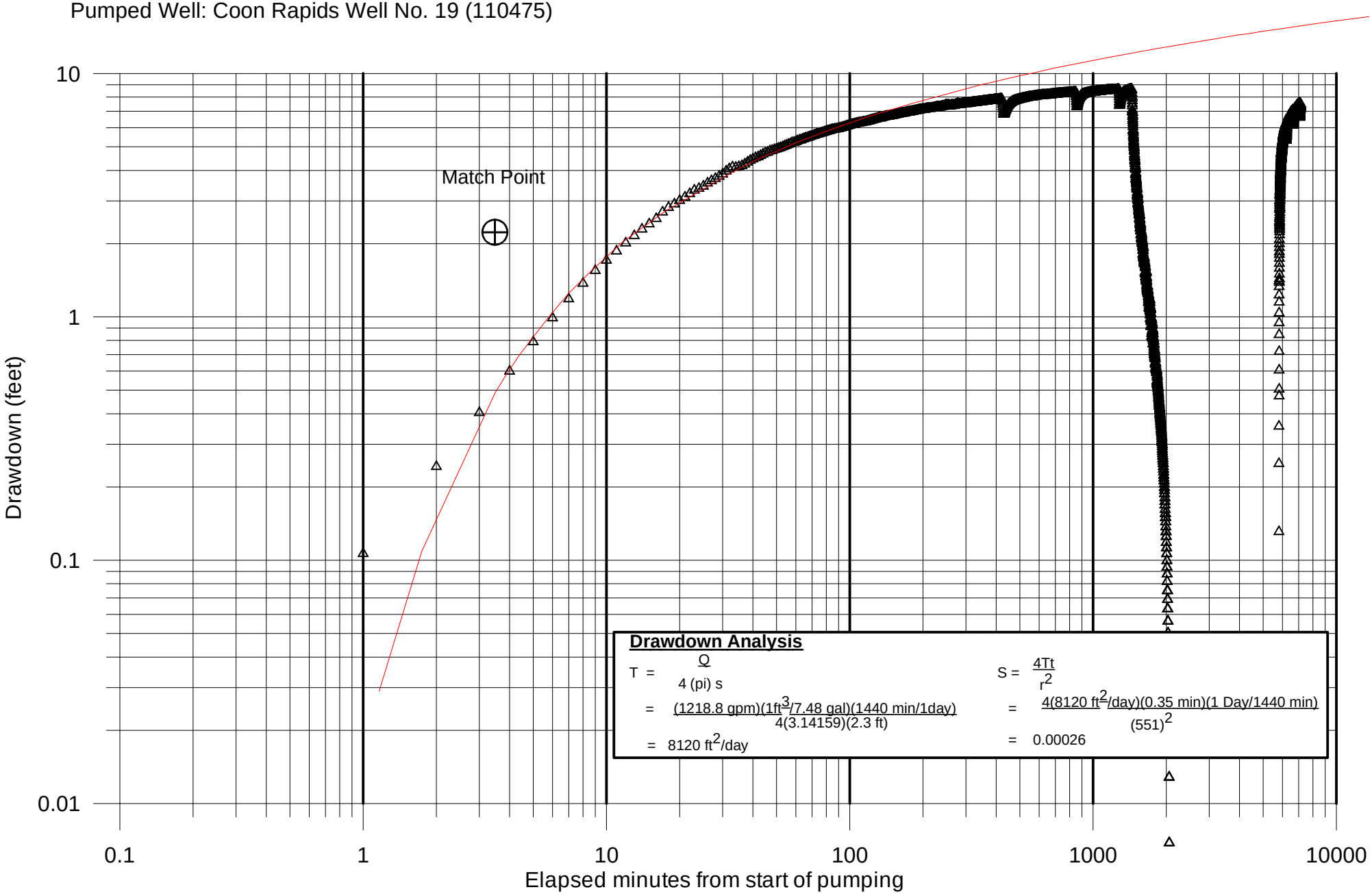
Coon Rapids No. 20 (420956) Aquifer Test
August 31- September 1, 2002

	Transmissivity T (ft^2/day)	Storage Coefficient S	Time Period Emphasized	Analysis Method
	---	---	---	---
Test Well	40,500	0.00067	Minutes 10-200	Theis
No. 673418	27,330	NA	T/T' 4.2-18	Theis Recovery
	26,900	0.0007	Late pumping	Hantush-Jacob
Test Well	110,000	0.00078	Minutes 40-250	Theis
No. 673420	51,350	NA	T/T' 5.5- 10	Theis Recovery
	54,900	0.001	Late Pumping	Hantush-Jacob

Aquifer Test Report Appendix A

Data Analysis

Observed Drawdown in 673418
Pumped Well: Coon Rapids Well No. 19 (110475)



Drawdown Analysis

$$T = \frac{Q}{4\,(pi)\,s} = \frac{(1218.8\ gpm)(1ft^3/7.48\ gal)(1440\ min/1day)}{4(3.14159)(2.3\ ft)} = 8120\ ft^2/day$$

$$S = \frac{4Tt}{r^2} = \frac{4(8120\ ft^2/day)(0.35\ min)(1\ Day/1440\ min)}{(551)^2} = 0.00026$$

UNSTEADY FLOW TO A WELL IN A SEMI-CONFINED AQUIFER WITH NO STORAGE IN OVERLYING AQUITARDS (HANTUSH-JACOB)

This document reads a set of time-drawdown data from disk, calculates a theoretical time-drawdown curve using user-specified parameters, and plots them both in a way that the user can interactively adjust the theoretical curve to obtain a match with the field data. Applied to Monitoring Well 673418 during pumping of Coon Rapids Well No. 19 (110475). Results presented below.

Read the field data and perform the data initialization:

Read data from disk: $A := \mathrm{READPRN}(\text{"673418.prn"})$

Data initializations: $nrows := rows(A)$

$nrows = 1.442 \cdot 10^3$

$i := 0, 1 .. nrows - 1$

$t := A^{<0>} \cdot min$

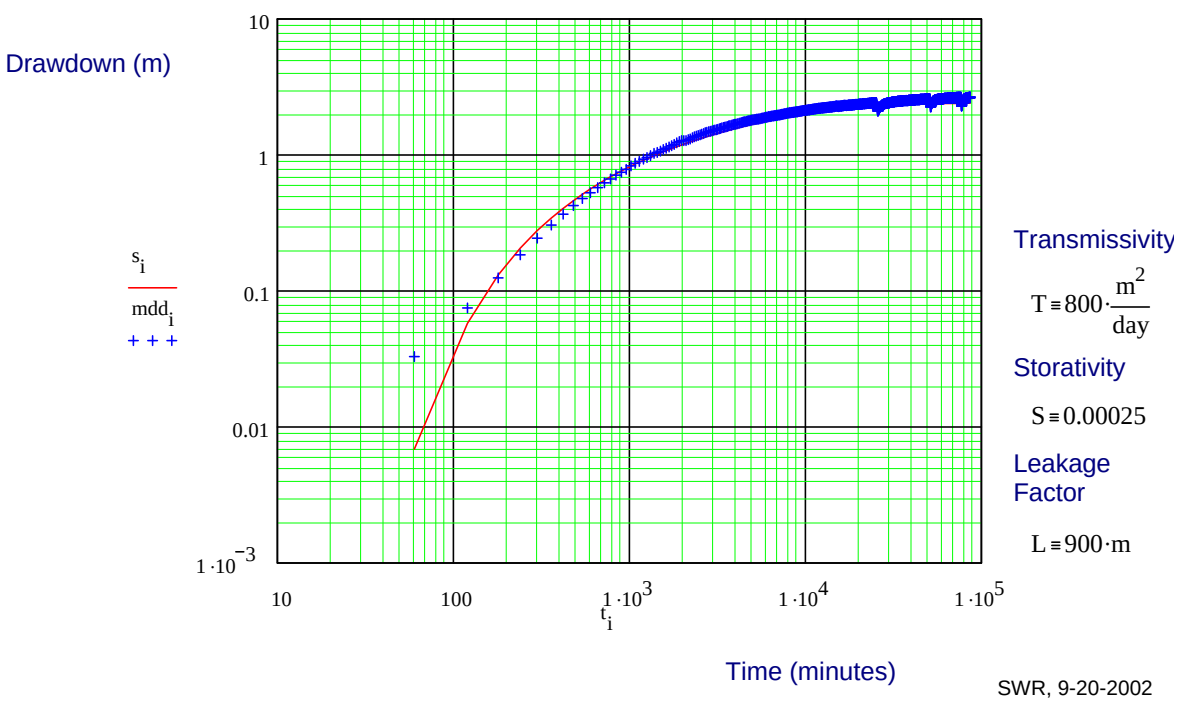
$mdd := A^{<1>} \cdot m$

Enter test parameters:

Well discharge (L^3/T): $Q := 6644.1 \cdot \frac{m^3}{day}$

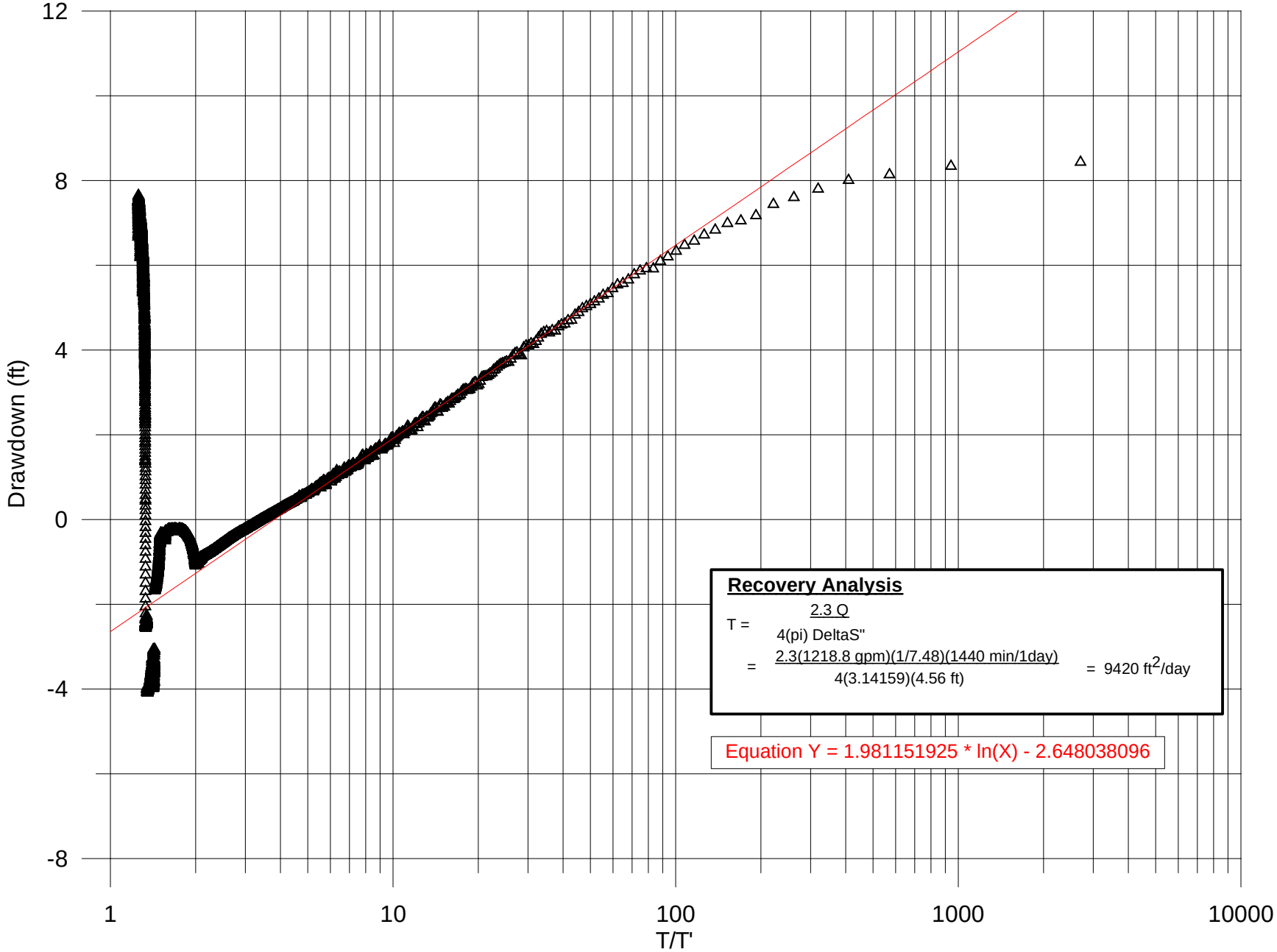
Radial distance from pumping to observation well (L): $r := 168 \cdot m$

Comparison of Observed and Theoretical Drawdowns (Hantush-Jacob Method)



SWR, 9-20-2002

Observed Recovery in Well 673418
Pumped Well: Coon Rapids Well No. 19 (110475)



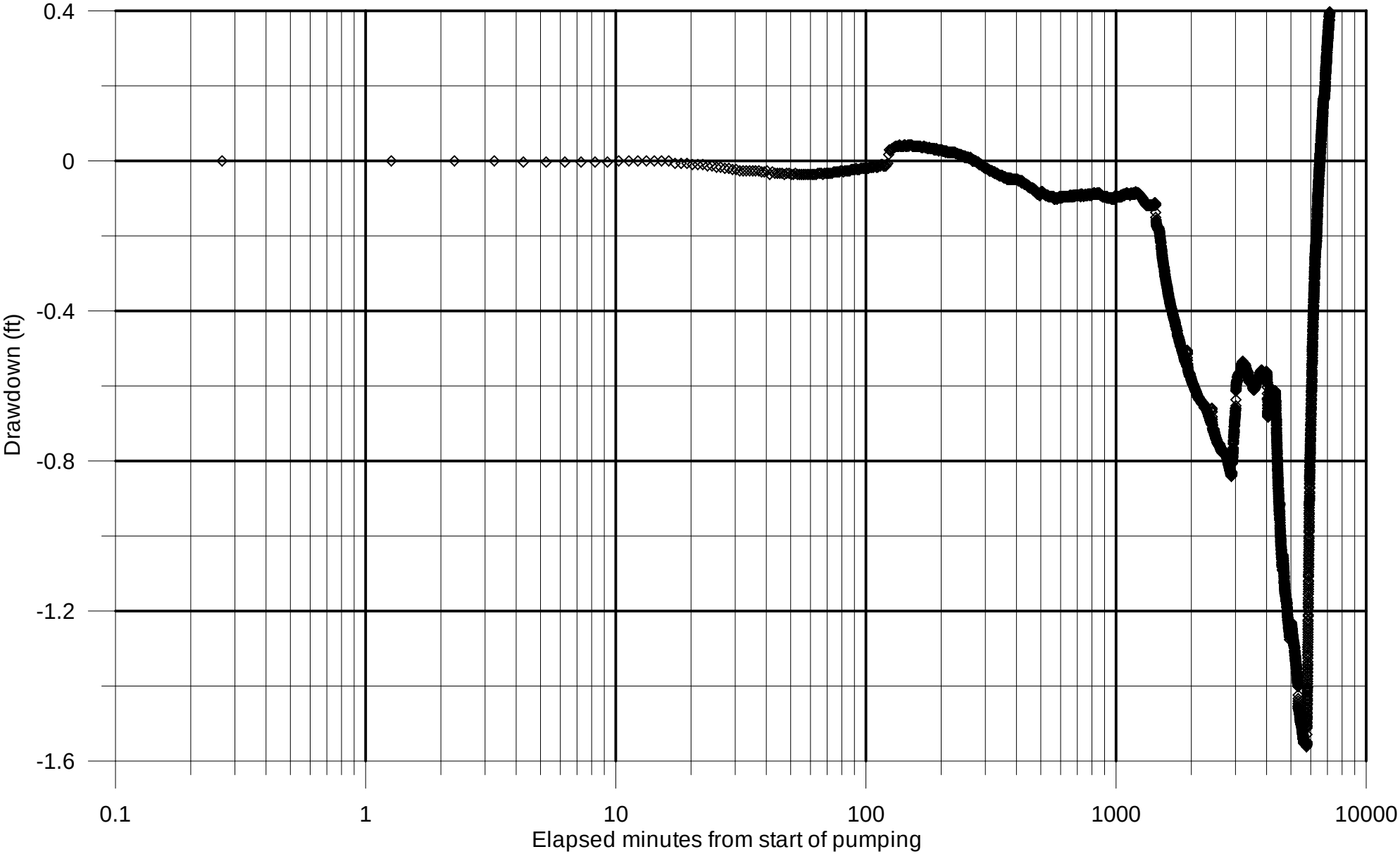
Recovery Analysis

$$T = \frac{2.3\,Q}{4(\pi)\,\text{DeltaS''}}$$

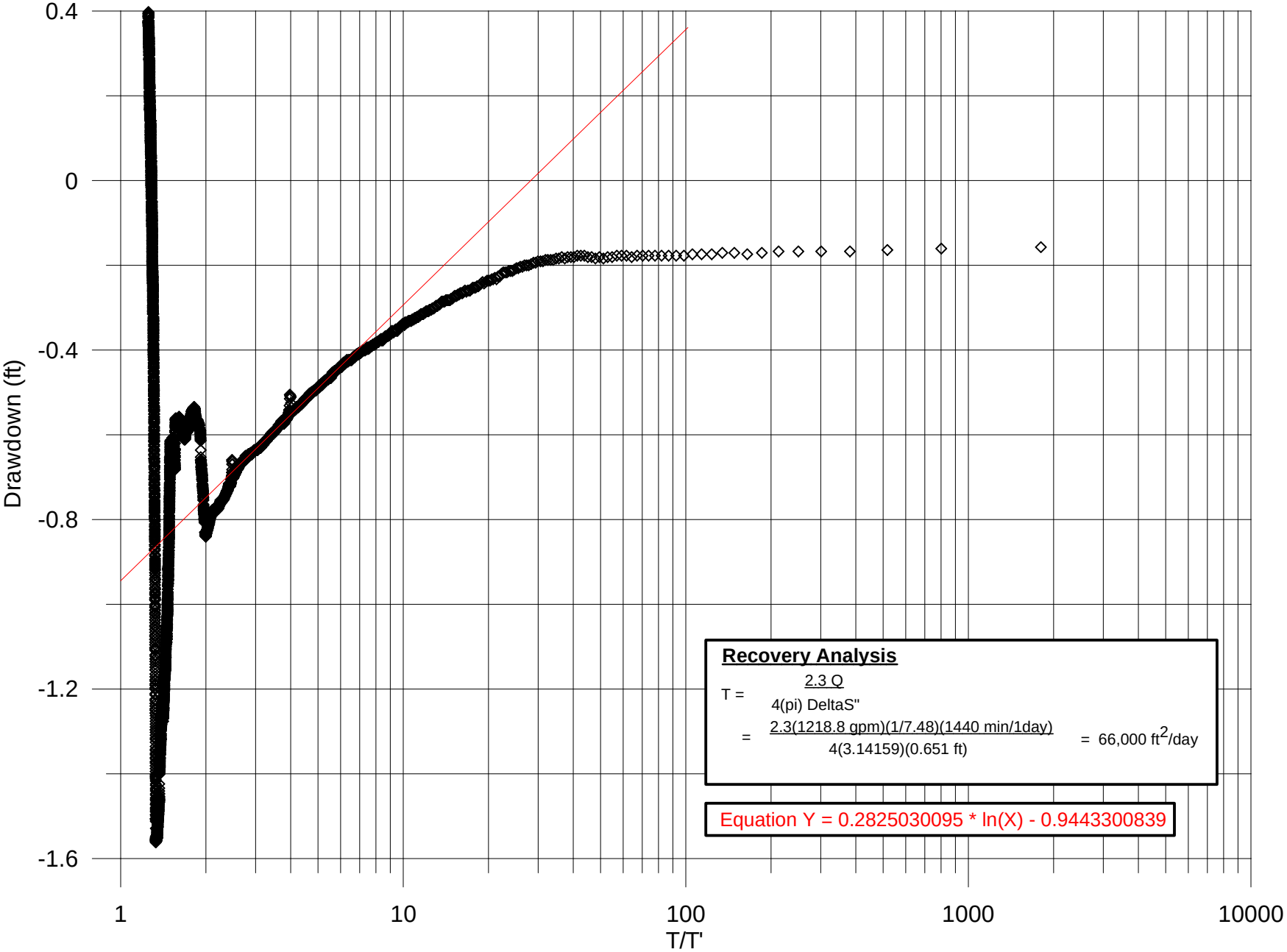
$$= \frac{2.3(1218.8\text{ gpm})(1/7.48)(1440\text{ min}/1\text{day})}{4(3.14159)(4.56\text{ ft})} = 9420\text{ ft}^2/\text{day}$$

Equation Y = 1.981151925 * ln(X) - 2.648038096

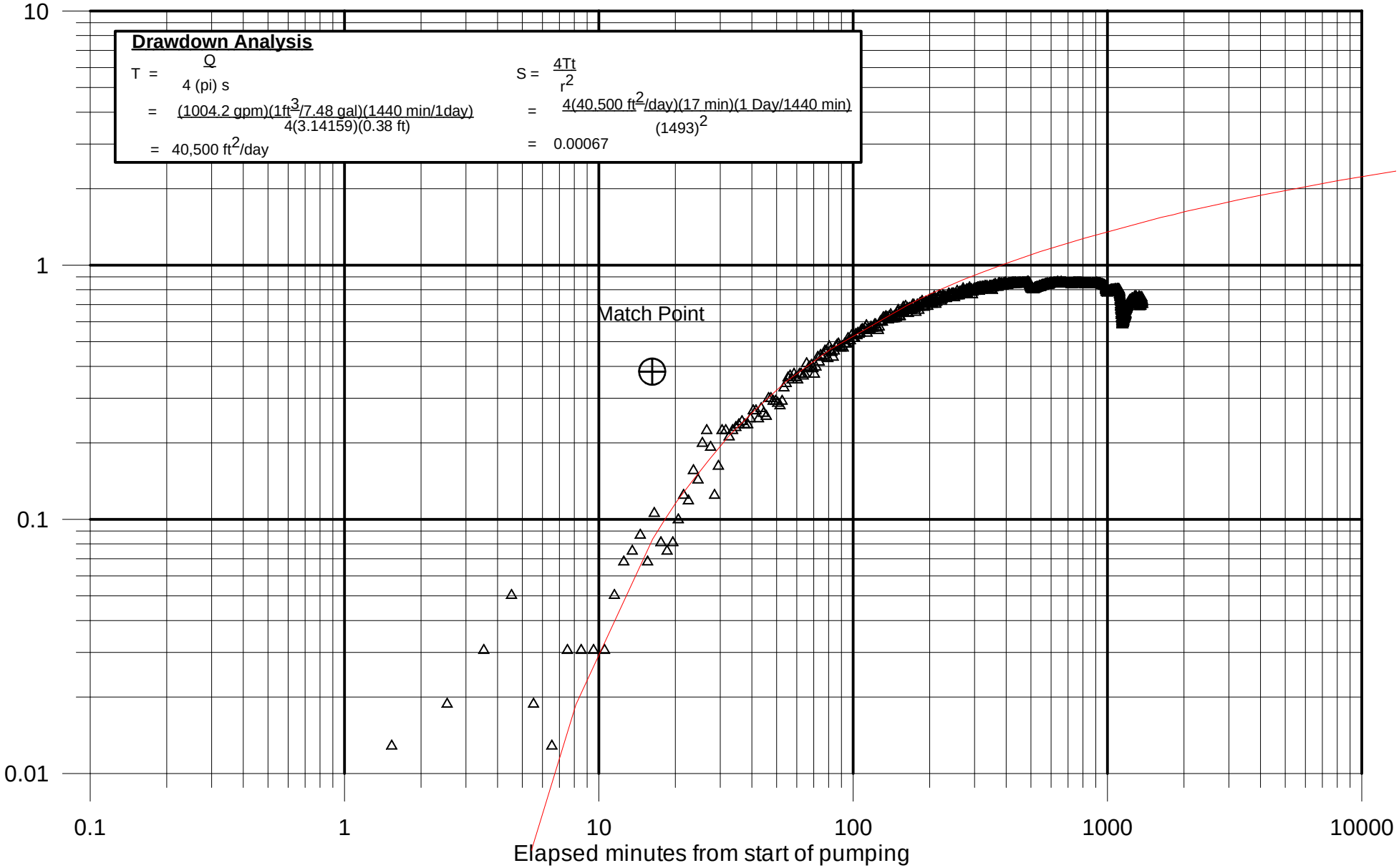
Observed Drawdown in well 673420
Pumped Well: Coon Rapids Well No. 19 (110475)



Observed Recovery in 673420
Pumped Well: Coon Rapids Well No. 19 (110475)



Observed Drawdown in Test Well 673418
Pumped Well: Coon Rapids No. 20 (420956)
Test Date: August 31 - September 1, 2002



UNSTEADY FLOW TO A WELL IN A SEMI-CONFINED AQUIFER WITH NO STORAGE IN OVERLYING AQUITARDS (HANTUSH-JACOB)

This document reads a set of time-drawdown data from disk, calculates a theoretical time-drawdown curve using user-specified parameters, and plots them both in a way that the user can interactively adjust the theoretical curve to obtain a match with the field data. Applied to Monitoring Well 673418 during pumping of Coon Rapids Well No. 20 (420956). Results presented below.

Read the field data and perform the data initialization:

Read data from disk: $A := \mathrm{READPRN}(\text{"673418\_cr20dd.txt"})$

Data initializations: $nrows := \mathrm{rows}(A)$

$nrows = 1.441 \cdot 10^3$

$i := 0, 1 .. nrows - 1$

$t := A^{<0>} \cdot min$

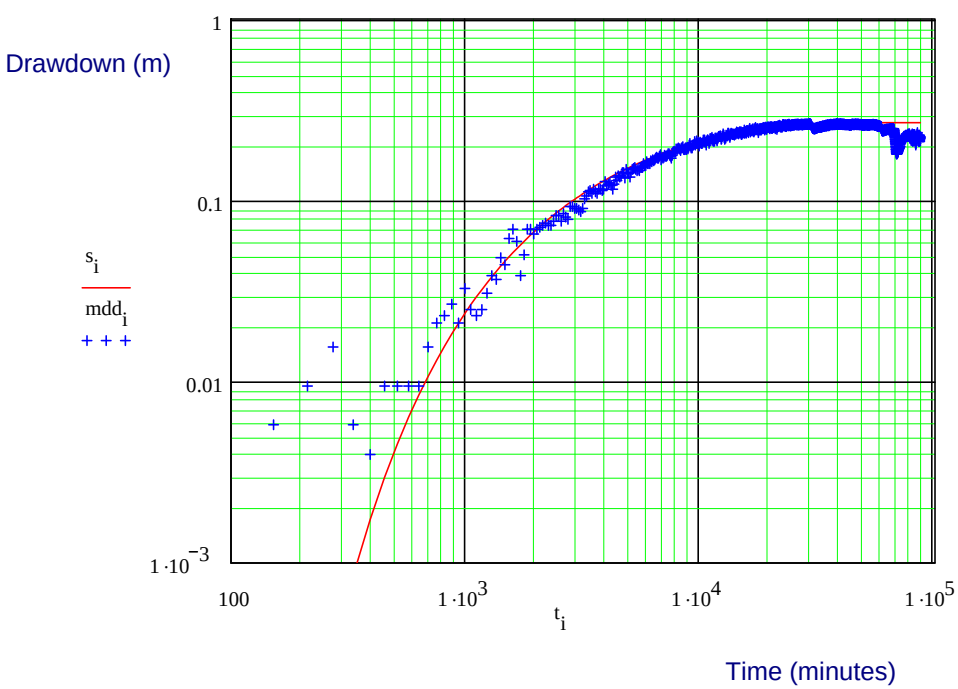
$mdd := A^{<1>} \cdot m$

Enter test parameters:

Well discharge (L^3/T): $Q := 5474.1 \cdot \frac{m^3}{day}$

Radial distance from pumping to observation well (L): $r := 455 \cdot m$

Comparison of Observed and Theoretical Drawdowns (Hantush-Jacob Method)



Transmissivity

$T \equiv 2500 \cdot \frac{m^2}{day}$

Storativity

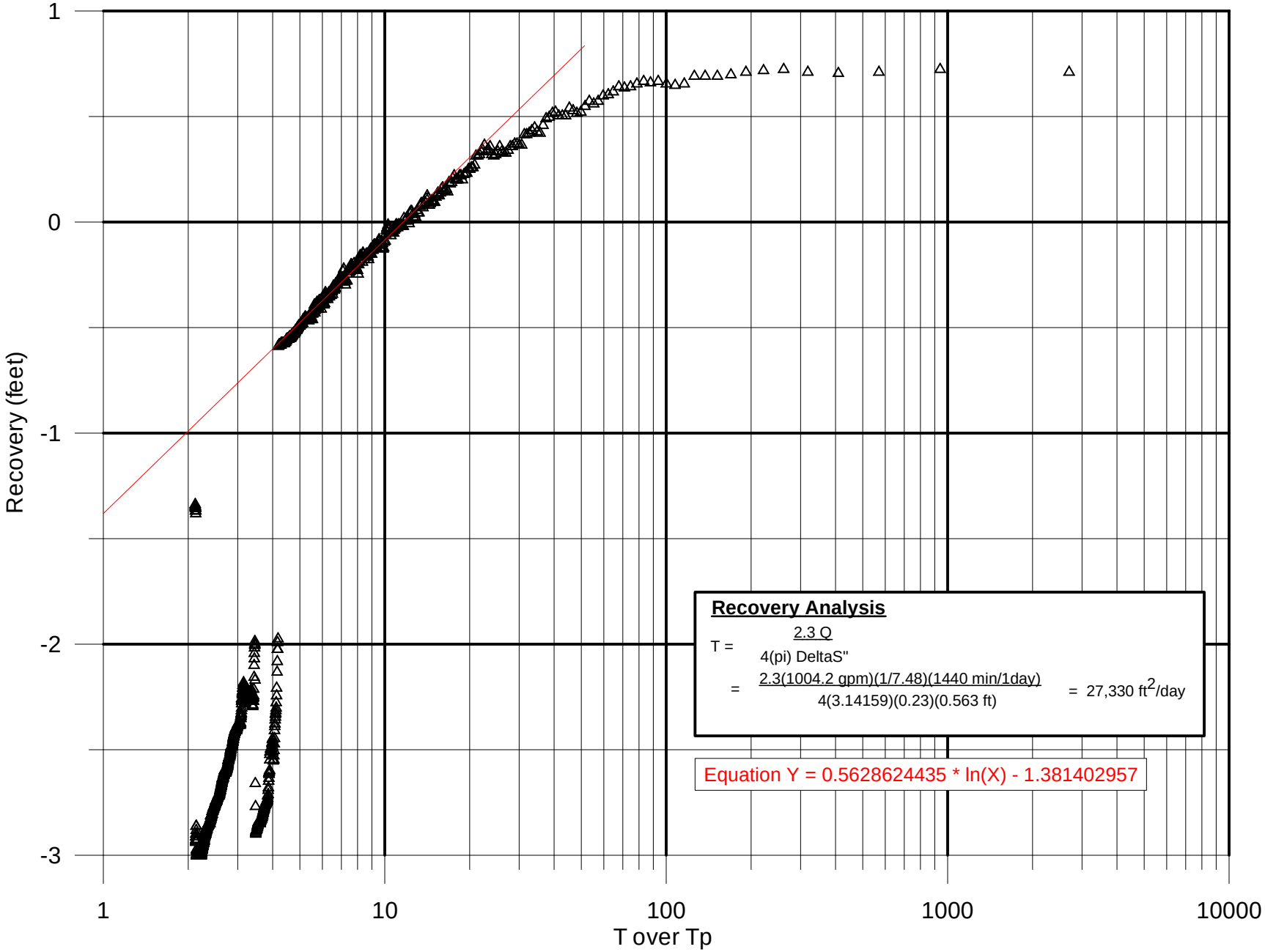
$S \equiv 0.0007$

Leakage Factor

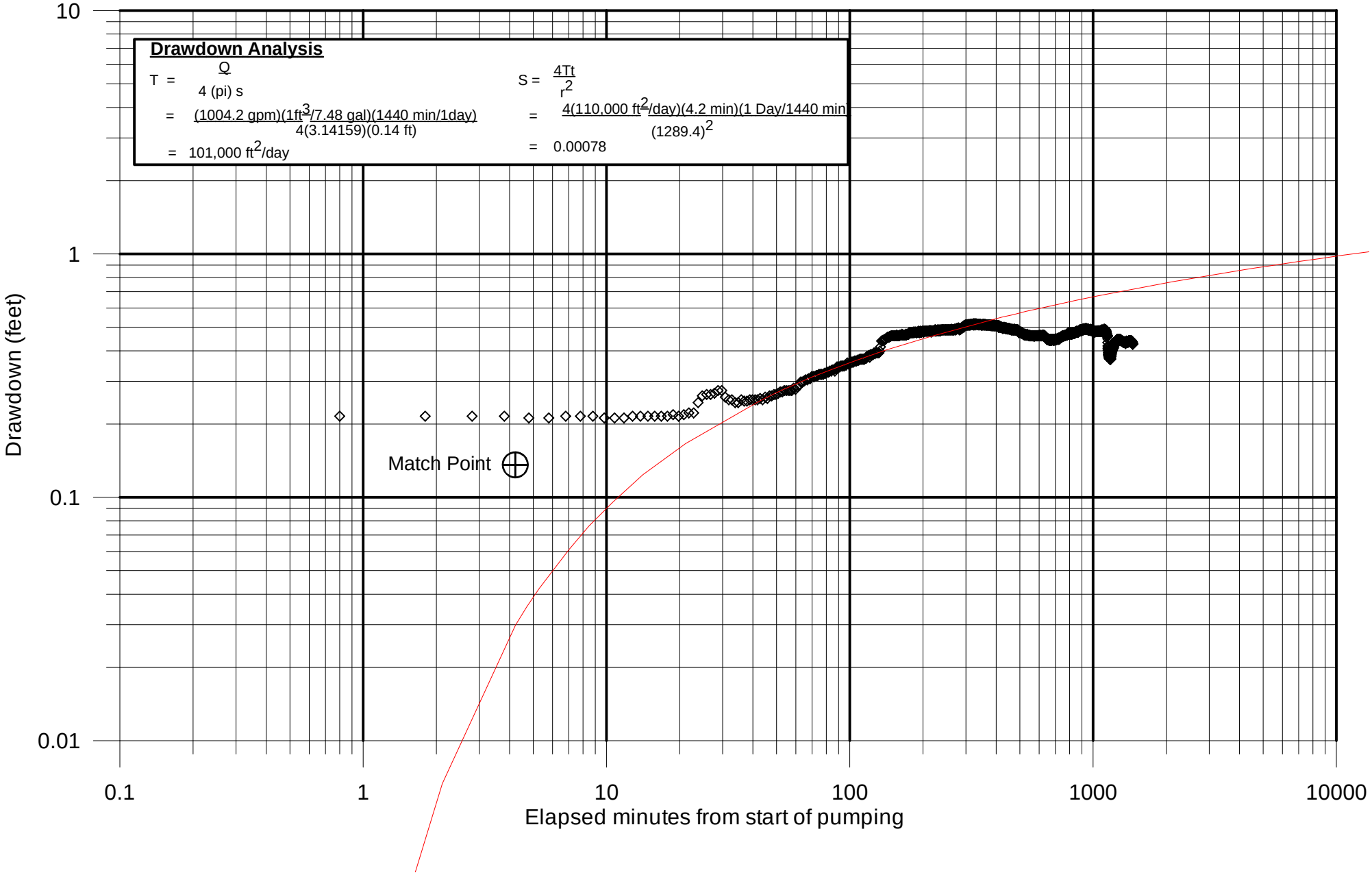
$L \equiv 750 \cdot m$

SWR, 9-26-2002

Observed Recovery in Test Well 673418
Pumped Well: Coon Rapids Well No. 20 (420956)
Test Date: August 31 - September 1, 2002



Observed Drawdown in Test Well 673420
Pumped Well: Coon Rapids No. 20 (420956)
Test Date: August 31 - September 1, 2002



UNSTEADY FLOW TO A WELL IN A SEMI-CONFINED AQUIFER WITH NO STORAGE IN OVERLYING AQUITARDS (HANTUSH-JACOB)

This document reads a set of time-drawdown data from disk, calculates a theoretical time-drawdown curve using user-specified parameters, and plots them both in a way that the user can interactively adjust the theoretical curve to obtain a match with the field data. Applied to Monitoring Well 673420 during pumping of Coon Rapids Well No. 20 (420956). Results presented below.

Read the field data and perform the data initialization:

Read data from disk: $A := \mathrm{READPRN}(\text{"673420\_dd\_cr20\_.prn"})$

Data initializations: $nrows := rows(A)$

$nrows = 2.371 \cdot 10^3$

$i := 0, 1 .. nrows - 1$

$t := A^{<0>} \cdot min$

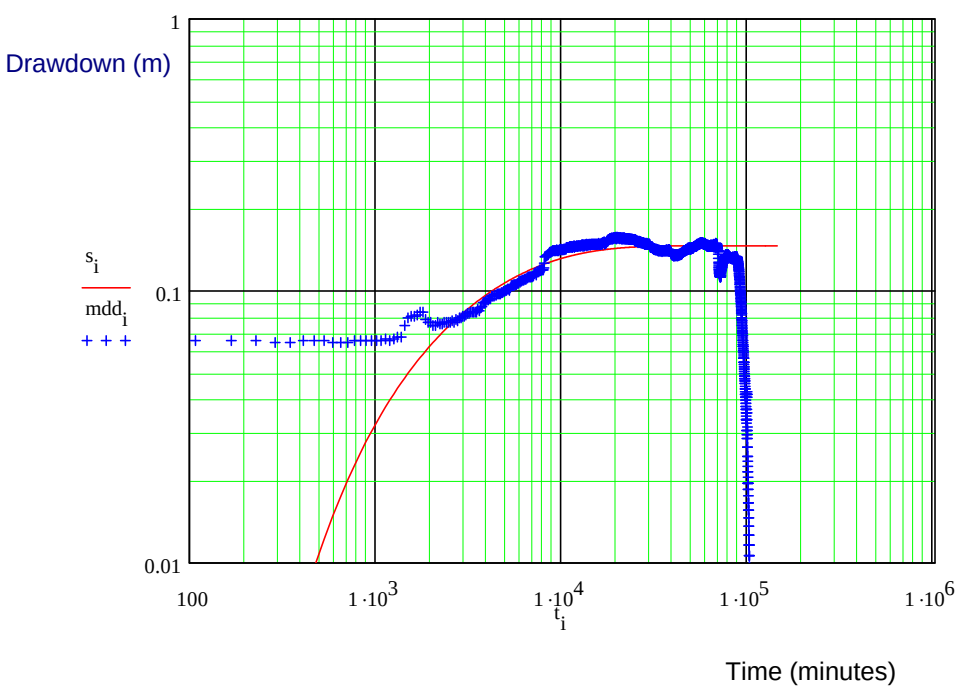
$mdd := A^{<1>} \cdot m$

Enter test parameters:

Well discharge (L^3/T): $Q := 5474 \cdot \frac{m^3}{day}$

Radial distance from pumping to observation well (L): $r := 393 \cdot m$

Comparison of Observed and Theoretical Drawdowns (Hantush-Jacob Method)



Transmissivity

$T \equiv 5100 \cdot \frac{m^2}{day}$

Storativity

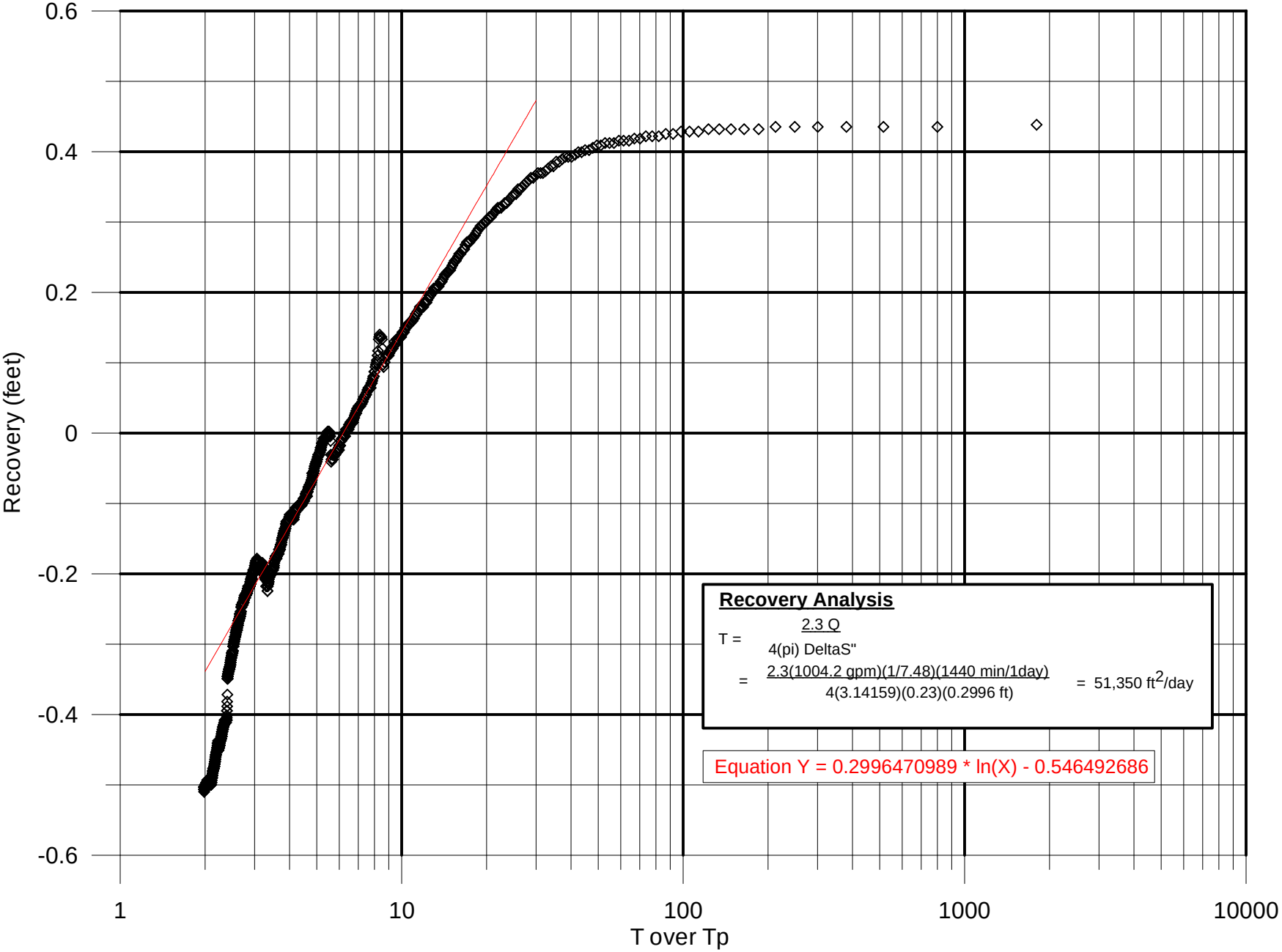
$S \equiv 0.001$

Leakage Factor

$L \equiv 725 \cdot m$

SWR, 9-26-2002

Observed Recovery in Test Well 673420
Pumped Well: Coon Rapids Well No. 20 (420956)
Test Date: August 31-September 1, 2002



Aquifer Test Report Appendix B

Field Data Sheets

Minnesota Department of Health
Special Services Unit
Drinking Water Protection Section
P.O. Box 64975
St. Paul, Minnesota 55164-0975

Test No.

Aquifer Test Information

Test Location	Well Owner	Test Conducted By
CR #19	COON RAPIDS	SCWR/HR GREEN/City CR
Date/Time Test Start	**Flow Rate (Units)**	**Pump Type**
8/29/02 11 am	VARIABLE	
Date/Time Recovery Start	**Flow Rate Measuring Device**	**Pump Intake Depth**
8/30/02 11 am	Flow meter	
Date/Time Test Finish	**Totalizer: End**	**Pumped Well Inner Casing Diameter**
9/3/02	203,718,000	
Notes	**Totalizer: Start**	**Confined/Unconfined**
	201963,000	CONF
	Total Pumped (Units)	**Quad Sheet Name/Number**
	1755,000 gals [1218.89 gpm]	

Unique Well Numbers	Location T, R, S, Quarters	Location N, E	Radial Distance	Open Depth	Transducer Setting	Measuring Point Location	Elevation, Datum
Pumped Well ~~VARIES~~ CR #19 110475		N E					
Observation Wells		N E					
OB Well # 673418		N (well 19) E 0208291	168m 551.2 ft	BTW	52.29 59.92		8-29-02 9:37 9-3-02 10:00
673420		N (well 19) E 0208291	566.8 m 1860 ft well 14		61.96 62.37		10:31 8-29 9-3-02
		N E	94 m				
		N E					

Sketch Map of Well Locations

0209032.txt

MINNESOTA MDH DEPARTMENT OF HEALTH
Environmental Health Division
Drinking Water Protection Section
Source Water Protection Unit
P.O. Box 64975
St. Paul, Minnesota 55164-0975

Determination of Aquifer Properties and Aquifer Test Plan (DAP-ATP) Form

Public Water Supply ID:	1020017	PWS Name:	Coon Rapids

Contact Information for Person Completing this Form

Name:	John Greer
Address:	Barr Engineering Company
	4700 West 77th Street, Suite 200
City, State, Zip:	Edina, MN 55435
Phone, Fax, e-mail:	(952) 832-2691

Aquifer Properties Determination Methods

☐ 1) An existing pumping test that meets the requirements of wellhead protection rule part 4720.5520 and that was previously conducted on a well connected to the public water supply system.

☐ 2) An existing pumping test that meets the requirements of wellhead protection rule part 4720.5520 and that was previously conducted on another well in a hydrogeologic setting determined by the department to be equivalent.

☐ 3) A proposed new test to be conducted on a new or existing well connected to the public water supply system and that meets the requirements for larger-sized water systems (wellhead protection rule part 4720.5520). A test plan must be approved before conducting the test.

☐ 4) A proposed new test to be conducted on a new or existing public well connected to the public water supply system and that meets the requirements for smaller-sized water systems (wellhead protection rule part 4720.5530). A test plan must be approved before conducting the test.

☐ 5) An existing pumping test that does not meet the requirements of wellhead protection rule part 4720.5520 and that was previously conducted on: 1) a public water supply well or 2) another well in a hydrogeologic setting determined by the department to be equivalent.

☑ 6) Existing specific capacity test(s) conducted on the public water supply well(s) or specific capacity tests conducted on other wells in a hydrogeologic setting determined by the department to be equivalent.

☐ 7) An existing published transmissivity value.

- Include all test data and analysis documentation with the estimated transmissivity, ft^2/day, when the aquifer properties determination method is; 1, 2, 5, 6, or 7, listed above.
- ▪▪ Attach detailed aquifer test plan for methods 3 or 4.

Submitted by: John Greer	Prof. License: 30347	Date: 7/31/2015

To request this document in another format, please call our Section Receptionist (651/201-4700) or Division TTY (651/201-5797).

Rationale for: 1) Aquifer Properties Determination or 2) Proposed New Test

Briefly describe the rationale for: 1) selected method to determine aquifer properties from existing data, **or** 2) a new aquifer test to be conducted on the pumped well referenced below. Include unique well numbers of all wells that were (or will be) monitored during data collection. How does the existing or proposed test deviate from the ideal. (e.g. rate, duration, no. of obwells, interfering wells, etc.) Attach documentation as necessary.

Aquifer Name:	Tunnel City Group - Wonewoc Sandstone	✓ Confined	☐ Unconfined	☐ Fractured Rock

Specific capacity data on the CWI logs for Coon Rapids Wells 24 (Unique Number 674478) and 25 (Unique Number 674479) were analyzed using the TGuess Method (Bradbury and Rothschild, 1985) to obtain a geometric mean transmissivity of 7,700 ft**2/day for the combined Tunnel City-Wonewoc aquifer (see attached).

The Tunnel City Group (CTCG) and Wonewoc Sandstone (CWOC) are represented as separate layers in the groundwater model, so this combined transmissivity must be apportioned between the two units. A search of the CWI within 5 km of Coon Rapids found 418 wells with sufficient data completed only in the CTCG and 42 wells with sufficient data completed only the CWOC. Average formation thicknesses of 149 feet for the CTCG and 57 feet for the CWOC were determined from the logs for the City of Coon Rapids wells that completely penetrate both units. The CTCG and CWOC data were analyzed using the TGuess method to obtain geometric mean T values of 1,300 ft**2/day for the CTCG and 530 ft**2/day for the CWOC. From these results, a ratio of 2.45:1 was used to apportion the combined Tunnel City-Wonewoc T of 7,700 ft**2/day to the CTCG and CWOC; the base case CTCG for the groundwater model was 5,470 ft**2/day and the base case CWOC T was 2,230 ft**2/day.

For the sensitivity analysis, the minimum T of 6,400 ft**2/day from Well 25 and the maximum T of 9,400 ft**2/day from Well 24 will be used as the lower and upper bounds, respectively, on Tunnel City-Wonewoc transmissivity. These values will be apportioned between layers using the 2.45:1 ratio as detailed above for the base model.

Proposed New Test Information Summary

Pumped Well Name (Unique Number):	674478, 674479	**Test Duration (Hours):**	varies
Location: X, Y (meters) UTM-Z15N or Lat-Lon (decimal degrees) datum: NAD83	473799, 5001596 (674478) 474351, 5001197 (674479)	**Pump Type:**	unknown
		Discharge Rate:	1560 gpm
Number of Observation Wells:	0	**Flow Rate Measuring Device Type:**	unknown

- A map showing the location of the pumping well and observation well(s) must be included.

List the unique number of each public water supply well to which this DAP-ATP Form applies

202926	202932	110460			
202929	202931	110461			
202972	202930	168720			
202951	202965	674478			
202937	168721	674479			
202943	161413				

Reviewed by: Amal Djerrari	**Approved:** ● Yes ○ No	**Approval Date:** 8/3/2015

Tunnel City - Wonewoc

Worksheet for Estimating Transmissivity and Hydraulic Conductivity from Specific Capacity Test Data

Explanation and notes attached.

Maximum iterations	100
Error tolerance (as drawdown)	0.001 feet

Field Data								*Estimated Parameters*			*Calculated Results*								*Diagnostics*					
		Depth to Water				Screened Interval													*Solution Integrity*			*Sensitivity of T:*		
Location	Well Diam.	Initial	Final	Test Duration	Mean Pumping Rate	Depth to Top	Depth to Bottom	Storage Coeff. (S)	Well loss Coeff. (C)	Aquifer Thickness (b)	Measured Drawdown (s_m)	Saturated Screen Length (L)	Well loss (s_w)	Partial Penetration Parameter (s_p)	Specific Capacity	**Transmissivity (T)**	**T (ft^2/day)**	**Conductivity (K)**	Calculated Drawdown	Error as Drawdown	Well Bore Storage Test	to S at ± 1 factor of 10	to s_w at 10% of s_m	to b at ± 25%
	inches	feet	feet	hours	gpm	feet	feet	-	sec^2/ft^5	feet	feet	feet	feet	-	gpm/ft	**sq ft/sec**		**ft/day**	feet			sq ft/sec	sq ft/sec	sq ft/sec
00674478 (Coon Rapids 24)	24	60.2	112	8	1560	240.5	388.0	0.001	0	236.0	51.80	147.5	0.0E+00	2.27	30.12	**1.1E-01**	**9.4E+03**	**39.7**	51.80	0.00%	pass	1.3E-02	1.3E-02	4.0E-02
00674479 (Coon Rapids 25)	24	51.4	121.4	48	1560	229.0	388.0	0.001	0	195.0	70.00	159.0	0.0E+00	0.74	22.29	**7.4E-02**	**6.4E+03**	**32.6**	70.00	0.00%	pass	9.6E-03	8.7E-03	1.9E-02

Geometric Mean **7.7E+03**

References:

Bradbury, K.B., and E.R. Rothschild, 1985. A computerized technique for estimating the hydraulic conductivity of aquifer from specific capacity data: Ground Water vol. 23, No. 2, pp. 240-246.

ASTM International, 2004. Standard Test Method for Determining Specific Capacity and Estimating Transmissivity at the Control Well, Standard D 5472-93, in Annual Book of ASTM Standards, Vol. 04.08 pp. 1279-1282.

Tunnel City Group

Worksheet for Estimating Transmissivity and Hydraulic Conductivity from Specific Capacity Test Data

Explanation and notes attached.

Maximum iterations	100
Error tolerance (as drawdown)	0.001 feet

	Field Data							*Estimated Parameters*			*Calculated Results*								*Diagnostics*					
		Depth to Water				Screened Interval													*Solution Integrity*			*Sensitivity of T:*		
Location	Well Diam.	Initial	Final	Test Duration	Mean Pumping Rate	Depth to Top	Depth to Bottom	Storage Coeff. (S)	Well loss Coeff. (C)	Aquifer Thickness (b)	Measured Drawdown (s_m)	Saturated Screen Length (L)	Well loss (s_w)	Partial Penetrameter Parameter (s_p)	Specific Capacity	**Transmissivity (T)**	**T (ft^2/day)**	**Conductivity (K)**	Calculated Drawdown	Error as Drawdown	Well Bore Storage Test	to S at ± 1 factor of 10	to s_w at 10% of s_m	to b at ± 25%
	inches	feet	feet	hours	gpm	feet	feet	-	sec^2/ft^5	feet	feet	feet	feet	-	gpm/ft	**sq ft/sec**		**ft/day**	feet			sq ft/sec	sq ft/sec	sq ft/sec
00104713	4	40	55	4	60	173.0	187.0	0.001	0	149.0	15.00	14.0	0.0E+00	42.84	4.00	**7.4E-02**	**6.4E+03**	**42.7**	15.00	0.00%	pass	1.6E-03	8.3E-03	3.7E-02
00104723	4	30	40	3	30	150.0	188.0	0.001	0	149.0	10.00	38.0	0.0E+00	14.78	3.00	**2.5E-02**	**2.1E+03**	**14.3**	10.00	0.00%	pass	1.3E-03	2.8E-03	1.1E-02
00104753	4	20	30	3	60	161.0	188.0	0.001	0	149.0	10.00	27.0	0.0E+00	21.84	6.00	**6.5E-02**	**5.7E+03**	**38.0**	10.00	0.00%	pass	2.5E-03	7.4E-03	3.1E-02
00104788	4	12	30	4	45	171.0	188.0	0.001	0	149.0	18.00	17.0	0.0E+00	35.30	2.50	**3.9E-02**	**3.4E+03**	**22.7**	18.00	0.00%	pass	1.0E-03	4.4E-03	1.9E-02
00104846	4	25	60	3	90	152.0	167.0	0.001	0	149.0	35.00	15.0	0.0E+00	40.00	2.57	**4.4E-02**	**3.8E+03**	**25.8**	35.00	0.00%	pass	1.1E-03	5.0E-03	2.2E-02
00104866	4	20	50	4	60	149.0	172.0	0.001	0	149.0	30.00	23.0	0.0E+00	25.91	2.00	**2.4E-02**	**2.1E+03**	**14.2**	30.00	0.00%	pass	8.3E-04	2.8E-03	1.2E-02
00104898	4	20	50	6	60	150.0	200.0	0.001	0	149.0	30.00	50.0	0.0E+00	10.31	2.00	**1.3E-02**	**1.2E+03**	**7.7**	30.00	0.00%	pass	8.4E-04	1.5E-03	6.1E-03
00104899	4	40	65	3	30	213.0	223.0	0.001	0	149.0	25.00	10.0	0.0E+00	59.65	1.20	**2.9E-02**	**2.5E+03**	**16.8**	25.00	0.00%	pass	4.9E-04	3.2E-03	1.5E-02
00105116	4	50	60	3	40	141.0	156.0	0.001	0	149.0	10.00	15.0	0.0E+00	40.00	4.00	**6.9E-02**	**6.0E+03**	**40.3**	10.00	0.00%	pass	1.6E-03	7.8E-03	3.5E-02
00105327	4	30	40	3	20	158.0	201.0	0.001	0	149.0	10.00	43.0	0.0E+00	12.65	2.00	**1.5E-02**	**1.3E+03**	**8.6**	10.00	0.00%	pass	8.4E-04	1.7E-03	6.9E-03
00105384	4	30	40	3	30	197.0	214.0	0.001	0	149.0	10.00	17.0	0.0E+00	35.30	3.00	**4.7E-02**	**4.1E+03**	**27.2**	10.00	0.01%	pass	1.2E-03	5.3E-03	2.3E-02
00107147	4	60	80	2	20	311.0	335.0	0.001	0	149.0	20.00	24.0	0.0E+00	24.77	1.00	**1.2E-02**	**1.0E+03**	**6.7**	20.00	0.00%	pass	4.1E-04	1.3E-03	5.7E-03
00111261	4	22	50	4	40	105.0	156.0	0.001	0	149.0	28.00	51.0	0.0E+00	10.02	1.43	**9.2E-03**	**7.9E+02**	**5.3**	28.00	0.00%	pass	6.0E-04	1.0E-03	4.3E-03
00111269	4	23	54	4	50	108.0	160.0	0.001	0	149.0	31.00	52.0	0.0E+00	9.74	1.61	**1.0E-02**	**8.8E+02**	**5.9**	31.00	0.00%	pass	6.8E-04	1.2E-03	4.8E-03
00114342	4	35	37	3	20	137.0	175.0	0.001	0	149.0	2.00	38.0	0.0E+00	14.78	10.00	**8.5E-02**	**7.3E+03**	**49.0**	2.00	0.01%	pass	4.2E-03	9.6E-03	3.8E-02
00114417	10	89	120	10	300	240.0	383.0	0.001	0	149.0	31.00	143.0	0.0E+00	0.15	9.68	**2.9E-02**	**2.5E+03**	**16.6**	31.00	0.00%	pass	4.2E-03	3.4E-03	7.2E-03
00121670	4	12	30	3	30	144.0	200.0	0.001	0	149.0	18.00	56.0	0.0E+00	8.71	1.67	**9.9E-03**	**8.5E+02**	**5.7**	18.00	0.00%	pass	7.0E-04	1.1E-03	4.6E-03
00122176	4	17	40	2	30	119.0	129.0	0.001	0	149.0	23.00	10.0	0.0E+00	59.65	1.30	**3.1E-02**	**2.7E+03**	**18.2**	23.00	0.00%	pass	5.4E-04	3.5E-03	1.7E-02
00122201	4	22	45	6	20	188.0	201.0	0.001	0	149.0	23.00	13.0	0.0E+00	46.09	0.87	**1.7E-02**	**1.5E+03**	**9.8**	23.00	0.00%	pass	3.6E-04	1.9E-03	8.7E-03
00122215	6	18	42	4	100	127.0	181.0	0.001	0	149.0	24.00	54.0	0.0E+00	8.50	4.17	**2.5E-02**	**2.1E+03**	**14.3**	24.00	0.00%	pass	1.8E-03	2.8E-03	1.1E-02
00122231	6	22	48	5	100	141.0	241.0	0.001	0	149.0	26.00	100.0	0.0E+00	2.27	3.85	**1.4E-02**	**1.2E+03**	**8.1**	26.00	0.00%	pass	1.7E-03	1.6E-03	5.6E-03
00122451	4	28	40	2	30	148.0	172.0	0.001	0	149.0	12.00	24.0	0.0E+00	24.77	2.50	**2.9E-02**	**2.5E+03**	**17.0**	12.00	0.00%	pass	1.0E-03	3.3E-03	1.4E-02
00122464	4	38	45	2	25	159.0	230.0	0.001	0	149.0	7.00	71.0	0.0E+00	5.78	3.57	**1.8E-02**	**1.5E+03**	**10.2**	7.00	0.01%	pass	1.5E-03	2.0E-03	8.1E-03
00122534	4	27	40	2	25	163.0	215.0	0.001	0	149.0	13.00	52.0	0.0E+00	9.74	1.92	**1.2E-02**	**1.0E+03**	**7.0**	13.00	0.00%	pass	8.1E-04	1.4E-03	5.7E-03
00122886	4	15	32	4	12	155.0	200.0	0.001	0	149.0	17.00	45.0	0.0E+00	11.92	0.71	**4.9E-03**	**4.3E+02**	**2.9**	17.00	0.00%	pass	3.0E-04	5.6E-04	2.3E-03
00124102	4	13	20	5	30	108.0	117.0	0.001	0	149.0	7.00	9.0	0.0E+00	66.14	4.29	**1.1E-01**	**9.9E+03**	**66.6**	7.00	0.00%	pass	1.8E-03	1.3E-02	6.1E-02
00124136	4	35	50	4	50	180.0	197.0	0.001	0	149.0	15.00	17.0	0.0E+00	35.30	3.33	**5.2E-02**	**4.5E+03**	**30.3**	15.00	0.00%	pass	1.4E-03	5.9E-03	2.6E-02
00124136	4	35	50	2	50	180.0	197.0	0.001	0	149.0	15.00	17.0	0.0E+00	35.30	3.33	**5.2E-02**	**4.5E+03**	**30.1**	15.00	0.00%	pass	1.4E-03	5.8E-03	2.6E-02
00124971	4	35	55	4	30	127.0	132.0	0.001	0	149.0	20.00	5.0	0.0E+00	117.56	1.50	**6.7E-02**	**5.8E+03**	**39.1**	20.00	0.00%	pass	6.1E-04	7.5E-03	3.8E-02
00124998	4	16	30	4	100	172.0	204.0	0.001	0	149.0	14.00	32.0	0.0E+00	18.09	7.14	**6.9E-02**	**6.0E+03**	**39.9**	14.00	0.00%	pass	3.0E-03	7.8E-03	3.1E-02
00126388	4	50	60	3	30	216.0	246.0	0.001	0	149.0	10.00	30.0	0.0E+00	19.45	3.00	**3.0E-02**	**2.6E+03**	**17.3**	10.00	0.00%	pass	1.2E-03	3.4E-03	1.4E-02
00126472	4	50	60	3	40	151.0	186.0	0.001	0	149.0	10.00	35.0	0.0E+00	16.31	4.00	**3.5E-02**	**3.1E+03**	**20.5**	10.00	0.00%	pass	1.7E-03	4.0E-03	1.6E-02
00126500	4	30	40	3	30	136.0	170.0	0.001	0	149.0	10.00	34.0	0.0E+00	16.87	3.00	**2.7E-02**	**2.3E+03**	**15.6**	10.00	0.00%	pass	1.2E-03	3.1E-03	1.3E-02
00126601	4	40	63	3	12	132.0	200.0	0.001	0	149.0	23.00	68.0	0.0E+00	6.28	0.52	**2.5E-03**	**2.2E+02**	**1.5**	23.00	0.00%	pass	2.2E-04	2.9E-04	1.2E-03
00126606	4	22	42	3	12	110.0	145.0	0.001	0	149.0	20.00	35.0	0.0E+00	16.31	0.60	**5.1E-03**	**4.4E+02**	**3.0**	20.00	0.00%	pass	2.5E-04	5.8E-04	2.4E-03
00126611	4	40	63	3	12	156.0	215.0	0.001	0	149.0	23.00	59.0	0.0E+00	8.02	0.52	**2.8E-03**	**2.5E+02**	**1.7**	23.00	0.00%	pass	2.2E-04	3.3E-04	1.4E-03
00126695	4	20	50	1	60	179.0	235.0	0.001	0	149.0	30.00	56.0	0.0E+00	8.71	2.00	**1.2E-02**	**9.9E+02**	**6.7**	30.00	0.00%	pass	8.4E-04	1.3E-03	5.6E-03
00126782	4	20	42	3	12	132.0	185.0	0.001	0	149.0	22.00	53.0	0.0E+00	9.47	0.55	**3.3E-03**	**2.8E+02**	**1.9**	22.00	0.00%	pass	2.3E-04	3.7E-04	1.6E-03
00126814	4	20	30	3	30	125.0	185.0	0.001	0	149.0	10.00	60.0	0.0E+00	7.80	3.00	**1.7E-02**	**1.5E+03**	**9.9**	10.00	0.01%	pass	1.3E-03	2.0E-03	7.9E-03
00127218	4	22	32	3	30	132.0	172.0	0.001	0	149.0	10.00	40.0	0.0E+00	13.87	3.00	**2.4E-02**	**2.0E+03**	**13.8**	10.00	0.00%	pass	1.3E-03	2.7E-03	1.1E-02
00127250	4	50	60	3	40	108.0	141.0	0.001	0	149.0	10.00	33.0	0.0E+00	17.46	4.00	**3.7E-02**	**3.2E+03**	**21.5**	10.00	0.00%	pass	1.7E-03	4.2E-03	1.7E-02
00128107	4	19	22	3	50	134.0	155.0	0.001	0	149.0	3.00	21.0	0.0E+00	28.47	16.67	**2.2E-01**	**1.9E+04**	**130.3**	3.00	0.01%	pass	6.9E-03	2.5E-02	1.1E-01
00128150	4	24	26	3	20	197.0	201.0	0.001	0	149.0	2.00	4.0	0.0E+00	146.35	10.00	**5.5E-01**	**4.8E+04**	**321.5**	2.00	0.00%	pass	4.1E-03	6.2E-02	3.2E-01
00131212	4	20	40	2	40	112.0	180.0	0.001	0	149.0	20.00	68.0	0.0E+00	6.28	2.00	**1.0E-02**	**8.6E+02**	**5.8**	20.00	0.00%	pass	8.5E-04	1.2E-03	4.7E-03
00131265	4	28	45	2	30	125.0	130.0	0.001	0	149.0	17.00	5.0	0.0E+00	117.56	1.76	**7.9E-02**	**6.8E+03**	**45.9**	17.00	0.00%	pass	7.2E-04	8.8E-03	4.5E-02
00131278	4	16	35	2	30	151.0	180.0	0.001	0	149.0	19.00	29.0	0.0E+00	20.20	1.58	**1.6E-02**	**1.4E+03**	**9.2**	19.00	0.00%	pass	6.6E-04	1.8E-03	7.6E-03
00132007	4	43	55	3	50	191.0	236.0	0.001	0	149.0	12.00	45.0	0.0E+00	11.92	4.17	**3.0E-02**	**2.6E+03**	**17.5**	12.00	0.00%	pass	1.7E-03	3.4E-03	1.4E-02
00132021	4	27	33	3	50	209.0	280.0	0.001	0	149.0	6.00	71.0	0.0E+00	5.78	8.33	**4.3E-02**	**3.7E+03**	**24.8**	6.00	0.00%	pass	3.5E-03	4.9E-03	1.9E-02
00135310	4	40	84	2	20	169.0	209.0	0.001	0	149.0	44.00	40.0	0.0E+00	13.87	0.45	**3.4E-03**	**2.9E+02**	**2.0**	44.00	0.00%	pass	1.9E-04	3.9E-04	1.7E-03
00135845	4	30	45	2	30	142.0	166.0	0.001	0	149.0	15.00	24.0	0.0E+00	24.77	2.00	**2.3E-02**	**2.0E+03**	**13.6**	15.00	0.00%	pass	8.3E-04	2.6E-03	1.1E-02
00136071	4	15	40	4	60	190.0	239.0	0.001	0	149.0	25.00	49.0	0.0E+00	10.61	2.40	**1.6E-02**	**1.4E+03**	**9.4**	25.00	0.00%	pass	1.0E-03	1.8E-03	7.4E-03
00136093	4	20	40	4	60	147.0	201.0	0.001	0	149.0	20.00	54.0	0.0E+00	9.21	3.00	**1.9E-02**	**1.6E+03**	**10.9**	20.00	0.00%	pass	1.3E-03	2.2E-03	8.6E-03
00137742	4	25	80	2	100	169.0	215.0	0.001	0	149.0	55.00	46.0	0.0E+00	11.57	1.82	**1.3E-02**	**1.1E+03**	**7.3**	55.00	0.00%	pass	7.6E-04	1.4E-03	5.9E-03
00137742	4	25	60	2	25	169.0	215.0	0.001	0	149.0	35.00	46.0	0.0E+00	11.57	0.71	**4.8E-03**	**4.2E+02**	**2.8**	35.00	0.00%	pass	3.0E-04	5.5E-04	2.3E-03
00139715	4	20	40	3	50	150.0	200.0	0.001	0	149.0	20.00	50.0	0.0E+00	10.31	2.50	**1.6E-02**	**1.4E+03**	**9.5**	20.00	0.00%	pass	1.0E-03	1.9E-03	7.6E-03
00139715	4	20	40	2	50	150.0	200.0	0.001	0	149.0	20.00	50.0	0.0E+00	10.31	2.50	**1.6E-02**	**1.4E+03**	**9.4**	20.00	0.00%	pass	1.0E-03	1.9E-03	7.6E-03
00140015	4	32	42	3	50	123.0	173.0	0.001	0	149.0	10.00	50.0	0.0E+00	10.31	5.00	**3.4E-02**	**2.9E+03**	**19.4**	10.00	0.00%	pass	2.1E-03	3.8E-03	1.5E-02
00140127	4	25	40	4	30	178.0	187.0	0.001	0	149.0	15.00	9.0	0.0E+00	66.14	2.00	**5.3E-02**	**4.6E+03**	**30.9**	15.00	0.00%	pass	8.2E-04	6.0E-03	2.9E-02
00140134	4	12	25	4	50	180.0	215.0	0.001	0	149.0	13.00	35.0	0.0E+00	16.31	3.85	**3.4E-02**	**3.0E+03**	**19.8**	13.00	0.00%	pass	1.6E-03	3.9E-03	1.6E-02
00140142	4	20	40	4	60	181.0	205.0	0.001	0	149.0	20.00	24.0	0.0E+00	24.77	3.00	**3.6E-02**	**3.1E+03**	**20.7**	20.00	0.00%	pass	1.2E-03	4.0E-03	1.7E-02
00140156	4	45	60	4	45	169.0	242.0	0.001	0	149.0	15.00	73.0	0.0E+00	5.47	3.00	**1.5E-02**	**1.3E+03**	**8.5**	15.00	0.00%	pass	1.3E-03	1.7E-03	6.6E-03
00143228	4	20	40	2	30	137.0	186.0	0.001	0	149.0	20.00	49.0	0.0E+00	10.61	1.50	**9.8E-03**	**8.4E+02**	**5.7**	20.00	0.00%	pass	6.3E-04	1.1E-03	4.6E-03
00144029	4	22	36	3	30	100.0	130.0	0.001	0	149.0	14.00	30.0	0.0E+00	19.45	2.14	**2.1E-02**	**1.8E+03**	**12.3**	14.00	0.00%	pass	8.9E-04	2.4E-03	1.0E-02
00144196	4	35	55	2	25	121.0	126.0	0.001	0	149.0	20.00	5.0	0.0E+00	117.56	1.25	**5.6E-02**	**4.8E+03**	**32.4**	20.00	0.00%	pass	5.1E-04	6.2E-03	3.2E-02
00145410	4	33	50	5	30	133.0	179.0	0.001	0	149.0	17.00	46.0	0.0E+00	11.57	1.76	**1.2E-02**	**1.1E+03**	**7.2**	17.00	0.00%	pass	7.4E-04	1.4E-03	5.7E-03

00147116	4	19	63	4	100	107.0	136.0	0.001	0	149.0	44.00	29.0	0.0E+00	20.20	2.27	**2.3E-02**	**2.0E+03**	**13.4**	44.00	0.00%	pass	9.4E-04	2.6E-03	1.1E-02
00147142	4	20	50	3	20	80.0	120.0	0.001	0	149.0	30.00	40.0	0.0E+00	13.87	0.67	**5.1E-03**	**4.4E+02**	**3.0**	30.00	0.00%	pass	2.8E-04	5.8E-04	2.4E-03
00147143	4	31	63	8	80	190.0	261.0	0.001	0	149.0	32.00	71.0	0.0E+00	5.78	2.50	**1.3E-02**	**1.1E+03**	**7.4**	32.00	0.00%	pass	1.1E-03	1.5E-03	5.6E-03
00147155	4	15	50	3	65	168.0	210.0	0.001	0	149.0	35.00	42.0	0.0E+00	13.04	1.86	**1.4E-02**	**1.2E+03**	**8.1**	35.00	0.00%	pass	7.8E-04	1.6E-03	6.5E-03
00149422	4	10	20	3	40	150.0	171.0	0.001	0	149.0	10.00	21.0	0.0E+00	28.47	4.00	**5.3E-02**	**4.6E+03**	**30.7**	10.00	0.00%	pass	1.7E-03	6.0E-03	2.6E-02
00155121	4	17	32	3	50	166.0	216.0	0.001	0	149.0	15.00	50.0	0.0E+00	10.31	3.33	**2.2E-02**	**1.9E+03**	**12.8**	15.00	0.00%	pass	1.4E-03	2.5E-03	1.0E-02
00155266	4	25	35	3	35	126.0	173.0	0.001	0	149.0	10.00	47.0	0.0E+00	11.24	3.50	**2.4E-02**	**2.1E+03**	**14.2**	10.00	0.00%	pass	1.5E-03	2.8E-03	1.1E-02
00155907	4	25	35	3	20	150.0	171.0	0.001	0	149.0	10.00	21.0	0.0E+00	28.47	2.00	**2.6E-02**	**2.3E+03**	**15.2**	10.00	0.00%	pass	8.3E-04	3.0E-03	1.3E-02
00156559	4	10	30	2	30	119.0	138.0	0.001	0	149.0	20.00	19.0	0.0E+00	31.54	1.50	**2.1E-02**	**1.8E+03**	**12.2**	20.00	0.00%	pass	6.2E-04	2.4E-03	1.0E-02
00156561	4	20	40	2	30	144.0	201.0	0.001	0	149.0	20.00	57.0	0.0E+00	8.48	1.50	**8.6E-03**	**7.4E+02**	**5.0**	20.00	0.00%	pass	6.3E-04	9.9E-04	4.1E-03
00156570	4	30	70	2	50	155.0	195.0	0.001	0	149.0	40.00	40.0	0.0E+00	13.87	1.25	**9.6E-03**	**8.3E+02**	**5.6**	40.00	0.00%	pass	5.2E-04	1.1E-03	4.6E-03
00158324	4	15	50	4	50	178.0	200.0	0.001	0	149.0	35.00	22.0	0.0E+00	27.13	1.43	**1.8E-02**	**1.6E+03**	**10.4**	35.00	0.00%	pass	5.9E-04	2.0E-03	8.7E-03
00158324	4	15	50	2	50	178.0	200.0	0.001	0	149.0	35.00	22.0	0.0E+00	27.13	1.43	**1.8E-02**	**1.5E+03**	**10.3**	35.00	0.00%	pass	5.9E-04	2.0E-03	8.7E-03
00158330	4	20	40	3	40	134.0	156.0	0.001	0	149.0	20.00	22.0	0.0E+00	27.13	2.00	**2.5E-02**	**2.2E+03**	**14.6**	20.00	0.00%	pass	8.3E-04	2.8E-03	1.2E-02
00158330	4	20	40	2	40	134.0	156.0	0.001	0	149.0	20.00	22.0	0.0E+00	27.13	2.00	**2.5E-02**	**2.2E+03**	**14.6**	20.00	0.00%	pass	8.3E-04	2.8E-03	1.2E-02
00158334	4	20	40	4	40	135.0	188.0	0.001	0	149.0	20.00	53.0	0.0E+00	9.47	2.00	**1.3E-02**	**1.1E+03**	**7.3**	20.00	0.00%	pass	8.4E-04	1.4E-03	5.8E-03
00158334	4	20	40	2	40	135.0	188.0	0.001	0	149.0	20.00	53.0	0.0E+00	9.47	2.00	**1.2E-02**	**1.1E+03**	**7.1**	20.00	0.00%	pass	8.4E-04	1.4E-03	5.8E-03
00159327	4	12	95	4	65	197.0	231.0	0.001	0	149.0	83.00	34.0	0.0E+00	16.87	0.78	**6.9E-03**	**6.0E+02**	**4.0**	83.00	0.00%	pass	3.3E-04	7.8E-04	3.3E-03
00159563	4	15	25	4	30	144.0	187.0	0.001	0	149.0	10.00	43.0	0.0E+00	12.65	3.00	**2.3E-02**	**1.9E+03**	**13.1**	10.00	0.00%	pass	1.3E-03	2.6E-03	1.0E-02
00159631	4	30	33	4	45	138.0	171.0	0.001	0	149.0	3.00	33.0	0.0E+00	17.46	15.00	**1.4E-01**	**1.2E+04**	**83.0**	3.00	0.01%	pass	6.2E-03	1.6E-02	6.4E-02
00161441	14	9.5	24	24	500	243.0	323.0	0.001	0	149.0	14.50	80.0	0.0E+00	3.43	34.48	**1.5E-01**	**1.3E+04**	**89.1**	14.50	0.00%	pass	1.5E-02	1.8E-02	5.5E-02
00161813	4	32	50	2	30	209.0	260.0	0.001	0	149.0	18.00	51.0	0.0E+00	10.02	1.67	**1.1E-02**	**9.1E+02**	**6.1**	18.00	0.00%	pass	7.0E-04	1.2E-03	5.0E-03
00165893	4	25	40	4.5	30	150.0	197.0	0.001	0	149.0	15.00	47.0	0.0E+00	11.24	2.00	**1.4E-02**	**1.2E+03**	**8.1**	15.00	0.00%	pass	8.4E-04	1.6E-03	6.4E-03
00166870	4	27	75	3	30	112.0	160.0	0.001	0	149.0	48.00	48.0	0.0E+00	10.92	0.63	**4.1E-03**	**3.5E+02**	**2.4**	48.00	0.00%	pass	2.6E-04	4.7E-04	2.0E-03
00166889	4	32	60	3	40	98.0	150.0	0.001	0	149.0	28.00	52.0	0.0E+00	9.74	1.43	**9.0E-03**	**7.7E+02**	**5.2**	28.00	0.00%	pass	6.0E-04	1.0E-03	4.2E-03
00169239	4	15	25	3.5	35	181.0	185.0	0.001	0	149.0	10.00	4.0	0.0E+00	146.35	3.50	**1.9E-01**	**1.7E+04**	**112.2**	10.00	0.00%	pass	1.4E-03	2.2E-02	1.1E-01
00169240	4	20	30	3.5	25	169.0	173.0	0.001	0	149.0	10.00	4.0	0.0E+00	146.35	2.50	**1.4E-01**	**1.2E+04**	**80.1**	10.00	0.00%	pass	1.0E-03	1.5E-02	8.0E-02
00170412	4	35	60	3	40	150.0	201.0	0.001	0	149.0	25.00	51.0	0.0E+00	10.02	1.60	**1.0E-02**	**8.8E+02**	**5.9**	25.00	0.00%	pass	6.7E-04	1.2E-03	4.8E-03
00170412	4	35	60	2	40	150.0	201.0	0.001	0	149.0	25.00	51.0	0.0E+00	10.02	1.60	**1.0E-02**	**8.7E+02**	**5.9**	25.00	0.00%	pass	6.7E-04	1.2E-03	4.8E-03
00170415	4	25	60	3	50	118.0	152.0	0.001	0	149.0	35.00	34.0	0.0E+00	16.87	1.43	**1.3E-02**	**1.1E+03**	**7.3**	35.00	0.00%	pass	6.0E-04	1.4E-03	6.0E-03
00170415	4	25	60	2	50	118.0	152.0	0.001	0	149.0	35.00	34.0	0.0E+00	16.87	1.43	**1.3E-02**	**1.1E+03**	**7.3**	35.00	0.00%	pass	6.0E-04	1.4E-03	6.0E-03
00170429	4	15	40	4	40	138.0	156.0	0.001	0	149.0	25.00	18.0	0.0E+00	33.32	1.60	**2.4E-02**	**2.1E+03**	**13.8**	25.00	0.00%	pass	6.6E-04	2.7E-03	1.2E-02
00170429	4	15	40	2	40	138.0	156.0	0.001	0	149.0	25.00	18.0	0.0E+00	33.32	1.60	**2.4E-02**	**2.0E+03**	**13.7**	25.00	0.00%	pass	6.6E-04	2.7E-03	1.2E-02
00170445	4	25	60	3	30	190.0	246.0	0.001	0	149.0	35.00	56.0	0.0E+00	8.71	0.86	**5.0E-03**	**4.3E+02**	**2.9**	35.00	0.00%	pass	3.6E-04	5.7E-04	2.4E-03
00170445	4	25	60	2	30	190.0	246.0	0.001	0	149.0	35.00	56.0	0.0E+00	8.71	0.86	**4.9E-03**	**4.2E+02**	**2.8**	35.00	0.00%	pass	3.6E-04	5.6E-04	2.4E-03
00174572	4	20	30	4	40	60.0	112.0	0.001	0	149.0	10.00	52.0	0.0E+00	9.74	4.00	**2.6E-02**	**2.2E+03**	**15.1**	10.00	0.00%	pass	1.7E-03	3.0E-03	1.2E-02
00174862	4	18	100	3	65	138.0	153.0	0.001	0	149.0	82.00	15.0	0.0E+00	40.00	0.79	**1.4E-02**	**1.2E+03**	**7.8**	82.00	0.00%	pass	3.3E-04	1.5E-03	6.9E-03
00175606	4	12	30	2	30	114.0	127.0	0.001	0	149.0	18.00	13.0	0.0E+00	46.09	1.67	**3.2E-02**	**2.8E+03**	**18.7**	18.00	0.00%	pass	6.9E-04	3.6E-03	1.7E-02
00175608	4	20	40	2	30	175.0	246.0	0.001	0	149.0	20.00	71.0	0.0E+00	5.78	1.50	**7.1E-03**	**6.2E+02**	**4.1**	20.00	0.00%	pass	6.4E-04	8.2E-04	3.4E-03
00178931	4	25	50	3	30	152.0	175.0	0.001	0	149.0	25.00	23.0	0.0E+00	25.91	1.20	**1.5E-02**	**1.3E+03**	**8.4**	25.00	0.00%	pass	5.0E-04	1.6E-03	7.0E-03
00179360	4	7	20	3	50	191.0	245.0	0.001	0	149.0	13.00	54.0	0.0E+00	9.21	3.85	**2.4E-02**	**2.1E+03**	**14.0**	13.00	0.00%	pass	1.6E-03	2.8E-03	1.1E-02
00183172	4	35	45	2	30	185.0	211.0	0.001	0	149.0	10.00	26.0	0.0E+00	22.75	3.00	**3.3E-02**	**2.9E+03**	**19.2**	10.00	0.00%	pass	1.2E-03	3.7E-03	1.6E-02
00183178	4	23	40	2	30	142.0	178.0	0.001	0	149.0	17.00	36.0	0.0E+00	15.77	1.76	**1.5E-02**	**1.3E+03**	**8.6**	17.00	0.00%	pass	7.4E-04	1.7E-03	7.0E-03
00183460	4	13	25	3	60	192.0	218.0	0.001	0	149.0	12.00	26.0	0.0E+00	22.75	5.00	**5.6E-02**	**4.8E+03**	**32.5**	12.00	0.00%	pass	2.1E-03	6.3E-03	2.6E-02
00183465	4	13	25	3	60	174.0	198.0	0.001	0	149.0	12.00	24.0	0.0E+00	24.77	5.00	**6.0E-02**	**5.2E+03**	**34.6**	12.00	0.00%	pass	2.1E-03	6.7E-03	2.8E-02
00184772	4	20	40	1	50	175.0	220.0	0.001	0	149.0	20.00	45.0	0.0E+00	11.92	2.50	**1.7E-02**	**1.5E+03**	**10.1**	20.00	0.00%	pass	1.0E-03	2.0E-03	8.3E-03
00190449	4	50	100	3	30	225.0	298.0	0.001	0	149.0	50.00	73.0	0.0E+00	5.47	0.60	**2.7E-03**	**2.4E+02**	**1.6**	50.00	0.00%	pass	2.5E-04	3.2E-04	1.3E-03
00193457	4	40	45	2	35	142.0	192.0	0.001	0	149.0	5.00	50.0	0.0E+00	10.31	7.00	**4.7E-02**	**4.0E+03**	**27.2**	5.00	0.00%	pass	2.9E-03	5.4E-03	2.1E-02
00193762	4	30	60	4	40	214.0	261.0	0.001	0	149.0	30.00	47.0	0.0E+00	11.24	1.33	**9.1E-03**	**7.9E+02**	**5.3**	30.00	0.00%	pass	5.6E-04	1.0E-03	4.3E-03
00193762	4	30	60	2	40	214.0	261.0	0.001	0	149.0	30.00	47.0	0.0E+00	11.24	1.33	**9.0E-03**	**7.8E+02**	**5.2**	30.00	0.00%	pass	5.6E-04	1.0E-03	4.3E-03
00193769	4	10	60	4	40	203.0	261.0	0.001	0	149.0	50.00	58.0	0.0E+00	8.25	0.80	**4.5E-03**	**3.9E+02**	**2.6**	50.00	0.00%	pass	3.4E-04	5.2E-04	2.2E-03
00193769	4	10	60	2	40	203.0	261.0	0.001	0	149.0	50.00	58.0	0.0E+00	8.25	0.80	**4.4E-03**	**3.8E+02**	**2.6**	50.00	0.00%	pass	3.4E-04	5.1E-04	2.2E-03
00194968	4	25	100	5	45	241.0	283.0	0.001	0	149.0	75.00	42.0	0.0E+00	13.04	0.60	**4.4E-03**	**3.8E+02**	**2.6**	75.00	0.00%	pass	2.5E-04	5.1E-04	2.1E-03
00197403	4	20	75	1	100	214.0	230.0	0.001	0	149.0	55.00	16.0	0.0E+00	37.51	1.82	**2.9E-02**	**2.5E+03**	**17.0**	55.00	0.00%	pass	7.5E-04	3.3E-03	1.5E-02
00197403	4	20	40	2	50	214.0	230.0	0.001	0	149.0	20.00	16.0	0.0E+00	37.51	2.50	**4.1E-02**	**3.5E+03**	**23.6**	20.00	0.00%	pass	1.0E-03	4.6E-03	2.1E-02
00197571	4	38	52	3	40	169.0	200.0	0.001	0	149.0	14.00	31.0	0.0E+00	18.75	2.86	**2.8E-02**	**2.4E+03**	**16.0**	14.00	0.00%	pass	1.2E-03	3.1E-03	1.3E-02
00199985	4	30	50	2	30	241.0	290.0	0.001	0	149.0	20.00	49.0	0.0E+00	10.61	1.50	**9.8E-03**	**8.4E+02**	**5.7**	20.00	0.00%	pass	6.3E-04	1.1E-03	4.6E-03
00199993	4	20	40	2	30	218.0	260.0	0.001	0	149.0	20.00	42.0	0.0E+00	13.04	1.50	**1.1E-02**	**9.6E+02**	**6.4**	20.00	0.00%	pass	6.3E-04	1.3E-03	5.3E-03
00199998	4	34	50	2	30	212.0	265.0	0.001	0	149.0	16.00	53.0	0.0E+00	9.47	1.88	**1.2E-02**	**1.0E+03**	**6.7**	16.00	0.00%	pass	7.9E-04	1.3E-03	5.4E-03
00248810	4	32	55	3	20	147.0	188.0	0.001	0	149.0	23.00	41.0	0.0E+00	13.45	0.87	**6.5E-03**	**5.7E+02**	**3.8**	23.00	0.00%	pass	3.6E-04	7.5E-04	3.1E-03
00251821	4	46	48	1	25	226.0	270.0	0.001	0	149.0	2.00	44.0	0.0E+00	12.28	12.50	**9.2E-02**	**8.0E+03**	**53.5**	2.00	0.00%	pass	5.2E-03	1.1E-02	4.2E-02
00257095	4	20	40	3	80	151.0	215.0	0.001	0	149.0	20.00	64.0	0.0E+00	7.00	4.00	**2.2E-02**	**1.9E+03**	**12.7**	20.00	0.00%	pass	1.7E-03	2.5E-03	9.9E-03
00270121	4	14	46	2	16	132.0	165.0	0.001	0	149.0	32.00	33.0	0.0E+00	17.46	0.50	**4.4E-03**	**3.8E+02**	**2.6**	32.00	0.00%	pass	2.1E-04	5.0E-04	2.1E-03
00404152	4	40	60	3	35	148.0	170.0	0.001	0	149.0	20.00	22.0	0.0E+00	27.13	1.75	**2.2E-02**	**1.9E+03**	**12.8**	20.00	0.00%	pass	7.2E-04	2.5E-03	1.1E-02
00404503	4	21	30	3	60	161.0	190.0	0.001	0	149.0	9.00	29.0	0.0E+00	20.20	6.67	**6.9E-02**	**6.0E+03**	**40.0**	9.00	0.01%	pass	2.8E-03	7.8E-03	3.2E-02
00404541	4	8	20	3	60	154.0	176.0	0.001	0	149.0	12.00	22.0	0.0E+00	27.13	5.00	**6.4E-02**	**5.5E+03**	**37.1**	12.00	0.00%	pass	2.1E-03	7.2E-03	3.1E-02
00404543	4	23	30	3	30	117.0	185.0	0.001	0	149.0	7.00	68.0	0.0E+00	6.28	4.29	**2.2E-02**	**1.9E+03**	**12.9**	7.00	0.01%	pass	1.8E-03	2.6E-03	1.0E-02
00404703	4	18	35	3	20	147.0	157.0	0.001	0	149.0	17.00	10.0	0.0E+00	59.65	1.18	**2.8E-02**	**2.5E+03**	**16.5**	17.00	0.00%	pass	4.8E-04	3.2E-03	1.5E-02
00404761	4	20	100	60	15	175.0	215.0	0.001	0	149.0	80.00	40.0	0.0E+00	13.87	0.19	**1.5E-03**	**1.3E+02**	**0.9**	80.00	0.00%	pass	7.8E-05	1.7E-04	6.8E-04
00405736	4	13	40	1	45	136.0	146.0	0.001	0	149.0	27.00	10.0	0.0E+00	59.65	1.67	**4.0E-02**	**3.5E+03**	**23.2**	27.00	0.00%	pass	6.9E-04	4.5E-03	2.2E-02
00405804	4	30	100	1	100	203.0	236.0	0.001	0	149.0	70.00	33.0	0.0E+00	17.46	1.43	**1.3E-02**	**1.1E+03**	**7.4**	70.00	0.00%	pass	6.0E-04	1.4E-03	6.1E-03
00405804	4	30	50	2	35	203.0	236.0	0.001	0	149.0	20.00	33.0	0.0E+00	17.46	1.75	**1.6E-02**	**1.4E+03**	**9.2**	20.00	0.00%	pass	7.3E-04	1.8E-03	7.5E-03
00405868	4	10	60	1	60	111.0	155.0	0.001	0	149.0	50.00	44.0	0.0E+00	12.28	1.20	**8.4E-03**	**7.2E+02**	**4.8**	50.00	0.00%	pass	5.0E-04	9.5E-04	4.1E-03
00405868	4	10	30	3	40	111.0	155.0	0.001	0	149.0	20.00	44.0	0.0E+00	12.28	2.00	**1.5E-02**	**1.3E+03**	**8.4**	20.00	0.00%	pass	8.4E-04	1.7E-03	6.8E-03
00406253	4	36	100	2	40	147.0	217.0	0.001	0	149.0	64.00	70.0	0.0E+00	5.94	0.63	**2.9E-03**	**2.5E+02**	**1.7**	64.00	0.00%	pass	2.7E-04	3.4E-04	1.4E-03
00406265	4	25	100	2	40	220.0	257.0	0.001	0	149.0	75.00	37.0	0.0E+00	15.26	0.53	**4.3E-03**	**3.7E+02**	**2.5**	75.00	0.00%	pass	2.2E-04	4.9E-04	2.1E-03
00406273	4	30	40	2	40	126.0	200.0	0.001	0	149.0	10.00	74.0	0.0E+00	5.32	4.00	**1.9E-02**	**1.6E+03**	**11.1**	10.00	0.01%	pass	1.7E-03	2.2E-03	8.7E-03
00406286	4	20	100	1	50	147.0	220.0	0.001	0	149.0	80.00	73.0	0.0E+00	5.47	0.63	**2.7E-03**	**2.3E+02**	**1.6**	80.00	0.00%	pass	2.7E-04	3.2E-04	1.4E-03

00406298	4	10	100	1	50	147.0	219.0	0.001	0	149.0	90.00	72.0	0.0E+00	5.63	0.56	**2.4E-03**	**2.1E+02**	**1.4**	90.00	0.00%	pass	2.4E-04	2.8E-04	1.2E-03
00406323	4	25	100	2	50	190.0	220.0	0.001	0	149.0	75.00	30.0	0.0E+00	19.45	0.67	**6.4E-03**	**5.5E+02**	**3.7**	75.00	0.00%	pass	2.8E-04	7.2E-04	3.1E-03
00406327	4	20	80	2.5	50	109.0	160.0	0.001	0	149.0	60.00	51.0	0.0E+00	10.02	0.83	**5.2E-03**	**4.5E+02**	**3.0**	60.00	0.00%	pass	3.5E-04	6.0E-04	2.5E-03
00406332	4	25	100	2	60	147.0	223.0	0.001	0	149.0	75.00	76.0	0.0E+00	5.04	0.80	**3.5E-03**	**3.0E+02**	**2.0**	75.00	0.00%	pass	3.4E-04	4.1E-04	1.7E-03
00406341	4	30	100	1	50	131.0	203.0	0.001	0	149.0	70.00	72.0	0.0E+00	5.63	0.71	**3.2E-03**	**2.7E+02**	**1.8**	70.00	0.00%	pass	3.0E-04	3.7E-04	1.6E-03
00406342	4	18	100	1	50	155.0	183.0	0.001	0	149.0	82.00	28.0	0.0E+00	20.99	0.61	**6.1E-03**	**5.3E+02**	**3.5**	82.00	0.00%	pass	2.5E-04	6.9E-04	3.0E-03
00406344	4	20	80	3	50	105.0	168.0	0.001	0	149.0	60.00	63.0	0.0E+00	7.19	0.83	**4.4E-03**	**3.8E+02**	**2.5**	60.00	0.00%	pass	3.5E-04	5.0E-04	2.1E-03
00406347	4	50	80	4	40	210.0	283.0	0.001	0	149.0	30.00	73.0	0.0E+00	5.47	1.33	**6.3E-03**	**5.5E+02**	**3.7**	30.00	0.00%	pass	5.7E-04	7.3E-04	2.9E-03
00408566	4	25	30	2	40	110.0	180.0	0.001	0	149.0	5.00	70.0	0.0E+00	5.94	8.00	**4.1E-02**	**3.5E+03**	**23.7**	5.00	0.00%	pass	3.4E-03	4.7E-03	1.8E-02
00408570	4	20	25	2	40	126.0	176.0	0.001	0	149.0	5.00	50.0	0.0E+00	10.31	8.00	**5.4E-02**	**4.6E+03**	**31.2**	5.00	0.00%	pass	3.4E-03	6.1E-03	2.4E-02
00408573	4	7	50	3	20	240.0	260.0	0.001	0	149.0	43.00	20.0	0.0E+00	29.94	0.47	**6.2E-03**	**5.4E+02**	**3.6**	43.00	0.00%	pass	1.9E-04	7.0E-04	3.1E-03
00408596	4	15	100	2	20	153.0	220.0	0.001	0	149.0	85.00	67.0	0.0E+00	6.45	0.24	**1.1E-03**	**9.5E+01**	**0.6**	85.00	0.00%	pass	1.0E-04	1.3E-04	5.6E-04
00408954	4	25	60	3	20	162.0	167.0	0.001	0	149.0	35.00	5.0	0.0E+00	117.56	0.57	**2.6E-02**	**2.2E+03**	**14.8**	35.00	0.00%	pass	2.3E-04	2.8E-03	1.5E-02
00408954	4	25	60	2	20	162.0	167.0	0.001	0	149.0	35.00	5.0	0.0E+00	117.56	0.57	**2.5E-02**	**2.2E+03**	**14.8**	35.00	0.00%	pass	2.3E-04	2.8E-03	1.5E-02
00409450	4	30	75	1	100	217.0	250.0	0.001	0	149.0	45.00	33.0	0.0E+00	17.46	2.22	**2.0E-02**	**1.7E+03**	**11.5**	45.00	0.00%	pass	9.3E-04	2.3E-03	9.5E-03
00409450	4	30	45	1	15	217.0	250.0	0.001	0	149.0	15.00	33.0	0.0E+00	17.46	1.00	**8.8E-03**	**7.6E+02**	**5.1**	15.00	0.00%	pass	4.2E-04	1.0E-03	4.3E-03
00409517	4	13	26	3	20	126.0	175.0	0.001	0	149.0	13.00	49.0	0.0E+00	10.61	1.54	**1.0E-02**	**8.8E+02**	**5.9**	13.00	0.00%	pass	6.5E-04	1.2E-03	4.8E-03
00410627	4	14	25	4	50	185.0	232.0	0.001	0	149.0	11.00	47.0	0.0E+00	11.24	4.55	**3.2E-02**	**2.8E+03**	**18.7**	11.00	0.00%	pass	1.9E-03	3.7E-03	1.5E-02
00410646	4	23	30	4	35	137.0	168.0	0.001	0	149.0	7.00	31.0	0.0E+00	18.75	5.00	**4.9E-02**	**4.2E+03**	**28.5**	7.00	0.00%	pass	2.1E-03	5.6E-03	2.3E-02
00410958	4	22	26	2	40	130.0	160.0	0.001	0	149.0	4.00	30.0	0.0E+00	19.45	10.00	**1.0E-01**	**8.7E+03**	**58.4**	4.00	0.01%	pass	4.2E-03	1.1E-02	4.6E-02
00411515	4	20	40	3	30	125.0	130.0	0.001	0	149.0	20.00	5.0	0.0E+00	117.56	1.50	**6.7E-02**	**5.8E+03**	**39.0**	20.00	0.00%	pass	6.1E-04	7.5E-03	3.8E-02
00415857	4	17	25	3	60	123.0	165.0	0.001	0	149.0	8.00	42.0	0.0E+00	13.04	7.50	**5.8E-02**	**5.0E+03**	**33.8**	8.00	0.00%	pass	3.1E-03	6.6E-03	2.6E-02
00415885	4	22	28	3	80	138.0	180.0	0.001	0	149.0	6.00	42.0	0.0E+00	13.04	13.33	**1.0E-01**	**9.1E+03**	**60.9**	6.00	0.00%	pass	5.6E-03	1.2E-02	4.7E-02
00415951	4	20	35	3	40	178.0	255.0	0.001	0	149.0	15.00	77.0	0.0E+00	4.90	2.67	**1.2E-02**	**1.1E+03**	**7.1**	15.00	0.00%	pass	1.1E-03	1.4E-03	5.6E-03
00415960	4	15	29	3	60	110.0	160.0	0.001	0	149.0	14.00	50.0	0.0E+00	10.31	4.29	**2.9E-02**	**2.5E+03**	**16.6**	14.00	0.00%	pass	1.8E-03	3.3E-03	1.3E-02
00415968	4	20	41	3	50	126.0	160.0	0.001	0	149.0	21.00	34.0	0.0E+00	16.87	2.38	**2.1E-02**	**1.8E+03**	**12.4**	21.00	0.00%	pass	9.9E-04	2.4E-03	9.9E-03
00416097	4	10	23	5	45	172.0	223.0	0.001	0	149.0	13.00	51.0	0.0E+00	10.02	3.46	**2.3E-02**	**2.0E+03**	**13.3**	13.00	0.00%	pass	1.5E-03	2.6E-03	1.0E-02
00416167	4	35	55	3	60	130.0	180.0	0.001	0	149.0	20.00	50.0	0.0E+00	10.31	3.00	**2.0E-02**	**1.7E+03**	**11.5**	20.00	0.00%	pass	1.3E-03	2.3E-03	9.1E-03
00416420	4	35	60	3	30	143.0	245.0	0.001	0	149.0	25.00	102.0	0.0E+00	2.31	1.20	**4.2E-03**	**3.6E+02**	**2.4**	25.00	0.00%	pass	5.2E-04	4.9E-04	1.8E-03
00416448	4	9	25	2	30	145.0	155.0	0.001	0	149.0	16.00	10.0	0.0E+00	59.65	1.88	**4.5E-02**	**3.9E+03**	**26.3**	16.00	0.00%	pass	7.7E-04	5.1E-03	2.4E-02
00417466	4	25	100	2	55	168.0	239.0	0.001	0	149.0	75.00	71.0	0.0E+00	5.78	0.73	**3.4E-03**	**2.9E+02**	**2.0**	75.00	0.00%	pass	3.1E-04	3.9E-04	1.7E-03
00417474	4	20	100	1	50	168.0	243.0	0.001	0	149.0	80.00	75.0	0.0E+00	5.18	0.63	**2.7E-03**	**2.3E+02**	**1.5**	80.00	0.00%	pass	2.7E-04	3.1E-04	1.4E-03
00417483	4	20	80	2	60	242.0	283.0	0.001	0	149.0	60.00	41.0	0.0E+00	13.45	1.00	**7.5E-03**	**6.5E+02**	**4.3**	60.00	0.00%	pass	4.2E-04	8.5E-04	3.6E-03
00417497	4	20	100	4	60	115.0	203.0	0.001	0	149.0	80.00	88.0	0.0E+00	3.58	0.75	**3.0E-03**	**2.6E+02**	**1.7**	80.00	0.00%	pass	3.2E-04	3.4E-04	1.4E-03
00418362	4	25	100	3	40	175.0	203.0	0.001	0	149.0	75.00	28.0	0.0E+00	20.99	0.53	**5.4E-03**	**4.7E+02**	**3.1**	75.00	0.00%	pass	2.2E-04	6.1E-04	2.6E-03
00418365	4	25	100	3	35	129.0	134.0	0.001	0	149.0	75.00	5.0	0.0E+00	117.56	0.47	**2.1E-02**	**1.8E+03**	**12.1**	75.00	0.00%	pass	1.9E-04	2.3E-03	1.2E-02
00418391	4	25	100	4	55	189.0	283.0	0.001	0	149.0	75.00	94.0	0.0E+00	2.99	0.73	**2.7E-03**	**2.4E+02**	**1.6**	75.00	0.00%	pass	3.1E-04	3.2E-04	1.2E-03
00418393	4	32	100	2.5	40	189.0	243.0	0.001	0	149.0	68.00	54.0	0.0E+00	9.21	0.59	**3.5E-03**	**3.0E+02**	**2.0**	68.00	0.00%	pass	2.5E-04	4.0E-04	1.7E-03
00418432	4	10	25	4	40	154.0	216.0	0.001	0	149.0	15.00	62.0	0.0E+00	7.39	2.67	**1.5E-02**	**1.3E+03**	**8.6**	15.00	0.01%	pass	1.1E-03	1.7E-03	6.8E-03
00418451	4	25	100	6	75	210.0	263.0	0.001	0	149.0	75.00	53.0	0.0E+00	9.47	1.00	**6.2E-03**	**5.4E+02**	**3.6**	75.00	0.00%	pass	4.2E-04	7.1E-04	2.9E-03
00419515	4	9	20	3	45	143.0	168.0	0.001	0	149.0	11.00	25.0	0.0E+00	23.72	4.09	**4.7E-02**	**4.1E+03**	**27.3**	11.00	0.00%	pass	1.7E-03	5.3E-03	2.2E-02
00419531	4	15	25	3	60	245.0	288.0	0.001	0	149.0	10.00	43.0	0.0E+00	12.65	6.00	**4.6E-02**	**3.9E+03**	**26.4**	10.00	0.00%	pass	2.5E-03	5.2E-03	2.1E-02
00419532	4	28	45	3	40	152.0	185.0	0.001	0	149.0	17.00	33.0	0.0E+00	17.46	2.35	**2.2E-02**	**1.9E+03**	**12.5**	17.00	0.00%	pass	9.8E-04	2.4E-03	1.0E-02
00421010	4	10	147	2	75	147.0	157.0	0.001	0	149.0	137.00	10.0	0.0E+00	59.65	0.55	**1.3E-02**	**1.1E+03**	**7.6**	137.00	0.00%	pass	2.3E-04	1.5E-03	7.1E-03
00425078	4	23	40	3.5	30	157.0	161.0	0.001	0	149.0	17.00	4.0	0.0E+00	146.35	1.76	**9.7E-02**	**8.4E+03**	**56.4**	17.00	0.00%	pass	7.2E-04	1.1E-02	5.6E-02
00425090	4	17	30	4	30	148.0	153.0	0.001	0	149.0	13.00	5.0	0.0E+00	117.56	2.31	**1.0E-01**	**9.0E+03**	**60.2**	13.00	0.00%	pass	9.5E-04	1.2E-02	5.9E-02
00425350	4	30	50	3	40	176.0	245.0	0.001	0	149.0	20.00	69.0	0.0E+00	6.11	2.00	**1.0E-02**	**8.6E+02**	**5.8**	20.00	0.00%	pass	8.5E-04	1.2E-03	4.6E-03
00425350	4	30	50	2	40	176.0	245.0	0.001	0	149.0	20.00	69.0	0.0E+00	6.11	2.00	**9.8E-03**	**8.5E+02**	**5.7**	20.00	0.00%	pass	8.5E-04	1.1E-03	4.6E-03
00425716	4	8	100	3	100	105.0	141.0	0.001	0	149.0	92.00	36.0	0.0E+00	15.77	1.09	**9.1E-03**	**7.9E+02**	**5.3**	92.00	0.00%	pass	4.5E-04	1.0E-03	4.3E-03
00425719	4	30	100	6	80	175.0	223.0	0.001	0	149.0	70.00	48.0	0.0E+00	10.92	1.14	**7.8E-03**	**6.7E+02**	**4.5**	70.00	0.00%	pass	4.8E-04	8.9E-04	3.6E-03
00425730	4	25	100	3	60	168.0	223.0	0.001	0	149.0	75.00	55.0	0.0E+00	8.96	0.80	**4.7E-03**	**4.1E+02**	**2.7**	75.00	0.00%	pass	3.4E-04	5.4E-04	2.3E-03
00425748	4	20	56	1	30	69.0	75.0	0.001	0	149.0	36.00	6.0	0.0E+00	98.34	0.83	**3.1E-02**	**2.7E+03**	**18.2**	36.00	0.00%	pass	3.4E-04	3.5E-03	1.8E-02
00425749	4	22	84	2	60	123.0	143.0	0.001	0	149.0	62.00	20.0	0.0E+00	29.94	0.97	**1.3E-02**	**1.1E+03**	**7.5**	62.00	0.00%	pass	4.0E-04	1.5E-03	6.5E-03
00425789	4	33	100	4	50	116.0	123.0	0.001	0	149.0	67.00	7.0	0.0E+00	84.57	0.75	**2.5E-02**	**2.1E+03**	**14.3**	67.00	0.00%	pass	3.1E-04	2.8E-03	1.4E-02
00425830	4	30	50	2	30	226.0	276.0	0.001	0	149.0	20.00	50.0	0.0E+00	10.31	1.50	**9.6E-03**	**8.3E+02**	**5.6**	20.00	0.00%	pass	6.3E-04	1.1E-03	4.6E-03
00425845	4	20	40	2	30	214.0	260.0	0.001	0	149.0	20.00	46.0	0.0E+00	11.57	1.50	**1.0E-02**	**8.9E+02**	**6.0**	20.00	0.00%	pass	6.3E-04	1.2E-03	4.9E-03
00425849	4	53	75	2	50	230.0	300.0	0.001	0	149.0	22.00	70.0	0.0E+00	5.94	2.27	**1.1E-02**	**9.6E+02**	**6.4**	22.00	0.00%	pass	9.6E-04	1.3E-03	5.2E-03
00426475	4	25	45	3	25	170.0	201.0	0.001	0	149.0	20.00	31.0	0.0E+00	18.75	1.25	**1.2E-02**	**1.0E+03**	**6.9**	20.00	0.00%	pass	5.2E-04	1.3E-03	5.6E-03
00428503	4	15	50	3	45	167.0	200.0	0.001	0	149.0	35.00	33.0	0.0E+00	17.46	1.29	**1.2E-02**	**1.0E+03**	**6.7**	35.00	0.00%	pass	5.4E-04	1.3E-03	5.5E-03
00429075	4	30	50	3	30	165.0	200.0	0.001	0	149.0	20.00	35.0	0.0E+00	16.31	1.50	**1.3E-02**	**1.1E+03**	**7.5**	20.00	0.00%	pass	6.3E-04	1.5E-03	6.1E-03
00430212	4	20	84	1.75	75	101.0	123.0	0.001	0	149.0	64.00	22.0	0.0E+00	27.13	1.17	**1.5E-02**	**1.3E+03**	**8.4**	64.00	0.00%	pass	4.9E-04	1.6E-03	7.2E-03
00430262	4	14	40	32	50	109.0	163.0	0.001	0	149.0	26.00	54.0	0.0E+00	9.21	1.92	**1.3E-02**	**1.1E+03**	**7.3**	26.00	0.00%	pass	8.1E-04	1.4E-03	5.5E-03
00430268	4	12	100	5	50	154.0	192.0	0.001	0	149.0	88.00	38.0	0.0E+00	14.78	0.57	**4.6E-03**	**3.9E+02**	**2.6**	88.00	0.00%	pass	2.4E-04	5.2E-04	2.2E-03
00430281	4	31	120	5	50	175.0	228.0	0.001	0	149.0	89.00	53.0	0.0E+00	9.47	0.56	**3.4E-03**	**3.0E+02**	**2.0**	89.00	0.00%	pass	2.4E-04	3.9E-04	1.6E-03
00430332	4	51	100	1	30	147.0	159.0	0.001	0	149.0	49.00	12.0	0.0E+00	49.88	0.61	**1.2E-02**	**1.1E+03**	**7.2**	49.00	0.00%	pass	2.5E-04	1.4E-03	6.6E-03
00430510	4	20	150	2	20	179.0	215.0	0.001	0	149.0	130.00	36.0	0.0E+00	15.77	0.15	**1.2E-03**	**1.1E+02**	**0.7**	130.00	0.00%	pass	6.4E-05	1.4E-04	6.1E-04
00431418	4	25	35	4	30	178.0	215.0	0.001	0	149.0	10.00	37.0	0.0E+00	15.26	3.00	**2.5E-02**	**2.2E+03**	**14.7**	10.00	0.00%	pass	1.3E-03	2.9E-03	1.2E-02
00431425	4	30	40	4	30	162.0	187.0	0.001	0	149.0	10.00	25.0	0.0E+00	23.72	3.00	**3.5E-02**	**3.0E+03**	**20.0**	10.00	0.00%	pass	1.2E-03	3.9E-03	1.6E-02
00431428	4	25	35	3	30	127.0	144.0	0.001	0	149.0	10.00	17.0	0.0E+00	35.30	3.00	**4.7E-02**	**4.1E+03**	**27.2**	10.00	0.01%	pass	1.2E-03	5.3E-03	2.3E-02
00431624	4	20	50	3	30	137.0	246.0	0.001	0	149.0	30.00	109.0	0.0E+00	1.81	1.00	**3.3E-03**	**2.8E+02**	**1.9**	30.00	0.00%	pass	4.3E-04	3.9E-04	1.4E-03
00431667	4	14	44	3	90	152.0	185.0	0.001	0	149.0	30.00	33.0	0.0E+00	17.46	3.00	**2.8E-02**	**2.4E+03**	**16.0**	30.00	0.00%	pass	1.2E-03	3.1E-03	1.3E-02
00431690	4	15	40	3	80	141.0	180.0	0.001	0	149.0	25.00	39.0	0.0E+00	14.31	3.20	**2.6E-02**	**2.2E+03**	**15.0**	25.00	0.00%	pass	1.3E-03	2.9E-03	1.2E-02
00432991	6	31	36	2	85	220.0	260.0	0.001	0	149.0	5.00	40.0	0.0E+00	12.76	17.00	**1.3E-01**	**1.1E+04**	**74.9**	5.00	0.01%	pass	7.1E-03	1.5E-02	5.7E-02
00434618	4	5	100	3	85	122.0	168.0	0.001	0	149.0	95.00	46.0	0.0E+00	11.57	0.89	**6.1E-03**	**5.3E+02**	**3.6**	95.00	0.00%	pass	3.7E-04	7.0E-04	2.9E-03
00434621	4	15	100	4	50	133.0	203.0	0.001	0	149.0	85.00	70.0	0.0E+00	5.94	0.59	**2.8E-03**	**2.4E+02**	**1.6**	85.00	0.00%	pass	2.5E-04	3.2E-04	1.4E-03
00434631	4	11	30	2	30	148.0	216.0	0.001	0	149.0	19.00	68.0	0.0E+00	6.28	1.58	**7.8E-03**	**6.7E+02**	**4.5**	19.00	0.00%	pass	6.7E-04	9.0E-04	3.7E-03
00434670	4	15	50	3	40	110.0	150.0	0.001	0	149.0	35.00	40.0	0.0E+00	13.87	1.14	**8.8E-03**	**7.6E+02**	**5.1**	35.00	0.00%	pass	4.8E-04	1.0E-03	4.2E-03
00434670	4	15	50	2	40	110.0	150.0	0.001	0	149.0	35.00	40.0	0.0E+00	13.87	1.14	**8.8E-03**	**7.6E+02**	**5.1**	35.00	0.00%	pass	4.8E-04	1.0E-03	4.2E-03

00435725	4	16	35	3	30	203.0	238.0	0.001	0	149.0	19.00	35.0	0.0E+00	16.31	1.58	**1.4E-02**	**1.2E+03**	**7.9**	19.00	0.00%	pass	6.6E-04	1.6E-03	6.4E-03
00435808	4	16	25	3.5	40	217.0	230.0	0.001	0	149.0	9.00	13.0	0.0E+00	46.09	4.44	**8.7E-02**	**7.5E+03**	**50.5**	9.00	0.00%	pass	1.8E-03	9.8E-03	4.4E-02
00437679	4	24	29	3	30	225.0	260.0	0.001	0	149.0	5.00	35.0	0.0E+00	16.31	6.00	**5.3E-02**	**4.6E+03**	**31.0**	5.00	0.00%	pass	2.5E-03	6.1E-03	2.4E-02
00439015	4	28	120	1	60	168.0	203.0	0.001	0	149.0	92.00	35.0	0.0E+00	16.31	0.65	**5.4E-03**	**4.7E+02**	**3.1**	92.00	0.00%	pass	2.7E-04	6.2E-04	2.7E-03
00439015	4	28	100	3	50	168.0	203.0	0.001	0	149.0	72.00	35.0	0.0E+00	16.31	0.69	**5.9E-03**	**5.1E+02**	**3.4**	72.00	0.00%	pass	2.9E-04	6.7E-04	2.8E-03
00439885	4	26	60	3	80	167.0	197.0	0.001	0	149.0	34.00	30.0	0.0E+00	19.45	2.35	**2.3E-02**	**2.0E+03**	**13.5**	34.00	0.00%	pass	9.8E-04	2.6E-03	1.1E-02
00439933	4	40	50	3	50	143.0	175.0	0.001	0	149.0	10.00	32.0	0.0E+00	18.09	5.00	**4.8E-02**	**4.1E+03**	**27.6**	10.00	0.00%	pass	2.1E-03	5.4E-03	2.2E-02
00439961	4	22	32	3	70	143.0	170.0	0.001	0	149.0	10.00	27.0	0.0E+00	21.84	7.00	**7.7E-02**	**6.6E+03**	**44.4**	10.00	0.01%	pass	2.9E-03	8.7E-03	3.6E-02
00439965	4	30	40	3	40	154.0	215.0	0.001	0	149.0	10.00	61.0	0.0E+00	7.59	4.00	**2.3E-02**	**2.0E+03**	**13.2**	10.00	0.00%	pass	1.7E-03	2.6E-03	1.0E-02
00440811	4	30	50	2	30	149.0	154.0	0.001	0	149.0	20.00	5.0	0.0E+00	117.56	1.50	**6.7E-02**	**5.8E+03**	**39.0**	20.00	0.00%	pass	6.1E-04	7.5E-03	3.8E-02
00440839	4	25	45	2	40	228.0	245.0	0.001	0	149.0	20.00	17.0	0.0E+00	35.30	2.00	**3.1E-02**	**2.7E+03**	**18.0**	20.00	0.00%	pass	8.3E-04	3.5E-03	1.6E-02
00446002	4	30	40	3	40	197.0	265.0	0.001	0	149.0	10.00	68.0	0.0E+00	6.28	4.00	**2.1E-02**	**1.8E+03**	**12.0**	10.00	0.01%	pass	1.7E-03	2.4E-03	9.4E-03
00448052	4	12	25	3	60	166.0	190.0	0.001	0	149.0	13.00	24.0	0.0E+00	24.77	4.62	**5.5E-02**	**4.8E+03**	**31.9**	13.00	0.00%	pass	1.9E-03	6.2E-03	2.6E-02
00448069	4	35	43	3	60	135.0	166.0	0.001	0	149.0	8.00	31.0	0.0E+00	18.75	7.50	**7.4E-02**	**6.4E+03**	**42.8**	8.00	0.01%	pass	3.1E-03	8.4E-03	3.4E-02
00448237	4	20	150	2	40	261.0	306.0	0.001	0	149.0	130.00	45.0	0.0E+00	11.92	0.31	**2.1E-03**	**1.8E+02**	**1.2**	130.00	0.00%	pass	1.3E-04	2.4E-04	1.0E-03
00448838	4	56	63	3	30	200.0	260.0	0.001	0	149.0	7.00	60.0	0.0E+00	7.80	4.29	**2.5E-02**	**2.1E+03**	**14.3**	7.00	0.00%	pass	1.8E-03	2.8E-03	1.1E-02
00448864	4	16	25	3	35	110.0	180.0	0.001	0	149.0	9.00	70.0	0.0E+00	5.94	3.89	**2.0E-02**	**1.7E+03**	**11.4**	9.00	0.01%	pass	1.6E-03	2.3E-03	8.9E-03
00449100	4	30	50	3	80	124.0	170.0	0.001	0	149.0	20.00	46.0	0.0E+00	11.57	4.00	**2.8E-02**	**2.5E+03**	**16.5**	20.00	0.00%	pass	1.7E-03	3.3E-03	1.3E-02
00453431	4	17	25	3	75	142.0	184.0	0.001	0	149.0	8.00	42.0	0.0E+00	13.04	9.38	**7.3E-02**	**6.3E+03**	**42.5**	8.00	0.00%	pass	3.9E-03	8.3E-03	3.3E-02
00453436	4	35	45	3	60	131.0	144.0	0.001	0	149.0	10.00	13.0	0.0E+00	46.09	6.00	**1.2E-01**	**1.0E+04**	**68.2**	10.00	0.00%	pass	2.5E-03	1.3E-02	6.0E-02
00456501	4	18	40	3	30	223.0	255.0	0.001	0	149.0	22.00	32.0	0.0E+00	18.09	1.36	**1.3E-02**	**1.1E+03**	**7.3**	22.00	0.00%	pass	5.7E-04	1.4E-03	6.0E-03
00456968	4	15	63	1	100	131.0	159.0	0.001	0	149.0	48.00	28.0	0.0E+00	20.99	2.08	**2.1E-02**	**1.8E+03**	**12.3**	48.00	0.00%	pass	8.7E-04	2.4E-03	1.0E-02
00457058	4	30	120	4	50	147.0	206.0	0.001	0	149.0	90.00	59.0	0.0E+00	8.02	0.56	**3.1E-03**	**2.6E+02**	**1.8**	90.00	0.00%	pass	2.3E-04	3.5E-04	1.5E-03
00457058	4	30	100	3.5	45	147.0	206.0	0.001	0	149.0	70.00	59.0	0.0E+00	8.02	0.64	**3.6E-03**	**3.1E+02**	**2.1**	70.00	0.00%	pass	2.7E-04	4.1E-04	1.7E-03
00457910	4	45	75	4	50	151.0	190.0	0.001	0	149.0	30.00	39.0	0.0E+00	14.31	1.67	**1.3E-02**	**1.2E+03**	**7.7**	30.00	0.00%	pass	7.0E-04	1.5E-03	6.2E-03
00457910	4	45	75	2	50	151.0	190.0	0.001	0	149.0	30.00	39.0	0.0E+00	14.31	1.67	**1.3E-02**	**1.1E+03**	**7.6**	30.00	0.00%	pass	7.0E-04	1.5E-03	6.2E-03
00458906	4	20	140	3	50	158.0	203.0	0.001	0	149.0	120.00	45.0	0.0E+00	11.92	0.42	**2.8E-03**	**2.5E+02**	**1.7**	120.00	0.00%	pass	1.7E-04	3.3E-04	1.4E-03
00458906	4	20	80	1	40	158.0	203.0	0.001	0	149.0	60.00	45.0	0.0E+00	11.92	0.67	**4.5E-03**	**3.9E+02**	**2.6**	60.00	0.00%	pass	2.8E-04	5.1E-04	2.2E-03
00460905	4	30	55	2	30	198.0	245.0	0.001	0	149.0	25.00	47.0	0.0E+00	11.24	1.20	**8.1E-03**	**7.0E+02**	**4.7**	25.00	0.00%	pass	5.0E-04	9.2E-04	3.8E-03
00460917	4	12	35	2	30	197.0	245.0	0.001	0	149.0	23.00	48.0	0.0E+00	10.92	1.30	**8.6E-03**	**7.4E+02**	**5.0**	23.00	0.00%	pass	5.5E-04	9.9E-04	4.1E-03
00461866	4	25	45	3	25	200.0	245.0	0.001	0	149.0	20.00	45.0	0.0E+00	11.92	1.25	**8.8E-03**	**7.6E+02**	**5.1**	20.00	0.00%	pass	5.2E-04	1.0E-03	4.1E-03
00462852	4	35	55	3	30	99.0	140.0	0.001	0	149.0	20.00	41.0	0.0E+00	13.45	1.50	**1.1E-02**	**9.9E+02**	**6.6**	20.00	0.00%	pass	6.3E-04	1.3E-03	5.4E-03
00463713	4	22	40	3	35	198.0	201.0	0.001	0	149.0	18.00	3.0	0.0E+00	194.25	1.94	**1.4E-01**	**1.2E+04**	**81.4**	18.00	0.00%	pass	8.0E-04	1.6E-02	8.3E-02
00464187	4	25	42	3	30	203.0	261.0	0.001	0	149.0	17.00	58.0	0.0E+00	8.25	1.76	**1.0E-02**	**8.8E+02**	**5.9**	17.00	0.00%	pass	7.4E-04	1.2E-03	4.8E-03
00467605	4	30	40	3	40	195.0	260.0	0.001	0	149.0	10.00	65.0	0.0E+00	6.81	4.00	**2.2E-02**	**1.9E+03**	**12.5**	10.00	0.01%	pass	1.7E-03	2.5E-03	9.8E-03
00470381	4	18	28	3	50	180.0	214.0	0.001	0	149.0	10.00	34.0	0.0E+00	16.87	5.00	**4.5E-02**	**3.9E+03**	**26.3**	10.00	0.00%	pass	2.1E-03	5.2E-03	2.1E-02
00471042	4	20	60	1	40	158.0	201.0	0.001	0	149.0	40.00	43.0	0.0E+00	12.65	1.00	**7.1E-03**	**6.1E+02**	**4.1**	40.00	0.00%	pass	4.2E-04	8.1E-04	3.4E-03
00472736	4	22	30	3	49	145.0	173.0	0.001	0	149.0	8.00	28.0	0.0E+00	20.99	6.13	**6.5E-02**	**5.6E+03**	**37.7**	8.00	0.01%	pass	2.5E-03	7.3E-03	3.0E-02
00472741	4	14	23	3	49	145.0	172.0	0.001	0	149.0	9.00	27.0	0.0E+00	21.84	5.44	**5.9E-02**	**5.1E+03**	**34.4**	9.00	0.00%	pass	2.3E-03	6.7E-03	2.8E-02
00473106	4	15	27	2	18	195.0	205.0	0.001	0	149.0	12.00	10.0	0.0E+00	59.65	1.50	**3.6E-02**	**3.1E+03**	**21.0**	12.00	0.01%	pass	6.2E-04	4.1E-03	1.9E-02
00473144	4	32	38	2	20	135.0	145.0	0.001	0	149.0	6.00	10.0	0.0E+00	59.65	3.33	**8.1E-02**	**7.0E+03**	**46.9**	6.00	0.00%	pass	1.4E-03	9.1E-03	4.3E-02
00474088	4	20	30	3	60	79.0	140.0	0.001	0	149.0	10.00	61.0	0.0E+00	7.59	6.00	**3.4E-02**	**3.0E+03**	**20.0**	10.00	0.00%	pass	2.5E-03	4.0E-03	1.5E-02
00475371	4	15	47	3	20	160.0	172.0	0.001	0	149.0	32.00	12.0	0.0E+00	49.88	0.63	**1.3E-02**	**1.1E+03**	**7.5**	32.00	0.00%	pass	2.6E-04	1.4E-03	6.8E-03
00475396	4	20	80	3	60	211.0	240.0	0.001	0	149.0	60.00	29.0	0.0E+00	20.20	1.00	**1.0E-02**	**8.6E+02**	**5.8**	60.00	0.00%	pass	4.2E-04	1.1E-03	4.8E-03
00477331	4	10	20	3	30	123.0	133.0	0.001	0	149.0	10.00	10.0	0.0E+00	59.65	3.00	**7.3E-02**	**6.3E+03**	**42.3**	10.00	0.00%	pass	1.2E-03	8.2E-03	3.9E-02
00478543	3	18	36	2	30	250.0	280.0	0.001	0	149.0	18.00	30.0	0.0E+00	20.59	1.67	**1.7E-02**	**1.5E+03**	**9.9**	18.00	0.00%	pass	6.9E-04	1.9E-03	8.2E-03
00478544	3	6	18	2	30	250.0	270.0	0.001	0	149.0	12.00	20.0	0.0E+00	31.79	2.50	**3.6E-02**	**3.1E+03**	**20.8**	12.00	0.00%	pass	1.0E-03	4.0E-03	1.8E-02
00479448	4	30	130	4	50	155.0	160.0	0.001	0	149.0	100.00	5.0	0.0E+00	117.56	0.50	**2.2E-02**	**1.9E+03**	**13.0**	100.00	0.00%	pass	2.0E-04	2.5E-03	1.3E-02
00479933	4	29	40	2	30	187.0	247.0	0.001	0	149.0	11.00	60.0	0.0E+00	7.80	2.73	**1.5E-02**	**1.3E+03**	**8.9**	11.00	0.01%	pass	1.1E-03	1.8E-03	7.1E-03
00479938	4	55	80	4	35	275.0	336.0	0.001	0	149.0	25.00	61.0	0.0E+00	7.59	1.40	**7.7E-03**	**6.7E+02**	**4.5**	25.00	0.00%	pass	5.9E-04	8.9E-04	3.6E-03
00487507	4	14	50	3	80	240.0	255.0	0.001	0	149.0	36.00	15.0	0.0E+00	40.00	2.22	**3.8E-02**	**3.3E+03**	**22.2**	36.00	0.00%	pass	9.2E-04	4.3E-03	1.9E-02
00487802	4	20	140	1	70	168.0	220.0	0.001	0	149.0	120.00	52.0	0.0E+00	9.74	0.58	**3.4E-03**	**3.0E+02**	**2.0**	120.00	0.00%	pass	2.5E-04	4.0E-04	1.7E-03
00487802	4	20	80	1	40	168.0	220.0	0.001	0	149.0	60.00	52.0	0.0E+00	9.74	0.67	**4.0E-03**	**3.4E+02**	**2.3**	60.00	0.00%	pass	2.8E-04	4.5E-04	2.0E-03
00489003	4	22	30	3.5	35	208.0	276.0	0.001	0	149.0	8.00	68.0	0.0E+00	6.28	4.38	**2.3E-02**	**2.0E+03**	**13.3**	8.00	0.01%	pass	1.8E-03	2.6E-03	1.0E-02
00489043	4	10	25	3	35	184.0	247.0	0.001	0	149.0	15.00	63.0	0.0E+00	7.19	2.33	**1.3E-02**	**1.1E+03**	**7.3**	15.00	0.00%	pass	9.9E-04	1.5E-03	5.9E-03
00490089	4	30	55	3	40	216.0	275.0	0.001	0	149.0	25.00	59.0	0.0E+00	8.02	1.60	**9.1E-03**	**7.8E+02**	**5.3**	25.00	0.00%	pass	6.7E-04	1.0E-03	4.3E-03
00494232	4	12	20	3	49	142.0	177.0	0.001	0	149.0	8.00	35.0	0.0E+00	16.31	6.13	**5.5E-02**	**4.7E+03**	**31.7**	8.00	0.00%	pass	2.6E-03	6.2E-03	2.5E-02
00494236	4	20	30	3	49	151.0	182.0	0.001	0	149.0	10.00	31.0	0.0E+00	18.75	4.90	**4.8E-02**	**4.1E+03**	**27.7**	10.00	0.00%	pass	2.0E-03	5.4E-03	2.2E-02
00496370	4	20	40	2	30	133.0	158.0	0.001	0	149.0	20.00	25.0	0.0E+00	23.72	1.50	**1.7E-02**	**1.5E+03**	**9.8**	20.00	0.00%	pass	6.2E-04	1.9E-03	8.2E-03
00498147	4	15	25	3	30	201.0	211.0	0.001	0	149.0	10.00	10.0	0.0E+00	59.65	3.00	**7.3E-02**	**6.3E+03**	**42.3**	10.00	0.00%	pass	1.2E-03	8.2E-03	3.9E-02
00498218	4	12	50	3	60	137.0	168.0	0.001	0	149.0	38.00	31.0	0.0E+00	18.75	1.58	**1.5E-02**	**1.3E+03**	**8.7**	38.00	0.00%	pass	6.6E-04	1.7E-03	7.1E-03
00500462	4	35	80	3	30	220.0	260.0	0.001	0	149.0	45.00	40.0	0.0E+00	13.87	0.67	**5.1E-03**	**4.4E+02**	**3.0**	45.00	0.00%	pass	2.8E-04	5.8E-04	2.4E-03
00500561	4	43	53	3	50	117.0	155.0	0.001	0	149.0	10.00	38.0	0.0E+00	14.78	5.00	**4.2E-02**	**3.6E+03**	**24.1**	10.00	0.00%	pass	2.1E-03	4.7E-03	1.9E-02
00500568	4	7	17	3	30	182.0	187.0	0.001	0	149.0	10.00	5.0	0.0E+00	117.56	3.00	**1.3E-01**	**1.2E+04**	**78.3**	10.00	0.00%	pass	1.2E-03	1.5E-02	7.7E-02
00500594	4	15	25	3	60	204.0	240.0	0.001	0	149.0	10.00	36.0	0.0E+00	15.77	6.00	**5.2E-02**	**4.5E+03**	**30.3**	10.00	0.00%	pass	2.5E-03	5.9E-03	2.4E-02
00500679	4	50	70	3	40	224.0	264.0	0.001	0	149.0	20.00	40.0	0.0E+00	13.87	2.00	**1.6E-02**	**1.4E+03**	**9.1**	20.00	0.00%	pass	8.4E-04	1.8E-03	7.3E-03
00503661	4	15	100	3	60	147.0	181.0	0.001	0	149.0	85.00	34.0	0.0E+00	16.87	0.71	**6.2E-03**	**5.3E+02**	**3.6**	85.00	0.00%	pass	2.9E-04	7.0E-04	2.9E-03
00503673	4	70	140	2.25	35	256.0	301.0	0.001	0	149.0	70.00	45.0	0.0E+00	11.92	0.50	**3.4E-03**	**2.9E+02**	**2.0**	70.00	0.00%	pass	2.1E-04	3.9E-04	1.7E-03
00503723	6	24	98	3	100	113.0	177.0	0.001	0	149.0	74.00	64.0	0.0E+00	6.46	1.35	**6.6E-03**	**5.7E+02**	**3.8**	74.00	0.00%	pass	5.7E-04	7.7E-04	3.1E-03
00505353	4	40	145	2	45	275.0	281.0	0.001	0	149.0	105.00	6.0	0.0E+00	98.34	0.43	**1.6E-02**	**1.4E+03**	**9.4**	105.00	0.00%	pass	1.8E-04	1.8E-03	9.2E-03
00506377	4	25	40	3	50	170.0	240.0	0.001	0	149.0	15.00	70.0	0.0E+00	5.94	3.33	**1.7E-02**	**1.4E+03**	**9.7**	15.00	0.00%	pass	1.4E-03	1.9E-03	7.6E-03
00506521	4	52	92	3	60	193.0	228.0	0.001	0	149.0	40.00	35.0	0.0E+00	16.31	1.50	**1.3E-02**	**1.1E+03**	**7.5**	40.00	0.00%	pass	6.3E-04	1.5E-03	6.1E-03
00506527	4	10	20	3	30	148.0	153.0	0.001	0	149.0	10.00	5.0	0.0E+00	117.56	3.00	**1.3E-01**	**1.2E+04**	**78.3**	10.00	0.00%	pass	1.2E-03	1.5E-02	7.7E-02
00506541	4	20	30	3	50	123.0	170.0	0.001	0	149.0	10.00	47.0	0.0E+00	11.24	5.00	**3.5E-02**	**3.0E+03**	**20.4**	10.00	0.00%	pass	2.1E-03	4.0E-03	1.6E-02
00511963	4	10	25	3	45	162.0	214.0	0.001	0	149.0	15.00	52.0	0.0E+00	9.74	3.00	**1.9E-02**	**1.7E+03**	**11.1**	15.00	0.00%	pass	1.3E-03	2.2E-03	8.8E-03
00511972	4	25	40	4	45	148.0	172.0	0.001	0	149.0	15.00	24.0	0.0E+00	24.77	3.00	**3.6E-02**	**3.1E+03**	**20.7**	15.00	0.00%	pass	1.2E-03	4.0E-03	1.7E-02
00512762	4	15	40	3	50	172.0	226.0	0.001	0	149.0	25.00	54.0	0.0E+00	9.21	2.00	**1.2E-02**	**1.1E+03**	**7.1**	25.00	0.00%	pass	8.4E-04	1.4E-03	5.7E-03
00514721	4	20	35	2	20	140.0	150.0	0.001	0	149.0	15.00	10.0	0.0E+00	59.65	1.33	**3.2E-02**	**2.8E+03**	**18.7**	15.00	0.01%	pass	5.5E-04	3.6E-03	1.7E-02

00518967	4	22	32	3	49	102.0	139.0	0.001	0	149.0	10.00	37.0	0.0E+00	15.26	4.90	**4.2E-02**	**3.6E+03**	**24.1**	10.00	0.00%	pass	2.0E-03	4.7E-03	1.9E-02
00521348	4	50	293	1	100	278.0	293.0	0.001	0	149.0	243.00	15.0	0.0E+00	40.00	0.41	**6.9E-03**	**6.0E+02**	**4.0**	243.00	0.00%	pass	1.7E-04	7.7E-04	3.6E-03
00521868	4	20	80	3	40	189.0	215.0	0.001	0	149.0	60.00	26.0	0.0E+00	22.75	0.67	**7.2E-03**	**6.2E+02**	**4.2**	60.00	0.00%	pass	2.8E-04	8.2E-04	3.5E-03
00523638	4	27	39	2	20	140.0	150.0	0.001	0	149.0	12.00	10.0	0.0E+00	59.65	1.67	**4.0E-02**	**3.5E+03**	**23.4**	12.00	0.00%	pass	6.9E-04	4.5E-03	2.2E-02
00523961	4	26	41	3	50	112.0	202.0	0.001	0	149.0	15.00	90.0	0.0E+00	3.38	3.33	**1.4E-02**	**1.2E+03**	**7.9**	15.00	0.00%	pass	1.4E-03	1.6E-03	5.9E-03
00523970	4	15	35	3	40	147.0	187.0	0.001	0	149.0	20.00	40.0	0.0E+00	13.87	2.00	**1.6E-02**	**1.4E+03**	**9.1**	20.00	0.00%	pass	8.4E-04	1.8E-03	7.3E-03
00524214	4	30	80	3	30	244.0	254.0	0.001	0	149.0	50.00	10.0	0.0E+00	59.65	0.60	**1.4E-02**	**1.2E+03**	**8.4**	50.00	0.00%	pass	2.5E-04	1.6E-03	7.7E-03
00524565	4	20	22	1	40	128.0	138.0	0.001	0	149.0	2.00	10.0	0.0E+00	59.65	20.00	**4.9E-01**	**4.2E+04**	**283.9**	2.00	0.01%	pass	8.2E-03	5.5E-02	2.6E-01
00524571	4	20	22	1	12	97.0	140.0	0.001	0	149.0	2.00	43.0	0.0E+00	12.65	6.00	**4.4E-02**	**3.8E+03**	**25.7**	2.00	0.05%	pass	2.5E-03	5.1E-03	2.1E-02
00525523	4	23	33	3	49	141.0	184.0	0.001	0	149.0	10.00	43.0	0.0E+00	12.65	4.90	**3.7E-02**	**3.2E+03**	**21.5**	10.00	0.00%	pass	2.0E-03	4.2E-03	1.7E-02
00525533	4	40	50	3	49	91.0	152.0	0.001	0	149.0	10.00	61.0	0.0E+00	7.59	4.90	**2.8E-02**	**2.4E+03**	**16.2**	10.00	0.00%	pass	2.1E-03	3.2E-03	1.3E-02
00527970	4	45	80	3	30	113.0	155.0	0.001	0	149.0	35.00	42.0	0.0E+00	13.04	0.86	**6.3E-03**	**5.5E+02**	**3.7**	35.00	0.00%	pass	3.6E-04	7.2E-04	3.0E-03
00531399	4	15	60	3	30	194.0	266.0	0.001	0	149.0	45.00	72.0	0.0E+00	5.63	0.67	**3.1E-03**	**2.7E+02**	**1.8**	45.00	0.00%	pass	2.8E-04	3.6E-04	1.5E-03
00531833	4	18	40	2	25	263.0	281.0	0.001	0	149.0	22.00	18.0	0.0E+00	33.32	1.14	**1.7E-02**	**1.4E+03**	**9.7**	22.00	0.00%	pass	4.7E-04	1.9E-03	8.4E-03
00533014	4	10	15	4	50	156.0	201.0	0.001	0	149.0	5.00	45.0	0.0E+00	11.92	10.00	**7.5E-02**	**6.5E+03**	**43.3**	5.00	0.02%	pass	4.2E-03	8.5E-03	3.3E-02
00533492	4	21	41	3	40	197.0	231.0	0.001	0	149.0	20.00	34.0	0.0E+00	16.87	2.00	**1.8E-02**	**1.5E+03**	**10.3**	20.00	0.00%	pass	8.3E-04	2.0E-03	8.4E-03
00533519	4	30	50	3	30	165.0	225.0	0.001	0	149.0	20.00	60.0	0.0E+00	7.80	1.50	**8.4E-03**	**7.2E+02**	**4.8**	20.00	0.00%	pass	6.3E-04	9.6E-04	3.9E-03
00536770	4	20	30	2	18	194.0	198.0	0.001	0	149.0	10.00	4.0	0.0E+00	146.35	1.80	**9.9E-02**	**8.6E+03**	**57.5**	10.00	0.00%	pass	7.3E-04	1.1E-02	5.8E-02
00538061	4	20	40	3	40	208.0	250.0	0.001	0	149.0	20.00	42.0	0.0E+00	13.04	2.00	**1.5E-02**	**1.3E+03**	**8.7**	20.00	0.00%	pass	8.4E-04	1.7E-03	7.0E-03
00538080	4	20	40	3	40	103.0	150.0	0.001	0	149.0	20.00	47.0	0.0E+00	11.24	2.00	**1.4E-02**	**1.2E+03**	**8.0**	20.00	0.00%	pass	8.4E-04	1.6E-03	6.4E-03
00538127	4	35	55	3	40	154.0	225.0	0.001	0	149.0	20.00	71.0	0.0E+00	5.78	2.00	**9.8E-03**	**8.4E+02**	**5.7**	20.00	0.00%	pass	8.5E-04	1.1E-03	4.5E-03
00540065	4	12	20	3	40	112.0	142.0	0.001	0	149.0	8.00	30.0	0.0E+00	19.45	5.00	**5.0E-02**	**4.3E+03**	**29.0**	8.00	0.00%	pass	2.1E-03	5.7E-03	2.3E-02
00540437	4	15	40	3	50	144.0	185.0	0.001	0	149.0	25.00	41.0	0.0E+00	13.45	2.00	**1.5E-02**	**1.3E+03**	**8.9**	25.00	0.00%	pass	8.4E-04	1.7E-03	7.2E-03
00541761	4	30	55	3	30	141.0	171.0	0.001	0	149.0	25.00	30.0	0.0E+00	19.45	1.20	**1.2E-02**	**1.0E+03**	**6.8**	25.00	0.00%	pass	5.0E-04	1.3E-03	5.6E-03
00546162	4	25	90	6	80	105.0	175.0	0.001	0	149.0	65.00	70.0	0.0E+00	5.94	1.23	**6.1E-03**	**5.3E+02**	**3.6**	65.00	0.00%	pass	5.2E-04	7.1E-04	2.8E-03
00547598	4	12	25	3	35	196.0	245.0	0.001	0	149.0	13.00	49.0	0.0E+00	10.61	2.69	**1.8E-02**	**1.6E+03**	**10.5**	13.00	0.00%	pass	1.1E-03	2.1E-03	8.3E-03
00547605	4	10	60	3	40	193.0	246.0	0.001	0	149.0	50.00	53.0	0.0E+00	9.47	0.80	**4.9E-03**	**4.2E+02**	**2.8**	50.00	0.00%	pass	3.4E-04	5.6E-04	2.3E-03
00551256	4	15	60	3	45	126.0	146.0	0.001	0	149.0	45.00	20.0	0.0E+00	29.94	1.00	**1.4E-02**	**1.2E+03**	**7.8**	45.00	0.00%	pass	4.1E-04	1.5E-03	6.7E-03
00554759	4	40	70	4	30	166.0	200.0	0.001	0	149.0	30.00	34.0	0.0E+00	16.87	1.00	**8.8E-03**	**7.6E+02**	**5.1**	30.00	0.00%	pass	4.2E-04	1.0E-03	4.2E-03
00554780	4	12	30	3	50	187.0	240.0	0.001	0	149.0	18.00	53.0	0.0E+00	9.47	2.78	**1.7E-02**	**1.5E+03**	**10.1**	18.00	0.00%	pass	1.2E-03	2.0E-03	8.1E-03
00556695	4	12	45	3	30	169.0	212.0	0.001	0	149.0	33.00	43.0	0.0E+00	12.65	0.91	**6.6E-03**	**5.7E+02**	**3.8**	33.00	0.00%	pass	3.8E-04	7.5E-04	3.1E-03
00556715	4	20	60	3	40	182.0	232.0	0.001	0	149.0	40.00	50.0	0.0E+00	10.31	1.00	**6.4E-03**	**5.5E+02**	**3.7**	40.00	0.00%	pass	4.2E-04	7.3E-04	3.0E-03
00557440	4	10	30	2	20	163.0	180.0	0.001	0	149.0	20.00	17.0	0.0E+00	35.30	1.00	**1.5E-02**	**1.3E+03**	**8.9**	20.00	0.00%	pass	4.1E-04	1.7E-03	7.8E-03
00559043	4	30	60	5	50	244.0	305.0	0.001	0	149.0	30.00	61.0	0.0E+00	7.59	1.67	**9.3E-03**	**8.1E+02**	**5.4**	30.00	0.00%	pass	7.0E-04	1.1E-03	4.3E-03
00559384	4	25	55	30	40	154.0	225.0	0.001	0	149.0	30.00	71.0	0.0E+00	5.78	1.33	**7.0E-03**	**6.0E+02**	**4.0**	30.00	0.00%	pass	5.6E-04	8.0E-04	3.0E-03
00559391	4	20	40	3	40	168.0	205.0	0.001	0	149.0	20.00	37.0	0.0E+00	15.26	2.00	**1.7E-02**	**1.4E+03**	**9.7**	20.00	0.00%	pass	8.3E-04	1.9E-03	7.8E-03
00559397	4	35	55	3	40	225.0	262.0	0.001	0	149.0	20.00	37.0	0.0E+00	15.26	2.00	**1.7E-02**	**1.4E+03**	**9.7**	20.00	0.00%	pass	8.3E-04	1.9E-03	7.8E-03
00559406	4	10	20	3	40	90.0	150.0	0.001	0	149.0	10.00	60.0	0.0E+00	7.80	4.00	**2.3E-02**	**2.0E+03**	**13.3**	10.00	0.00%	pass	1.7E-03	2.6E-03	1.0E-02
00559410	4	48	68	3	40	167.0	220.0	0.001	0	149.0	20.00	53.0	0.0E+00	9.47	2.00	**1.2E-02**	**1.1E+03**	**7.2**	20.00	0.00%	pass	8.4E-04	1.4E-03	5.8E-03
00559424	4	22	42	3	40	210.0	250.0	0.001	0	149.0	20.00	40.0	0.0E+00	13.87	2.00	**1.6E-02**	**1.4E+03**	**9.1**	20.00	0.00%	pass	8.4E-04	1.8E-03	7.3E-03
00559446	4	20	30	2	10	170.0	200.0	0.001	0	149.0	10.00	30.0	0.0E+00	19.45	1.00	**9.7E-03**	**8.3E+02**	**5.6**	10.00	0.00%	pass	4.2E-04	1.1E-03	4.6E-03
00559498	4	22	50	2	50	210.0	276.0	0.001	0	149.0	28.00	66.0	0.0E+00	6.63	1.79	**9.1E-03**	**7.9E+02**	**5.3**	28.00	0.00%	pass	7.6E-04	1.0E-03	4.3E-03
00562970	4	28	48	3	40	207.0	250.0	0.001	0	149.0	20.00	43.0	0.0E+00	12.65	2.00	**1.5E-02**	**1.3E+03**	**8.6**	20.00	0.00%	pass	8.4E-04	1.7E-03	6.9E-03
00563498	4	20	40	3	30	186.0	196.0	0.001	0	149.0	20.00	10.0	0.0E+00	59.65	1.50	**3.6E-02**	**3.1E+03**	**21.1**	20.00	0.00%	pass	6.2E-04	4.1E-03	1.9E-02
00564172	4	30	42	3	25	265.0	292.0	0.001	0	149.0	12.00	27.0	0.0E+00	21.84	2.08	**2.2E-02**	**1.9E+03**	**13.0**	12.00	0.00%	pass	8.6E-04	2.5E-03	1.1E-02
00566171	4	10	25	3	50	191.0	240.0	0.001	0	149.0	15.00	49.0	0.0E+00	10.61	3.33	**2.2E-02**	**1.9E+03**	**13.0**	15.00	0.00%	pass	1.4E-03	2.6E-03	1.0E-02
00572022	4	15	40	3	50	180.0	220.0	0.001	0	149.0	25.00	40.0	0.0E+00	13.87	2.00	**1.6E-02**	**1.4E+03**	**9.1**	25.00	0.00%	pass	8.4E-04	1.8E-03	7.3E-03
00576749	4	30	50	3	30	196.0	231.0	0.001	0	149.0	20.00	35.0	0.0E+00	16.31	1.50	**1.3E-02**	**1.1E+03**	**7.5**	20.00	0.00%	pass	6.3E-04	1.5E-03	6.1E-03
00577032	4	60	100	1	30	136.0	200.0	0.001	0	149.0	40.00	64.0	0.0E+00	7.00	0.75	**3.7E-03**	**3.2E+02**	**2.2**	40.00	0.00%	pass	3.2E-04	4.3E-04	1.9E-03
00580587	4	20	60	6	25	155.0	185.0	0.001	0	149.0	40.00	30.0	0.0E+00	19.45	0.63	**6.1E-03**	**5.3E+02**	**3.5**	40.00	0.00%	pass	2.6E-04	6.9E-04	2.9E-03
00580648	4	26	150	2.5	40	190.0	215.0	0.001	0	149.0	124.00	25.0	0.0E+00	23.72	0.32	**3.6E-03**	**3.1E+02**	**2.1**	124.00	0.00%	pass	1.3E-04	4.0E-04	1.8E-03
00582672	4	35	80	2	30	272.0	316.0	0.001	0	149.0	45.00	44.0	0.0E+00	12.28	0.67	**4.7E-03**	**4.0E+02**	**2.7**	45.00	0.00%	pass	2.8E-04	5.3E-04	2.3E-03
00582855	4	40	50	3	60	150.0	198.0	0.001	0	149.0	10.00	48.0	0.0E+00	10.92	6.00	**4.2E-02**	**3.6E+03**	**24.2**	10.00	0.00%	pass	2.5E-03	4.8E-03	1.9E-02
00584416	4	25	60	10	30	230.0	287.0	0.001	0	149.0	35.00	57.0	0.0E+00	8.48	0.86	**5.1E-03**	**4.4E+02**	**2.9**	35.00	0.00%	pass	3.6E-04	5.8E-04	2.3E-03
00584430	4	6	40	4	50	148.0	215.0	0.001	0	149.0	34.00	67.0	0.0E+00	6.45	1.47	**7.5E-03**	**6.5E+02**	**4.4**	34.00	0.00%	pass	6.2E-04	8.7E-04	3.5E-03
00588556	4	25	50	4	40	200.0	260.0	0.001	0	149.0	25.00	60.0	0.0E+00	7.80	1.60	**9.0E-03**	**7.8E+02**	**5.2**	25.00	0.00%	pass	6.7E-04	1.0E-03	4.2E-03
00588563	4	12	40	5	50	159.0	220.0	0.001	0	149.0	28.00	61.0	0.0E+00	7.59	1.79	**1.0E-02**	**8.7E+02**	**5.8**	28.00	0.00%	pass	7.5E-04	1.2E-03	4.6E-03
00588572	4	30	50	3	30	239.0	291.0	0.001	0	149.0	20.00	52.0	0.0E+00	9.74	1.50	**9.4E-03**	**8.1E+02**	**5.5**	20.00	0.00%	pass	6.3E-04	1.1E-03	4.4E-03
00592879	4	20	60	4	50	204.0	260.0	0.001	0	149.0	40.00	56.0	0.0E+00	8.71	1.25	**7.4E-03**	**6.4E+02**	**4.3**	40.00	0.00%	pass	5.3E-04	8.5E-04	3.5E-03
00595671	4	35	60	5	50	180.0	240.0	0.001	0	149.0	25.00	60.0	0.0E+00	7.80	2.00	**1.1E-02**	**9.9E+02**	**6.6**	25.00	0.00%	pass	8.4E-04	1.3E-03	5.2E-03
00595673	4	30	50	5	50	212.0	260.0	0.001	0	149.0	20.00	48.0	0.0E+00	10.92	2.50	**1.7E-02**	**1.5E+03**	**10.0**	20.00	0.00%	pass	1.0E-03	2.0E-03	7.9E-03
00596673	4	23	120	2	50	133.0	150.0	0.001	0	149.0	97.00	17.0	0.0E+00	35.30	0.52	**7.9E-03**	**6.8E+02**	**4.6**	97.00	0.00%	pass	2.1E-04	8.8E-04	4.0E-03
00599174	4	30	50	5	50	239.0	280.0	0.001	0	149.0	20.00	41.0	0.0E+00	13.45	2.50	**2.0E-02**	**1.7E+03**	**11.3**	20.00	0.00%	pass	1.0E-03	2.2E-03	8.9E-03
00602052	4	25	60	4	50	191.0	290.0	0.001	0	149.0	35.00	99.0	0.0E+00	2.55	1.43	**5.3E-03**	**4.5E+02**	**3.0**	35.00	0.00%	pass	6.1E-04	6.1E-04	2.3E-03
00602087	4	25	60	3	30	233.0	283.0	0.001	0	149.0	35.00	50.0	0.0E+00	10.31	0.86	**5.5E-03**	**4.7E+02**	**3.2**	35.00	0.00%	pass	3.6E-04	6.3E-04	2.6E-03
00606054	4	20	40	5	50	139.0	180.0	0.001	0	149.0	20.00	41.0	0.0E+00	13.45	2.50	**2.0E-02**	**1.7E+03**	**11.3**	20.00	0.00%	pass	1.0E-03	2.2E-03	8.9E-03
00606064	4	25	50	6	50	155.0	200.0	0.001	0	149.0	25.00	45.0	0.0E+00	11.92	2.00	**1.4E-02**	**1.3E+03**	**8.4**	25.00	0.00%	pass	8.4E-04	1.7E-03	6.6E-03
00609853	4	25	60	8	50	220.0	300.0	0.001	0	149.0	35.00	80.0	0.0E+00	4.51	1.43	**6.5E-03**	**5.6E+02**	**3.8**	35.00	0.00%	pass	6.1E-04	7.5E-04	2.9E-03
00613573	4	35	80	10	50	212.0	275.0	0.001	0	149.0	45.00	63.0	0.0E+00	7.19	1.11	**6.1E-03**	**5.3E+02**	**3.6**	45.00	0.00%	pass	4.7E-04	7.0E-04	2.8E-03
00621007	4	15	60	2	100	114.0	155.0	0.001	0	149.0	45.00	41.0	0.0E+00	13.45	2.22	**1.7E-02**	**1.5E+03**	**9.8**	45.00	0.00%	pass	9.3E-04	1.9E-03	7.9E-03
00624973	4	30	210	4	40	239.0	250.0	0.001	0	149.0	180.00	11.0	0.0E+00	54.33	0.22	**4.9E-03**	**4.2E+02**	**2.8**	180.00	0.00%	pass	9.1E-05	5.5E-04	2.6E-03
00627861	4	25	50	8	40	153.0	220.0	0.001	0	149.0	25.00	67.0	0.0E+00	6.45	1.60	**8.4E-03**	**7.3E+02**	**4.9**	25.00	0.00%	pass	6.8E-04	9.7E-04	3.8E-03
00631742	4	20	60	2	150	155.0	200.0	0.001	0	149.0	40.00	45.0	0.0E+00	11.92	3.75	**2.7E-02**	**2.3E+03**	**15.6**	40.00	0.00%	pass	1.6E-03	3.1E-03	1.2E-02
00632756	4	20	60	3	50	142.0	192.0	0.001	0	149.0	40.00	50.0	0.0E+00	10.31	1.25	**8.1E-03**	**7.0E+02**	**4.7**	40.00	0.00%	pass	5.2E-04	9.2E-04	3.8E-03
00636919	4	20	60	3	30	169.0	216.0	0.001	0	149.0	40.00	47.0	0.0E+00	11.24	0.75	**5.0E-03**	**4.3E+02**	**2.9**	40.00	0.00%	pass	3.1E-04	5.7E-04	2.4E-03
00636924	4	30	60	5	50	180.0	220.0	0.001	0	149.0	30.00	40.0	0.0E+00	13.87	1.67	**1.3E-02**	**1.1E+03**	**7.6**	30.00	0.00%	pass	7.0E-04	1.5E-03	6.1E-03
00638287	4	25	50	6	50	139.0	180.0	0.001	0	149.0	25.00	41.0	0.0E+00	13.45	2.00	**1.6E-02**	**1.3E+03**	**9.1**	25.00	0.00%	pass	8.4E-04	1.8E-03	7.1E-03
00641208	4	30	240	1	50	215.0	240.0	0.001	0	149.0	210.00	25.0	0.0E+00	23.72	0.24	**2.6E-03**	**2.2E+02**	**1.5**	210.00	0.00%	pass	9.9E-05	2.9E-04	1.3E-03

00641250	4	38	140	1	80	205.0	240.0	0.001	0	149.0	102.00	35.0	0.0E+00	16.31	0.78	**6.5E-03**	**5.7E+02**	**3.8**	102.00	0.00%	pass	3.3E-04	7.4E-04	3.2E-03
00642607	4	40	70	1	20	210.0	232.0	0.001	0	149.0	30.00	22.0	0.0E+00	27.13	0.67	**8.1E-03**	**7.0E+02**	**4.7**	30.00	0.00%	pass	2.8E-04	9.2E-04	4.1E-03
00642640	4	40	60	1	20	210.0	235.0	0.001	0	149.0	20.00	25.0	0.0E+00	23.72	1.00	**1.1E-02**	**9.6E+02**	**6.4**	20.00	0.00%	pass	4.1E-04	1.3E-03	5.5E-03
00643796	4	18	60	2	30	215.0	272.0	0.001	0	149.0	42.00	57.0	0.0E+00	8.48	0.71	**4.0E-03**	**3.5E+02**	**2.3**	42.00	0.00%	pass	3.0E-04	4.6E-04	2.0E-03
00644640	4	30	60	5	50	160.0	260.0	0.001	0	149.0	30.00	100.0	0.0E+00	2.47	1.67	**6.2E-03**	**5.4E+02**	**3.6**	30.00	0.00%	pass	7.1E-04	7.2E-04	2.6E-03
00645655	4	21	30	3	60	179.0	211.0	0.001	0	149.0	9.00	32.0	0.0E+00	18.09	6.67	**6.4E-02**	**5.5E+03**	**37.0**	9.00	0.00%	pass	2.8E-03	7.2E-03	2.9E-02
00645658	4	24	32	3	60	172.0	210.0	0.001	0	149.0	8.00	38.0	0.0E+00	14.78	7.50	**6.3E-02**	**5.4E+03**	**36.5**	8.00	0.00%	pass	3.1E-03	7.2E-03	2.9E-02
00648511	4	19	60	3	30	152.0	202.0	0.001	0	149.0	41.00	50.0	0.0E+00	10.31	0.73	**4.6E-03**	**4.0E+02**	**2.7**	41.00	0.00%	pass	3.1E-04	5.3E-04	2.2E-03
00648828	4	45	255	1	70	234.0	255.0	0.001	0	149.0	210.00	21.0	0.0E+00	28.47	0.33	**4.2E-03**	**3.6E+02**	**2.4**	210.00	0.00%	pass	1.4E-04	4.7E-04	2.1E-03
00649217	4	10	30	4	30	93.0	110.0	0.001	0	149.0	20.00	17.0	0.0E+00	35.30	1.50	**2.3E-02**	**2.0E+03**	**13.5**	20.00	0.00%	pass	6.2E-04	2.6E-03	1.2E-02
00650703	4	37	80	1	30	154.0	200.0	0.001	0	149.0	43.00	46.0	0.0E+00	11.57	0.70	**4.6E-03**	**4.0E+02**	**2.7**	43.00	0.00%	pass	2.9E-04	5.3E-04	2.3E-03
00659787	4	35	55	1	20	210.0	231.0	0.001	0	149.0	20.00	21.0	0.0E+00	28.47	1.00	**1.3E-02**	**1.1E+03**	**7.4**	20.00	0.00%	pass	4.1E-04	1.4E-03	6.4E-03
00661125	4	20	50	8	40	191.0	340.0	0.001	0	149.0	30.00	149.0	0.0E+00	0.00	1.33	**3.8E-03**	**3.3E+02**	**2.2**	30.00	0.00%	pass	5.8E-04	4.5E-04	1.2E-03
00669166	4	22	60	2	30	137.0	198.0	0.001	0	149.0	38.00	61.0	0.0E+00	7.59	0.79	**4.2E-03**	**3.6E+02**	**2.4**	38.00	0.00%	pass	3.3E-04	4.8E-04	2.0E-03
00670224	4	15	50	8	50	160.0	190.0	0.001	0	149.0	35.00	30.0	0.0E+00	19.45	1.43	**1.4E-02**	**1.2E+03**	**8.3**	35.00	0.00%	pass	5.9E-04	1.6E-03	6.6E-03
00681481	4	45	80	1	20	136.0	156.0	0.001	0	149.0	35.00	20.0	0.0E+00	29.94	0.57	**7.5E-03**	**6.5E+02**	**4.4**	35.00	0.00%	pass	2.4E-04	8.5E-04	3.8E-03
00693255	4	30	120	1	60	209.0	240.0	0.001	0	149.0	90.00	31.0	0.0E+00	18.75	0.67	**6.1E-03**	**5.3E+02**	**3.6**	90.00	0.00%	pass	2.8E-04	7.0E-04	3.0E-03
00693865	4	25	50	8	50	218.0	240.0	0.001	0	149.0	25.00	22.0	0.0E+00	27.13	2.00	**2.6E-02**	**2.2E+03**	**14.8**	25.00	0.00%	pass	8.3E-04	2.9E-03	1.2E-02
00706703	4	20	60	2	25	211.0	246.0	0.001	0	149.0	40.00	35.0	0.0E+00	16.31	0.63	**5.3E-03**	**4.6E+02**	**3.1**	40.00	0.00%	pass	2.6E-04	6.0E-04	2.5E-03
00707655	4	15	50	8	70	240.0	300.0	0.001	0	149.0	35.00	60.0	0.0E+00	7.80	2.00	**1.2E-02**	**1.0E+03**	**6.7**	35.00	0.00%	pass	8.4E-04	1.3E-03	5.2E-03
00707857	4	29	50	8	70	169.0	300.0	0.001	0	149.0	21.00	131.0	0.0E+00	0.64	3.33	**1.1E-02**	**9.4E+02**	**6.3**	21.00	0.00%	pass	1.4E-03	1.3E-03	3.5E-03
00707875	4	25	50	8	60	217.0	260.0	0.001	0	149.0	25.00	43.0	0.0E+00	12.65	2.40	**1.8E-02**	**1.6E+03**	**10.6**	25.00	0.00%	pass	1.0E-03	2.1E-03	8.2E-03
00707896	4	20	50	8	60	175.0	296.0	0.001	0	149.0	30.00	121.0	0.0E+00	1.11	2.00	**6.7E-03**	**5.8E+02**	**3.9**	30.00	0.00%	pass	8.6E-04	7.8E-04	2.4E-03
00707897	4	26	60	8	60	183.0	320.0	0.001	0	149.0	34.00	137.0	0.0E+00	0.40	1.76	**5.4E-03**	**4.6E+02**	**3.1**	34.00	0.00%	pass	7.7E-04	6.3E-04	1.7E-03
00716797	4	25	260	1	30	232.0	260.0	0.001	0	149.0	235.00	28.0	0.0E+00	20.99	0.13	**1.2E-03**	**1.1E+02**	**0.7**	235.00	0.00%	pass	5.3E-05	1.4E-04	6.3E-04
00716799	4	22	220	1	100	216.0	220.0	0.001	0	149.0	198.00	4.0	0.0E+00	146.35	0.51	**2.8E-02**	**2.4E+03**	**16.0**	198.00	0.00%	pass	2.1E-04	3.1E-03	1.6E-02
00735706	4	18	165	1	60	168.0	186.0	0.001	0	149.0	147.00	18.0	0.0E+00	33.32	0.41	**5.9E-03**	**5.1E+02**	**3.4**	147.00	0.00%	pass	1.7E-04	6.6E-04	3.0E-03
00735706	4	18	75	2	40	168.0	186.0	0.001	0	149.0	57.00	18.0	0.0E+00	33.32	0.70	**1.0E-02**	**8.8E+02**	**5.9**	57.00	0.00%	pass	2.9E-04	1.2E-03	5.2E-03
00739556	4	15	50	8	80	163.0	188.0	0.001	0	149.0	35.00	25.0	0.0E+00	23.72	2.29	**2.6E-02**	**2.3E+03**	**15.4**	35.00	0.00%	pass	9.5E-04	3.0E-03	1.2E-02
00742803	4	70	240	1	30	263.0	300.0	0.001	0	149.0	170.00	37.0	0.0E+00	15.26	0.18	**1.4E-03**	**1.2E+02**	**0.8**	170.00	0.00%	pass	7.4E-05	1.5E-04	6.9E-04
00748035	4	27	80	2	100	167.0	196.0	0.001	0	149.0	53.00	29.0	0.0E+00	20.20	1.89	**1.9E-02**	**1.6E+03**	**11.0**	53.00	0.00%	pass	7.8E-04	2.1E-03	9.0E-03
00756072	4	15	35	45	55	160.0	190.0	0.001	0	149.0	20.00	30.0	0.0E+00	19.45	2.75	**2.9E-02**	**2.5E+03**	**16.6**	20.00	0.00%	pass	1.1E-03	3.2E-03	1.3E-02
00761478	4	30	90	2	75	173.0	220.0	0.001	0	149.0	60.00	47.0	0.0E+00	11.24	1.25	**8.4E-03**	**7.3E+02**	**4.9**	60.00	0.00%	pass	5.2E-04	9.6E-04	4.0E-03
00765325	4	20	60	3	30	80.0	175.0	0.001	0	149.0	40.00	95.0	0.0E+00	2.90	0.75	**2.7E-03**	**2.4E+02**	**1.6**	40.00	0.00%	pass	3.2E-04	3.2E-04	1.3E-03
00776889	4	24	220	1.5	25	219.0	245.0	0.001	0	149.0	196.00	26.0	0.0E+00	22.75	0.13	**1.3E-03**	**1.1E+02**	**0.8**	196.00	0.00%	pass	5.3E-05	1.5E-04	6.7E-04
00778026	4	24	100	6	50	199.0	245.0	0.001	0	149.0	76.00	46.0	0.0E+00	11.57	0.66	**4.6E-03**	**3.9E+02**	**2.6**	76.00	0.00%	pass	2.8E-04	5.2E-04	2.1E-03
00778031	6	20	27.75	2.5	100	161.0	260.0	0.001	0	149.0	7.75	99.0	0.0E+00	2.35	12.90	**4.9E-02**	**4.2E+03**	**28.2**	7.75	0.01%	pass	5.5E-03	5.7E-03	1.9E-02
00778073	4	22	44	1	20	126.0	171.0	0.001	0	149.0	22.00	45.0	0.0E+00	11.92	0.91	**6.2E-03**	**5.3E+02**	**3.6**	22.00	0.00%	pass	3.8E-04	7.0E-04	3.0E-03
00779162	4	13	50	5	70	194.0	235.0	0.001	0	149.0	37.00	41.0	0.0E+00	13.45	1.89	**1.5E-02**	**1.3E+03**	**8.5**	37.00	0.00%	pass	7.9E-04	1.7E-03	6.8E-03
00779305	4	25	50	3	75	168.0	218.0	0.001	0	149.0	25.00	50.0	0.0E+00	10.31	3.00	**2.0E-02**	**1.7E+03**	**11.5**	25.00	0.00%	pass	1.3E-03	2.3E-03	9.1E-03
00784102	8	34	250	3	400	168.0	250.0	0.001	0	149.0	216.00	82.0	0.0E+00	3.69	1.85	**7.1E-03**	**6.1E+02**	**4.1**	216.00	0.00%	pass	7.9E-04	8.3E-04	3.2E-03
																Max	**4.8E+04**	**3.2E+02**						
																Min	**9.5E+01**	**6.4E-01**						
																Geomean	**1.3E+03**	**8.9E+00**						

References:

Bradbury, K.B., and E.R. Rothschild, 1985. A computerized technique for estimating the hydraulic conductivity of aquifer from specific capacity data: Ground Water vol. 23, No. 2, pp. 240-246.

ASTM International, 2004. Standard Test Method for Determining Specific Capacity and Estimating Transmissivity at the Control Well, Standard D 5472-93, in Annual Book of ASTM Standards, Vol. 04.08 pp. 1279-1282.

Wonewoc

Worksheet for Estimating Transmissivity and Hydraulic Conductivity from Specific Capacity Test Data

Explanation and notes attached.

Maximum iterations	100
Error tolerance (as drawdown)	0.001 feet

	Field Data							*Estimated Parameters*			*Calculated Results*								*Diagnostics*					
		Depth to Water				Screened Interval													*Solution Integrity*			*Sensitivity of T:*		
Location	Well Diam.	Initial	Final	Test Duration	Mean Pumping Rate	Depth to Top	Depth to Bottom	Storage Coeff. (S)	Well loss Coeff. (C)	Aquifer Thickness (b)	Measured Drawdown (s_m)	Saturated Screen Length (L)	Well loss (s_w)	Partial Penetration Parameter (s_p)	Specific Capacity	**Transmissivity (T)**	**T (ft^2/day)**	**Conductivity (K)**	Calculated Drawdown	Error as Drawdown	Well Bore Storage Test	to S at ± 1 factor of 10	to s_w at 10% of s_m	to b at ± 25%
	inches	feet	feet	hours	gpm	feet	feet	-	sec^2/ft^5	feet	feet	feet	feet	-	gpm/ft	**sq ft/sec**		**ft/day**	feet			sq ft/sec	sq ft/sec	sq ft/sec
00104703	3	24	40	4	25	216.0	229.0	0.001	0	57.0	16.00	13.0	0.0E+00	14.60	1.56	**1.3E-02**	**1.1E+03**	**19.4**	16.00	0.00%	pass	6.5E-04	1.5E-03	5.7E-03
00122194	4	15	35	3	30	220.0	260.0	0.001	0	57.0	20.00	40.0	0.0E+00	1.71	1.50	**5.0E-03**	**4.3E+02**	**7.5**	20.00	0.00%	pass	6.5E-04	5.9E-04	1.8E-03
00140176	4	20	35	4	60	245.0	288.0	0.001	0	57.0	15.00	43.0	0.0E+00	1.28	4.00	**1.4E-02**	**1.2E+03**	**20.6**	15.00	0.00%	pass	1.7E-03	1.6E-03	4.4E-03
00145432	4	13	30	5	25	172.0	214.0	0.001	0	57.0	17.00	42.0	0.0E+00	1.42	1.47	**4.9E-03**	**4.2E+02**	**7.4**	17.00	0.00%	pass	6.3E-04	5.7E-04	1.7E-03
00147153	4	21	25	3	60	202.0	231.0	0.001	0	57.0	4.00	29.0	0.0E+00	4.14	15.00	**7.0E-02**	**6.0E+03**	**105.6**	4.00	0.00%	pass	6.4E-03	8.1E-03	2.7E-02
00154527	4	40	55	4	35	181.0	186.0	0.001	0	57.0	15.00	5.0	0.0E+00	35.86	2.33	**3.7E-02**	**3.2E+03**	**56.0**	15.00	0.00%	pass	9.6E-04	4.2E-03	1.9E-02
00155262	4	20	30	3	25	207.0	213.0	0.001	0	57.0	10.00	6.0	0.0E+00	30.09	2.50	**3.4E-02**	**3.0E+03**	**52.0**	10.00	0.00%	pass	1.0E-03	3.9E-03	1.7E-02
00169693	4	10	30	2	30	275.0	311.0	0.001	0	57.0	20.00	36.0	0.0E+00	2.42	1.50	**5.3E-03**	**4.5E+02**	**8.0**	20.00	0.00%	pass	6.5E-04	6.2E-04	2.1E-03
00178923	4	25	60	3	30	223.0	275.0	0.001	0	57.0	35.00	52.0	0.0E+00	0.35	0.86	**2.3E-03**	**2.0E+02**	**3.5**	35.00	0.00%	pass	3.7E-04	2.8E-04	6.9E-04
00179376	4	15	35	3	55	278.0	306.0	0.001	0	57.0	20.00	28.0	0.0E+00	4.45	2.75	**1.2E-02**	**1.1E+03**	**18.5**	20.00	0.00%	pass	1.2E-03	1.4E-03	5.1E-03
00190419	4	20	40	3	20	202.0	243.0	0.001	0	57.0	20.00	41.0	0.0E+00	1.56	1.00	**3.2E-03**	**2.8E+02**	**4.8**	20.00	0.00%	pass	4.3E-04	3.8E-04	1.2E-03
00197581	4	7	28	3	60	212.0	270.0	0.001	0	57.0	21.00	58.0	0.0E+00	-0.06	2.86	**7.9E-03**	**6.8E+02**	**12.0**	21.00	0.00%	pass	1.2E-03	9.4E-04	1.9E-03
00199906	4	26	50	2	30	201.0	220.0	0.001	0	57.0	24.00	19.0	0.0E+00	8.48	1.25	**7.1E-03**	**6.2E+02**	**10.8**	24.00	0.00%	pass	5.3E-04	8.2E-04	3.2E-03
00406314	4	10	100	1	50	210.0	280.0	0.001	0	57.0	90.00	70.0	0.0E+00	-0.62	0.56	**1.1E-03**	**9.8E+01**	**1.7**	90.00	0.00%	pass	2.5E-04	1.4E-04	4.1E-04
00406320	4	20	100	2	60	273.0	340.0	0.001	0	57.0	80.00	67.0	0.0E+00	-0.50	0.75	**1.7E-03**	**1.5E+02**	**2.6**	80.00	0.00%	pass	3.3E-04	2.1E-04	5.0E-04
00408981	4	15	45	2	35	195.0	231.0	0.001	0	57.0	30.00	36.0	0.0E+00	2.42	1.17	**4.0E-03**	**3.5E+02**	**6.1**	30.00	0.00%	pass	5.0E-04	4.7E-04	1.7E-03
00408981	4	15	45	3	35	195.0	231.0	0.001	0	57.0	30.00	36.0	0.0E+00	2.42	1.17	**4.1E-03**	**3.6E+02**	**6.3**	30.00	0.00%	pass	5.0E-04	4.8E-04	1.7E-03
00409516	4	15	245	3	12	217.0	245.0	0.001	0	57.0	230.00	28.0	0.0E+00	4.45	0.05	**1.9E-04**	**1.7E+01**	**0.3**	230.00	0.00%	pass	2.2E-05	2.3E-05	9.7E-05
00411507	4	20	40	3	30	256.0	335.0	0.001	0	57.0	20.00	79.0	0.0E+00	-0.99	1.50	**3.4E-03**	**3.0E+02**	**5.2**	20.00	0.00%	pass	6.6E-04	4.2E-04	1.6E-03
00429151	4	8	18	3	25	220.0	225.0	0.001	0	57.0	10.00	5.0	0.0E+00	35.86	2.50	**3.9E-02**	**3.4E+03**	**59.8**	10.00	0.00%	pass	1.0E-03	4.4E-03	2.0E-02
00435830	4	7	15	4	30	213.0	255.0	0.001	0	57.0	8.00	42.0	0.0E+00	1.42	3.75	**1.3E-02**	**1.1E+03**	**19.5**	8.00	0.00%	pass	1.6E-03	1.5E-03	4.3E-03
00435832	4	10	20	4	30	168.0	216.0	0.001	0	57.0	10.00	48.0	0.0E+00	0.71	3.00	**9.4E-03**	**8.1E+02**	**14.2**	10.00	0.00%	pass	1.3E-03	1.1E-03	2.8E-03
00437222	4	12	75	1	100	195.0	236.0	0.001	0	57.0	63.00	41.0	0.0E+00	1.56	1.59	**4.9E-03**	**4.2E+02**	**7.4**	63.00	0.00%	pass	6.9E-04	5.8E-04	1.9E-03
00437222	4	12	30	1	25	195.0	236.0	0.001	0	57.0	18.00	41.0	0.0E+00	1.56	1.39	**4.2E-03**	**3.6E+02**	**6.4**	18.00	0.00%	pass	6.0E-04	5.0E-04	1.7E-03
00437700	4	13	30	3	25	205.0	240.0	0.001	0	57.0	17.00	35.0	0.0E+00	2.62	1.47	**5.4E-03**	**4.6E+02**	**8.1**	17.00	0.00%	pass	6.3E-04	6.3E-04	2.2E-03
00450304	4	16	40	5	30	232.0	286.0	0.001	0	57.0	24.00	54.0	0.0E+00	0.20	1.25	**3.5E-03**	**3.0E+02**	**5.3**	24.00	0.00%	pass	5.5E-04	4.2E-04	9.4E-04
00450309	4	15	30	4	35	232.0	286.0	0.001	0	57.0	15.00	54.0	0.0E+00	0.20	2.33	**6.7E-03**	**5.8E+02**	**10.2**	15.00	0.00%	pass	1.0E-03	8.0E-04	1.7E-03
00450310	4	19	45	4	25	238.0	298.0	0.001	0	57.0	26.00	60.0	0.0E+00	-0.17	0.96	**2.5E-03**	**2.1E+02**	**3.8**	26.00	0.00%	pass	4.2E-04	3.0E-04	6.3E-04
00450325	4	25	45	5	30	232.0	291.0	0.001	0	57.0	20.00	59.0	0.0E+00	-0.12	1.50	**4.1E-03**	**3.5E+02**	**6.2**	20.00	0.00%	pass	6.6E-04	4.9E-04	1.0E-03
00477365	4	36	70	2	35	306.0	350.0	0.001	0	57.0	34.00	44.0	0.0E+00	1.15	1.03	**3.0E-03**	**2.6E+02**	**4.6**	34.00	0.00%	pass	4.5E-04	3.6E-04	1.1E-03
00494285	4	15	25	3	30	162.0	167.0	0.001	0	57.0	10.00	5.0	0.0E+00	35.86	3.00	**4.7E-02**	**4.1E+03**	**72.0**	10.00	0.01%	pass	1.2E-03	5.3E-03	2.4E-02
00506378	4	25	40	3	40	228.0	258.0	0.001	0	57.0	15.00	30.0	0.0E+00	3.85	2.67	**1.1E-02**	**9.7E+02**	**17.1**	15.00	0.00%	pass	1.1E-03	1.3E-03	4.6E-03
00509243	4	10	160	1	70	163.0	174.0	0.001	0	57.0	150.00	11.0	0.0E+00	16.37	0.47	**3.9E-03**	**3.3E+02**	**5.9**	150.00	0.00%	pass	1.9E-04	4.4E-04	1.8E-03
00509243	4	10	100	2	50	163.0	174.0	0.001	0	57.0	90.00	11.0	0.0E+00	16.37	0.56	**4.7E-03**	**4.0E+02**	**7.1**	90.00	0.00%	pass	2.3E-04	5.3E-04	2.2E-03
00510535	4	20	45	2	40	203.0	245.0	0.001	0	57.0	25.00	42.0	0.0E+00	1.42	1.60	**5.0E-03**	**4.3E+02**	**7.6**	25.00	0.00%	pass	6.9E-04	5.9E-04	1.8E-03
00510535	4	20	45	3	40	203.0	245.0	0.001	0	57.0	25.00	42.0	0.0E+00	1.42	1.60	**5.2E-03**	**4.4E+02**	**7.8**	25.00	0.00%	pass	6.9E-04	6.1E-04	1.8E-03
00511955	4	18	30	3.5	50	212.0	261.0	0.001	0	57.0	12.00	49.0	0.0E+00	0.61	4.17	**1.3E-02**	**1.1E+03**	**19.7**	12.00	0.00%	pass	1.8E-03	1.5E-03	3.7E-03
00562952	4	20	200	3	25	227.0	238.0	0.001	0	57.0	180.00	11.0	0.0E+00	16.37	0.14	**1.1E-03**	**9.9E+01**	**1.7**	180.00	0.00%	pass	5.8E-05	1.3E-04	5.5E-04
00587137	4	25	65	2	75	220.0	245.0	0.001	0	57.0	40.00	25.0	0.0E+00	5.52	1.88	**8.8E-03**	**7.6E+02**	**13.3**	40.00	0.00%	pass	8.0E-04	1.0E-03	3.8E-03
00599191	4	30	50	3	40	224.0	240.0	0.001	0	57.0	20.00	16.0	0.0E+00	10.65	2.00	**1.3E-02**	**1.2E+03**	**20.2**	20.00	0.00%	pass	8.4E-04	1.5E-03	5.8E-03
00624533	4	20	50	6	70	300.0	320.0	0.001	0	57.0	30.00	20.0	0.0E+00	7.89	2.33	**1.4E-02**	**1.2E+03**	**20.5**	30.00	0.00%	pass	9.8E-04	1.6E-03	5.7E-03
00705752	4	18	100	2	55	200.0	240.0	0.001	0	57.0	82.00	40.0	0.0E+00	1.71	0.67	**2.1E-03**	**1.8E+02**	**3.1**	82.00	0.00%	pass	2.9E-04	2.5E-04	8.3E-04

Max	**6.0E+03**	**1.1E+02**
Min	**1.7E+01**	**2.9E-01**
Geomean	**5.3E+02**	**9.3E+00**

References:

Bradbury, K.B., and E.R. Rothschild, 1985. A computerized technique for estimating the hydraulic conductivity of aquifer from specific capacity data: Ground Water vol. 23, No. 2, pp. 240-246.

ASTM International, 2004. Standard Test Method for Determining Specific Capacity and Estimating Transmissivity at the Control Well, Standard D 5472-93, in Annual Book of ASTM Standards, Vol. 04.08 pp. 1279-1282.

MINNESOTA MDH DEPARTMENT OF HEALTH
Environmental Health Division
Drinking Water Protection Section
Source Water Protection Unit
P.O. Box 64975
St. Paul, Minnesota 55164-0975

Determination of Aquifer Properties and Aquifer Test Plan (DAP-ATP) Form

Public Water Supply ID:	1020017	PWS Name:	Coon Rapids

Contact Information for Person Completing this Form

Name:	John Greer
Address:	Barr Engineering Company
	4700 West 77th Street, Suite 200
City, State, Zip:	Edina, MN 55435
Phone, Fax, e-mail:	(952) 832-2691

Aquifer Properties Determination Methods

☐ 1) An existing pumping test that meets the requirements of wellhead protection rule part 4720.5520 and that was previously conducted on a well connected to the public water supply system.

☐ 2) An existing pumping test that meets the requirements of wellhead protection rule part 4720.5520 and that was previously conducted on another well in a hydrogeologic setting determined by the department to be equivalent.

☐ 3) A proposed new test to be conducted on a new or existing well connected to the public water supply system and that meets the requirements for larger-sized water systems (wellhead protection rule part 4720.5520). A test plan must be approved before conducting the test.

☐ 4) A proposed new test to be conducted on a new or existing public well connected to the public water supply system and that meets the requirements for smaller-sized water systems (wellhead protection rule part 4720.5530). A test plan must be approved before conducting the test.

☐ 5) An existing pumping test that does not meet the requirements of wellhead protection rule part 4720.5520 and that was previously conducted on: 1) a public water supply well or 2) another well in a hydrogeologic setting determined by the department to be equivalent.

☑ 6) Existing specific capacity test(s) conducted on the public water supply well(s) or specific capacity tests conducted on other wells in a hydrogeologic setting determined by the department to be equivalent.

☐ 7) An existing published transmissivity value.

- Include all test data and analysis documentation with the estimated transmissivity, ft^2/day, when the aquifer properties determination method is; 1, 2, 5, 6, or 7, listed above.
- ▪ Attach detailed aquifer test plan for methods 3 or 4.

Submitted by: John Greer	Prof. License: 30347	Date: 7/31/2015

To request this document in another format, please call our Section Receptionist (651/201-4700) or Division TTY (651/201-5797).

Rationale for: 1) Aquifer Properties Determination or 2) Proposed New Test

Briefly describe the rationale for: 1) selected method to determine aquifer properties from existing data, **or** 2) a new aquifer test to be conducted on the pumped well referenced below. Include unique well numbers of all wells that were (or will be) monitored during data collection. How does the existing or proposed test deviate from the ideal. (e.g. rate, duration, no. of obwells, interfering wells, etc.) Attach documentation as necessary.

Aquifer Name:	Mt. Simon Sandstone	✓ Confined	☐ Unconfined	☐ Fractured Rock

Specific capacity data on the CWI log for Coon Rapids Well 18 (Unique Number 110469) was analyzed using the TGuess Method (Bradbury and Rothschild, 1985) to obtain a transmissivity of 4,700 ft**2/day (see attached).

Four production tests were conducted on Andover Well 3 (Unique Number 431683) in 1987. See the attached plots (provided by MDH) for test data and analysis. Below is a summary of the results from the four tests:

Date	Flow Rate (gpm)	T(ft**2/day)
10/12/1987	600	1,880
10/13/1987	600	1,600
10/14/1987	800	2,200
10/16/1987	1000	2,130

The geometric mean transmissivity of all five tests is 2,310 ft**2/day, which will be used in the base case model. The max and min of the four tests, 1,600 ft**2/day and 4,700 ft**2/day, respectively, will be used as the sensitivity analysis ranges.

Proposed New Test Information Summary

Pumped Well Name (Unique Number):	110469, 431683	**Test Duration (Hours):**	varies
Location: X, Y (meters) UTM-Z15N or Lat-Lon (decimal degrees) datum: NAD83	476962, 5004924 (110469) 476994, 5007465 (431683)	**Pump Type:**	unknown
		Discharge Rate:	600, 800, 1000, 1400 gpm
Number of Observation Wells:	0	**Flow Rate Measuring Device Type:**	unknown

- A map showing the location of the pumping well and observation well(s) must be included.

List the unique number of each public water supply well to which this DAP-ATP Form applies

202929	202965	110469			
202972	168721				
202951	161413				
202943	110460				
202932	110461				
202930	168720				

Reviewed by: Amal Djerrari	**Approved:** ● Yes ○ No	**Approval Date:** 8/3/2015

Mt. Simon

Worksheet for Estimating Transmissivity and Hydraulic Conductivity from Specific Capacity Test Data

Explanation and notes attached.

Maximum iterations	100
Error tolerance (as drawdown)	0.001 feet

Field Data								*Estimated Parameters*			*Calculated Results*								*Diagnostics*					
		Depth to Water				Screened Interval													*Solution Integrity*			*Sensitivity of T:*		
Location	Well Diam.	Initial	Final	Test Duration	Mean Pumping Rate	Depth to Top	Depth to Bottom	Storage Coeff. (S)	Well loss Coeff. (C)	Aquifer Thickness (b)	Measured Drawdown (s_m)	Saturated Screen Length (L)	Well loss (s_w)	Partial Penetration Parameter (s_p)	Specific Capacity	**Transmissivity (T)**	**T (ft^2/day)**	**Conductivity (K)**	Calculated Drawdown	Error as Drawdown	Well Bore Storage Test	to S at ± 1 factor of 10	to s_w at 10% of s_m	to b at ± 25%
	inches	feet	feet	hours	gpm	feet	feet	-	sec^2/ft^5	feet	feet	feet	feet	-	gpm/ft	**sq ft/sec**		**ft/day**	feet			sq ft/sec	sq ft/sec	sq ft/sec
00110469 (Coon Rapids 18)	24	140	248	36	1400	575.0	637.0	0.001	0	128.0	108.00	62.0	0.0E+00	3.53	12.96	**5.4E-02**	**4.7E+03**	**36.7**	108.00	0.00%	pass	5.5E-03	6.3E-03	1.9E-02

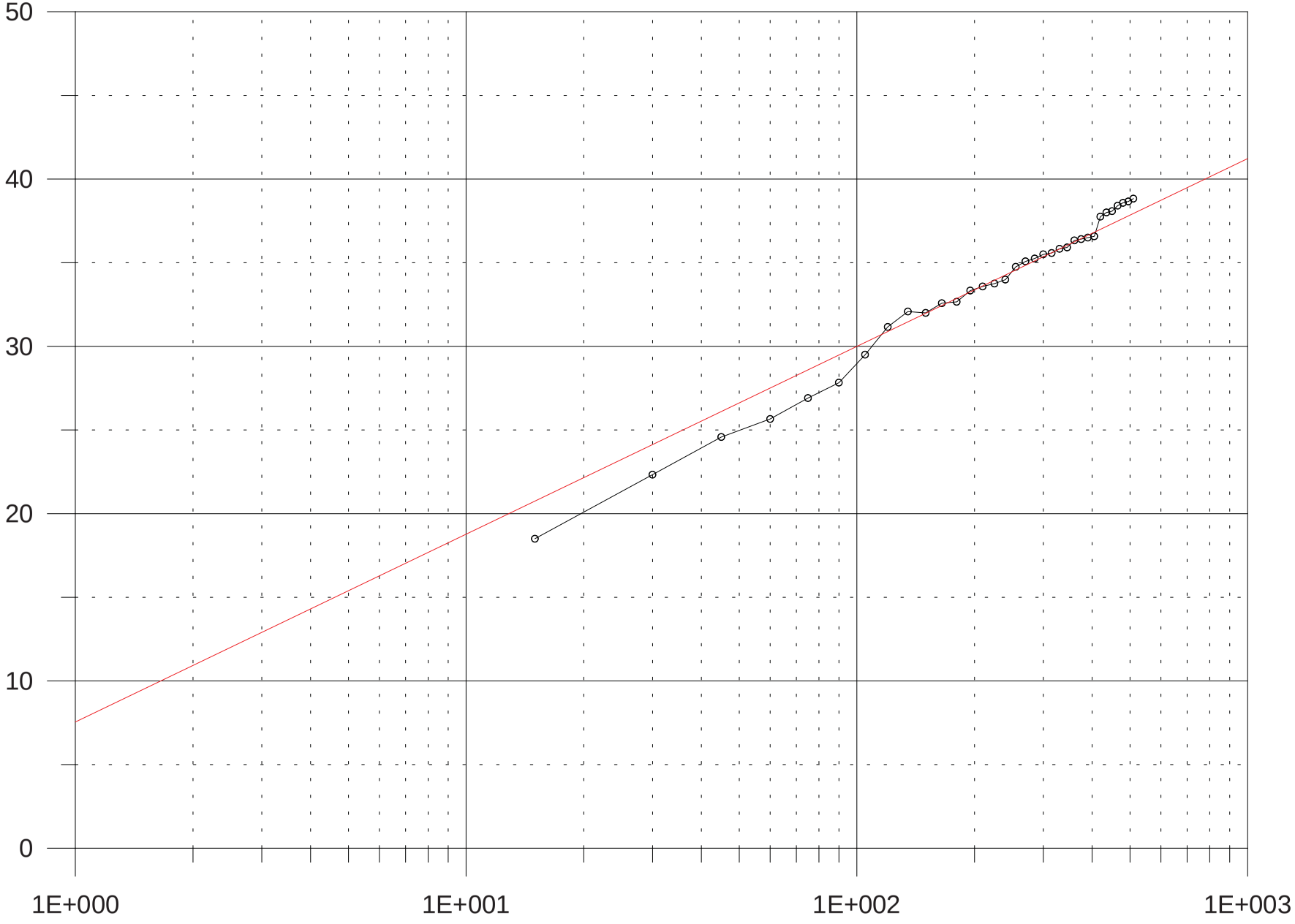
References:

Bradbury, K.B., and E.R. Rothschild, 1985. A computerized technique for estimating the hydraulic conductivity of aquifer from specific capacity data: Ground Water vol. 23, No. 2, pp. 240-246.

ASTM International, 2004. Standard Test Method for Determining Specific Capacity and Estimating Transmissivity at the Control Well, Standard D 5472-93, in Annual Book of ASTM Standards, Vol. 04.08 pp. 1279-1282.

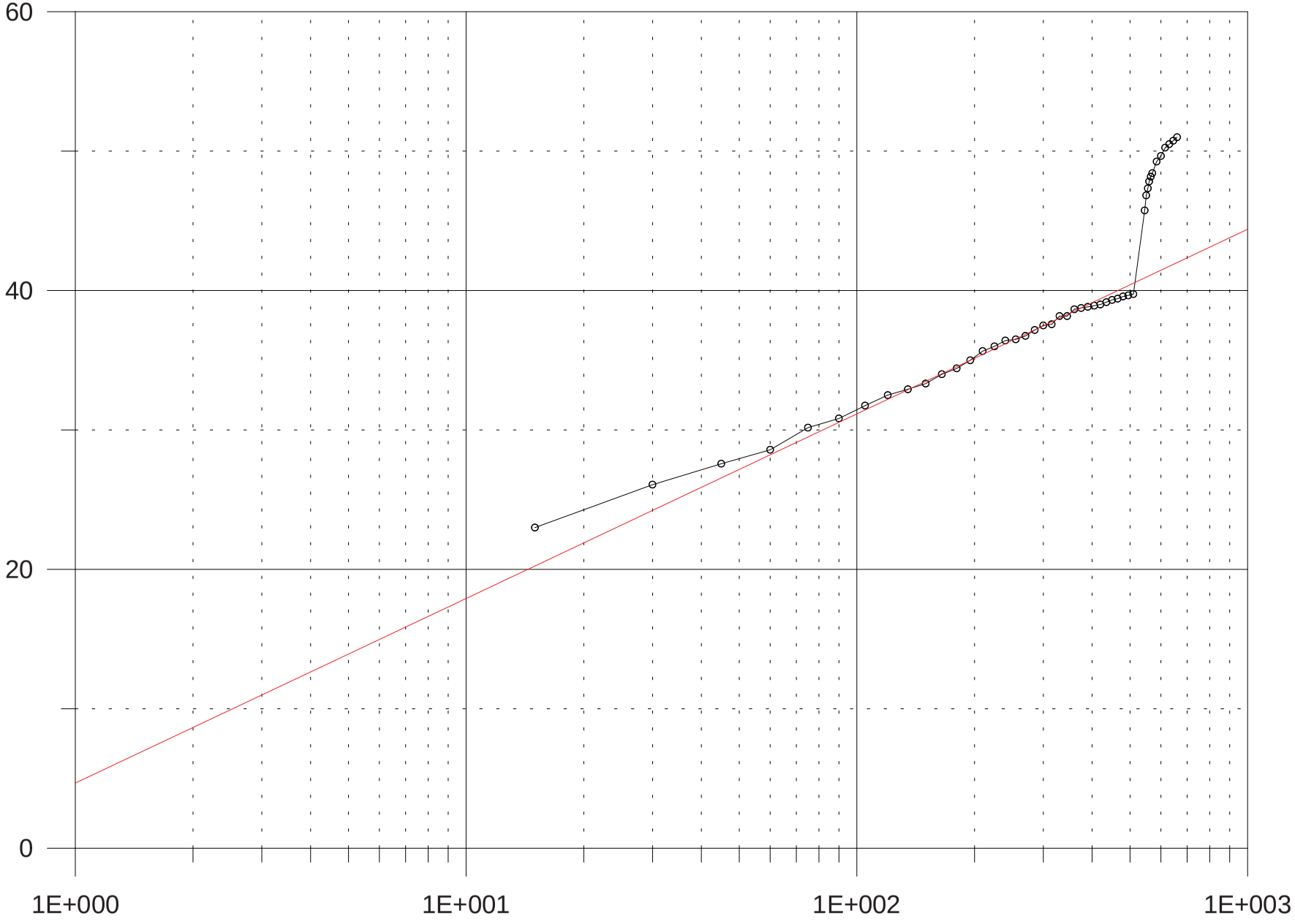
Test of Andover Well #3 (431683)
10/12/1987
Production Test

T = 35.3 600 / 11.24 = 1880 ft2/day



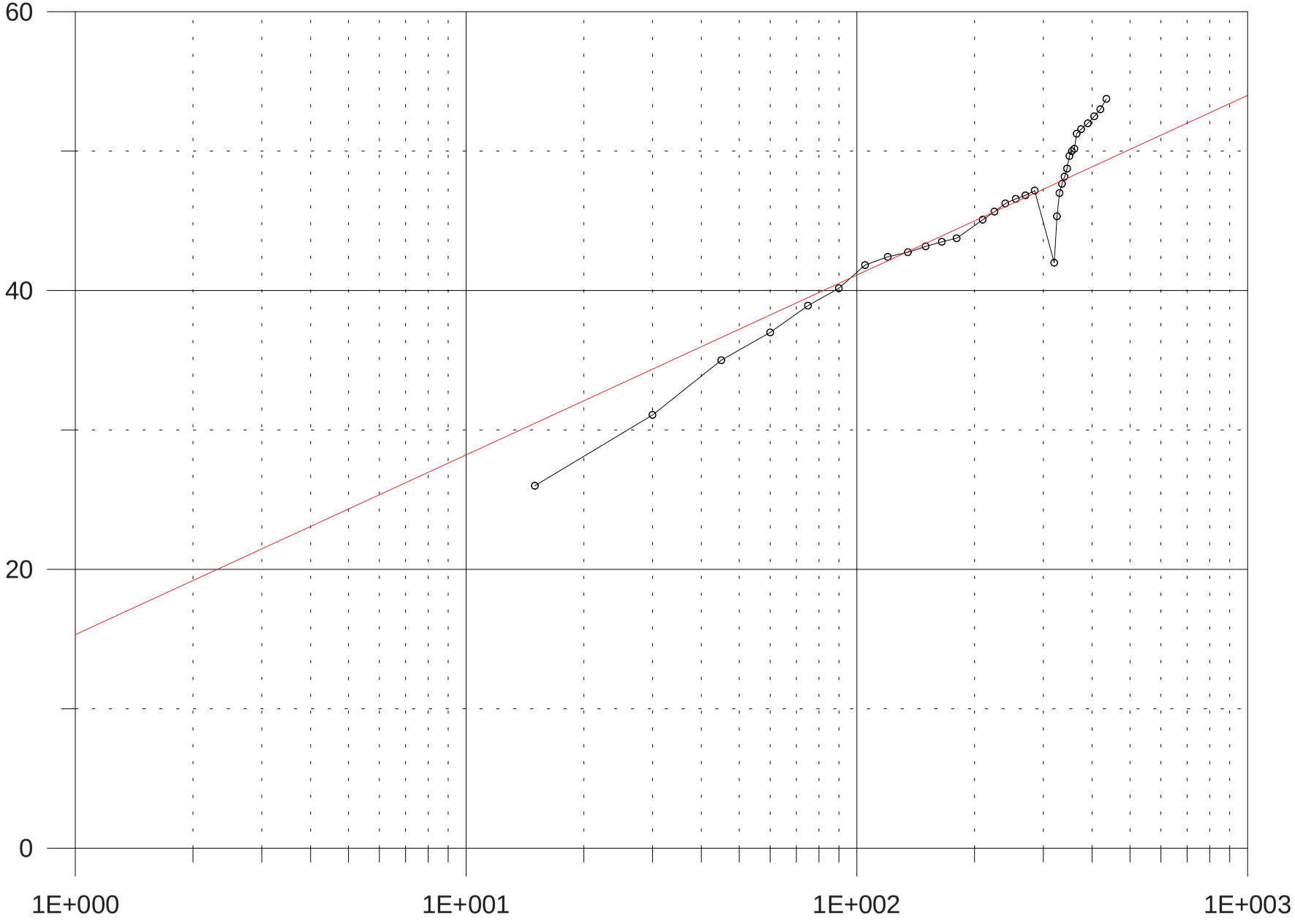
Test of Andover Well #3 (431683)
10/13/1987
Production Test

T = 35.3 600 / 13.24 = 1600 ft2/day



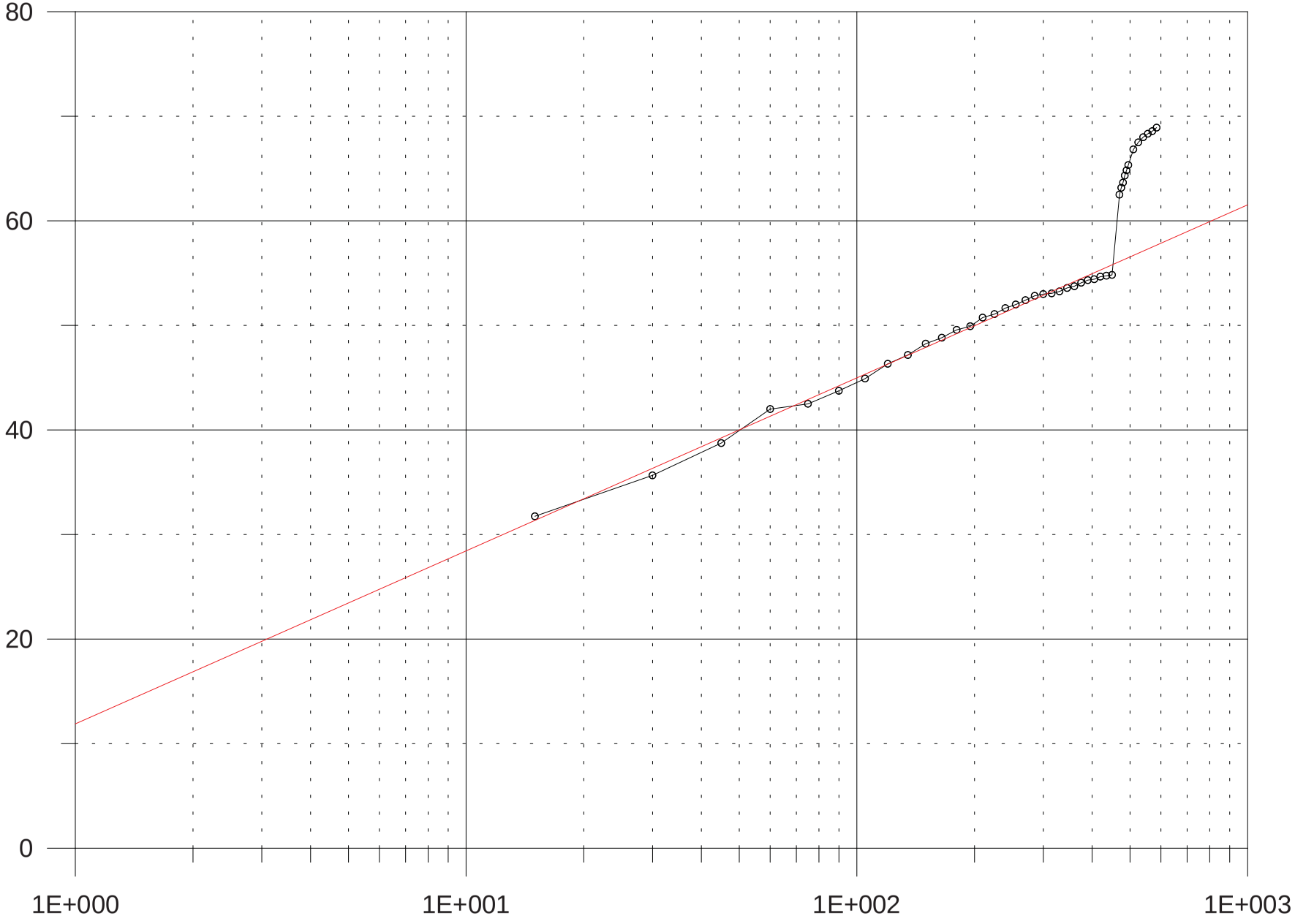
Test of Andover Well #3 (431683)
10/14/1987
Production Test

T = 35.3 800/ 12.89 = 2200ft2/day



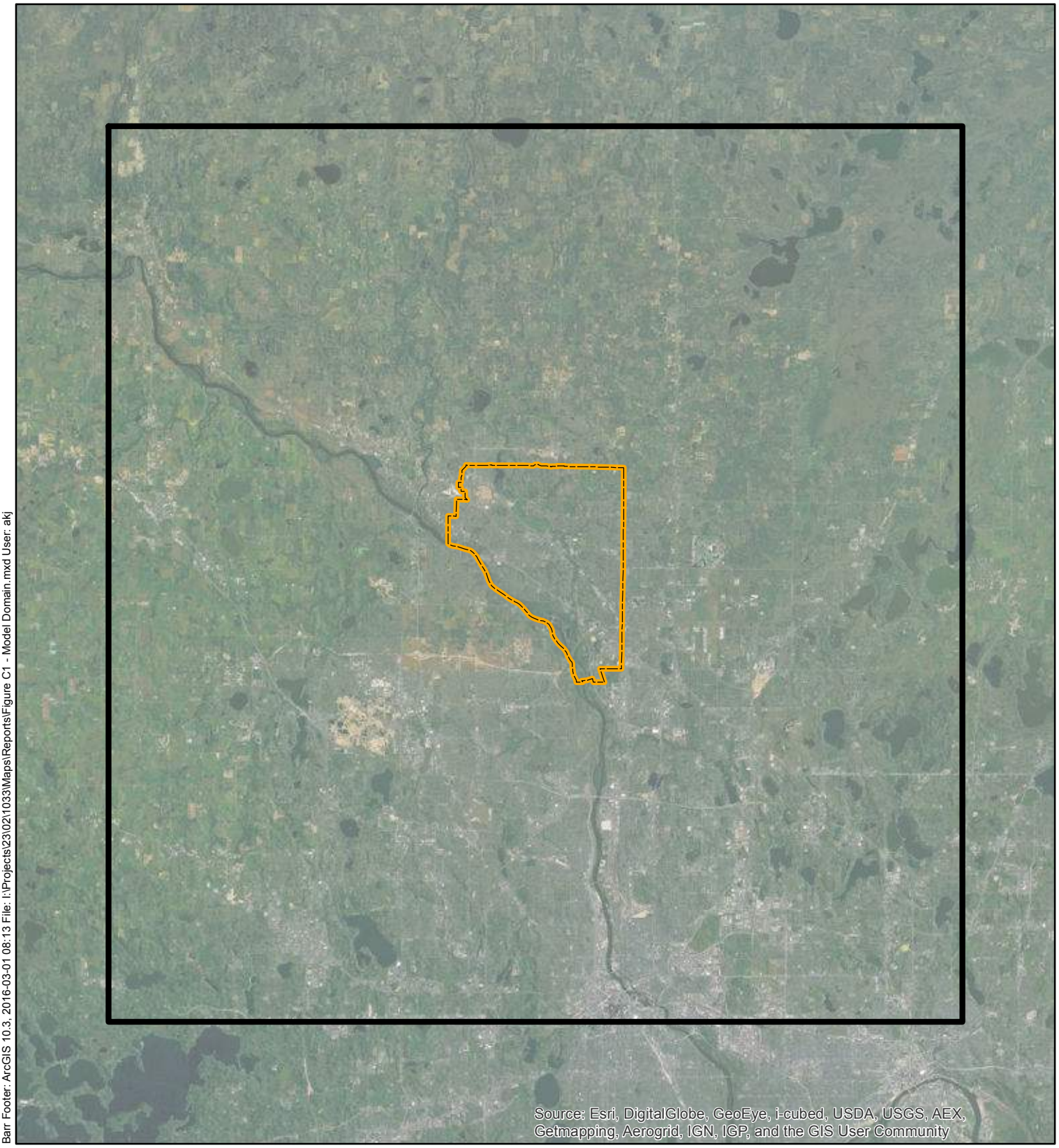
Test of Andover Well #3 (431683)
10/16/1987
Production Test

T = 35.3 1000/ 15.56 = 2130 ft2/day



Appendix C

Groundwater Model Details



Barr Footer: ArcGIS 10.3, 2016-03-01 08:13 File: I:\Projects\23\02\1033\Maps\Reports\Figure C1 - Model Domain.mxd User: akj

Model Boundary

Coon Rapids City Limits

N

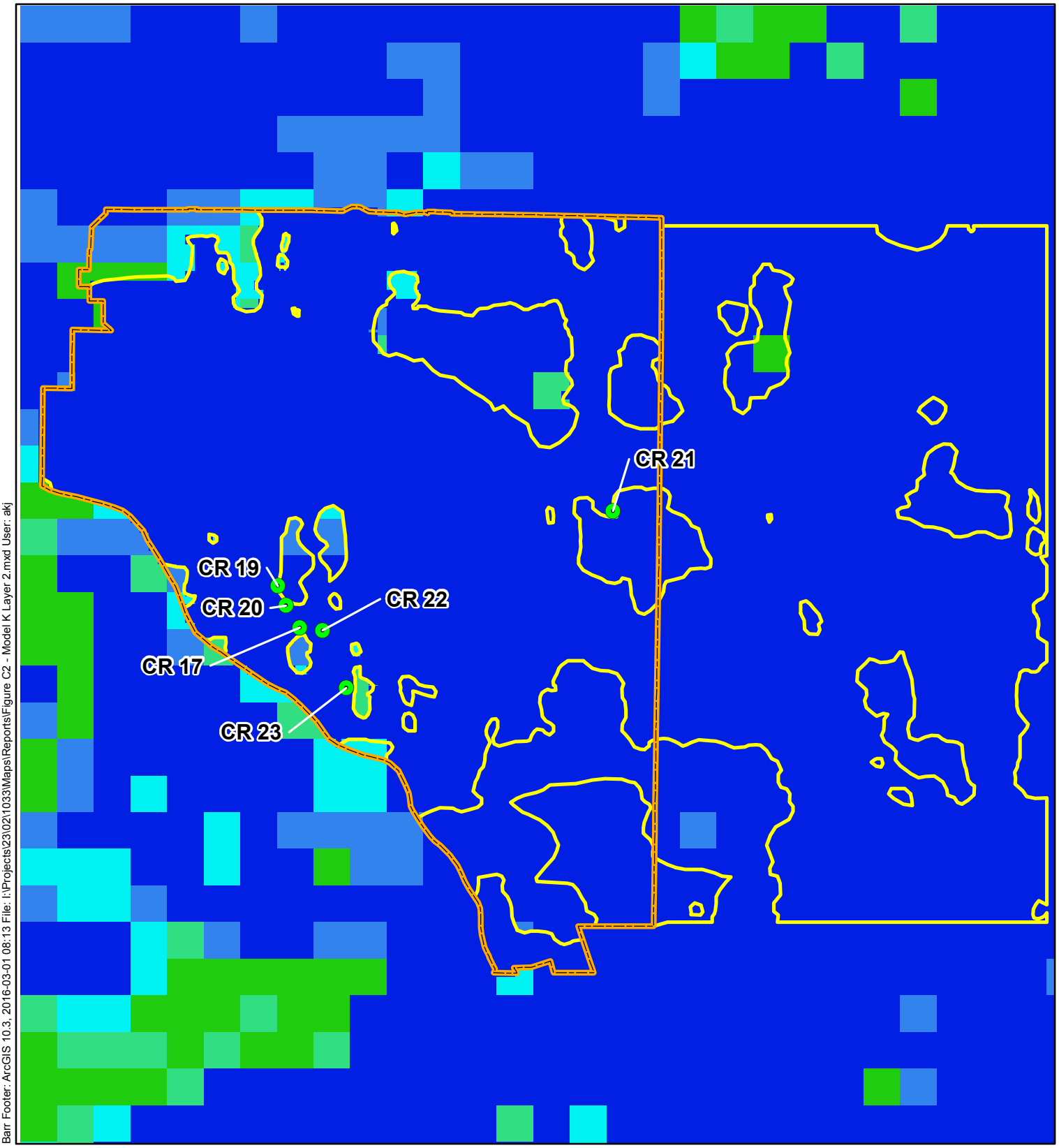
Miles

4 0 4

BARR

Figure C1

MODEL DOMAIN
Coon Rapids WHPP Amendment
City of Coon Rapids, MN



Barr Footer: ArcGIS 10.3, 2016-03-01 08:13 File: I:\Projects\23\02\1033\Maps\Reports\Figure C2 - Model K Layer 2.mxd User: akj

Coon Rapids Municipal Well open to Quaternary

Coon Rapids City Limits

Till Unit Ce Extent in K Modification Area

Layer 2 Kz (m/day)

- 0.0001 - 0.0549
- 0.0550 - 0.2536
- 0.2537 - 1.0045
- 1.0046 - 3.3159
- 3.3160 - 7.6300

N

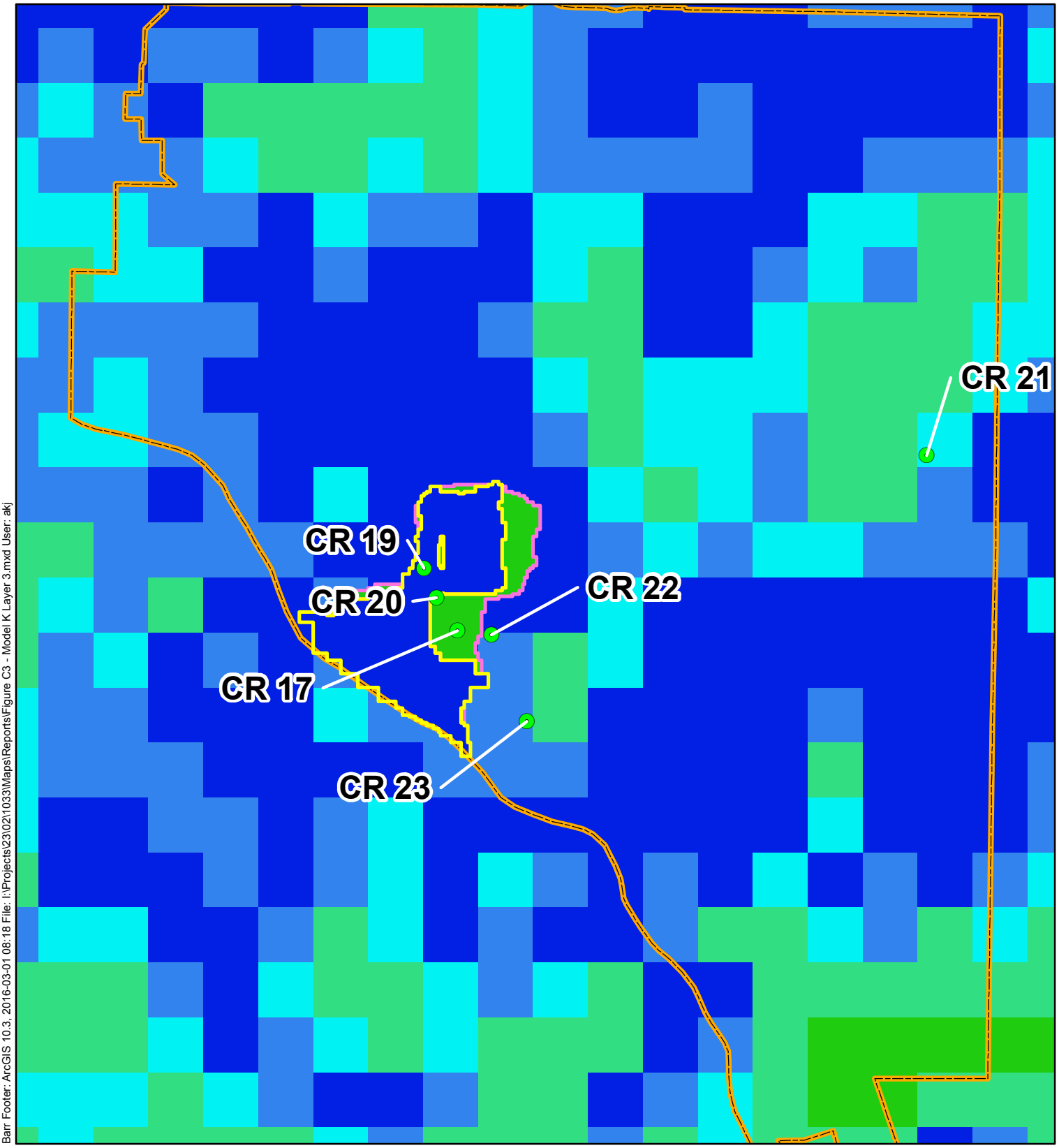
Feet

6,000 0 6,000

BARR

Figure C2

HYDRAULIC CONDUCTIVITY
LAYER 2
Coon Rapids WHPP Amendment
City of Coon Rapids, MN



Barr Footer: ArcGIS 10.3, 2016-03-01 08:18 File: I:\Projects\23\02\1033\Maps\Reports\Figure C3 - Model K Layer 3.mxd User: akj

Coon Rapids Municipal Well open to Quaternary

Coon Rapids City Limits

Layer 3 Kx (m/day)

- 0.62 - 3.91
- 3.92 - 9.03
- 9.04 - 16.54
- 16.55 - 39.67
- 39.68 - 71.05

Till Unit Xt Extent

Sand Unit Sr Extent

N

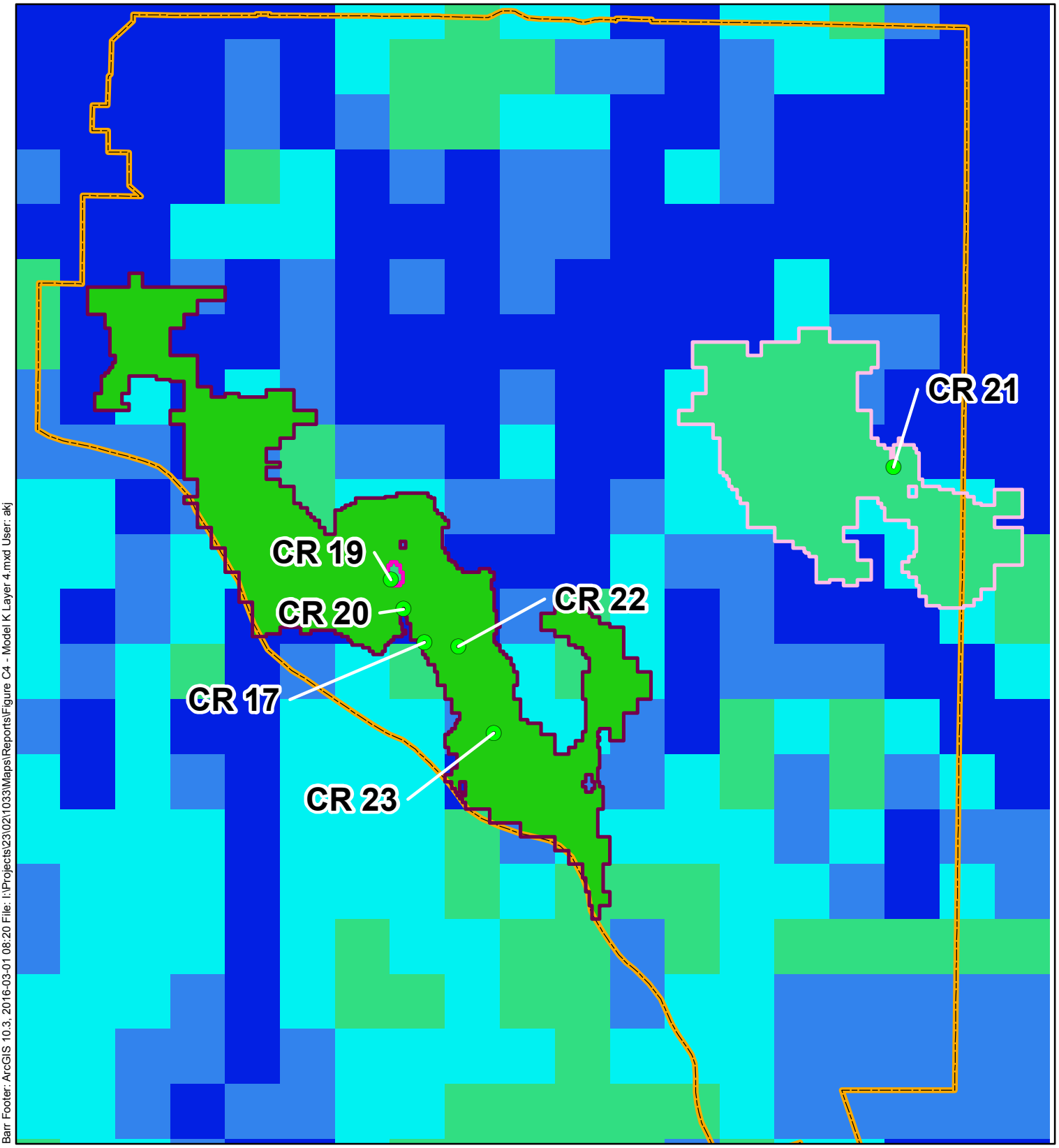
Feet

4,000 0 4,000

BARR

Figure C3

HYDRAULIC CONDUCTIVITY
LAYER 3
Coon Rapids WHPP Amendment
City of Coon Rapids, MN



Barr Footer: ArcGIS 10.3, 2016-03-01 08:20 File: I:\Projects\23\02\1033\Maps\Reports\Figure C4 - Model K Layer 4.mxd User: akj

Coon Rapids Municipal Well open to Quaternary

Coon Rapids City Limits

Layer 4 Kx (m/day)

- 0.57 - 8.63
- 8.64 - 18.38
- 18.39 - 32.30
- 32.31 - 104.43
- 104.44 - 314.42

Sand Units Sp/Sx Extent (Wells 17, 20, 22, 23)

Sand Units Sx/Sr Extent (Well 21)

Sand Unit Sr Extent (Well 19)

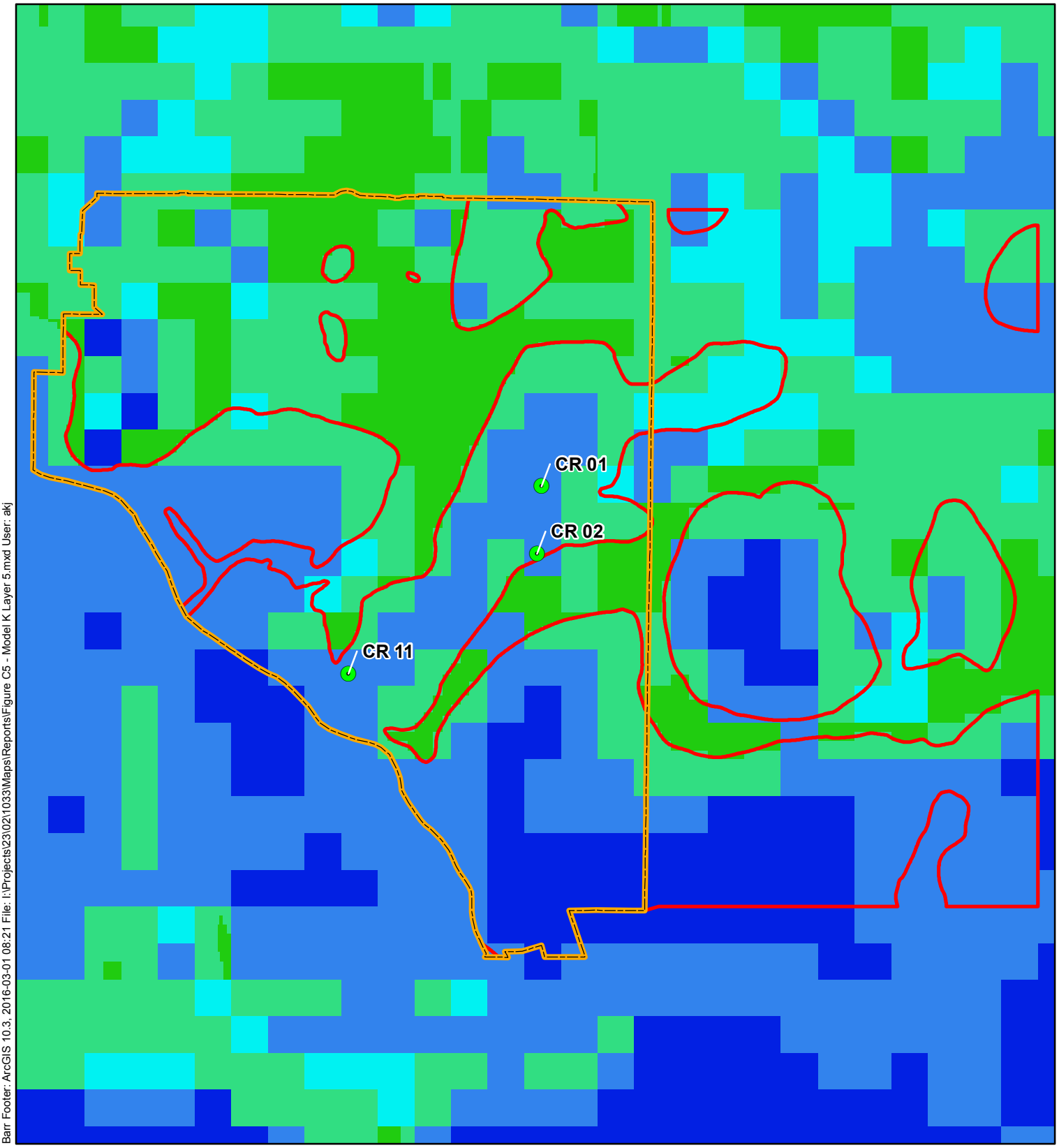
Feet

4,000 0 4,000

BARR

Figure C4

HYDRAULIC CONDUCTIVITY
LAYER 4
Coon Rapids WHPP Amendment
City of Coon Rapids, MN



Barr Footer: ArcGIS 10.3, 2016-03-01 08:21 File: I:\Projects\23\02\1033\Maps\Reports\Figure C5 - Model K Layer 5.mxd User: akj

Coon Rapids Municipal Well Open to St. Lawrence Formation

Coon Rapids City Limits

St. Lawrence K Modification Area

Layer 5 Kx (m/day)

- 0.26 - 1.00
- 1.01 - 4.01
- 4.02 - 11.58
- 11.59 - 28.98
- 28.99 - 50.00

N

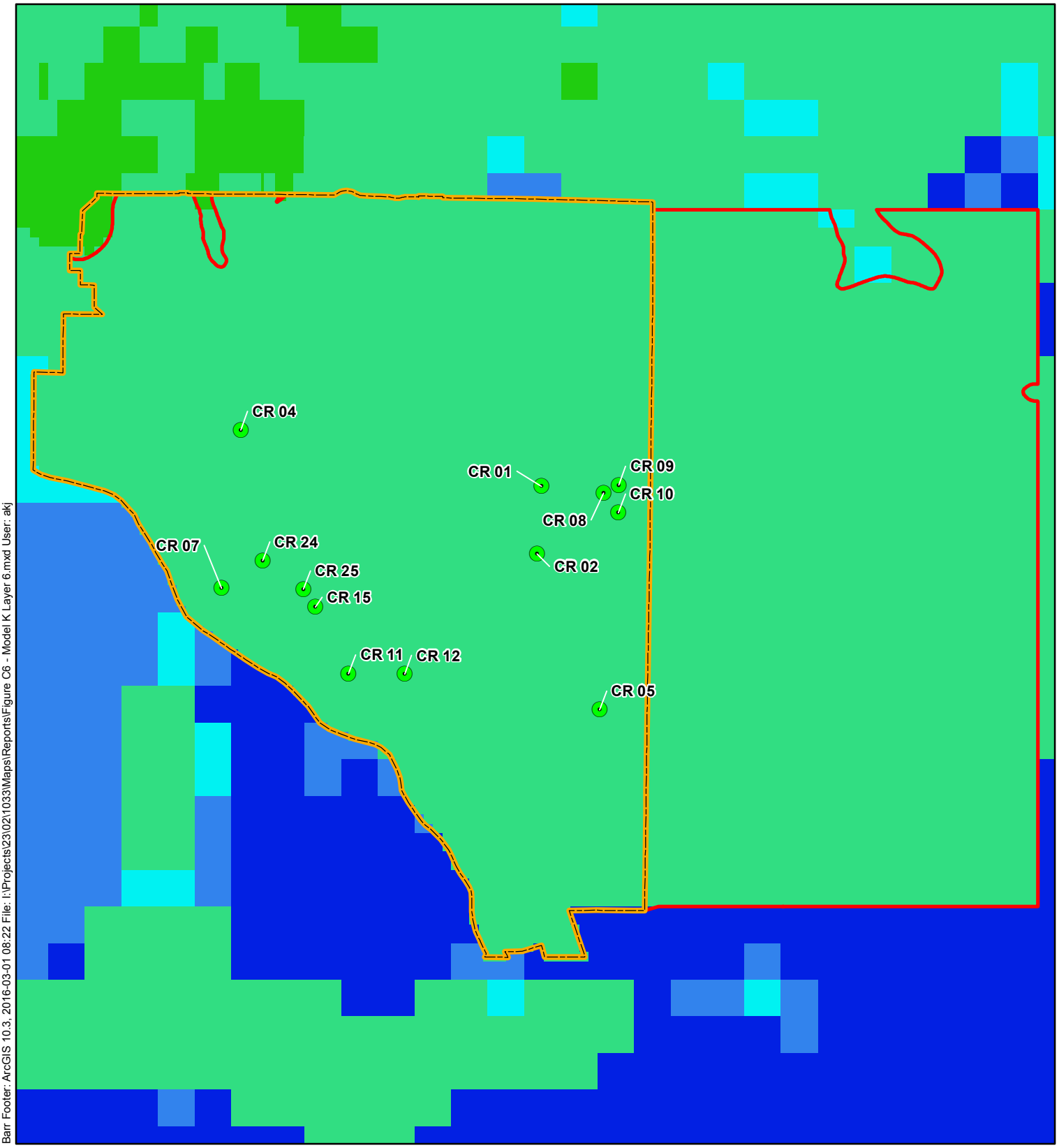
Feet

6,000 0 6,000

BARR

Figure C5

HYDRAULIC CONDUCTIVITY
LAYER 5
Coon Rapids WHPP Amendment
City of Coon Rapids, MN



Barr Footer: ArcGIS 10.3, 2016-03-01 08:22 File: I:\Projects\23\02\1033\Maps\Reports\Figure C6 - Model K Layer 6.mxd User: akj

Coon Rapids Municipal Well Open to Tunnel City Group

Coon Rapids City Limits

Tunnel City K Modification Area

Layer 6 Kx (m/day)

- 0.33 - 0.41
- 0.42 - 0.48
- 0.49 - 1.32
- 1.33 - 15.00
- 15.01 - 50.00

N

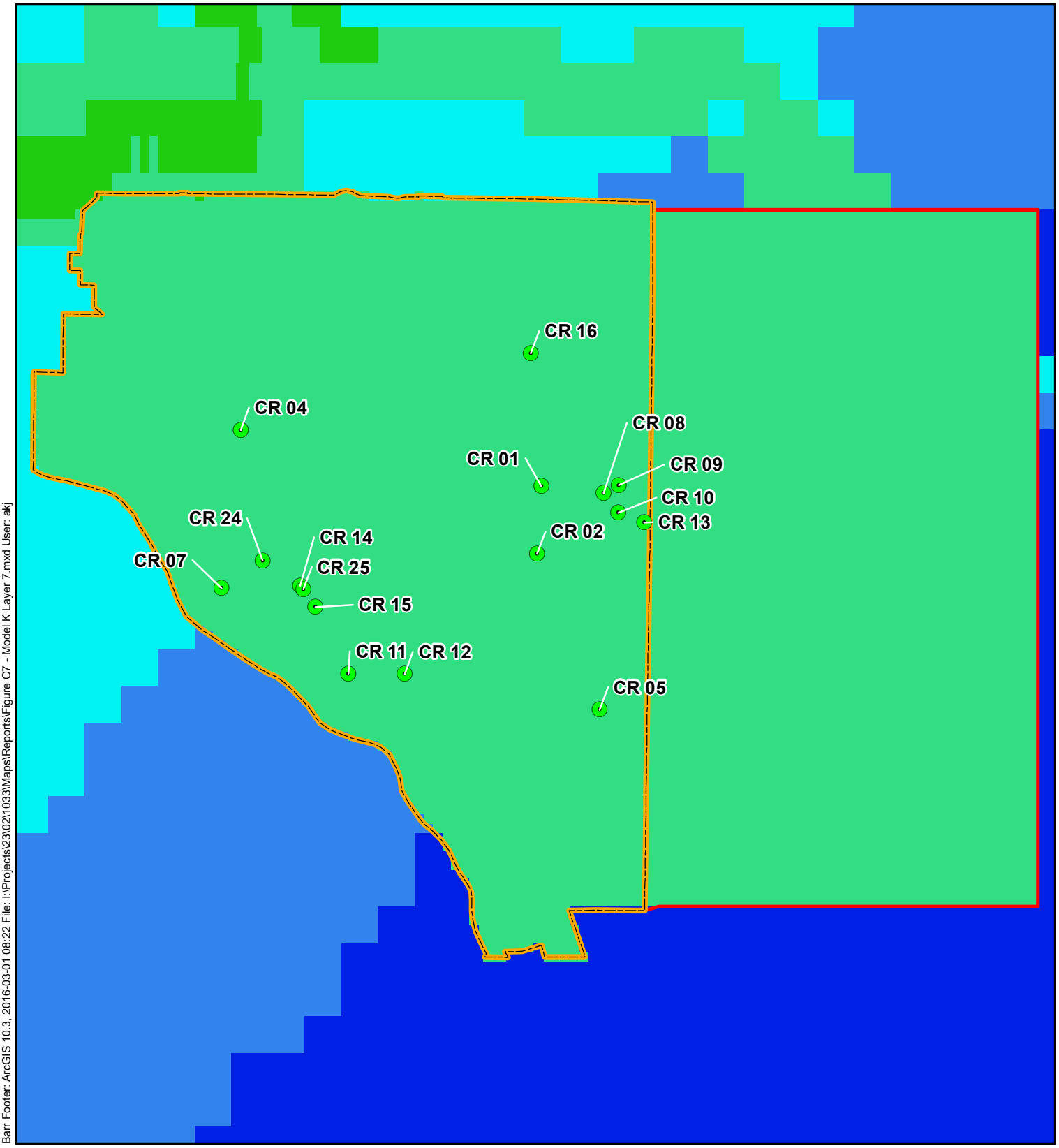
Feet

6,000 0 6,000

BARR

Figure C6

HYDRAULIC CONDUCTIVITY
LAYER 6
Coon Rapids WHPP Amendment
City of Coon Rapids, MN



Barr Footer: ArcGIS 10.3, 2016-03-01 08:22 File: I:\Projects\23\02\1033\Maps\Reports\Figure C7 - Model K Layer 7.mxd User: akj

Coon Rapids Municipal Well Open to Wonewoc Sandstone

Coon Rapids City Limits

K Modification Area

Layer 7 Kx (m/day)

- 0.36 - 0.57
- 0.58 - 0.69
- 0.70 - 1.17
- 1.18 - 12.00
- 12.01 - 50.00

N

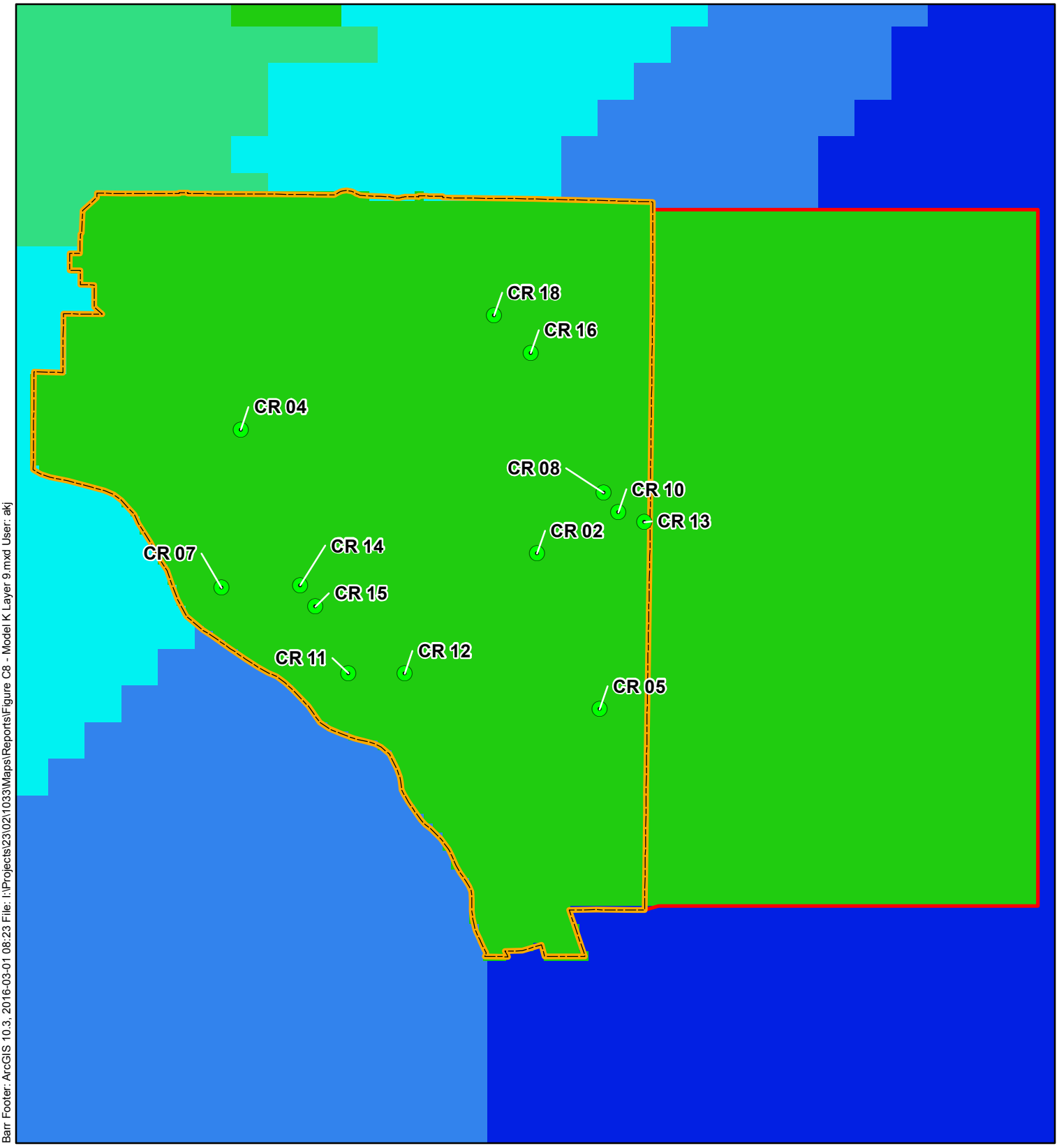
Feet

6,000 0 6,000

BARR

Figure C7

HYDRAULIC CONDUCTIVITY
LAYER 7
Coon Rapids WHPP Amendment
City of Coon Rapids, MN



Barr Footer: ArcGIS 10.3, 2016-03-01 08:23 File: I:\Projects\23\02\1033\Maps\Reports\Figure C8 - Model K Layer 9.mxd User: akj

Coon Rapids Municipal Well Open to Mt. Simon

Coon Rapids City Limits

K Modification Area

Layer 9 Kx (m/day)

- 0.87 - 1.05
- 1.06 - 1.17
- 1.18 - 1.33
- 1.34 - 2.42
- 2.43 - 8.20

N

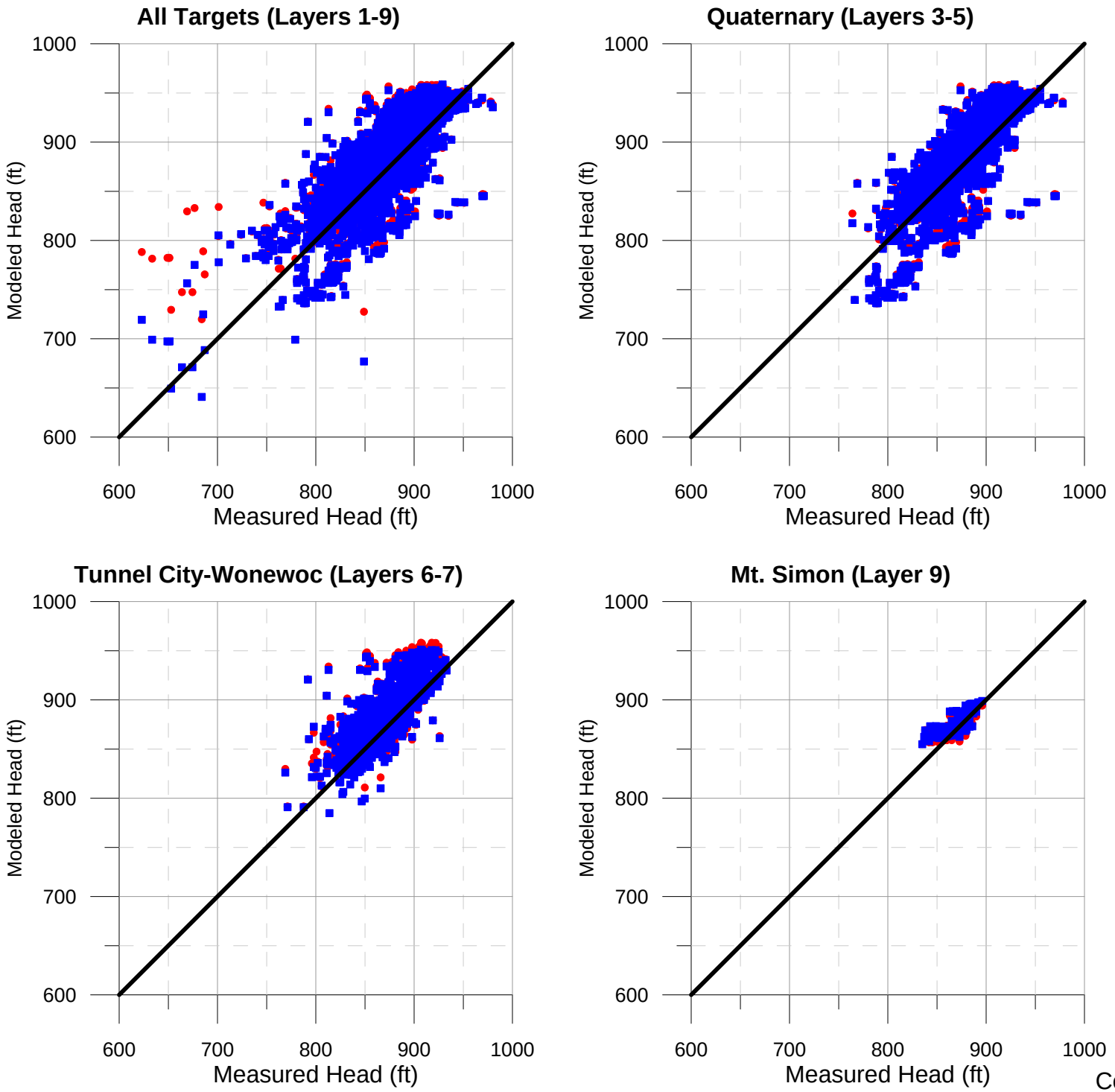
Feet

6,000 0 6,000

BARR

Figure C8

HYDRAULIC CONDUCTIVITY
LAYER 9
Coon Rapids WHPP Amendment
City of Coon Rapids, MN



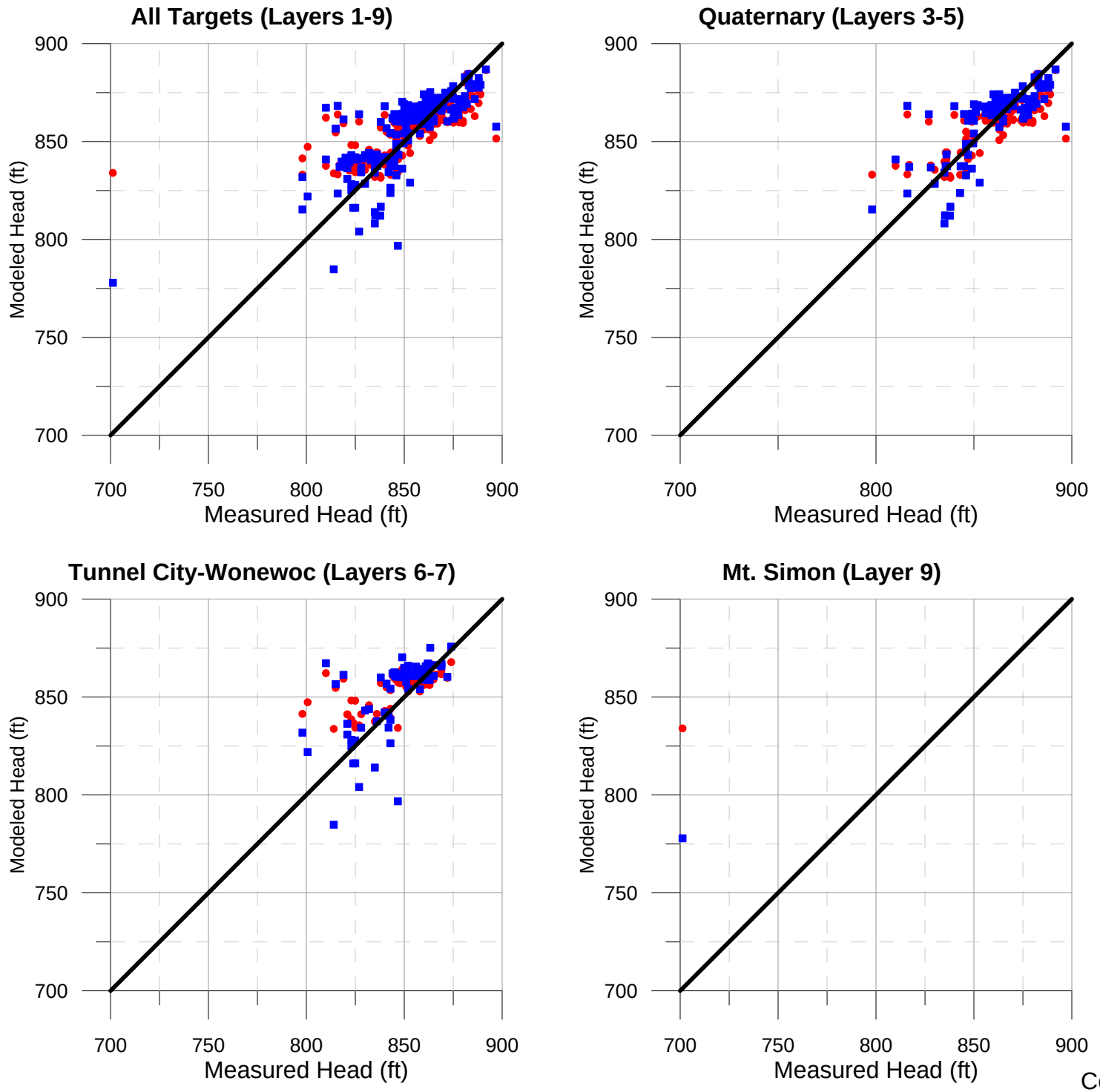
Only Metro Model 3 targets within the TMR model boundary shown.

WHPP model has updated K field but uses identical pumping rates to the base Metro Model 3.

Figure C9

MODEL CALIBRATION
ALL MODEL TARGETS
Coon Rapids WHPP Amendment
City of Coon Rapids, MN

V:\23\02\1033\MM3\TMR\Calibration\Calibration_Comparison.grf



Only Metro Model 3 targets within Coon Rapids city limits shown.

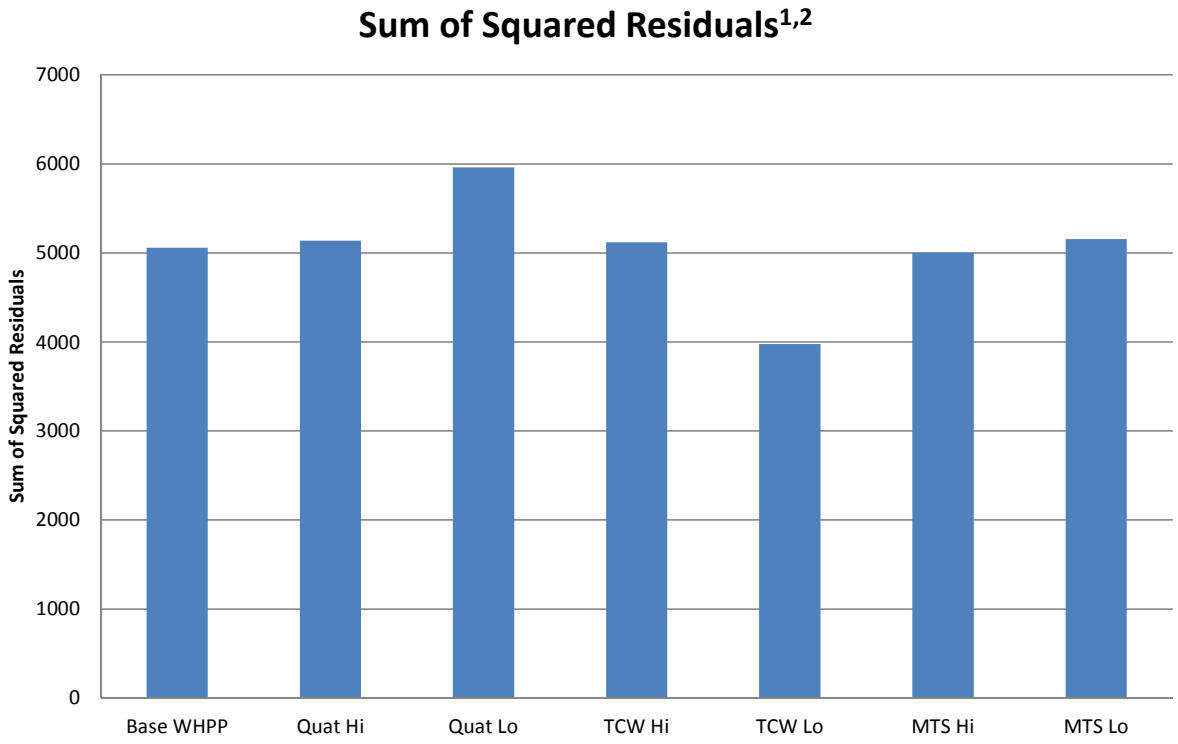
WHPP model has updated K field but uses identical pumping rates to the base Metro Model 3.

V:\23\02\1033\MM3\TMR\Calibration\Calibration_Comparison_CRonly.grf

Figure C10

MODEL CALIBRATION
COON RAPIDS ONLY
Coon Rapids WHPP Amendment
City of Coon Rapids, MN

Figure C11
Sensitivity Analysis Results
Coon Rapids WHPP Amendment



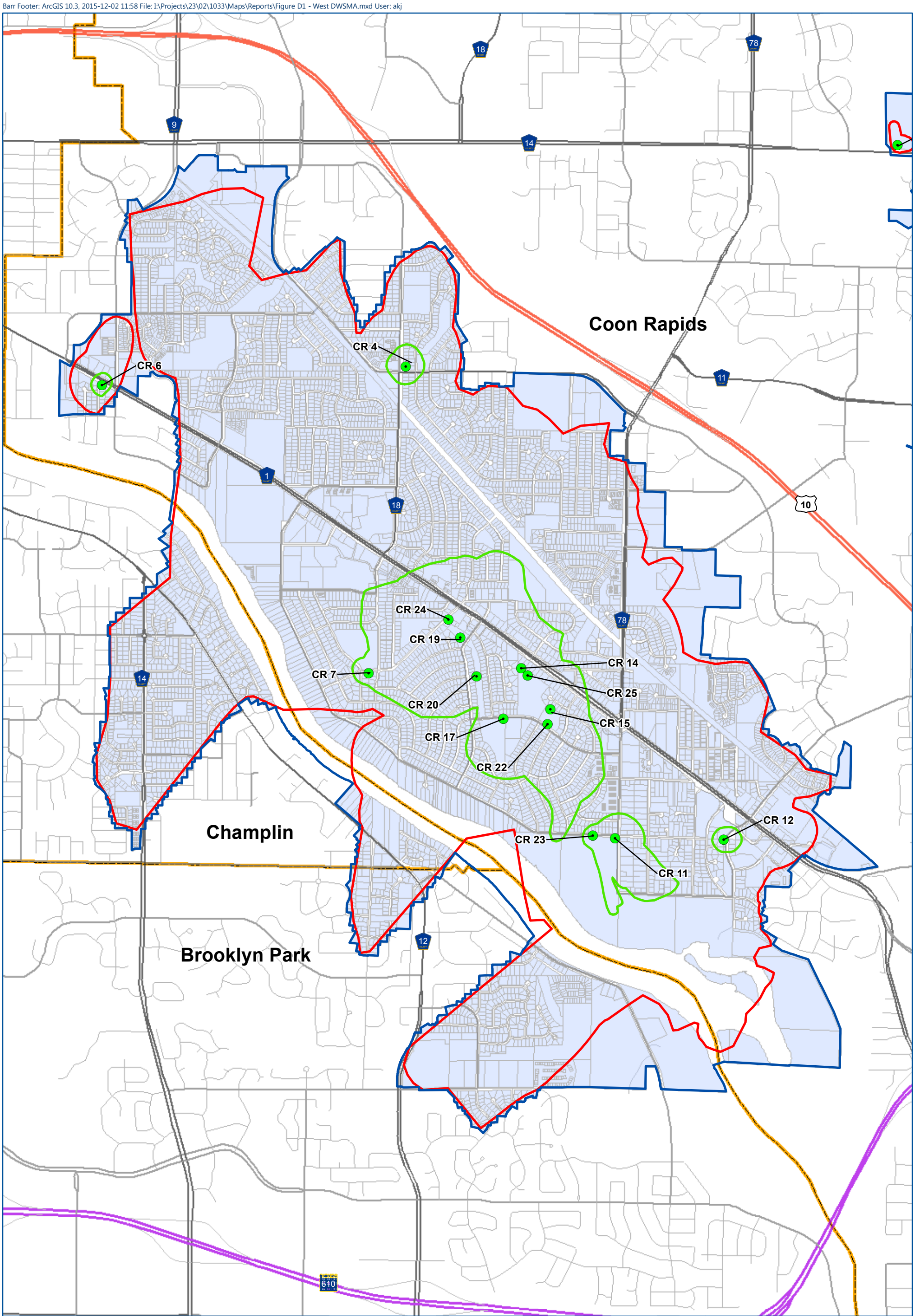
[1] Residuals calculated for the 220 Metro Model 3 calibration targets within Coon Rapids city limits only

[2] Residual = measured head - modeled head

Appendix D

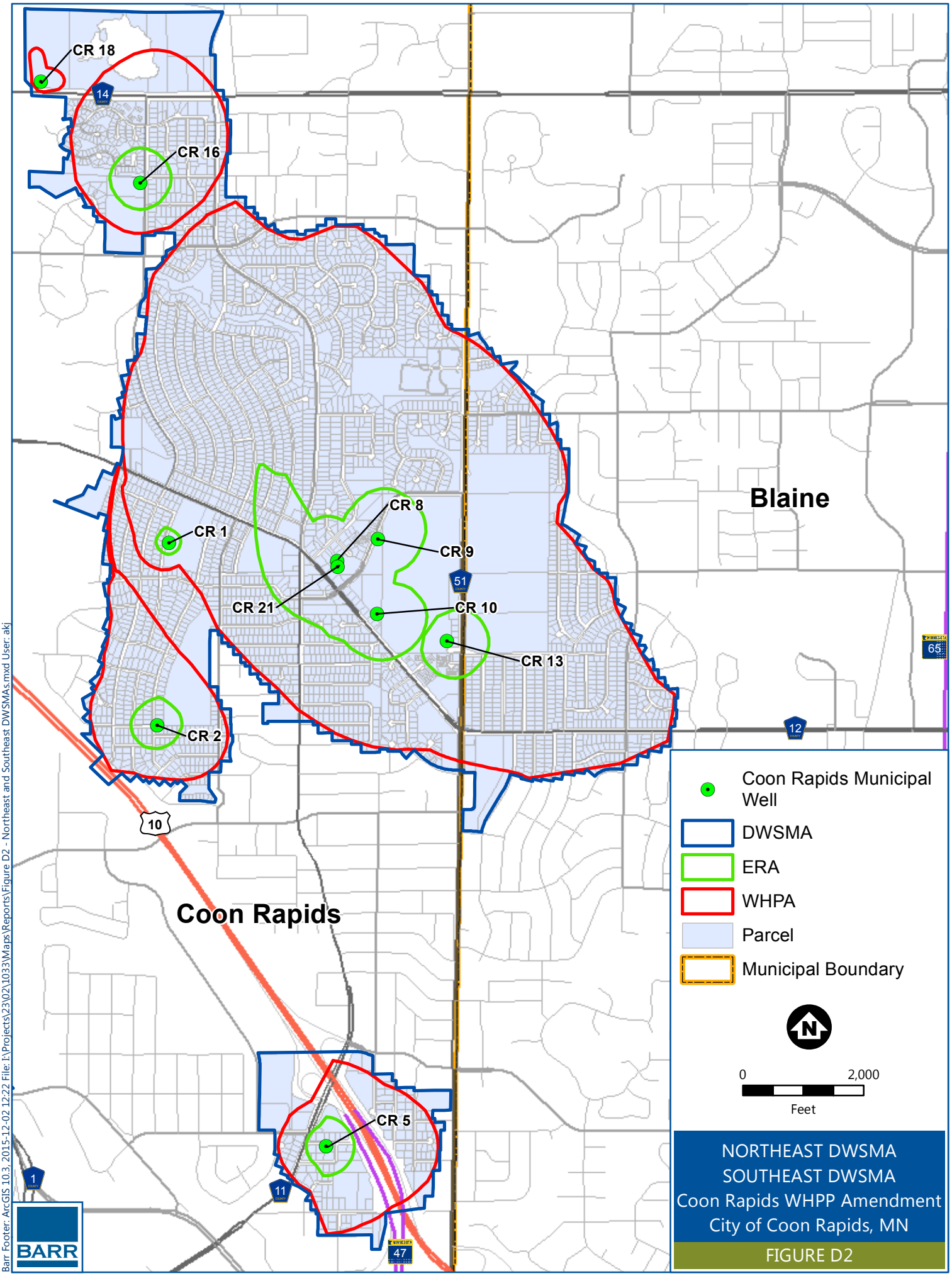
1:24,000 DWSMA Maps

Barr Footer: ArcGIS 10.3, 2015-12-02 11:58 File: I:\Projects\23\02\1033\Maps\Reports\Figure D1 - West DWSMA.mxd User: akj



WEST DWSMA
Coon Rapids WHPP Amendment
City of Coon Rapids, MN

FIGURE D1


CR 18
CR 16
CR 8
CR 9
CR 1
CR 21
CR 10
CR 13
CR 2
CR 5
Blaine
Coon Rapids
14
51
65
12
10
1
11
47
Coon Rapids Municipal Well
DWSMA
ERA
WHPA
Parcel
Municipal Boundary
N
0
2,000
Feet
NORTHEAST DWSMA
SOUTHEAST DWSMA
Coon Rapids WHPP Amendment
City of Coon Rapids, MN
FIGURE D2
BARR
Barr Footer: ArcGIS 10.3, 2015-12-02 12:22 File: I:\Projects\23\02\1033\Maps\Reports\Figure D2 - Northeast and Southeast DWSMAs.mxd User: akj

Appendix E

MDH Well Vulnerability Assessments

Adam K. Janzen

From: Djerrari, Amal (MDH) <amal.djerrari@state.mn.us>
Sent: Friday, October 23, 2015 15:18
To: Adam K. Janzen
Cc: John Greer; Djerrari, Amal (MDH)
Subject: RE: Coon Rapids Tritium

Hi Adam
I just received the tritium results for Coon Rapids
Amal

Well Id	Collection Date	Analyte	Result	PWS Id
202931	7/9/2015	TRITIUM	2.902362371	1020017
110460	7/9/2015	TRITIUM	1.763706017	1020017
474384	7/9/2015	TRITIUM	8.563001794	1020017
202929	7/9/2015	TRITIUM	2.581490857	1020017
202951	7/9/2015	TRITIUM	<.8	1020017
202937	7/9/2015	TRITIUM	6.833970803	1020017
110469	7/9/2015	TRITIUM	<.8	1020017

Amal M. Djerrari, Ph.D., P.E
Hydrologist

Minnesota Department of Health
Source Water Protection Unit
625 Robert Street North
St. Paul, MN 55164

ph: (651) 201-4577
Cell: (651) 245-1918
Fax: (651) 201-4701
e-mail: amal.djerrari@state.mn.us

MINNESOTA DEPARTMENT OF HEALTH
SECTION OF DRINKING WATER PROTECTION
SWP Vulnerability Rating

625 Robert St. N. St. Paul MN 55155
P.O. Box 64975 St. Paul MN 55164 - 0975

PWSID: 1020017
SYSTEM NAME: Coon Rapids
WELL NAME: Well #1

TIER: 2
WHP RANK:
UNIQUE WELL #: 00202926

COUNTY: Anoka | TOWNSHIP NUMBER: 31 | RANGE: 24 W | SECTION: 13 | QUARTERS: BCCA

CRITERIA		DESCRIPTION	POINTS
Aquifer Name(s)	:	Multiple Aquifer	
DNR Geologic Sensitivity Rating	:	Low	20
L Score	:	3	
Geologic Data From	:	Well Record	
Year Constructed	:	1957	
Construction Method	:	Cable Tool/Bored	0
Casing Depth	:	220	5
Well Depth	:	462	
Casing grouted into borehole?		Unknown	0
Cement grout between casings?		Not applicable	0
All casings extend to land surface?		Yes	0
Gravel - packed casings?		No	0
Wood or masonry casing?		No	0
Holes or cracks in casing?		Unknown	0
Isolation distance violations?			0
Pumping Rate	:	600	10
Pathogen Detected?			0
Surface Water Characteristics?			0
Maximum nitrate detected	:	<.05 12/16/1997	0
Maximum tritium detected	:	Unknown	0
Non-THMS VOCs detected?			0
Pesticides detected?			0
Carbon 14 age	:	Unknown	0
Wellhead Protection Score	:		35
Wellhead Protection Vulnerability Rating	:		NOT VULNERABLE

Vulnerability Overridden :

COMMENTS

ST. LAWRENCE - EAU CLAIRE

MINNESOTA DEPARTMENT OF HEALTH
SECTION OF DRINKING WATER PROTECTION
SWP Vulnerability Rating

625 Robert St. N. St. Paul MN 55155
P.O. Box 64975 St. Paul MN 55164 - 0975

PWSID: 1020017
SYSTEM NAME: Coon Rapids
WELL NAME: Well #2

TIER: 2
WHP RANK:
UNIQUE WELL #: 00202929

COUNTY: Anoka | TOWNSHIP NUMBER: 31 | RANGE: 24 W | SECTION: 13 | QUARTERS: CCCC

CRITERIA		DESCRIPTION	POINTS
Aquifer Name(s)	:	Multiple Aquifer	
DNR Geologic Sensitivity Rating	:	Low	20
L Score	:	1	
Geologic Data From	:	Well Record	
Year Constructed	:	1957	
Construction Method	:	Cable Tool/Bored	0
Casing Depth	:	226	5
Well Depth	:	685	
Casing grouted into borehole?		Unknown	0
Cement grout between casings?		Not applicable	0
All casings extend to land surface?		Yes	0
Gravel - packed casings?		No	0
Wood or masonry casing?		No	0
Holes or cracks in casing?		Unknown	0
Isolation distance violations?			0
Pumping Rate	:	600	10
Pathogen Detected?			0
Surface Water Characteristics?			0
Maximum nitrate detected	:	.18 07/13/2004	0
Maximum tritium detected	:	Unknown	0
Non-THMS VOCs detected?			0
Pesticides detected?			0
Carbon 14 age	:	Unknown	0
Wellhead Protection Score	:		35
Wellhead Protection Vulnerability Rating	:		NOT VULNERABLE

Vulnerability Overridden :

COMMENTS
ST. LAWRENCE - SOLOR CHURCH

MINNESOTA DEPARTMENT OF HEALTH
SECTION OF DRINKING WATER PROTECTION
SWP Vulnerability Rating

625 Robert St. N. St. Paul MN 55155
P.O. Box 64975 St. Paul MN 55164 - 0975

PWSID: 1020017
SYSTEM NAME: Coon Rapids
WELL NAME: Well #4

TIER: 2
WHP RANK:
UNIQUE WELL #: 00202972

COUNTY: Anoka | TOWNSHIP NUMBER: 31 | RANGE: 24 W | SECTION: 9 | QUARTERS: DCCC

CRITERIA		DESCRIPTION	POINTS
Aquifer Name(s)	:	Franconia-Mt. Simon	
DNR Geologic Sensitivity Rating	:	Low	20
L Score	:	1	
Geologic Data From	:	Well Record	
Year Constructed	:	1960	
Construction Method	:	Cable Tool/Bored	0
Casing Depth	:	233	5
Well Depth	:	605	
Casing grouted into borehole?		Yes	0
Cement grout between casings?		Yes	0
All casings extend to land surface?		Yes	0
Gravel - packed casings?		No	0
Wood or masonry casing?		No	0
Holes or cracks in casing?		Unknown	0
Isolation distance violations?			0
Pumping Rate	:	600	10
Pathogen Detected?			0
Surface Water Characteristics?			0
Maximum nitrate detected	:	.46 07/08/2013	0
Maximum tritium detected	:	Unknown	0
Non-THMS VOCs detected?			0
Pesticides detected?			0
Carbon 14 age	:	Unknown	0
Wellhead Protection Score	:		35
Wellhead Protection Vulnerability Rating	:		NOT VULNERABLE
Vulnerability Overridden	:		

COMMENTS

NITRATE DATA FROM PWSD 1989, 8/75 SAMPLE Low rating is based on the thickness of the St. Lawrence that is grouted off. Log was not descriptive enough to assess the glacial deposits.

MINNESOTA DEPARTMENT OF HEALTH
SECTION OF DRINKING WATER PROTECTION
SWP Vulnerability Rating

625 Robert St. N. St. Paul MN 55155
P.O. Box 64975 St. Paul MN 55164 - 0975

PWSID: 1020017
SYSTEM NAME: Coon Rapids
WELL NAME: Well #5

TIER: 2
WHP RANK:
UNIQUE WELL #: 00202951

COUNTY: Anoka | TOWNSHIP NUMBER: 31 | RANGE: 24 W | SECTION: 25 | QUARTERS: ACBB

CRITERIA		DESCRIPTION	POINTS
Aquifer Name(s)	:	Franconia-Mt. Simon	
DNR Geologic Sensitivity Rating	:	Low	15
L Score	:	4	
Geologic Data From	:	Well Record	
Year Constructed	:	1961	
Construction Method	:	Cable Tool/Bored	0
Casing Depth	:	242	5
Well Depth	:	695	
Casing grouted into borehole?		Unknown	0
Cement grout between casings?		Unknown	5
All casings extend to land surface?		Yes	0
Gravel - packed casings?		No	0
Wood or masonry casing?		No	0
Holes or cracks in casing?		Unknown	0
Isolation distance violations?			0
Pumping Rate	:	900	10
Pathogen Detected?			0
Surface Water Characteristics?			0
Maximum nitrate detected	:	<.4	0
Maximum tritium detected	:	Unknown	0
Non-THMS VOCs detected?			0
Pesticides detected?			0
Carbon 14 age	:	Unknown	0
Wellhead Protection Score	:		35
Wellhead Protection Vulnerability Rating	:		NOT VULNERABLE

Vulnerability Overridden :

COMMENTS
Low score is based on the thickness of the St. Lawrence that is sealed off.

MINNESOTA DEPARTMENT OF HEALTH
SECTION OF DRINKING WATER PROTECTION
SWP Vulnerability Rating

625 Robert St. N. St. Paul MN 55155
P.O. Box 64975 St. Paul MN 55164 - 0975

PWSID: 1020017 | TIER: 2
SYSTEM NAME: Coon Rapids | WHP RANK:
WELL NAME: Well #6 | UNIQUE WELL #: 00202937

COUNTY: Anoka | TOWNSHIP NUMBER: 31 | RANGE: 24 W | SECTION: 17 | QUARTERS: BBAA

CRITERIA		DESCRIPTION	POINTS
Aquifer Name(s)	:	Tunnel City Group	
DNR Geologic Sensitivity Rating	:	Low	20
L Score	:	2	
Geologic Data From	:	Well Record	
Year Constructed	:	1960	
Construction Method	:	Cable Tool/Bored	0
Casing Depth	:	118	10
Well Depth	:	158	
Casing grouted into borehole?		Unknown	0
Cement grout between casings?		Not applicable	0
All casings extend to land surface?		Yes	0
Gravel - packed casings?		No	0
Wood or masonry casing?		No	0
Holes or cracks in casing?		Unknown	0
Isolation distance violations?			0
Pumping Rate	:	1050	20
Pathogen Detected?			0
Surface Water Characteristics?			0
Maximum nitrate detected	:	<1	0
Maximum tritium detected	:	14.9 11/08/1999	VULNERABLE
Non-THMS VOCs detected?			0
Pesticides detected?			0
Carbon 14 age	:	Unknown	0
Wellhead Protection Score	:		50
Wellhead Protection Vulnerability Rating	:		VULNERABLE

Vulnerability Overridden :

COMMENTS
NITRATE DATA FROM PWSD 1989, 8/75 SAMPLE

MINNESOTA DEPARTMENT OF HEALTH
SECTION OF DRINKING WATER PROTECTION
SWP Vulnerability Rating

625 Robert St. N. St. Paul MN 55155
P.O. Box 64975 St. Paul MN 55164 - 0975

PWSID: 1020017
SYSTEM NAME: Coon Rapids
WELL NAME: Well #7

TIER: 2
WHP RANK:
UNIQUE WELL #: 00202943

COUNTY: Anoka | TOWNSHIP NUMBER: 31 | RANGE: 24 W | SECTION: 21 | QUARTERS: BDAC

CRITERIA		DESCRIPTION	POINTS
Aquifer Name(s)	:	Franconia-Mt. Simon	
DNR Geologic Sensitivity Rating	:	Low	20
L Score	:	3	
Geologic Data From	:	Well Record	
Year Constructed	:	1964	
Construction Method	:	Cable Tool/Bored	0
Casing Depth	:	189	10
Well Depth	:	632	
Casing grouted into borehole?		Unknown	0
Cement grout between casings?		Unknown	5
All casings extend to land surface?		Yes	0
Gravel - packed casings?		No	0
Wood or masonry casing?		No	0
Holes or cracks in casing?		Unknown	0
Isolation distance violations?			0
Pumping Rate	:	1050	20
Pathogen Detected?			0
Surface Water Characteristics?			0
Maximum nitrate detected	:	<.4	0
Maximum tritium detected	:	1.1 11/08/1999	VULNERABLE
Non-THMS VOCs detected?			0
Pesticides detected?			0
Carbon 14 age	:	Unknown	0
Wellhead Protection Score	:		55
Wellhead Protection Vulnerability Rating	:		VULNERABLE

Vulnerability Overridden :

COMMENTS

MINNESOTA DEPARTMENT OF HEALTH
SECTION OF DRINKING WATER PROTECTION
SWP Vulnerability Rating

625 Robert St. N. St. Paul MN 55155
P.O. Box 64975 St. Paul MN 55164 - 0975

PWSID: 1020017
SYSTEM NAME: Coon Rapids
WELL NAME: Well #8

TIER: 2
WHP RANK:
UNIQUE WELL #: 00202932

COUNTY: Anoka | TOWNSHIP NUMBER: 31 | RANGE: 24 W | SECTION: 13 | QUARTERS: ACCD

CRITERIA		DESCRIPTION	POINTS
Aquifer Name(s)	:	Franconia-Mt. Simon	
DNR Geologic Sensitivity Rating	:	Low	20
L Score	:	1	
Geologic Data From	:	Data Inferred From Nearby Wells	
Year Constructed	:	1965	
Construction Method	:	Cable Tool/Bored	0
Casing Depth	:	283	5
Well Depth	:	700	
Casing grouted into borehole?		Yes	0
Cement grout between casings?		Yes	0
All casings extend to land surface?		Yes	0
Gravel - packed casings?		No	0
Wood or masonry casing?		No	0
Holes or cracks in casing?		Unknown	0
Isolation distance violations?			0
Pumping Rate	:	1000	10
Pathogen Detected?			0
Surface Water Characteristics?			0
Maximum nitrate detected	:	<1	0
Maximum tritium detected	:	Unknown	0
Non-THMS VOCs detected?			0
Pesticides detected?			0
Carbon 14 age	:	Unknown	0
Wellhead Protection Score	:		35
Wellhead Protection Vulnerability Rating	:		NOT VULNERABLE

Vulnerability Overridden :

COMMENTS

NITRATE DATA FFROM PWSD 1989, 8/75 SAMPLE. Low rating is taken from the log of well #2 (202929).

MINNESOTA DEPARTMENT OF HEALTH
SECTION OF DRINKING WATER PROTECTION
SWP Vulnerability Rating

625 Robert St. N. St. Paul MN 55155
P.O. Box 64975 St. Paul MN 55164 - 0975

PWSID: 1020017 | TIER: 2
SYSTEM NAME: Coon Rapids | WHP RANK:
WELL NAME: Well #9 | UNIQUE WELL #: 00202931

COUNTY: Anoka | TOWNSHIP NUMBER: 31 | RANGE: 24 W | SECTION: 13 | QUARTERS: ACCD

CRITERIA		DESCRIPTION	POINTS
Aquifer Name(s)	:	Franconia-Eau Claire	
DNR Geologic Sensitivity Rating	:	Very low	10
L Score	:	10	
Geologic Data From	:	Data Inferred From Nearby Wells	
Year Constructed	:	1969	
Construction Method	:	Cable Tool/Bored	0
Casing Depth	:	294	5
Well Depth	:	500	
Casing grouted into borehole?		Yes	0
Cement grout between casings?		Yes	0
All casings extend to land surface?		Yes	0
Gravel - packed casings?		No	0
Wood or masonry casing?		No	0
Holes or cracks in casing?		Unknown	0
Isolation distance violations?			0
Pumping Rate	:	1000	10
Pathogen Detected?			NOT VULNERABLE
Surface Water Characteristics?			NOT VULNERABLE
Maximum nitrate detected	:	<.4	NOT VULNERABLE
Maximum tritium detected	:	<.8 04/21/1997	NOT VULNERABLE
Non-THMS VOCs detected?			0
Pesticides detected?			0
Carbon 14 age	:	Unknown	0
Wellhead Protection Score	:		25
Wellhead Protection Vulnerability Rating	:		NOT VULNERABLE

Vulnerability Overridden :

COMMENTS
Very low rating is based on the log for well #2 (202931).

625 Robert St. N. St. Paul MN 55155
P.O. Box 64975 St. Paul MN 55164 - 0975

MINNESOTA DEPARTMENT OF HEALTH
SECTION OF DRINKING WATER PROTECTION
SWP Vulnerability Rating

PWSID: 1020017
SYSTEM NAME: Coon Rapids
WELL NAME: Well #10

TIER: 2
WHP RANK:
UNIQUE WELL #: 00202930

COUNTY: Anoka | TOWNSHIP NUMBER: 31 | RANGE: 24 W | SECTION: 13 | QUARTERS: DABC

CRITERIA		DESCRIPTION	POINTS
Aquifer Name(s)	:	Franconia-Mt. Simon	
DNR Geologic Sensitivity Rating	:	Very low	10
L Score	:	10	
Geologic Data From	:	Data Inferred From Nearby Wells	
Year Constructed	:	1970	
Construction Method	:	Cable Tool/Bored	0
Casing Depth	:	272	5
Well Depth	:	684	
Casing grouted into borehole?		Unknown	0
Cement grout between casings?		Yes	0
All casings extend to land surface?		Yes	0
Gravel - packed casings?		No	0
Wood or masonry casing?		No	0
Holes or cracks in casing?		Unknown	0
Isolation distance violations?			0
Pumping Rate	:	1000	10
Pathogen Detected?			0
Surface Water Characteristics?			0
Maximum nitrate detected	:	<1	0
Maximum tritium detected	:	Unknown	0
Non-THMS VOCs detected?			0
Pesticides detected?			0
Carbon 14 age	:	Unknown	0
Wellhead Protection Score	:		25
Wellhead Protection Vulnerability Rating	:		NOT VULNERABLE

Vulnerability Overridden :

COMMENTS

NITRATE DATA FROM PWSD 1989, 8/75 SAMPLE NITRATE DATA FROM PWSD 1989, 7/80 SAMPLE NITRATE DATA FROM PWSD 1989, 6/84 SAMPLE NITRATE DATA FROM PWWSD 1989, 7/79 SAMPLE Very low rating is based on well #13 and the presence of the St. Lawrence confining layer.

625 Robert St. N. St. Paul MN 55155
P.O. Box 64975 St. Paul MN 55164 - 0975

MINNESOTA DEPARTMENT OF HEALTH
SECTION OF DRINKING WATER PROTECTION
SWP Vulnerability Rating

PWSID: 1020017
SYSTEM NAME: Coon Rapids
WELL NAME: Well #11

TIER: 2
WHP RANK:
UNIQUE WELL #: 00202965

COUNTY: Anoka | TOWNSHIP NUMBER: 31 | RANGE: 24 W | SECTION: 27 | QUARTERS: BAAA

CRITERIA		DESCRIPTION	POINTS
Aquifer Name(s)	:	Tunnel City-Wonewoc	
DNR Geologic Sensitivity Rating	:	Very low	0
L Score	:	4	
Geologic Data From	:	Well Record	
Year Constructed	:	1972	
Construction Method	:	Rotary/Drilled	0
Casing Depth	:	189	10
Well Depth	:	421	
Casing grouted into borehole?		Yes	0
Cement grout between casings?		Not applicable	0
All casings extend to land surface?		Yes	0
Gravel - packed casings?		No	0
Wood or masonry casing?		No	0
Holes or cracks in casing?		Unknown	0
Isolation distance violations?			0
Pumping Rate	:	1100	20
Pathogen Detected?			0
Surface Water Characteristics?			0
Maximum nitrate detected	:	<.4	0
Maximum tritium detected	:	2.7 06/08/2010	VULNERABLE
Non-THMS VOCs detected?			0
Pesticides detected?			0
Carbon 14 age	:	Unknown	0
Wellhead Protection Score	:		30
Wellhead Protection Vulnerability Rating	:		VULNERABLE
Vulnerability Overridden	:		

COMMENTS
NITRATE DATA FROEM PWSD 1989, 10/85 SAMPLE. Previous tritium result 7.2 on 11/08/1999.

625 Robert St. N. St. Paul MN 55155
P.O. Box 64975 St. Paul MN 55164 - 0975

MINNESOTA DEPARTMENT OF HEALTH
SECTION OF DRINKING WATER PROTECTION
SWP Vulnerability Rating

PWSID: 1020017
SYSTEM NAME: Coon Rapids
WELL NAME: Well #12

TIER: 2
WHP RANK:
UNIQUE WELL #: 00168721

COUNTY: Anoka | TOWNSHIP NUMBER: 31 | RANGE: 24 W | SECTION: 27 | QUARTERS: AAAA

CRITERIA		DESCRIPTION	POINTS
Aquifer Name(s)	:	Franconia-Mt. Simon	
DNR Geologic Sensitivity Rating	:	Very low	10
L Score	:	9	
Geologic Data From	:	Well Record	
Year Constructed	:	1975	
Construction Method	:	Cable Tool/Bored	0
Casing Depth	:	208	5
Well Depth	:	604	
Casing grouted into borehole?		Yes	0
Cement grout between casings?		Yes	0
All casings extend to land surface?		Yes	0
Gravel - packed casings?		No	0
Wood or masonry casing?		No	0
Holes or cracks in casing?		Unknown	0
Isolation distance violations?			0
Pumping Rate	:	850	10
Pathogen Detected?			0
Surface Water Characteristics?			0
Maximum nitrate detected	:	<.4	0
Maximum tritium detected	:	Unknown	0
Non-THMS VOCs detected?			0
Pesticides detected?			0
Carbon 14 age	:	Unknown	0
Wellhead Protection Score	:		25
Wellhead Protection Vulnerability Rating	:		NOT VULNERABLE

Vulnerability Overridden :

COMMENTS

625 Robert St. N. St. Paul MN 55155
P.O. Box 64975 St. Paul MN 55164 - 0975

MINNESOTA DEPARTMENT OF HEALTH
SECTION OF DRINKING WATER PROTECTION
SWP Vulnerability Rating

PWSID: 1020017
SYSTEM NAME: Coon Rapids
WELL NAME: Well #13

TIER: 2
WHP RANK:
UNIQUE WELL #: 00168720

COUNTY: Anoka | TOWNSHIP NUMBER: 31 | RANGE: 24 W | SECTION: 13 | QUARTERS: DADD

CRITERIA		DESCRIPTION	POINTS
Aquifer Name(s)	:	Franconia-Mt. Simon	
DNR Geologic Sensitivity Rating	:	Very low	10
L Score	:	10	
Geologic Data From	:	Well Record	
Year Constructed	:	1977	
Construction Method	:	Cable Tool/Bored	0
Casing Depth	:	395	5
Well Depth	:	693	
Casing grouted into borehole?		Yes	0
Cement grout between casings?		Yes	0
All casings extend to land surface?		Yes	0
Gravel - packed casings?		No	0
Wood or masonry casing?		No	0
Holes or cracks in casing?		Unknown	0
Isolation distance violations?			0
Pumping Rate	:	1000	10
Pathogen Detected?			0
Surface Water Characteristics?			0
Maximum nitrate detected	:	<.4	0
Maximum tritium detected	:	Unknown	0
Non-THMS VOCs detected?			0
Pesticides detected?			0
Carbon 14 age	:	Unknown	0
Wellhead Protection Score	:		25
Wellhead Protection Vulnerability Rating	:		NOT VULNERABLE

Vulnerability Overridden :

COMMENTS

MINNESOTA DEPARTMENT OF HEALTH
SECTION OF DRINKING WATER PROTECTION
SWP Vulnerability Rating

625 Robert St. N. St. Paul MN 55155
P.O. Box 64975 St. Paul MN 55164 - 0975

PWSID: 1020017
SYSTEM NAME: Coon Rapids
WELL NAME: Well #14

TIER: 2
WHP RANK:
UNIQUE WELL #: 00110460

COUNTY: Anoka | TOWNSHIP NUMBER: 31 | RANGE: 24 W | SECTION: 22 | QUARTERS: BCBB

CRITERIA		DESCRIPTION	POINTS
Aquifer Name(s)	:	Franconia-Mt. Simon	
DNR Geologic Sensitivity Rating	:	Medium	25
L Score	:	0	
Geologic Data From	:	Well Record	
Year Constructed	:	1977	
Construction Method	:	Cable Tool/Bored	0
Casing Depth	:	328	5
Well Depth	:	613	
Casing grouted into borehole?		Yes	0
Cement grout between casings?		Yes	0
All casings extend to land surface?		Yes	0
Gravel - packed casings?		No	0
Wood or masonry casing?		No	0
Holes or cracks in casing?		Unknown	0
Isolation distance violations?			0
Pumping Rate	:	1000	10
Pathogen Detected?			NOT VULNERABLE
Surface Water Characteristics?			NOT VULNERABLE
Maximum nitrate detected	:	<.4	NOT VULNERABLE
Maximum tritium detected	:	<.8 11/08/1999	NOT VULNERABLE
Non-THMS VOCs detected?			0
Pesticides detected?			0
Carbon 14 age	:	Unknown	0
Wellhead Protection Score	:		40
Wellhead Protection Vulnerability Rating	:		NOT VULNERABLE

Vulnerability Overridden :

COMMENTS

MINNESOTA DEPARTMENT OF HEALTH
SECTION OF DRINKING WATER PROTECTION
SWP Vulnerability Rating

625 Robert St. N. St. Paul MN 55155
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PWSID: 1020017
SYSTEM NAME: Coon Rapids
WELL NAME: Well #15

TIER: 2
WHP RANK:
UNIQUE WELL #: 00110461

COUNTY: Anoka | TOWNSHIP NUMBER: 31 | RANGE: 24 W | SECTION: 22 | QUARTERS: BCDD

CRITERIA		DESCRIPTION	POINTS
Aquifer Name(s)	:	Franconia-Mt. Simon	
DNR Geologic Sensitivity Rating	:	Low	20
L Score	:	1	
Geologic Data From	:	Well Record	
Year Constructed	:	1976	
Construction Method	:	Cable Tool/Bored	0
Casing Depth	:	225	5
Well Depth	:	615	
Casing grouted into borehole?		Yes	0
Cement grout between casings?		Yes	0
All casings extend to land surface?		Yes	0
Gravel - packed casings?		No	0
Wood or masonry casing?		No	0
Holes or cracks in casing?		Unknown	0
Isolation distance violations?			0
Pumping Rate	:	1300	20
Pathogen Detected?			0
Surface Water Characteristics?			0
Maximum nitrate detected	:	<.4	0
Maximum tritium detected	:	1 11/08/1999	VULNERABLE
Non-THMS VOCs detected?			0
Pesticides detected?			0
Carbon 14 age	:	Unknown	0
Wellhead Protection Score	:		45
Wellhead Protection Vulnerability Rating	:		VULNERABLE

Vulnerability Overridden :

COMMENTS

MINNESOTA DEPARTMENT OF HEALTH
SECTION OF DRINKING WATER PROTECTION
SWP Vulnerability Rating

625 Robert St. N. St. Paul MN 55155
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PWSID: 1020017
SYSTEM NAME: Coon Rapids
WELL NAME: Well #16

TIER: 2
WHP RANK:
UNIQUE WELL #: 00161413

COUNTY: Anoka | TOWNSHIP NUMBER: 31 | RANGE: 24 W | SECTION: 11 | QUARTERS: ADAA

CRITERIA		DESCRIPTION	POINTS
Aquifer Name(s)	:	Wonewoc-Mt.Simon	
DNR Geologic Sensitivity Rating	:	Very low	15
L Score	:	5	
Geologic Data From	:	Well Record	
Year Constructed	:	1981	
Construction Method	:	Cable Tool/Bored	0
Casing Depth	:	395	5
Well Depth	:	653	
Casing grouted into borehole?		Yes	0
Cement grout between casings?		Yes	0
All casings extend to land surface?		Yes	0
Gravel - packed casings?		No	0
Wood or masonry casing?		No	0
Holes or cracks in casing?		Unknown	0
Isolation distance violations?			0
Pumping Rate	:	1050	20
Pathogen Detected?			0
Surface Water Characteristics?			0
Maximum nitrate detected	:	<.05 08/02/1994	0
Maximum tritium detected	:	Unknown	0
Non-THMS VOCs detected?			0
Pesticides detected?			0
Carbon 14 age	:	Unknown	0
Wellhead Protection Score	:		40
Wellhead Protection Vulnerability Rating	:		NOT VULNERABLE

Vulnerability Overridden :

COMMENTS
L=5 Based on 58 feet of St. Lawrence Formation

625 Robert St. N. St. Paul MN 55155
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MINNESOTA DEPARTMENT OF HEALTH
SECTION OF DRINKING WATER PROTECTION
SWP Vulnerability Rating

PWSID: 1020017
SYSTEM NAME: Coon Rapids
WELL NAME: Well #17

TIER: 2
WHP RANK:
UNIQUE WELL #: 00150357

COUNTY: Anoka | TOWNSHIP NUMBER: 31 | RANGE: 24 W | SECTION: 21 | QUARTERS: DAAA

CRITERIA		DESCRIPTION	POINTS
Aquifer Name(s)	:	Quaternary Buried Artesian	
DNR Geologic Sensitivity Rating	:	Medium	25
L Score	:	0	
Geologic Data From	:	Well Record	
Year Constructed	:	1981	
Construction Method	:	Cable Tool/Bored	0
Casing Depth	:	81	10
Well Depth	:	121	
Casing grouted into borehole?		No	0
Cement grout between casings?		Not applicable	0
All casings extend to land surface?		Yes	0
Gravel - packed casings?		No	0
Wood or masonry casing?		No	0
Holes or cracks in casing?		Unknown	0
Isolation distance violations?			0
Pumping Rate	:	1000	10
Pathogen Detected?			0
Surface Water Characteristics?			0
Maximum nitrate detected	:	<.4	0
Maximum tritium detected	:	2 06/08/2010	VULNERABLE
Non-THMS VOCs detected?			0
Pesticides detected?			0
Carbon 14 age	:	Unknown	0
Wellhead Protection Score	:		45
Wellhead Protection Vulnerability Rating	:		VULNERABLE
Vulnerability Overridden	:		

COMMENTS

MINNESOTA DEPARTMENT OF HEALTH
SECTION OF DRINKING WATER PROTECTION
SWP Vulnerability Rating

625 Robert St. N. St. Paul MN 55155
P.O. Box 64975 St. Paul MN 55164 - 0975

PWSID: 1020017
SYSTEM NAME: Coon Rapids
WELL NAME: Well #18

TIER: 2
WHP RANK:
UNIQUE WELL #: 00110469

COUNTY: Anoka | TOWNSHIP NUMBER: 31 | RANGE: 24 W | SECTION: 2 | QUARTERS: DCDC

CRITERIA		DESCRIPTION	POINTS
Aquifer Name(s)	:	Mt. Simon	
DNR Geologic Sensitivity Rating	:	Very low	0
L Score	:	18	
Geologic Data From	:	Well Record	
Year Constructed	:	1986	
Construction Method	:	Cable Tool/Bored	0
Casing Depth	:	575	0
Well Depth	:	637	
Casing grouted into borehole?		Yes	0
Cement grout between casings?		Unknown	5
All casings extend to land surface?		Yes	0
Gravel - packed casings?		No	0
Wood or masonry casing?		No	0
Holes or cracks in casing?		Unknown	0
Isolation distance violations?			0
Pumping Rate	:	1000	10
Pathogen Detected?			NOT VULNERABLE
Surface Water Characteristics?			NOT VULNERABLE
Maximum nitrate detected	:	<.4	NOT VULNERABLE
Maximum tritium detected	:	<.8 04/21/1997	NOT VULNERABLE
Non-THMS VOCs detected?			0
Pesticides detected?			0
Carbon 14 age	:	A	-20
Wellhead Protection Score	:		-5
Wellhead Protection Vulnerability Rating	:		NOT VULNERABLE

Vulnerability Overridden :

COMMENTS

MINNESOTA DEPARTMENT OF HEALTH
SECTION OF DRINKING WATER PROTECTION
SWP Vulnerability Rating

625 Robert St. N. St. Paul MN 55155
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PWSID: 1020017
SYSTEM NAME: Coon Rapids
WELL NAME: Well #19

TIER: 2
WHP RANK:
UNIQUE WELL #: 00110475

COUNTY: Anoka | TOWNSHIP NUMBER: 31 | RANGE: 24 W | SECTION: 16 | QUARTERS:

CRITERIA		DESCRIPTION	POINTS
Aquifer Name(s)	:	Quaternary Buried Artesian	
DNR Geologic Sensitivity Rating	:	Low	20
L Score	:	3	
Geologic Data From	:	Well Record	
Year Constructed	:	1987	
Construction Method	:	Cable Tool/Bored	0
Casing Depth	:	115	10
Well Depth	:	135	
Casing grouted into borehole?		Yes	0
Cement grout between casings?		Unknown	5
All casings extend to land surface?		Yes	0
Gravel - packed casings?		No	0
Wood or masonry casing?		No	0
Holes or cracks in casing?		Unknown	0
Isolation distance violations?			0
Pumping Rate	:	1150	20
Pathogen Detected?			0
Surface Water Characteristics?			0
Maximum nitrate detected	:	.53 07/08/2014	0
Maximum tritium detected	:	36.7 07/16/1991	VULNERABLE
Non-THMS VOCs detected?			0
Pesticides detected?			0
Carbon 14 age	:	M	0
Wellhead Protection Score	:		55
Wellhead Protection Vulnerability Rating	:		VULNERABLE

Vulnerability Overridden :

COMMENTS

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MINNESOTA DEPARTMENT OF HEALTH
SECTION OF DRINKING WATER PROTECTION
SWP Vulnerability Rating

PWSID: 1020017
SYSTEM NAME: Coon Rapids
WELL NAME: Well #20

TIER: 2
WHP RANK:
UNIQUE WELL #: 00420956

COUNTY: Anoka | TOWNSHIP NUMBER: 31 | RANGE: 24 W | SECTION: 21 | QUARTERS: ADBD

CRITERIA		DESCRIPTION	POINTS
Aquifer Name(s)	:	Quaternary Buried Artesian	
DNR Geologic Sensitivity Rating	:	Low	20
L Score	:	1	
Geologic Data From	:	Well Record	
Year Constructed	:	1988	
Construction Method	:	Cable Tool/Bored	0
Casing Depth	:	95	10
Well Depth	:	135	
Casing grouted into borehole?		Yes	0
Cement grout between casings?		Yes	0
All casings extend to land surface?		Yes	0
Gravel - packed casings?		No	0
Wood or masonry casing?		No	0
Holes or cracks in casing?		Unknown	0
Isolation distance violations?			0
Pumping Rate	:	1100	20
Pathogen Detected?			0
Surface Water Characteristics?			0
Maximum nitrate detected	:	.35 07/08/2014	0
Maximum tritium detected	:	6.9 06/08/2010	VULNERABLE
Non-THMS VOCs detected?			0
Pesticides detected?			0
Carbon 14 age	:	Unknown	0
Wellhead Protection Score	:		50
Wellhead Protection Vulnerability Rating	:		VULNERABLE
Vulnerability Overridden	:		Jim Walsh

COMMENTS

MINNESOTA DEPARTMENT OF HEALTH
SECTION OF DRINKING WATER PROTECTION
SWP Vulnerability Rating

625 Robert St. N. St. Paul MN 55155
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PWSID: 1020017
SYSTEM NAME: Coon Rapids
WELL NAME: Well #21

TIER: 2
WHP RANK:
UNIQUE WELL #: 00474384

COUNTY: Anoka | TOWNSHIP NUMBER: 31 | RANGE: 24 W | SECTION: 13 | QUARTERS: ACCD

CRITERIA		DESCRIPTION	POINTS
Aquifer Name(s)	:	Quaternary Buried Artesian	
DNR Geologic Sensitivity Rating	:	Low	20
L Score	:	1	
Geologic Data From	:	Well Record	
Year Constructed	:	1990	
Construction Method	:	Cable Tool/Bored	0
Casing Depth	:	170	10
Well Depth	:	203	
Casing grouted into borehole?		Unknown	0
Cement grout between casings?		Yes	0
All casings extend to land surface?		Yes	0
Gravel - packed casings?		No	0
Wood or masonry casing?		No	0
Holes or cracks in casing?		Unknown	0
Isolation distance violations?			0
Pumping Rate	:	900	10
Pathogen Detected?			0
Surface Water Characteristics?			0
Maximum nitrate detected	:	<.05 07/07/2014	0
Maximum tritium detected	:	11.5 04/21/1997	VULNERABLE
Non-THMS VOCs detected?			0
Pesticides detected?			0
Carbon 14 age	:	Unknown	0
Wellhead Protection Score	:		40
Wellhead Protection Vulnerability Rating	:		VULNERABLE

Vulnerability Overridden :

COMMENTS

625 Robert St. N. St. Paul MN 55155
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MINNESOTA DEPARTMENT OF HEALTH
SECTION OF DRINKING WATER PROTECTION
SWP Vulnerability Rating

PWSID: 1020017
SYSTEM NAME: Coon Rapids
WELL NAME: Well #22

TIER: 2
WHP RANK:
UNIQUE WELL #: 00474385

COUNTY: Anoka | TOWNSHIP NUMBER: 31 | RANGE: 24 W | SECTION: 22 | QUARTERS: CBAA

CRITERIA		DESCRIPTION	POINTS
Aquifer Name(s)	:	Quaternary Buried Artesian	
DNR Geologic Sensitivity Rating	:	Medium	25
L Score	:	0	
Geologic Data From	:	Well Record	
Year Constructed	:	1990	
Construction Method	:	Cable Tool/Bored	0
Casing Depth	:	80	10
Well Depth	:	105	
Casing grouted into borehole?		Yes	0
Cement grout between casings?		Not applicable	0
All casings extend to land surface?		Yes	0
Gravel - packed casings?		No	0
Wood or masonry casing?		No	0
Holes or cracks in casing?		Unknown	0
Isolation distance violations?			0
Pumping Rate	:	250	5
Pathogen Detected?			0
Surface Water Characteristics?			0
Maximum nitrate detected	:	.07 09/23/2014	0
Maximum tritium detected	:	Unknown	0
Non-THMS VOCs detected?			0
Pesticides detected?			0
Carbon 14 age	:	Unknown	0
Wellhead Protection Score	:		40
Wellhead Protection Vulnerability Rating	:		VULNERABLE
Vulnerability Overridden	:		Jim Walsh

COMMENTS
Vulnerable because of tritium in Well 20.

625 Robert St. N. St. Paul MN 55155
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MINNESOTA DEPARTMENT OF HEALTH
SECTION OF DRINKING WATER PROTECTION
SWP Vulnerability Rating

PWSID: 1020017
SYSTEM NAME: Coon Rapids
WELL NAME: Well #23

TIER: 2
WHP RANK:
UNIQUE WELL #: 00463020

COUNTY: Anoka | TOWNSHIP NUMBER: 31 | RANGE: 24 W | SECTION: 27 | QUARTERS: BAA

CRITERIA		DESCRIPTION	POINTS
Aquifer Name(s)	:	Quaternary Buried Artesian	
DNR Geologic Sensitivity Rating	:	Medium	25
L Score	:	0	
Geologic Data From	:	Well Record	
Year Constructed	:	1991	
Construction Method	:	Cable Tool/Bored	0
Casing Depth	:	93	10
Well Depth	:	128	
Casing grouted into borehole?		Yes	0
Cement grout between casings?		Unknown	5
All casings extend to land surface?		Yes	0
Gravel - packed casings?		No	0
Wood or masonry casing?		No	0
Holes or cracks in casing?		Unknown	0
Isolation distance violations?			0
Pumping Rate	:	250	5
Pathogen Detected?			0
Surface Water Characteristics?			0
Maximum nitrate detected	:	<.05 09/23/2014	0
Maximum tritium detected	:	7.7 06/08/2010	VULNERABLE
Non-THMS VOCs detected?			0
Pesticides detected?			0
Carbon 14 age	:	Unknown	0
Wellhead Protection Score	:		45
Wellhead Protection Vulnerability Rating	:		VULNERABLE
Vulnerability Overridden	:		

COMMENTS
Previous tritium result 21.6 TU on 04/21/1997.

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MINNESOTA DEPARTMENT OF HEALTH
SECTION OF DRINKING WATER PROTECTION
SWP Vulnerability Rating

PWSID: 1020017
SYSTEM NAME: Coon Rapids
WELL NAME: Well #24

TIER: 2
WHP RANK:
UNIQUE WELL #: 00674478

COUNTY: Anoka | TOWNSHIP NUMBER: | RANGE: | SECTION: | QUARTERS:

CRITERIA		DESCRIPTION	POINTS
Aquifer Name(s)	:	Tunnel City-Wonewoc	
DNR Geologic Sensitivity Rating	:	Medium	25
L Score	:	0	
Geologic Data From	:	Well Record	
Year Constructed	:	2003	
Construction Method	:	Cable Tool/Bored	0
Casing Depth	:	241	5
Well Depth	:	388	
Casing grouted into borehole?		Yes	0
Cement grout between casings?		Yes	0
All casings extend to land surface?		Yes	0
Gravel - packed casings?		No	0
Wood or masonry casing?		No	0
Holes or cracks in casing?		Unknown	0
Isolation distance violations?			0
Pumping Rate	:	1150	20
Pathogen Detected?			0
Surface Water Characteristics?			0
Maximum nitrate detected	:	<.05 07/08/2014	0
Maximum tritium detected	:	7.7 07/15/2010	VULNERABLE
Non-THMS VOCs detected?			0
Pesticides detected?			0
Carbon 14 age	:	Unknown	0
Wellhead Protection Score	:		50
Wellhead Protection Vulnerability Rating	:		VULNERABLE

Vulnerability Overridden :

COMMENTS

625 Robert St. N. St. Paul MN 55155
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MINNESOTA DEPARTMENT OF HEALTH
SECTION OF DRINKING WATER PROTECTION
SWP Vulnerability Rating

PWSID: 1020017
SYSTEM NAME: Coon Rapids
WELL NAME: Well #25

TIER: 2
WHP RANK:
UNIQUE WELL #: 00674479

COUNTY: Anoka | TOWNSHIP NUMBER: | RANGE: | SECTION: | QUARTERS:

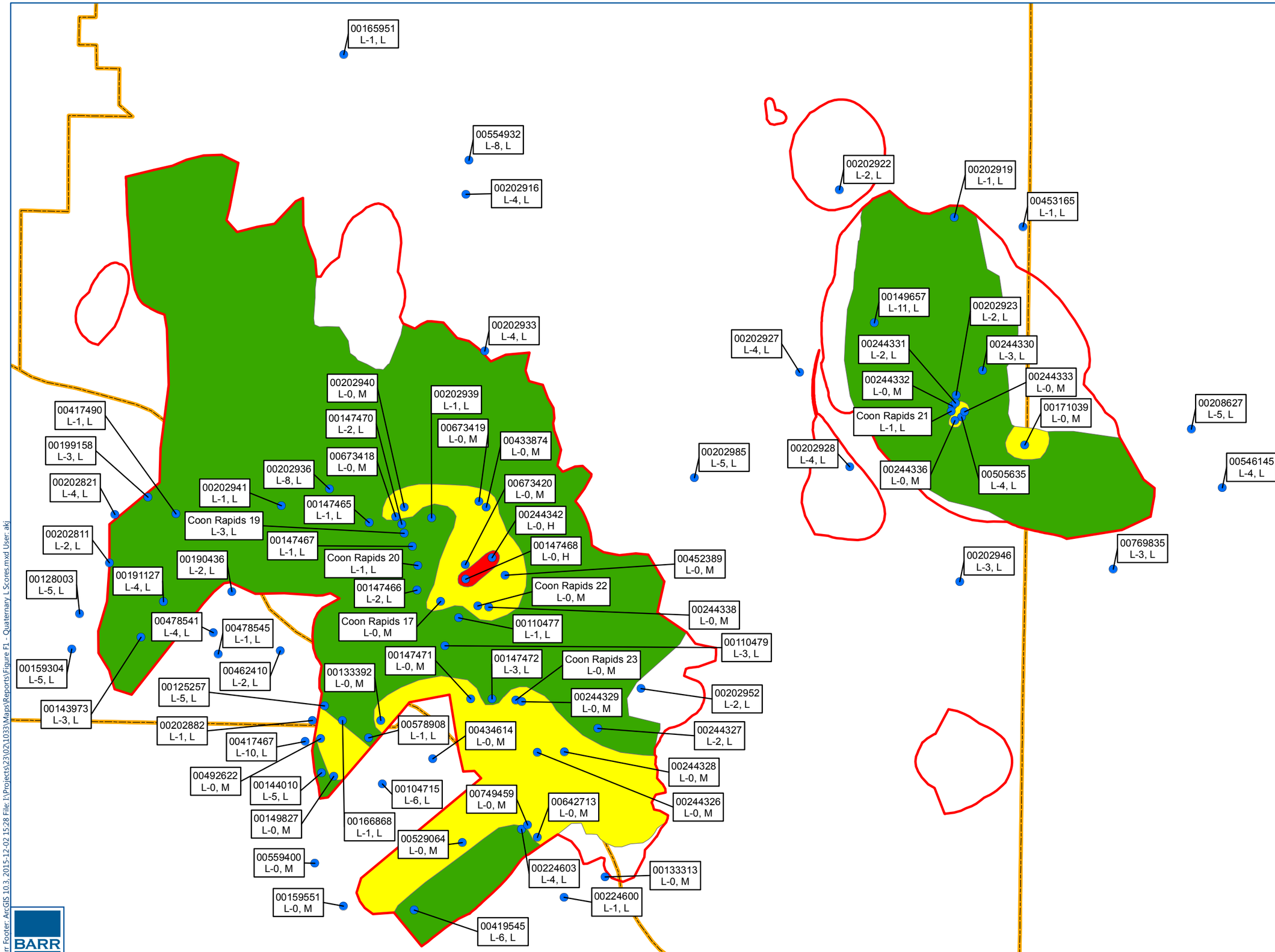
CRITERIA		DESCRIPTION	POINTS
Aquifer Name(s)	:	Tunnel City-Wonewoc	
DNR Geologic Sensitivity Rating	:	Low	20
L Score	:	3	
Geologic Data From	:	Well Record	
Year Constructed	:	2003	
Construction Method	:	Cable Tool/Bored	0
Casing Depth	:	229	5
Well Depth	:	388	
Casing grouted into borehole?		Yes	0
Cement grout between casings?		Yes	0
All casings extend to land surface?		Yes	0
Gravel - packed casings?		No	0
Wood or masonry casing?		No	0
Holes or cracks in casing?		Unknown	0
Isolation distance violations?			0
Pumping Rate	:	1125	20
Pathogen Detected?			0
Surface Water Characteristics?			0
Maximum nitrate detected	:	<.05 07/08/2014	0
Maximum tritium detected	:	Unknown	0
Non-THMS VOCs detected?			0
Pesticides detected?			0
Carbon 14 age	:	Unknown	0
Wellhead Protection Score	:		45
Wellhead Protection Vulnerability Rating	:		VULNERABLE

Vulnerability Overridden :

COMMENTS
L=3 Based on 30 feet of St. Lawrence Formation

Appendix F

L-Score and Vulnerability Maps



Quaternary L Score Well

WHPA

Municipal Boundary

Geologic Sensitivity

Very High

High

Moderate

Low

Unique Number/Well Name
L score, Geol. Sens.

Geologic sensitivity shown only for areas where the capture zone from the Quaternary aquifer is the uppermost capture zone in the WHPA.

Note: Only Quaternary wells deeper than 80' used in the L score calculations. The shallowest Coon Rapids Well (20) is screened from 80-105' below ground surface.

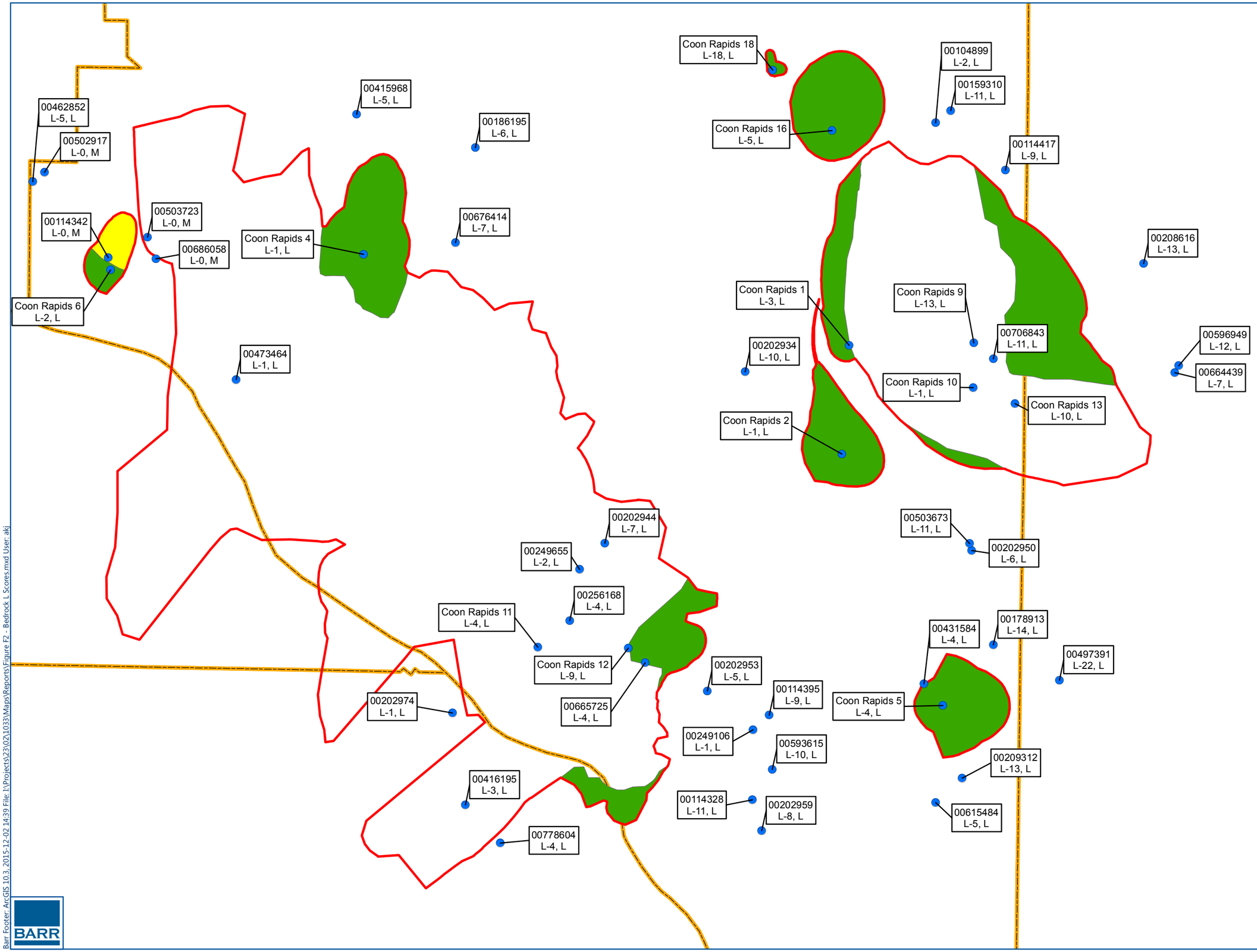
0 2,500
Feet

QUATERNARY L SCORES
AND GEOLOGIC SENSITIVITY
Coon Rapids WHPP Amendment
City of Coon Rapids, MN

FIGURE F1

BARR

Barr Footer: ArcGIS 10.3, 2015-12-02 15:28 File: I:\Projects\23\02\1033\Maps\Reports\Figure F1 - Quaternary L Scores.mxd User: akj



Bedrock L Score Well

WHPA

Municipal Boundary

Geologic Sensitivity

Very High

High

Moderate

Low

Unique Number/Well Name
L score, Geol. Sens.

Geologic sensitivity shown only for areas where the capture zone from a bedrock aquifer is the uppermost capture zone in the WHPA.

All L scores computed using only strata above the Tunnel City Group-Wonewoc Sandstone aquifer except at Coon Rapids 18, where all strata above the Mt. Simon aquifer were used.

0 2,500
Feet

BEDROCK L SCORES
AND GEOLOGIC SENSITIVITY
Coon Rapids WHPP Amendment
City of Coon Rapids, MN

FIGURE F2

BARR

Barr Footer: ArcGIS 10.3, 2015-12-02 14:39 File: I:\Projects\23\02\1033\Maps\Reports\Figure F2 - Bedrock L Scores.mxd User: akj

Appendix G

Groundwater Model Files and GIS Shapefiles

Wellhead and Source Water Protection – Part 2: Wellhead Protection Plan Amendment

Prepared for

Coon Rapids Minnesota

June 2017

DRAFT

4300 MarketPointe Drive, Suite 200
Minneapolis, MN 55435
Phone: 952.832.2600

Wellhead and Source Water Protection – Part 2: Wellhead Protection Plan Amendment

Prepared for

COON RAPIDS
Minnesota

June 2017

DRAFT

Wellhead and Source Water Protection –
Part 2: Wellhead Protection Plan Amendment

June 2017

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DRAFT

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Public Water Supply Profile

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General Information

UNIQUE WELL NUMBER(S) Primary: 202932, 202931, 202930, 202965, 161413, 110460, 110461, 150357, 110475, 420956, 474384, 674478, 674479; Seasonal: 202926, 202929, 202972, 202951, 202937, 202943, 168721, 168720, 110469, 474385, 463020

SIZE OF POPULATION SERVED 61,476 (2010 Census)

COUNTY Anoka

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Documentation List

Step	Date Performed
Scoping Meeting 2 Held (4720.5340, subp. 1)	September 23, 2016
Scoping 2 Decision Notice Received (4720.5340, subp. 2)	October 19, 2016
Remaining Portion of Plan Submitted to Local Units of Government (LUGs) (4720.5350)	July XX, 2017
Review Received From Local Units of Government (4720.5350, subp. 2)	July XX, 2017 to September XX, 2017
Review Comments Considered (4720.5350, subp. 3)	July XX, 2017 to September XX, 2017
Public Hearing Conducted (4720.5350, subp.4)	October XX, 2017
Remaining Portion WHP Plan Submitted (4720.5360, subp. 1)	October XX, 2017
Final WHP Plan Review Received (4720.5360, subp. 4)	

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Certification

I hereby certify that this plan, document, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Geologist under the laws of the state of Minnesota.

John C. Greer

PG #:

Date

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Acronyms

Acronym	Description
DWSMA	Drinking Water Supply Management Area
MGD	Million Gallons per Day
MGY	Million Gallons per Year
MDH	Minnesota Department of Health
MDNR	Minnesota Department of Natural Resources
MGS	Minnesota Geological Survey
MnOPS	Minnesota Office of Pipeline Safety
MPCA	Minnesota Pollution Control Agency
PCSI	Potential Contaminant Source Inventory
WHPA	Wellhead Protection Area
WHPP	Wellhead Protection Plan

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Executive Summary

The Wellhead and Source Water Protection Plan (the Plan) for the City of Coon Rapids (the City) addresses the 24 municipal water supply wells operated by the City. The City's previous Wellhead Protection Plan amendment was approved by the Minnesota Department of Health in 2007. This Plan amendment was prepared in accordance with the applicable portions of the State of Minnesota Wellhead Protection Rules (Minnesota Rules 4720.5100 through 4720.5590) due to the age of the Plan.

The City is a founding member of the Anoka County Municipal Wellhead Protection Group (ACMWPG). As a member of the ACMWPG, the City participates in an advisory group along with neighboring public water suppliers to address and collaborate on common elements of wellhead protection plans.

The City's municipal water supply system includes 24 wells: Wells 8, 9, 10, 11, 13, 14, 15, 17, 19, 20, 21, 24, and 25 are primary water supply wells. Wells 1, 2, 4, 5, 6, 7, 12, 16, 18, 22, and 23 are seasonal wells used on an as needed basis to meet peak demands. In total, these wells pump from three different aquifers: the Mt. Simon Sandstone aquifer, the Tunnel City-Wonewoc aquifer, and an unconsolidated, Quaternary-age confined sand and gravel aquifer. In accordance with Minnesota Rules 4720.5550, Wells 1, 2, 4, 5, 8, 9 10, 12, 13, 14, 16, and 18 are classified as not vulnerable to contamination from the surface and Wells 6, 7, 11, 15, 17, 19, 20, 21, 22, 23, 24, and 25 are classified as vulnerable to contamination.

This Plan amendment consists of two parts. In Part 1 of the Plan amendment, wellhead protection areas (WHPAs) for the City's water supply wells were delineated as were the associated drinking water supply management areas (DWSMAs). Three DWSMAs were delineated for Coon Rapids. The West DWSMA encompasses the WHPAs for Wells 4, 6, 7, 11, 12, 14, 15, 17, 19, 20, 22, 23, 24, and 15. The Northeast DWSMA encompasses the WHPAs for Wells 1, 2, 8, 9, 10, 13, 16, 18, and 21. The Southeast DWSMA encompasses the DWSMA for Well 5. The Southeast DWSMA is contained entirely within the Coon Rapids city limits, while the Northeast DWSMA extends east into Blaine and the West DWSMA extends southwest into Champlin and Brooklyn Park (see Figure 1).

In Part 1 of this Plan amendment, assessment of geologic conditions in and around the City's DWSMAs and available water quality data for the City's wells was done to determine the vulnerability to contamination of the uppermost source water aquifer. The aquifer vulnerability is classified as Low in 100% of the Southeast DWSMA. The aquifer vulnerability in approximately 94.5% of the area in the West DWSMA was classified as Moderate. The aquifer vulnerability was classified as Low in approximately 5% of the West DWSMA and High in approximately 0.5% of the West DWSMA. In the Northeast DWSMA, approximately 99% of the area received an aquifer vulnerability classification of Moderate. The aquifer vulnerability was classified as Low in approximately 1% of the Northeast DWSMA.

This document comprises Part 2 of the Plan amendment and includes the following information:

- A review of data elements identified by the Minnesota Department of Health as applicable to the DWSMAs.
- Results of an inventory of potential contaminant sources within the DWSMAs.

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- A review of changes, issues, problems, and opportunities related to the public water supply and the identified potential contaminant sources.
- A discussion of potential contaminant source management strategies and the goals, objectives, and action plans associated with these management strategies.
- A review of the Wellhead and Source Water Protection evaluation program and Coon Rapids' alternative water supply contingency strategy.

The types of potential contaminant sources that must be inventoried depends on the aquifer vulnerability classification within the DWSMAs. Potential contaminant sources identified in the DWSMAs include non-municipal wells, potential Class V well locations, chemical storage sites, and storage tanks.

The goals and objectives of this WHPP will focus on reducing the potential contaminant pathways to the source water aquifers that may be provided by private wells and educating property owners and water supply users to ensure proper management of the portions of the DWSMAs.

The following goals have been identified for implementation of this WHPP:

- The City will work to maintain or improve the current level of water quality so that the municipal water supply will continue to meet or exceed all applicable state and federal water quality standards.
- Work with other cities in the Anoka County Municipal Wellhead Protection Group along with Brooklyn Park and Champlin to protect the source water aquifers
- The City will provide information and promote activities that protect the source water aquifer that provides water to the municipal system. This will include increasing public awareness of the Wellhead and Source Water Protection Program and groundwater-related issues, and management of the identified potential contaminant sources within the DWSMAs.
- The City will continue to collect data to support future wellhead and source water protection efforts.

Actions identified to accomplish these goals include the following:

- Wells
    - Promoting proper management of existing active wells in the DWSMAs
    - Encouraging the proper sealing of all unused wells within the DWSMAs
    - Identification of new high capacity wells in or near the DWSMAs
    - Evaluation of City-owned observation wells and sealing of unneeded wells
- Potential contaminant source properties
    - Encouraging proper handling of chemicals/wastes
    - Encouraging proper operation and maintenance of storage tanks,
    - Periodically obtaining updated information on potential contaminant sources in the DWSMAs from the regulating agencies to maintain an up-to-date potential contaminant source database for the DWSMAs and allow timely recognition of potential issues that could affect the Coon Rapids municipal water supply or DWSMAs.

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- Public education
  - Distribution of the Coon Rapids Annual Water Quality Report for the water supply system,
  - Posting Wellhead Protection Program information on the City of Coon Rapids website http://www.ci.coon-rapids.mn.us/ and provide a link to Anoka County's *Know the Flow* website (http://www.knowtheflow.us/)
  - Inclusion of wellhead and source water protection in the City's planning process,
- Continued data collection
  - Recording static and pumping water levels in the Coon Rapids municipal wells,
  - Collection of additional local geologic and hydrogeologic data as it becomes available from public sources or from City-sponsored projects.

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1.0 Introduction

1.1 Background

The City of Coon Rapids (City) currently has 24 municipal water supply wells: Wells 8, 9, 10, 11, 13, 14, 15, 17, 19, 20, 21, 24, and 25 are primary water supply wells. Wells 1, 2, 4, 5, 6, 7, 12, 16, 18, 22, and 23 are seasonal wells used on an as needed basis to meet peak demands. In total, these wells pump from three different aquifers: the Mt. Simon Sandstone aquifer, the Tunnel City-Wonewoc aquifer, and an unconsolidated, Quaternary-age confined sand and gravel aquifer. Minnesota unique well number along with well construction, status, aquifer, and well vulnerability classification for each of Coon Rapids' municipal water supply wells is presented in Table 1. Well locations and Drinking Water Supply Management Area (DWSMA) locations are shown on Figure 1. Minnesota Department of Health (MDH) well records for all the Coon Rapids municipal wells are presented in Appendix A.

The previous Coon Rapids Wellhead Protection Plan (WHPP) Parts 1 and 2 were prepared in 2006-2007. The MDH issued final approval of the previous Part 2 WHPP in 2007. In accordance with the Minnesota Wellhead Protection Rules (Minnesota Rules 4720.5100 through 4720.5590), amendment of the City's WHPP was initiated based on the age of the Plan. The Part 1 WHPP amendment (Barr, 2016) was approved by the Minnesota Department of Health (MDH) in March 2016 (MDH, 2016a). A public information meeting on the Part 1 WHPP amendment was held on May 3, 2016.

In the Part 1 WHPP amendment, three separate DWSMAs were delineated for Coon Rapids that encompass the wellhead protection areas (WHPAs) delineated for the Coon Rapids water supply wells. In addition to the delineation of the WHPAs and the DWSMAs, Part 1 of the WHPP amendment includes an assessment of the vulnerability to contamination of the Coon Rapids municipal wells and the source water aquifers in the associated DWSMAs. In accordance with Minnesota Rules 4720.5550, Wells 1, 2, 4, 5, 8, 9 10, 12, 13, 14, 16, and 18 are classified as not vulnerable to contamination from the surface and Wells 6, 7, 11, 15, 17, 19, 20, 21, 22, 23, 24, and 25 are classified as vulnerable to contamination (see Table 1 and Appendix B). In the Part 1 amendment report, the vulnerability to contamination of the uppermost source water aquifers within the DWSMAs was identified as ranging from Low to High (Barr, 2016). Figure 1 shows the aquifer vulnerability zones in the Coon Rapids DWSMAs. The Coon Rapids Part 1 WHPP amendment is presented in Appendix B.

1.2 Description of the Public Water Supply System

Coon Rapids is located in Anoka County. The City currently has 13 primary water supply wells and 11 seasonal-use wells in the municipal water supply and distribution system for Public Water Supply #1020017. Locations of the wells are shown on Figure 1 and general construction details for the Coon Rapids municipal wells are summarized in Table 1. Copies of the MDH well records for the Coon Rapids municipal wells are presented in Appendix A.

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The 2010 census counted 61,476 people in Coon Rapids. The Metropolitan Council estimated the 2015 population of Coon Rapids to be 62,527. The Metropolitan Council projects Coon Rapids' population to reach 64,800 in 2020 and 68,400 in 2030 (Metropolitan Council, 2015a).

The City's Comprehensive Water System Plan (Bolton & Menk, 2014) projects the daily average water demand in 2029 using two different methodologies. The 2029 average day demand projections range from approximately 8.3 MGD to 9.05 MGD (approximately 5,800 gpm to 6,300 gpm). The Water System Plan also projects the 2029 maximum day water demand using the two methodologies. The 2029 maximum day demand projections range from approximately 23.75 MGD to 25.80 MGD (approximately 16,500 gpm to 17,900 gpm). Current daily water demand (based on the period 2010-2015) averages approximately 7.3 MGD. Maximum day demand (the largest daily water use in a given year) ranged from approximately 14.0 MGD to 20.8 MGD in the period 2010-2015. Coon Rapids' permitted annual appropriation volume is 3.2 BGY. The permitted instantaneous total pumping rate for the Coon Rapids system is 26,575 gpm.

As indicated in Table 1, Wells 1 through 7, 12, 16, 18, 22 and 23 are used only seasonally during peak demand periods. Annual pumping from Wells 16 and 18 is limited by a Compliance Agreement with the MDH as a result of radionuclide concentrations in the water pumped from these two wells.

The City has two water treatment plants that treat water from 15 of the City's wells for iron and manganese and add fluoride and disinfect the water before it enters the distribution system. Wells 8, 9, 10, 13, and 21 are connected to the East Water Treatment Plant. Wells 11, 14, 15, 17, 19, 20, 22, 23, 24, and 25 are connected to the West Water Treatment Plant. Wells 1, 2, 4, 5, 6, 7, 12, 16, and 18, which are used during high demand periods, are not connected to the treatment plants. Water from these nine wells is fluoridated and disinfected at the wellhead before it enters the distribution system.

Coon Rapids currently has five water storage facilities consisting of three elevated towers and two ground reservoirs. These facilities have a combined storage capacity of 14.5 million gallons. The Comprehensive Water System Plan (Bolton & Menk, 2014) recommends a new 1.5 million gallon elevated tower be constructed.

The City's Comprehensive Water System Plan (Bolton & Menk, 2014) does not indicate that any additional water supply wells will be needed to provide for projected future water demand.

As discussed by Barr (2016), pumping information from the City for the period 2010 through 2014 and City water use projections were used to develop pumping rate projections for use in delineating the WHPAs. Annual volume of water pumped by each of the City's municipal water supply wells during the period 2010 through 2014 is shown in Table 2.

1.3 DWSMAs

The DWSMAs delineated in the Part 1 WHPP amendment encompass the 10-year groundwater time of travel WHPAs around the City's wells. As shown on Figure 1, the Southeast DWSMA was delineated around Coon Rapids Well 5. The West DWSMA encompasses the WHPAs for Wells 4, 6, 7, 11, 12, 14, 15,

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17, 19, 20, 22, 23, 24, and 15. The Northeast DWSMA encompasses the WHPAs for Wells 1, 2, 8, 9, 10, 13, 16, 18, and 21. The West DWSMA is found in Township 31N, Range 24W, Sections 8, 9, 14, 15, 16, 17, 18, 20, 22, 23, 26, 27, and 28; Township 119N, Range 21W, Sections 2, 4, 10, 28, and 34; and Township 120N, Range 21W, Sections 18, 20, 28, 32, and 34. The Northeast DWSMA is found in Township 31N, Range 23W, Sections 18 and 19 and Township 31N, Range 24W, Sections 1, 2, 11, 12, 13, 14, 23, and 24. The Southeast small DWSMA associated with Well 5 lies within Township 31N, Range 24W, Sections 24 and 25. As shown on Figure 1, the Southeast DWSMA is contained entirely within the Coon Rapids city limits while the Northeast DWSMA extends east into Blaine and the West DWSMA extends southwest into Champlin and Brooklyn Park in Hennepin County. The West DWSMA overlaps the Champlin 2 DWSMA while the Northeast DWSMA overlies portions of the Blaine West and Blaine NW DWSMAs (Figure 1).

In the Part 1 amendment report, the aquifer vulnerability in approximately 94.5% of the area in the West DWSMA was classified as Moderate. The aquifer vulnerability was classified as Low in approximately 5% of the West DWSMA and High in approximately 0.5% of the West DWSMA. In the Northeast DWSMA, approximately 99% of the area received an aquifer vulnerability classification of Moderate. The aquifer vulnerability was classified as Low in approximately 1% of the Northeast DWSMA. The aquifer vulnerability within the entire Southeast DWSMA around Coon Rapids Well 5 was classified as Low.

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2.0 Identification and Assessment of Data Elements

The Minnesota Wellhead Protection Rules specify data elements that must be addressed in wellhead protection plans. For the WHPP amendment, MDH staff met with City staff on two occasions to discuss the data elements that are specified in the Minnesota Rules 4720.5400. Results of these scoping meetings were transmitted to the City via two Scoping Decisions dated May 7, 2015 (MDH, 2015) and October 14, 2016 (MDH, 2016b).

The first Scoping Meeting was held on April 29, 2015. At this meeting, the data elements related to delineation of the WHPAs and DWSMAs and assessment of well and aquifer vulnerability were discussed. The second Scoping Meeting was held on September 23, 2016. At this meeting, the data elements required to support development of Part 2 of the WHPP amendment (this document) which identifies potential contaminant sources within the DWSMAs and identifies management strategies to help safeguard the municipal water supply from identified potential contaminants were discussed. An assessment of these data elements, as required by the Minnesota Wellhead Protection Rules, is presented in Appendix C.

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3.0 Inventory of Potential Contaminant Sources

In Part 1 of this WHPP amendment, WHPAs and the DWSMAs were delineated. The DWSMAs encompass the 10-year groundwater time of travel WHPAs around the City's wells (Barr, 2016).The West DWSMA encompasses the WHPAs for Wells 4, 6, 7, 11, 12, 14, 15, 17, 19, 20, 22, 23, 24, and 15. The Northeast DWSMA encompasses the WHPAs for Wells 1, 2, 8, 9, 10, 13, 16, 18, and 21. The Southeast DWSMA encompasses the Well 5 WHPA. The Southeast DWSMA is contained entirely within the Coon Rapids city limits while the Northeast DWSMA extends east into Blaine and the West DWSMA extends southwest into Champlin and Brooklyn Park in Hennepin County (Figure 1).

As shown in Appendix C, the current land use (i.e., year 2010 data from the Metropolitan Council) numerous land uses are found within the DWSMAs. Land uses in the DWSMAs that cover 1% or more of the area in the DWSMAs include residential of various types, park/recreational/preserve, open water, institutional, retail and other commercial, undeveloped land, and major highways.

Per the October 14, 2016 Scoping 2 Decision Notice, the City performed a Potential Contaminant Source Inventory (PCSI) within the DWSMAs.

3.1 Inventory Process

At Scoping Meeting No. 2, the types of potential contaminant sources that must be inventoried in the Coon Rapids DWSMAs Area were discussed. As discussed in Appendix C, sources of data accessed for the potential contaminant source inventory include Anoka County, Minnesota Department of Agriculture (MDA), Minnesota Department of Health (MDH), Minnesota Department of Natural Resources (MDNR), Minnesota Department of Public Safety (MnDPS), Minnesota Geological Survey (MGS), Minnesota Office of Pipeline Safety (MnOPS), Minnesota Pollution Control Agency (MPCA), Metropolitan Council, Minnesota Geospatial Information Office (MGIO), National Pipeline Mapping System, and U.S. Environmental Protection Agency (USEPA) databases.

Aquifer vulnerability in the Coon Rapids DWSMAs varies (Figure 1). The aquifer vulnerability in the DWSMAs includes the following classifications: Low, Moderate, and High. In the West DWSMA, approximately 94.5% of the area has an aquifer vulnerability classification of Moderate. The aquifer vulnerability is classified as Low in approximately 5% of the West DWSMA and High in approximately 0.5% of the West DWSMA. In the Northeast DWSMA, approximately 99% of the area has an aquifer vulnerability classification of Moderate. The aquifer vulnerability is classified as Low in approximately 1% of the Northeast DWSMA. The aquifer vulnerability within the entire Southeast DWSMA around Coon Rapids Well 5 is classified as Low.

The potential contaminant source types that must be inventoried vary based on the aquifer vulnerability classification. In the areas where aquifer vulnerability is classified as High the types of potential contaminant point sources inventoried include chemical storage sites, potential Class V well locations (Class V wells are wells or other structures that facilitate injection of wastes into the subsurface), hazardous waste generators, individual sewage treatment systems (ISTS; a.k.a., septic systems), storage

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tank sites (registered storage tanks and leaking underground storage tank sites), pipeline facilities, and wells. In areas where the aquifer vulnerability is classified as Moderate the types of potential contaminant point sources inventoried include above-ground and underground storage tanks, leaking underground storage tank (LUST) locations, potential Class V well locations, pipeline facilities, chemical storage locations, spills/potential contamination sites, and wells. In areas where the aquifer vulnerability is classified as Low the types of potential contaminant point sources inventoried include potential Class V well locations and wells.

The first step in the inventory was to determine if there were any potential contaminant sources in the Inner Wellhead Management Zone (IWMZ) or the Emergency Response Zone (ERZ) around each of the Coon Rapids wells. The IWMZ is defined as the area within a 200 foot radius of each municipal well. The most recent IWMZ inventory for each of the Coon Rapids municipal wells is presented in Appendix C. The ERZ is defined as the area within which the travel time of groundwater to a municipal well is one year or less. The inventory was then expanded out to the boundaries of the DWSMAs.

As shown in Table 3, potential contaminant sources were assigned a priority based on the relative risk they pose to the public water supply. The evaluation of risk related to a potential contaminant source type is based on the locations of potential contaminant sources of that type and the aquifer vulnerability classification. Higher priority was assigned to those potential contaminant sources that would pose the highest risk to the municipal water supply should a contaminant release occur.

3.2 Inventory Results

A more detailed discussion of the potential contaminant sources within the DWSMAs is presented in Appendix C. The inventory results are summarized in Table 3.

The Wellhead Protection rules require that at least 25 locations of each type of potential contaminant source identified during the PCSI be verified during preparation of the plan. The rules also require that if there are fewer than 25 of a particular potential contaminant source type that all locations of that type be verified. For WHPP amendments, MDH policy modifies this requirement by applying the "25 rule" only to those portions of the new DWSMA that are outside the limits of the original DWSMA. In addition, MDH requires that potential contaminant source locations identified within the original DWSMA limits during preparation of the original plan be verified prior to submittal of the Part 2 WHPP amendment to MDH for approval.

During the preparation of this Plan amendment, all identified potential contaminant source locations within the old Coon Rapids DWSMA limits were verified. Furthermore, all potential contaminant source locations identified in the areas between the boundaries of the old and new Coon Rapids DWSMAs were verified during preparation of this Plan amendment. Verification procedures used included matching mapped locations with addresses on MDH Well Records or State/County-issued permits or in County/State/Federal databases, published business addresses, and property parcel addresses (note that not all verification procedures were used for each type of potential contaminant source). Verified locations are identified in the tables in Appendix C. New information developed on contaminant sources in the future will be verified as they are discovered as part of the WHPP implementation.

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4.0 Impact of Changes to the Public Water Supply Wells

In accordance with the requirements of Minnesota Rules 4720.5220, anticipated changes in the physical environment, land use, surface water, and groundwater in the DWSMAs within the next ten years and the impact of these changes on the source water aquifers are discussed in this section.

4.1 Potential Changes Identified

4.1.1 Physical Environment

Currently, significant or large-scale changes in the physical environment that might affect the DWSMAs, are not anticipated in the next ten years. Any changes are expected to be the result of development/redevelopment of properties or localized infrastructure changes. Such changes would not be expected to significantly affect the source water aquifers. Any minor changes to the physical environment will likely not affect the management strategies for the Coon Rapids DWSMAs presented in this WHPP.

The City of Coon Rapids' Water Comprehensive Plan (Bolton & Menk, 2014) does not anticipate the addition of new wells to meet projected future water demand.

The Southeast DWSMA is contained entirely within the Coon Rapids city limits while the Northeast DWSMA extends east into Blaine and the West DWSMA extends southwest into Champlin and Brooklyn Park in Hennepin County.

4.1.2 Land Use

The Metropolitan Council's 2015 System Statement indicates that Coon Rapids has the planning designation Suburban (Metropolitan Council, 2015b). Current land uses in the Coon Rapids DWSMAs include residential of various types, park/recreational/preserve, open water, institutional, retail and other commercial, undeveloped land, and major highways. Approximately 5% of the land in the DWSMAs is currently undeveloped (Figure 2). Projected future land uses within the City are anticipated to include many of the land uses currently present within the DWSMAs.

A land use map for the year 2010 and a projected year 2030 land use map are shown on Figures 2 and 3, respectively. Projected land use in Coon Rapids in 2030 is expected to be consistent with the City's current growth planning. Comparison of the year 2010 land use with the projected future land use indicates that, in general, the currently undeveloped properties within the main Coon Rapids DWSMAs will be developed.

All land uses anticipated during the next ten years within the DWSMAs are currently present in the areas covered by this WHPP. As a result, adjustments in the land use within the DWSMAs such as those projected for the year 2030 will be adequately addressed by the management strategies put forth in this WHPP.

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4.1.3 Surface Water

There are surface water bodies and wetlands within the Coon Rapids DWSMAs. The City's Storm Water Pollution Prevention Plan City ordinances, and zoning address these surface water bodies and wetlands. Coon Rapids' management of surface water bodies and wetlands is not expected to adversely affect the management strategies for the DWSMAs. Rather, the City's management of surface water bodies and wetlands is consistent with the objectives of this Plan.

The City is not aware of any plans to alter the course or location of any surface water bodies currently present within the DWSMAs in the next ten years.

4.1.4 Groundwater

As the population of Coon Rapids grows, water demand in the City will grow. As indicated in the City's Water Comprehensive Plan (Bolton & Menk, 2014), it is not anticipated that additional municipal wells will need to be installed to meet projected future demand.

City staff inspect the municipal wells regularly. The MDH inspects all wells annually. This annual inspection includes sampling of the wells to ensure they comply with applicable regulatory standards. In addition, Coon Rapids uses a SCADA system to measure the volume of water pumped from a well, the instantaneous pumping rate for each well, and the water level (static or pumping) in each well. The City's Water Comprehensive Plan (Bolton & Menk, 2014) recommends upgrades to the SCADA system.

Groundwater level data for the Mt. Simon Sandstone aquifer has been collected from an MDNR observation well (Observation Well 02028, Unique No. 209297) near Coon Rapids since May 1999. This observation well is located approximately 2.5 miles north-northwest of Coon Rapids Well 6. Water level data from the well indicates that potentiometric levels in the Mt. Simon Sandstone aquifer fluctuate seasonally but the data do not indicate any long term, downward trend over the monitoring period.

Groundwater level data for the deep, unconsolidated Quaternary aquifer in the vicinity of Coon Rapids has been collected from MDNR observation well 02016 (Unique No. 231864) since December 1980. This observation well is located approximately 0.7 miles north of Coon Rapids Well 16. . Water level data from the well indicates that potentiometric levels in the Quaternary aquifer fluctuate seasonally but the data do not indicate any long term, downward trend over the monitoring period.

The City supports water conservation. The City's water conservation program includes a tiered water rate structure and odd-even day sprinkling restrictions. The sprinkling restrictions are in place for the period June 1 through August 31. Under Title 13 Section 13-219 of the City Code the Emergency Board (which consists of the Mayor, City Manager, and Director of Public Services) can declare a Water Emergency and put in place measures over and above the City's odd-even day sprinkling restrictions to curtail water usage during periods of critical shortages. Allowable restrictions on water use during a Water Emergency are specified in Title 13 Section 13-220 of the City Code.

In the next ten years it is possible that new business or industrial developments in or near the Coon Rapids DWSMAs may seek to construct privately-owned high capacity wells completed in one of the City's

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source water aquifers. Such wells could potentially affect the DWSMA boundaries, depending on their location and pumping rate. At the time this plan was prepared, the City was not aware of any proposed developments with plans for privately-owned high capacity wells within or near the DWSMAs.

Available information from the MPARS database indicates that there are 37 high capacity wells within a zone that includes the Coon Rapids DWSMAs and extends one mile beyond the DWSMA boundaries (this number does not include the 24 Coon Rapids municipal supply wells). High capacity wells are defined as wells that pump more than 1,000,000 gallons per year or more than 10,000 gallons per day. Owners of these wells are required to obtain a groundwater appropriation permit from the MDNR. High capacity wells outside of the DWSMAs were identified because changes in operation of these wells could, potentially, affect the DWSMA boundaries. Of these 37 non-Coon Rapids wells, nine are used for municipal water supply, 19 are used for some type of irrigation, six are used for industrial processing, two are used for water level maintenance, and one is identified as a construction dewatering well. The high capacity wells in the DWSMAs and within one mile of the boundaries of the DWSMAs are shown on Figure 4 and summarized in Table 4. Additional information on these wells can be found in Appendix C.

Beyond the possible installation/operation of additional high capacity wells in the vicinity of the Coon Rapids DWSMAs, no significant changes regarding groundwater use within or near the DWSMAs are anticipated to occur within the next ten years.

4.2 Impact of Changes

4.2.1 Water Use

The City's Comprehensive Water System Plan (Bolton & Menk, 2014) projects the 2029 maximum day water demand (the largest daily water use in a given year) to be approximately 16,500 to 17,900 gpm (approximately 23.75 to 25.80 MGD). For the period 2010-2015, the City's maximum day water demand ranged from approximately 14.0 to 20.8 MGD. During this same period, the City's average day water demand ranged from approximately 5.8 to 8.1 MGD. The City's water distribution system is currently supplied with water from 24 wells with a total permitted operating capacity of 26,575 gpm (38.3 MGD).

Based on current projections, the City does not anticipate the need to install additional wells to meet future water demand. If it would become necessary to install additional wells in the future, the City would have to review and, likely, update their WHPAs and DWSMAs to take into account the effects of pumping from the new wells.

The placement of an additional high capacity well in or near the DWSMAs or significant changes in current groundwater appropriations by existing wells could have an impact on the source water aquifers and local water supplies. Such changes could also affect the WHPAs and DWSMAs identified for the existing City of Coon Rapids wells or change the static water levels in the wells. The City will work with the MDH Source Water Protection Unit and the MDNR to identify proposed high capacity wells in the vicinity of the Coon Rapids DWSMAs and provide interaction, to the extent practicable, with the proposed well owner to minimize potential problems.

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To conserve valuable water resources and to mitigate, to the extent possible, drought impacts, the City limits use of water from the municipal water supply system for lawn and garden sprinkling and irrigation to an odd-even schedule corresponding to property address from June 1 through August 31. In addition, City ordinances allow additional water use restrictions to be put in place during periods of critical shortages.

4.2.2 Influence of Existing Water and Land Government Programs and Regulations

As noted above, the City has controls on outdoor water usage and the ability to impose further restrictions on water use during periods of critical water shortages to conserve valuable water resources and address drought impacts. The City also provides water conservation information on their website and has a tiered billing structure for water use. These programs are designed to assist residents and businesses with water conservation strategies through incentives and educational information.

The City has a storm water management program. The goals of the program include maintaining or improving water quality in surface water bodies in or immediately downstream of the City. A storm water pollution prevention plan was developed as part of Coon Rapids' storm water management program. The City believes that the current program is sufficient to meet the objectives of this wellhead protection plan.

County and city ordinances, the MDNR Division of Waters' appropriations permitting program, the MPCA's storage tank permitting program and hazardous waste generator permitting program, the State of Minnesota Well Management and Drinking Water Supply Programs, State ISTS rules, State rules regarding chemical handling and storage, and the U.S. EPA's rules regarding Class V wells will be relied upon for assistance in regulating the installation of new wells, the operation of wells, water appropriation permitting, the proper sealing of unused wells, proper operation and maintenance of ISTS, proper maintenance and operation of storage tanks, proper storage of chemicals, proper handling of hazardous wastes, and addressing Class V wells. In addition, Coon Rapids is aware of and supports the low interest loan program offered by Anoka County Community Development that can be used for maintenance and sealing of private wells. Coon Rapids believes that the current level of regulations and oversight by various governmental entities are adequate to address these issues.

Land use control and land disturbing activities outside of the City of Coon Rapids will be governed by the local unit of government with jurisdiction in a particular area. This WHPP has been developed to protect the interests of the City of Coon Rapids and, to the extent practicable, to have no adverse effect on the plans and strategies developed for adjacent areas.

The City of Coon Rapids will continue to rely on Federal, State, County, and local agencies and regulations and programs to handle issues outside of the City's boundaries regarding water conservation, water appropriations, and well drilling. City staff will look to the MDH for continued regulation of the installation of wells and proper sealing and abandonment of old wells. In addition, The City recognizes that the MDNR plays a role in the approval of applications for construction of new high capacity wells as well as administering water appropriations.

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The programs identified above have proven to be effective. City staff will cooperate with the appropriate agencies, to the extent practicable, if issues arise in the future.

4.2.3 Administrative, Technical, and Financial Considerations

The City expects to have adequate resources available over a multi-year period to manage their source water aquifers within their DWSMAs. Funds to support ongoing wellhead and source water protection efforts will come from the City's water utilities budget. Wellhead and source water protection activities will be evaluated periodically per MDH requirements and any changes in the focus of the tasks will also be evaluated to determine if additional funding will be necessary to accommodate the changes. When appropriate and to assist in funding of activities, the City may apply for grants from the MDH Source Water Protection Grant Program to fund implementation of management activities described later in this Plan.

For this WHPP to be effective, the City will need to keep the public aware of the issues affecting the public water supply. Therefore, the wellhead and source water protection actions described later in this Plan will include public education. Routine administrative duties will be directed or performed by the Wellhead Protection Manager. Specific tasks and strategies will be performed by the Wellhead Protection Manager or delegated by the Manager to City staff or outside resources.

The City believes that the current water supply system is sufficient to meet projected future water demands. The City has an ongoing maintenance program to ensure that the water supply system will continue to be sufficient to meet water demand in the future.

The installation and operation of any additional high capacity wells in the source water aquifers in or near the DWSMAs would have the potential to affect the size and shape of the Coon Rapids WHPAs and DWSMAs. At a minimum, the City will update its Wellhead Protection Plan every 10 years as required by the Wellhead Protection Rules. If new high capacity wells are installed in the area, the City will evaluate if operation of such new wells would make it necessary to update the WHPA and DWSMA delineations.

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5.0 Issues, Problems, and Opportunities

In accordance with Minnesota Rules chapter 4720.5230, this section discusses issues, problems, and opportunities related to land use, comments from local units of government and the general public, the data elements and local, state, and federal programs and regulations.

5.1 Land Use Issues, Problems, and Opportunities

5.1.1 Source Water Aquifers

As shown on Figure 1, the aquifer vulnerability classification in the Coon Rapids DWSMAs ranges from Low to High. In the West DWSMA, approximately 94.5% of the area has an aquifer vulnerability classification of Moderate. The aquifer vulnerability is classified as Low in approximately 5% of the West DWSMA and High in approximately 0.5% of the West DWSMA. In the Northeast DWSMA, approximately 99% of the area has an aquifer vulnerability classification of Moderate. The aquifer vulnerability is classified as Low in approximately 1% of the Northeast DWSMA. The aquifer vulnerability within the entire Southeast DWSMA around Coon Rapids Well 5 is classified as Low.

The City currently has 24 water supply wells (Table 1). Thirteen of the wells are primary water supply wells and while the other 11 wells are used seasonally during periods of high demand.

The addition of high capacity wells within or near the DWSMAs (either municipal wells or private wells) could produce changes in the groundwater flow system (e.g., flow direction or static water level) which could result in changes to the shape and extent of the WHPAs and DWSMAs delineated for this WHPP. The City will work with the Wellhead Protection Consultant and MDH to evaluate the WHPA and DWSMA delineations and amend this WHPP as necessary if and when additional high capacity wells are installed within or near the DWSMAs.

As discussed elsewhere in this Plan amendment, potential sources of contamination that could affect the source water aquifer were identified during the PCSI. These potential contaminant sources include wells, storage tanks, properties where Class V wells may be or may have been present, and chemical storage locations. Table 3 indicates there are five chemical storage sites located within IWMZs around City water supply wells. As indicated in Appendix C, all of these storage sites are associated with City water treatment chemicals (i.e., stored at a water treatment plant or in a well house). As such, the City maintains control over these sites and manages them appropriately. Table 3 also indicates there are a total of four wells located within IWMZs around City water supply wells. These wells were installed as test wells prior to the installation of the nearby water supply wells. The test wells are under the control of the City and managed appropriately. No other no potential contaminant sources were identified in an IWMZ around a Coon Rapids municipal supply well. A small number of the identified potential contaminant source locations fall in the Emergency Response Zones (ERZs) around the municipal wells (Table 3).

Commented [JG1]: Note to City reviewers. Per discussion w/ Kory Jorgensen he will look into these wells further. These statements may require revision depending upon what Kory finds.

I've included a management action for evaluation and sealing of these wells in Section 7.2.3 so that the well sealing could be eligible for a Source Water Implementation Grant from the MDH. If during City review of this draft Plan it is determined that the management action is not needed it can be removed.

The entities in the various potential contaminant source categories are regulated and tracked by County, State, or Federal programs. The lack of City jurisdiction over the potential contaminant source entities poses a potential problem for protection of the source water aquifers. However, the jurisdictional issues also provide the City of Coon Rapids with an opportunity to develop working relationships with County

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and State agencies that regulate and track the potential contaminant source entities. Therefore, the City will work with the appropriate County and State programs, to the extent practicable, to address the potential contaminant sources within the DWSMAs.

Coon Rapids is a founding member of the Anoka County Municipal Wellhead Protection Group (ACMWPG). As such, the City has a vehicle established for working with surrounding communities and Anoka County to protect the source water aquifers, when mutually beneficial. The West DWSMA extends into Brooklyn Park and Champlin in Hennepin County. This provides the City with an opportunity to work with Brooklyn Park and Champlin to protect the source water aquifers, when mutually beneficial. Anoka County regulates some of the potential contaminant sources identified in the City's DWSMAs. Anoka County also provides household hazardous waste management services to residents to help prevent residential pollution of source water aquifers.

Coon Rapids has plans in place that include policies for managing growth of the City, the allowable land uses, water supplies, and wells (e.g., Coon Rapids, 2008; Bolton & Menk, 2014). Policies identified in these plans will protect the City's source water aquifers.

5.1.2 Groundwater Quality

Coon Rapids has always placed a high priority on the safety of the municipal water supply system. In order to safeguard the municipal water supply system, Coon Rapids strictly limits access to their wells and associated infrastructure to Coon Rapids staff.

Groundwater pumped from the source water aquifers by the Coon Rapids wells is currently free of pathogens and disease-causing organisms. In addition, no contaminants have been reported in water samples from the Coon Rapids wells at concentrations that exceed applicable Federal health-related standards, except for combined radium 226 and 228 in Wells 16 and 18. The City limits the volumes of water pumped from Wells 16 and 18 under a compliance agreement with the MDH to address the radium concentrations in the water pumped from these wells. Current system operations ensure that the water Coon Rapids supplies to its customers meets or exceeds the water quality requirements of the Federal Safe Drinking Water Act as documented in the City's annual Consumer Confidence Reports. The 2016 Consumer Confidence Report is presented in Appendix D. Consumer Confidence Reports from the past several years can be found on the City's website at http://www.ci.coon-rapids.mn.us/Archive.aspx?AMID=40.

As discussed in Appendix C, potential contaminant sources identified in the Coon Rapids DWSMAs include chemical storage sites, storage tanks, properties where Class V wells may be or may have been located, and wells. Table 3 provides a summary of the numbers of these potential contaminant sources identified in the DWSMAs during development of this Plan amendment. Development of this Plan amendment provides Coon Rapids with an opportunity to prepare and implement a program to track potential contaminant source locations within the DWSMAs and educate the public regarding source water protection.

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5.1.3 DWSMAs

Current land uses within the DWSMAs include residential of various types, park/recreational/preserve, open water, institutional, retail and other commercial, undeveloped land, and major highways As indicated in Table 1, Coon Rapids Wells 6, 7, 11, 15, 17, 19, 20, 21, 22, 23, 24, and 25 have been classified as vulnerable to contamination. The vulnerability to contamination of the portions of the source water aquifers encompassed by the DWSMAs has been classified as ranging from Low to High. Current and future land uses could potentially affect the management strategies for Coon Rapids' DWSMAs.

As noted above, Coon Rapids is a founding member of the ACMWPG. As a member of the ACMWPG, the City participates in an advisory group along with neighboring public water suppliers to address and collaborate on common elements of wellhead protection plans.

No other issues, problems, or opportunities, beyond those discussed herein, have been identified regarding land uses in the DWSMAs.

Information gathered for this WHPP amendment provides the City with the basis for tracking potential contaminant sources within the DWSMAs. Thus, the City has an opportunity to catalog and track potential contaminant sources and stay informed of land use changes or potential future threats to the source water aquifers.

The presence of privately owned wells within the DWSMAs provides potential pathways for contaminants to reach the source water aquifers if they are not properly constructed, maintained, or, if unused, properly sealed. Locations of wells identified within the DWSMAs during the PCSI are shown in Appendix C.

5.2 Issues, Problems, and Opportunities Disclosed at Public Meetings and in Written Comments

At the beginning of this wellhead protection planning process, the City of Coon Rapids sent a notification to surrounding local units of government of its intention to initiate work on an amendment to its wellhead and source water protection plan. After approval by the MDH in March 2016 (MDH, 2016a), Coon Rapids sent information on the WHPAs, DWSMAs, and aquifer and well vulnerability to the local units of government whose jurisdictions overlay some portion of the Coon Rapids DWSMAs.

The City of Coon Rapids held a public information meeting on May 3, 2016 to receive comments from the general public regarding Part 1 of the WHPP. The local units of government whose jurisdictions overlay the DWSMAs were notified of the public information meeting. No comments on the Part 1 Wellhead Protection Plan were received from the local units of government or the general public at the Public Information Meeting.

As required by the Wellhead Protection Rules, the City provided local units of government whose jurisdictions overlap the DWSMAs a copy of the draft Part 2 Wellhead Protection Plan amendment. ***NOTE TO REVIEWERS: ANY WRITTEN COMMENTS RECEIVED FROM LGUs WILL BE ADDRESSED HERE AFTER THE CONCLUSION OF THE LGU REVIEW PERIOD***

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The City of Coon Rapids held a Public Hearing on the WHPP amendment on XXXXXXX, 2017. The local units of government whose jurisdictions overlap the DWSMAs were notified of the Public Hearing date, time, and location. ***NOTE TO REVIEWERS: ANY COMMENTS RECEIVED AT THE PUBLIC HEARING WILL BE ADDRESSED HERE ***

5.3 Issues, Problems, and Opportunities Related to the Data Elements

Beginning with the delineation of WHPAs and DWSMAs (i.e., Part 1 of the WHPP) and continuing in this document, the required data elements have been addressed. As discussed in Appendix C, available local and regional information was used in compiling and assessing the data elements. Coon Rapids intends to continue collecting data from the municipal wells as well as other applicable information from public data sources, as it becomes available, during the life of this Plan. At a minimum, this Plan will be revised/updated in ten years, as required by the Wellhead Protection Rules. Each time this Plan is revised/updated the most recent and accurate data available will be used.

5.4 Issues, Problems, and Opportunities Related to Local, State, and Federal Programs and Regulations

The State of Minnesota and local units of government currently enforce land use ordinances, zoning laws, sewer ordinances, well permitting regulations, and groundwater appropriation permit regulations. Coon Rapids will work to promote the use of best management practices for potential contaminant source properties within the DWSMAs. It is anticipated that local issues will be adequately addressed through these existing processes and adoption of best management practices.

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6.0 Wellhead Protection Goals

In accordance with Minnesota Rules chapter 4720.5240, this section discusses the goals for present and future water use and land use to provide a framework for WHPP objectives and related actions.

Goals presented in this section were selected based on the information gathered and compiled from the data elements, delineations of the WHPAs and DWSMAs, results of the vulnerability assessments, results of the PCSI, expected changes in land and water uses, identified issues, problems, and opportunities, and evaluation of this information.

Through the years, the City has met water demands with a sufficient and safe water supply. Coon Rapids intends to continue providing a safe water supply to its residents and businesses and other customers into the future by implementing this WHPP. Implementation of this WHPP amendment will help ensure that the City will meet this goal.

As shown in Table 1, Coon Rapids Wells 6, 7, 11, 15, 17, 19, 20, 21, 22, 23, 24, and 25 are classified as being vulnerable to contamination. As shown on Figure 1, aquifer vulnerability classifications of the uppermost source water aquifer within the Coon Rapids DWSMAs ranges from Low to Moderate, except for a small area near Wells 15 and 25 in the West DWSMA in which the vulnerability is classified as High.

The goals and objectives of this WHPP will focus on reducing the potential contaminant pathways to the source water aquifers that may be provided by private wells, and educating property owners and water supply users to ensure proper management of the portions of the DWSMAs.

Coon Rapids has identified the following goals for implementation of this WHPP:

- The City will work to maintain or improve the current level of water quality so that the municipal water supply will continue to meet or exceed all applicable state and federal water quality standards.
- Work with other cities in the Anoka County Municipal Wellhead Protection Group along with Brooklyn Park and Champlin to protect the source water aquifers
- The City will provide information and promote activities that protect the source water aquifer that provides water to the municipal system. This will include increasing public awareness of the Wellhead and Source Water Protection Program and groundwater-related issues, and management of the identified potential contaminant sources within the DWSMAs.
- The City will continue to collect data to support future wellhead and source water protection efforts.

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7.0 Objectives and Plans of Action

In accordance with Minnesota Rules chapter 4720.5250, this section discusses the objectives and plans of action to goals for Coon Rapids' Wellhead and Source Water Protection Program.

7.1 Establishing Priorities

Within the DWSMAs, the vulnerability to contamination of the source water aquifer from which the City of Coon Rapids wells draw their water ranges from Low to High (Barr, 2016). The October 14, 2016 Scoping 2 Decision Notice from the MDH required Coon Rapids to evaluate the following types of potential contaminant sources in the PCSI:

- In areas where the aquifer vulnerability is classified as Moderate or High:
    - Above-ground and underground storage tanks
    - Leaking underground storage tank (LUST) locations
    - Potential Class V well locations
    - Pipeline facilities
    - Chemical storage locations
    - Spills/potential contamination sites
    - Wells
- In areas where the aquifer vulnerability is classified as Low
    - Potential Class V well locations
    - Wells

The number of each type of potential contaminant source in the DWSMAs is shown in Table 3.

The City of Coon Rapids has identified the objectives and corresponding actions described in the following sections for accomplishing the wellhead and source water protection goals discussed above in Section 6. These goals for the City of Coon Rapids' Wellhead and Source Water Protection Program will be achieved through the following existing and planned programs:

- Wells
    - Promoting proper management of existing active wells in the DWSMAs
    - Encouraging the proper sealing of all unused wells within the DWSMAs
    - Identification of new high capacity wells in or near the DWSMAs
    - Evaluation of City-owned observation wells and sealing of unneeded wells
- Potential contaminant source properties
    - Encouraging proper handling of chemicals/wastes
    - Encouraging proper operation and maintenance of storage tanks,
    - Periodically obtaining updated information on potential contaminant sources in the DWSMAs from the regulating agencies to maintain an up-to-date potential contaminant source database for the DWSMAs and allow timely recognition of potential issues that could affect the Coon Rapids municipal water supply or DWSMAs.

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- Public education
    - Distribution of the Coon Rapids Annual Water Quality Report for the water supply system,
    - Posting Wellhead Protection Program information on the City of Coon Rapids website http://www.ci.coon-rapids.mn.us/ and provide a link to Anoka County's *Know the Flow* website (http://www.knowtheflow.us/)
    - Inclusion of wellhead and source water protection in the City's planning process,
- Continued data collection
    - Recording static and pumping water levels in the Coon Rapids municipal wells,
    - Collection of additional local geologic and hydrogeologic data as it becomes available from public sources or from City-sponsored projects.

7.2 Well Management

The well management objectives outlined in this section consist of promoting the proper sealing of any unused, unmaintained, damaged, or abandoned wells, promoting proper management of active wells within the DWSMAs, and identification of new high capacity wells in or near the DWSMAs.

7.2.1 Distribution of Well Operation and Maintenance Information

The MDH has developed a handbook of information on proper well construction, operation, and maintenance titled "Well Owner's Handbook – A Consumer's Guide to Water Wells in Minnesota". This handbook is available on the MDH website. Coon Rapids will provide the handbook information to all owners of active wells within the DWSMAs. To accomplish this, a link to the MDH website page where the handbook can be found will be added to the City's website and the City will notify well owners within the DWSMAs via mail that the information is available through the City's website. Coon Rapids staff will track the number of well owners to whom they provide information regarding the Well Owner's Handbook.

7.2.1.1 Source of Action

Coon Rapids staff will obtain the website information for the handbook from the MDH. City staff will then mail the website information to appropriate addresses within the DWSMAs, include a link to the MDH website on the City's website and in the City's *Coon Rapids Connection* newsletter, and have a copy of the handbook available in a publicly accessible location in the Coon Rapids City offices.

7.2.1.2 Cooperators

None.

7.2.1.3 Time Frame

Distribution of the information to owners of will be done within one year after approval of this WHPP.

7.2.1.4 Estimated Cost

Approximately $500 - $1,000. Costs will include City staff time, mailer printing and postage costs, and handbook printing costs.

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7.2.1.5 Goals Achieved

Through the MDH handbook, well owners will be educated concerning the proper operation and maintenance of wells. Proper operation and maintenance of wells will reduce the potential risk of these wells becoming pathways for contaminants to travel from the ground surface to the source water aquifer.

Success criterion: Notification of well owners in the DWSMAs by mail that information on the proper operation and maintenance of private wells is available through the City's website will be completed within one year of MDH approval of the WHPP and tracking of the number of well owners to whom the notification is sent.

7.2.2 Promote the Proper Sealing of Unused, Unmaintained, Damaged, or Abandoned Wells within the DWSMAs

City staff will promote the proper sealing of unused, privately owned wells within the DWSMAs. As indicated in Table 3, the highest priority will be placed on those wells that are completed in the source water aquifers from which the Coon Rapids municipal wells pump.

Proper sealing of unused wells can be promoted by periodically mailing a reminder to owners of wells that unused wells should be properly sealed and/or by posting a reminder on the City's website, in the *Coon Rapids Connection* newsletter, and working with the ACMWPG and Anoka County Community Health and Environmental Service Department (ACCHESD) to post reminders on the *Know the Flow* website. The reminder will include a notification of the low interest loan program available through Anoka County for the sealing of unused wells (https://www.anokacounty.us/2023/Well-and-Septic-Repair-Low-Interest-Loan) and a link to the section of the *Know the Flow* website that has information related to sealing of unused wells. Proper sealing of unused wells at properties on which new developments are built or as properties are redeveloped can be promoted as part of the City's development approval process.

7.2.2.1 Source of Action

City of Coon Rapids staff.

7.2.2.2 Cooperators

ACMWPG, ACCHESD.

7.2.2.3 Time Frame

The first reminders to owners of wells identified as high priority will occur within two years of approval of this Plan.

7.2.2.4 Estimated Cost

Approximately $1,000-$2,000 for each well sealing reminder mailing event. City staff time and costs for preparing and mailing reminders to well owners and for preparing reminders to be included in the City's newsletter, on the City's website, or on the *Know the Flow* website.

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7.2.2.5 Goals Achieved

As this action is implemented, the City's goal of eliminating potential pathways for contaminants to travel from the ground surface to the source water aquifer will be realized.

Success criterion: The first reminder distributed to well owners in the DWSMAs within two years of MDH approval of this WHPP and subsequent reminders distributed every three years thereafter for the life of the Plan and tracking of the number of reminders distributed.

7.2.3 Evaluation of City-Owned Observation Wells and Sealing of Unneeded Wells

Results of the PCSI indicate that there are several City-owned observation wells in the vicinity of the City's water supply wells. City staff, potentially with the assistance of the Wellhead Protection Consultant, will evaluate these wells and determine if any of them should be sealed. Any wells determined to be unnecessary will be properly sealed. The highest priority will be placed on those wells that are completed in the source water aquifers from which the Coon Rapids municipal wells pump.

7.2.3.1 Source of Action

City of Coon Rapids staff.

7.2.3.2 Cooperators

Potentially the Wellhead Protection Consultant.

7.2.3.3 Time Frame

Evaluation of the observation wells will be completed within the first two years of Plan implementation. If it is determined that some or all of the wells should be sealed, a schedule for sealing of the wells will be developed at that time.

7.2.3.4 Estimated Cost

Approximately $1,000-$2,000 for evaluation of the wells. Costs include City staff time and, potentially, Wellhead Protection Consultant costs. Costs for properly sealing of wells will depend on the construction of each well (e.g., depth, diameter, and casing). It is estimated that the cost per well sealing is likely to be $3,000 to $5,000.

7.2.3.5 Goals Achieved

Unnecessary wells will be properly sealed so that they do not provide potential pathways for contaminants to travel from the ground surface to the source water aquifer.

Success criterion: Completion of evaluation of the wells on in the time frame identified in Section 7.2.3.3 and sealing of any wells determined to be unnecessary.

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7.2.4 Identify New High-Capacity Wells Within or Near the DWSMA

With assistance from the MDH and MDNR and, possibly, the Wellhead Protection Consultant, City staff will identify new high capacity wells that are proposed for construction in or near Coon Rapids' DWSMAs, and/or major changes to groundwater appropriations for existing high-capacity wells, to determine whether the pumping of said wells will affect the groundwater flow direction, static water level, or groundwater availability within the DWSMAs or alter the current boundaries of the DWSMA delineations or other portions of the City's WHPP.

7.2.4.1 Source of Action

City staff will request, or direct the Wellhead Protection Consultant to request, from the MDH and Regional MDNR office information on any newly proposed/constructed high capacity wells within or near the DWSMAs or any changes to existing appropriations permits for existing, nearby high capacity wells. City staff will also request assistance from the Wellhead Protection Consultant and the MDH to evaluate whether identified proposed pumping (or changes to pumping) will change the boundaries of the DWSMAs delineated for Coon Rapids' wells.

7.2.4.2 Cooperators

MDH, MDNR, and the Wellhead Protection Consultant.

7.2.4.3 Time Frame

Request information from the MDH and MDNR every two years; evaluation of potential changes to the DWSMA boundaries as needed.

7.2.4.4 Estimated Cost

Approximately $3,000-$10,000 for each event of identifying new wells or changes to existing appropriations permits and evaluating how the changes may affect the DWSMA boundaries. City staff time and, potentially, Wellhead Protection Consultant time. Actual costs will depend on the number of proposed/new high capacity wells and changes to existing appropriations permits are identified each request.

7.2.4.5 Goals Achieved

As this action is implemented, the City's WHPA/DWSMA delineations will remain current. New well owners will also be identified and educational materials identified/developed as part of other well management strategies can be provided to these new well owners.

Success criterion: Bi-annual determination of whether there are new high capacity wells in or near the DWSMAs and if there have been any major changes in permitted appropriations for existing high capacity wells in or near the DWSMAs.

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7.3 Potential Contaminant Source Properties

The management objectives outlined in this section consist of providing to owners of properties where Class V wells may be present information on Class V wells, promoting proper operation of storage tanks, maintaining an up-to-date database of storage tank properties in the portions of the DWSMAs where aquifer vulnerability is classified as Moderate, promoting proper handling of chemicals and wastes, and maintaining the Inner Wellhead Management Zone (IWMZ) around each well so that potential contaminants are prevented from entering the IWMZs.

7.3.1 Notification of Owners of Potential Class V Well Properties

During the PCSI, 23 separate property parcels where Class V wells may be or may have been located were identified within the DWSMAs. The City will provide a fact sheet on Class V wells and reporting requirements to owners of properties where Class V wells may be or may have been located. The fact sheet will describe what a Class V well is and the impacts such wells can have on groundwater quality.

Commented [JG2]: City reviewers – Bart Biernat from Anoka County suggested the following management action related to Class V wells in a June 19 email to Tim Himmer:

- Perform inspection, with Anoka County Environmental Services, of the identified Class V wells at County licensed hazardous waste generators. The City will document addressing the 23 Class V wells.

Anoka County Environmental Services regulates hazardous and solid waste disposal (https://www.anokacounty.us/554/Environmental-Health-Services). Many of these 23 properties may also be regulated by the county that does not permit disposal of hazardous waste through a Class V well. The City should consider partnering with Anoka County Environmental Services to address this mutual concern.

Is this a management action you are interested in including in the Plan?

7.3.1.1 Source of Action

City staff, perhaps with the assistance of the MDH, U.S. EPA, and/or Wellhead Protection Consultant, will obtain or prepare a fact sheet that includes information on what constitutes a Class V well and what federal requirements are associated with Class V wells. City staff will mail the fact sheet to targeted property owners in the DWSMAs and, if necessary, work with staff of Blaine and Champlin to distribute the information to property owners within their cities.

7.3.1.2 Cooperators

Potentially staff from the Cities of Blaine and Champlin, MDH, U.S. EPA, and the Wellhead Protection Consultant.

7.3.1.3 Time Frame

Distribution of the fact sheet on Class V wells will occur within two years of approval of this Plan.

7.3.1.4 Estimated Cost

Approximately $1,000 to $2,000. Estimated costs include Coon Rapids staff time, printing and postage costs and, potentially, Wellhead Protection Consultant costs.

7.3.1.5 Goals Achieved

Property owners will become aware of their responsibilities related to Class V wells. Compliance with the applicable regulations regarding Class V wells by the property owners will reduce the potential for groundwater contamination and impact to the source water aquifers.

Success criterion: Distribution of fact sheet completed according to the schedule outlined in section 7.3.1.3 and tracking of the number of fact sheets distributed.

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7.3.2 Information for Registered Storage Tank Owners

The City, possibly with the assistance of the Wellhead Protection Consultant, will prepare and send a letter to owners of properties within the West and Northeast DWSMAs that have active registered storage tanks. The letter will not be sent to owners of properties for which available information indicates that the storage tanks have been removed. This letter will direct recipients to MPCA publications and guidance on proper operation and maintenance of storage tanks and include information on the City's Wellhead and Source Water Protection Program (the Program). Information in the letter will also be posted on the City's website. Copies of the letter will be available in a publically accessible location in City Hall.

7.3.2.1 Source of Action

City staff, possibly with the assistance of the Wellhead Protection Consultant, will prepare the letter to owners of storage tank properties. City staff will also post information contained in the letter to the City's website.

7.3.2.2 Cooperators

Wellhead Protection Consultant, if needed

7.3.2.3 Time Frame

The letter will be sent to owners of active tanks on properties where aquifer vulnerability is classified as Moderate within two years of approval of this Plan. In addition, letters will be sent to property owners as new storage tanks are identified in the Moderate vulnerability portions of the DWSMAs. A reminder letter will be sent to all storage tank property owners in Moderate vulnerability portions of the DWSMAs in year seven of Plan implementation.

7.3.2.4 Estimated Cost

Approximately $800-$1,500. Estimated costs include City staff time, letter production and postage costs, and Wellhead Protection Consultant costs (as necessary).

7.3.2.5 Goals Achieved

Targeted property owners will be educated concerning the Wellhead and Source Water Protection program and on where to find information on proper operation and maintenance of storage tanks and the requirements necessary to maintain a safe and secure system. Property owners will be encouraged to use best management practices regarding their storage tanks, and report any releases of contaminants to the City in addition to any other actions required by applicable regulations. Planned distribution of this letter provides the City the opportunity to heighten the awareness of wellhead and source water protection with these property owners.

Success criterion: Distribution of the letter to owners of active storage tanks completed according to the schedule outlined in section 7.3.2.3 and tracking of the number of letters distributed.

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7.3.3 Tracking of Registered Storage Tanks

Biannually, the City will request, or direct the Wellhead Protection Consultant to request, from the MPCA information on the status of registered storage tanks in the portions of the Coon Rapids DWSMAs in which the aquifer vulnerability is classified as Moderate or High. This information will allow the City of Coon Rapids to update the PCSI database and maintain current information regarding these potential contaminant sources in the DWSMAs. This activity should also identify new registered storage tanks in the DWSMAs.

7.3.3.1 Source of Action

City staff, or the Wellhead Protection Consultant on behalf of the City, will contact MPCA staff to obtain the information on the status of registered storage tanks.

7.3.3.2 Cooperators

MPCA and, potentially, the Wellhead Protection Consultant.

7.3.3.3 Time Frame

This information will be requested from the MPCA every two years starting two years after approval of this Plan.

7.3.3.4 Estimated Cost

Approximately $1,000-$2,000 for each review and update. Estimated costs include City staff time and Wellhead Protection Consultant time (as necessary). Costs may vary depending upon the number of new registered storage tank locations that must be added to the PCSI database.

7.3.3.5 Goals Achieved

By tracking the status of registered storage tanks within the target areas, the City will remain aware of the current status of these potential contaminant sources. This will allow the City to identify potential impacts to the municipal water supply and give the City time to determine the best response to any potential impacts before the municipal water supply is compromised.

Success criterion: Submittal of a biannual request to the MPCA for information regarding the status of registered storage tanks in the portions of the DWSMAs where aquifer vulnerability is classified as Moderate or High and completion of any updates to the PCSI database necessitated by the new information.

7.3.4 Information for Chemical Storage Properties

Through direct mail contact, the City will encourage the owners of the potential contaminant source properties associated with chemical storage within the Moderate and High aquifer vulnerability portions of the DWSMAs to participate in self-audits of their chemical storage and waste generation and handling. The direct mail contact from the City will also encourage these businesses to request a site visit from the Minnesota Technical Assistance Program (MnTAP). MnTAP helps Minnesota businesses implement

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industry-tailored solutions that maximize resource efficiency, prevent pollution, and reduce costs to improve public health and the environment.

MnTAP helps Minnesota businesses protect the environment and stay competitive by providing practical alternatives to prevent pollution of land, air, and water. By reducing waste and increasing efficiency, businesses can save on disposal and raw material costs, decrease the regulatory compliance burden, and make working conditions healthier and safer for their employees.

A copy of the letter and mailing list will also be sent to ACCHESD with a request that the County determine that the properties are compliant with the County hazardous waste management ordinance that requires proper management of potential pollutants.

7.3.4.1 Source of Action

City staff, perhaps with the assistance of the Wellhead Protection Consultant, will prepare and distribute the direct mail notice. City staff will also request the assistance identified above from ACCHESD staff.

7.3.4.2 Cooperators

ACCHESD and, potentially, the Wellhead Protection Consultant.

7.3.4.3 Time Frame

Distribution of the direct mail notice and forwarding a copy of the letter and mailing list to ACCHESD will occur within one year of approval of this Plan. Biannually thereafter the direct mail notice will be sent to owners of any newly identified properties within the Moderate and High aquifer vulnerability portions of the DWSMAs that are associated with chemical storage.

7.3.4.4 Estimated Cost

Approximately $800 to $1,800 for each direct mail notification. Costs for the preparation of the direct mail notice will include City staff time, printing, postage costs, and, potentially, Wellhead Protection Consultant costs.

7.3.4.5 Goals Achieved

Business owners will become aware of issues related to their chemical storage or waste generation and handling and learn of available assistance for identifying ways to minimize and properly dispose their waste.

Success criterion: Contact of property owners according to the schedule outlined in section 7.3.4.3.

7.3.5 Inner Wellhead Management Zone Management

The IWMZ is defined in the Minnesota Rules as that area within a 200-foot radius of a public water supply well. The City will monitor setbacks in the IWMZs, possibly with the assistance of the MDH, to ensure that the IWMZ around each Coon Rapids municipal well remains free of potential contaminant sources. City

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staff, possibly with the assistance of the MDH, will document each IWMZ inspection and any actions taken to remove potential contaminant sources from an IWMZ.

7.3.5.1 Source of Action

Coon Rapids staff.

7.3.5.2 Cooperators

Possibly the MDH

7.3.5.3 Time Frame

The monitoring of setbacks within the IWMZs will be done at lease biannually after approval of this Plan.

7.3.5.4 Estimated Cost

Costs for monitoring the IWMZ setbacks include Coon Rapids staff time estimated as $1,800.

7.3.5.5 Goals Achieved

By monitoring the IWMZ setbacks, Coon Rapids will be able to keep the IWMZ around each well free of potential contaminant sources and ensure that any new regulated activities will meet required setbacks.

Success criterion: Completion of IWMZ potential contaminant source inventories keeping the IWMZ free of potential contaminant sources.

7.3.6 Transportation Corridors, Pipelines, and Emergency Response

Establish communication and create awareness among Coon Rapids city staff about transportation corridor and pipeline issues that may affect the public water supply and the procedures in place to address spills and prevent released contaminants from entering the municipal water supply. Transportation corridors include County and State highways, railroads, and pipelines (e.g., Figure C-12). The Wellhead Protection Manager will work with the City's Emergency Manager to ensure that emergency procedures that will protect the municipal water supply are part of the City's emergency response program.

The Wellhead Protection Manager will also provide copies of the WHPP to the Minnesota Pollution Control Agency (MPCA), Minnesota Office of Pipeline Safety (MnOPS), and owners of pipelines that cross the DWSMAs.

7.3.6.1 Source of Action

Coon Rapids staff.

7.3.6.2 Cooperators

None

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7.3.6.3 Time Frame

Meeting with the Emergency Manager will occur within two years of approval of this plan. Transmittal of the WHPP to the MPCA, MnOPS, and pipeline owners will occur within one year after approval of this Plan.

7.3.6.4 Estimated Cost

Costs for this action will include City staff time and production costs for WHPP copies. Estimated cost is $2,000 to $2,500.

7.3.6.5 Goals Achieved

The City's emergency responders will work with and assist County and State first responders in the handling of spills in transportation corridors or from pipelines to ensure, to the extent possible, released contaminants from entering the environment and impacting the municipal water supply.

State agencies and pipeline owners will be educated regarding the boundaries of the Coon Rapids DWSMAs and the management actions that are planned.

Success criterion: Emergency responder and pipeline owner awareness of the City's DWSMAs.

7.4 General Public Education

Public education concerning the DWSMAs associated with the City's municipal wells will include: inclusion of Wellhead and Source Water Protection Program information in the City's *Coon Rapids Connection* newsletter, distribution of the Coon Rapids Annual Water Quality Reports to residents of Coon Rapids, providing information on the City of Coon Rapids website (http://www.coonrapidsmn.gov/) and the Anoka County Water Resources Management *Know the Flow* website (http://www.knowtheflow.us/), and inclusion of wellhead and source water protection into the City's planning process.

7.4.1 Wellhead Protection Information

The City will develop information regarding the Wellhead and Source Water Protection Program for inclusion in the City's *Coon Rapids Connection* newsletter. The newsletter is available to all City residents and businesses.

7.4.1.1 Source of Action

City staff will prepare information on wellhead protection for the City's newsletter one to two times per year. If necessary, the Wellhead Protection Consultant will be contacted for assistance in preparing this information for the newsletter. City staff may also draw on the ACMWPG and ACCHESD for wellhead and source water protection educational materials. The newsletter is distributed to Coon Rapids residents and businesses four times per year and is available on the City's website.

7.4.1.2 Cooperators

ACMWPG, ACCHESD, Wellhead Protection Consultant, if necessary.

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7.4.1.3 Time Frame

One to two times per year upon approval of this WHPP.

7.4.1.4 Estimated Cost

Approximately $500 - $2,500 each time information is prepared for the newsletter. Costs will include City staff time for preparing the information, and costs for Wellhead Protection Consultant assistance (as needed).

7.4.1.5 Goals Achieved

The information in the newsletter will be intended to educate owners of properties within the DWSMAs, and the general public, about the City's Wellhead and Source Water Protection Program, groundwater protection principles, and steps that everyone can take to protect the City's municipal water supply.

Success criterion: At least annual distribution of information related to groundwater and wellhead protection via the City's newsletter.

7.4.2 Drinking Water Quality Report

The City will continue to annually prepare and distribute the Annual Water Quality Report to all Coon Rapids residents. The report provides residents with information regarding the City's municipal water supply and its water quality.

7.4.2.1 Source of Action

City staff.

7.4.2.2 Cooperators

None.

7.4.2.3 Time Frame

Annually as required by Federal regulations.

7.4.2.4 Estimated Cost

Costs include City staff time for preparation of the report, including a notice in the City's newsletter that the report is available on the City's website, and posting the report on the City's website. Estimated annual cost for preparation of the report is $xxxxx.[CITY REVIEWERS PLEASE PROVIDE ESTIMATED COST]

7.4.2.5 Goals Achieved

The residents of Coon Rapids will become more aware of the Federal water quality requirements for public water supplies. Residents will also become more aware of the overall quality of Coon Rapids' municipal water supply.

Success criterion: Annual publication/distribution of the Annual Water Quality Report.

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7.4.3 City of Coon Rapids and Anoka County Websites

The City will post information on the Wellhead and Source Water Protection Program on the City's website (http://www.coonrapidsmn.gov/) and on Anoka County's *Know the Flow* website (http://www.knowtheflow.us/). City staff may also the Wellhead Protection Consultant to assist with the preparation of information to be posted on the website or ask other members of the ACMWPG if they have wellhead and source water protection-related educational items that the City could disseminate via the website.

The City will also work with other members of the ACMWPG to maintain an up to date online DWSMA map and to notify residents of this resource. The map can be found at http://gis.anokacountymn.gov/dwsmas/.

7.4.3.1 Source of Action

City staff.

7.4.3.2 Cooperators

ACMWPG, Anoka County GIS, and, as needed, the Wellhead Protection Consultant.

7.4.3.3 Time Frame

To begin within one year of approval of this WHPP. Information on the websites will be updated periodically thereafter. Updates to the Anoka County online DWSMA map will be made as the City identifies new potential contaminant sources in the Coon Rapids DWSMAs.

7.4.3.4 Estimated Cost

Approximately $500-$2,500. City staff time and, potentially, Wellhead Protection Consultant costs.

7.4.3.5 Goals Achieved

The residents of Coon Rapids will become more aware of wellhead and source water protection issues and the actions Coon Rapids is taking to protect the municipal water supply. Education of the residents should lead to a better awareness of pollution prevention among the City's population.

Success criterion: Posting of Wellhead and Source Water Protection Program information on the City and County websites and periodic updating of the Anoka County online DWSMA map according to the schedule identified in section 7.4.3.3.

7.4.4 Inclusion of Wellhead and Source Water Protection in the Planning Process within the DWSMAs

Copies of this WHPP amendment will be supplied to the City's Planning and Economic Development Departments so that they have the most current information on the City's Wellhead Protection Program. The City has developed guidelines for infiltration of stormwater based on the location of a proposed project relative to the boundaries of the IWMZs, ERZs, and DWSMAs around the City's wells. The City will continue use these guidelines in the reviews of permit applications and proposed

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development/redevelopment projects. Use of these guidelines ensures that the development process is consistent with the goals of the City's Wellhead Protection Program.

7.4.4.1 Source of Action

City staff.

7.4.4.2 Cooperators

None.

7.4.4.3 Time Frame

Ongoing

7.4.4.4 Estimated Cost

City staff time for completing reviews. The costs will vary from year to year depending on the number applications reviewed and the size of proposed projects.

Success criterion: Continued incorporation of wellhead and source water protection into the City's development, zoning, and planning processes.

7.4.4.5 Goals Achieved

Wellhead and source water protection will be incorporated into future planning/development efforts. Potential pollution risks to the source water aquifers will be reduced.

7.5 Data Collection

Coon Rapids will continue to collect and maintain local geologic and hydrogeologic data as it becomes available in order to improve and augment current information and to provide additional data for future revisions of this WHPP. The City will also continue to collect information on potential contaminant sources within the DWSMAs.

7.5.1 Monitoring Static and Pumping Levels in Municipal Wells

The City will continue to routinely measure the static and pumping water levels in the municipal wells. These water levels will be recorded daily by the SCADA system and can be summarized in the reports obtained from the SCADA system.

The City intends to upgrade the transducers used to monitor water levels in the municipal wells as part of their ongoing well maintenance program. The objective will be to improve the accuracy of water level measurements in the municipal wells.

7.5.1.1 Source of Action

City staff.

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7.5.1.2 Cooperators

None.

7.5.1.3 Time Frame

Ongoing.

7.5.1.4 Estimated Cost

Monitoring of water levels in the City's wells by the SCADA system is part of routine operations. Estimated cost for installing new transducers in City wells during scheduled well rehabilitation and connecting the new transducers to the SCADA system is approximately $2,000 to $3,000 per well.

7.5.1.5 Goals Achieved

Routine collection of groundwater levels in the municipal wells will provide data for the evaluation of groundwater elevation trends over time. Upgrading the accuracy of transducers used to measure the groundwater elevations will provide higher quality data.

Success criterion: Compilation of a long term groundwater elevation dataset that can be used to evaluate groundwater elevation trends in the source water aquifers.

7.5.2 Other Geologic and Hydrogeologic Data Collection

The City will attempt to obtain local geologic and hydrogeologic data for the Coon Rapids area as it becomes available from other public sources or through City-sponsored projects. The City will also support, whenever possible, future data collection efforts by other governmental entities (e.g., MGS, MDH, MDA, MDNR, MPCA, Coon Creek Watershed District, and Anoka County).

7.5.2.1 Source of Action

City staff.

7.5.2.2 Cooperators

State and Anoka County agencies conducting geologic and hydrogeologic studies, well drilling companies, Wellhead Protection Consultant, and others.

7.5.2.3 Time Frame

Ongoing beginning with approval of this WHPP.

7.5.2.4 Estimated Cost

Approximately $1,000 to $1,500 for compiling data from other public sources. Note that the cost could vary depending on the source and the amount of data and the level of effort needed to put the data into a usable format.

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7.5.2.5 Goals Achieved

More accurate hydrogeologic data will be available for use in siting future wells and for future revisions of the delineated WHPAs and the DWSMAs for existing and proposed municipal wells. Updated and more accurate vulnerability assessments may be possible as a result of new information.

Success criterion: Compilation of a geologic/hydrogeologic dataset that can be used in the future.

7.5.3 Updating of the Groundwater Model Used in the WHPA Delineations

Any new local geologic and hydrogeologic data obtained for the Coon Rapids area will be periodically reviewed to determine if the groundwater model used in the WHPA delineations will need to be updated. In addition, pumping from high capacity wells often changes over time. Changes in pumping from high capacity wells in or near the Coon Rapids DWSMAs could affect the DWSMA boundaries. Therefore, the City will work with the Wellhead Protection Consultant to review available information and determine if the groundwater flow model should be updated so that future WHPA/DWSMA delineations will be consistent with available information.

7.5.3.1 Source of Action

City staff

7.5.3.2 Cooperators

Wellhead Protection Consultant

7.5.3.3 Time Frame

Five to seven years after approval of this Plan

7.5.3.4 Estimated Cost

Approximately $1,000 to $5,000 depending upon the magnitude of the revisions needed to make the groundwater flow model consistent with the most current available information.

7.5.3.5 Goals Achieved

The groundwater flow model for the Coon Rapids area used in the WHPA delineations will be consistent with available information. Since the groundwater flow model used to delineate the WHPAs will be consistent with current information updating of the WHPAs in the future can be done more efficiently.

Success criterion: An updated groundwater flow model that can be used for future updates to Part 1 of the City's WHPP, to evaluate the effect of new, non-City high capacity wells on the DWSMA boundaries, or to evaluate sites for new municipal wells.

7.5.4 Potential Contaminant Source Database

The City will periodically update the information on potential contaminant sources within the DWSMAs collected during the development of this WHPP amendment, with the assistance of the Wellhead Protection consultant – if needed. The City will add information to the potential contaminant source

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database as additional potential contaminant source sites are identified or as sites are closed through working with the MPCA, the MDH, the MDNR, the U.S. EPA, and Anoka County. New information for the PCSI database will be obtained by contacting appropriate MPCA, MDH, MDNR, U.S. EPA, and County programs on every two years regarding any new information on potential contaminant sources that may be available.

7.5.4.1 Source of Action

City staff.

7.5.4.2 Cooperators

MPCA, MDH, MDNR, U.S. EPA, Anoka County staff, City staff, and the Wellhead Protection Consultant, if needed.

7.5.4.3 Time Frame

Every two years after approval of this WHPP.

7.5.4.4 Estimated Cost

Approximately $500-$2,500 every two years. City staff time and, if needed, Wellhead Protection Consultant costs. Actual costs will depend upon the amount of new potential contaminant source location information that must be added to the potential contaminant source database and in any year could be higher than the estimated range shown.

7.5.4.5 Goals Achieved

This database will be a useful tool to track, catalog, and document the status of potential contaminant sources within the DWSMAs.

Success criterion: Maintaining an up to date potential contaminant source database.

7.5.5 Potential Contaminant Source Verification

Potential contaminant sources were identified within the DWSMAs during the PCSI. As part of the development of this WHPP, all locations of identified potential contaminant sources were verified by the Wellhead Protection Consultant to the extent possible based on the available data. Any new potential contaminant source locations identified during the implementation of this WHPP will be verified by the City with the assistance of the Wellhead Protection Consultant, if needed.

7.5.5.1 Source of Action

City staff.

7.5.5.2 Cooperators

City staff and the Wellhead Protection Consultant, if needed.

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7.5.5.3 Time Frame

Every two years after approval of this WHPP if new potential contaminant sources in the DWSMAs are identified.

7.5.5.4 Estimated Cost

Approximately $500-$3,000. City staff time and Wellhead Protection Consultant, if needed. Actual costs will depend upon the number of new potential contaminant source locations that must be verified and in any update could be higher than the estimated range shown.

7.5.5.5 Goals Achieved

Verification of newly identified potential contaminant source locations within the DWSMAs will allow the City to remain in compliance with the requirements of the State of Minnesota's Wellhead and Source Water Protection Program. Verification of the newly identified locations will also ensure that the City uses the most accurate data on type and location of potential contaminant sources as implementation of this WHPP proceeds.

Success criterion: All potential contaminant source locations in the database are verified to the extent possible.

7.5.6 Tritium and Oxygen Isotope Sampling

Tritium (^3H), a radioactive isotope of hydrogen, whose atmospheric concentrations rose in the 1950s and early 1960s due to atmospheric hydrogen bomb testing, has been used extensively to date groundwater. Tritium activities peaked during atmospheric hydrogen bomb testing of the 1950s and 1960s, and values of ^3H in precipitation reached a maximum of approximately 10,000 TU (tritium units) in 1963 (Mazor, 2004). Natural production of ^3H in the upper atmosphere introduces approximately 5 TU to precipitation each year (Mazor, 2004). The presence of tritium at concentrations above 1 tritium unit in a groundwater sample indicates the presence of a significant fraction of post-1954 (i.e., recently infiltrated) water in the sample.

The MDH sampled Wells 11, 17, 20, 23, and 24 in 2010 and Wells 2, 5, 6, 9, 14, 18, and 21 in 2015 for tritium. Other City water supply wells either have not been sampled for tritium or were last sampled for tritium prior to the year 2000. Sampling of City wells for tritium at regular intervals will allow for tracking of tritium concentrations over time. If a tritium concentration in a groundwater sample from a well is significantly higher than the concentration in a previous sample from the same well it could be an indication that there is a pathway such as a breech in the well casing or an unused, unsealed well in the vicinity that allows water to move from the surface to the source water aquifer faster than before the pathway became available. The City will ask the MDH to sample five of the municipal wells for tritium that were last sampled prior to 2010 or that have not been sampled for tritium within two years of approval of this Plan. Going forward, the City will then ask the MDH to sample five to seven of the municipal wells for tritium every five years thereafter. Since the MDH already has a program to sample municipal wells for tritium the City would rely on the MDH to collect the samples and have them analyzed for tritium.

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Per the recommendation in section 7.0 of the Part 1 WHPP amendment (Barr, 2016), the City will also work with the MDH to develop a program for oxygen isotope sampling of Wells 14, 15, 17, 20, 22, 23, and 25. The objective of the sampling would be to obtain data for determining if groundwater pumped from the wells nearest the region of High aquifer vulnerability and Quaternary wells whose capture zones extend under the Mississippi River is under the influence of surface water. This information would inform the next update of Part 1 of the WHPP regarding whether a conjunctive delineation (a.k.a., a surface water catchment area delineation) should be performed.

7.5.6.1 Source of Action

City and MDH staff.

7.5.6.2 Cooperators

MDH

7.5.6.3 Time Frame

Tritium sampling: Beginning within two years after approval of this Plan and then every five years thereafter.

Oxygen isotope sampling: The schedule would be determined during discussions with MDH staff with the goal of completing the sampling within seven years after approval of this Plan so that the data would be available for the next WHPP update.

7.5.6.4 Estimated Cost

At the time this plan was prepared, cities were not charged by the MDH for tritium or oxygen isotope sampling and analysis.

7.5.6.5 Goals Achieved

Tritium sampling will provide data for evaluating if pathways that allow for relatively rapid movement of water from the surface to the source water aquifers are present. Oxygen isotope sampling will provide data for determining if the wells nearest the region of High vulnerability and Quaternary wells whose capture zones extend under the Mississippi River is under the influence of surface water.

Success criterion: Collection of groundwater samples from the selected City wells and analysis of these samples for tritium on the schedule outlined in section 7.5.6.3. and for oxygen isotope on the scheduled developed in conjunction with the MDH.

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8.0 Evaluation Program

Per Minnesota Rule 4720.5270, the progress in implementing a WHPP must be evaluated routinely to determine the effectiveness of the WHPP in terms of accomplishment of goals. Monitoring and evaluation measures to ensure effectiveness of the management strategies are detailed below.

Evaluation activities discussed in this WHPP amendment include the following:

- Track the implementation of the objectives, activities, and tasks discussed above in Section 7.0.
- Determine the effectiveness of specific management strategies for the protection of the Coon Rapids municipal water supply.
- Identify possible changes to the management strategies to improve overall effectiveness.
- Determine the adequacy of financial resources and staff availability to perform and implement the management strategies planned each year.
- Update the WHPP in the event that new wells are added to the municipal water supply system.

The City of Coon Rapids will continue to cooperate with the MDH in the monitoring of the City's municipal water supply to determine if the management strategies presented in this WHPP are having a positive effect on water quality and to identify any water quality problems that may arise and need to be addressed.

The Coon Rapids Wellhead Protection Manager will strive to provide a report to the City Council every two years that summarizes the progress in implementing the management strategies and objectives in this WHPP. The report will be completed using the MDH Wellhead Protection Program Evaluation form (Appendix E). The City will retain a copy of the report in its Wellhead Protection file and send a copy of the report to the MDH Source Water Protection Unit in St. Paul. The intent of the biannual reports is to compile a comprehensive review of the implementation of the source management strategies for use when the City updates or revises this WHPP. As specified by the Wellhead Protection Rules, this WHPP will be updated a minimum of every 10 years, or more often as required due to changes to the municipal water supply system.

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9.0 Alternative Water Supply Contingency Strategy

The purpose of a contingency plan is to establish, provide, and keep updated certain emergency response procedures and information for the public water supply, which may become vital in the event of a partial or total loss of public water supply services as a result of natural disaster, chemical contamination, civil disorder, or human-caused disruptions.

The City's procedures for responding to water emergencies and the City's water conservation plan are presented in the City's XXXX Water Emergency and Conservation Plan. As required, the Water Emergency and Conservation Plan was submitted to the MDNR Division of Waters – Appropriation Permit Program and the Metropolitan Council for review and approval. The MDNR approval letter for the Water Emergency and Conservation Plan is dated YYYYYYYYY. The City Council adopted the Water Emergency and Conservation Plan on ZZZZZZZZ and the MDNR recorded the Water Emergency and Conservation Plan Certificate of Adoption as being completed on WWWWWW. A copy of the Water Emergency and Conservation Plan, the MDNR approval letter, and the Certificate of Adoption are presented in Appendix F. A copy of the Water Emergency and Conservation Plan can also be obtained from the City upon request.

Commented [JG3]: City reviewers: Please provide the correct dates for the highlighted items. If the City wishes to include a copy of the current Emergency and Conservation Plan please provide a PDF copy.

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10.0 References

Barr Engineering Company (Barr), 2016. City of Coon Rapids Wellhead Protection Plan Amendment – Part 1: Delineation of the Wellhead Protection Area (WHPA), Drinking Water Supply Management Area (DWSMA) and Assessments of Well and DWSMA Vulnerability, prepared for the City of Coon Rapids, March 2016.

Bolton & Menk, 2014. Comprehensive Water System Plan, prepared for City of Coon Rapids, project no. N21.107935, October 2014.

City of Coon Rapids (Coon Rapids), 2008. 2030 Comprehensive Plan.

Mazor, E. 2004. Chemical and Isotopic Groundwater Hydrology, 3rd ed., New York: Marcel Dekker Inc.

Metropolitan Council, 2015a. Coon Rapids Water Supply Profile in Appendix 1 of Master Water Supply Plan, September 23, 2015.

Metropolitan Council, 2015b. 2015 System Statement – City of Coon Rapids, System Statement issue date September 17, 2015.

Minnesota Department of Health (MDH), 2015. Scoping Decision Notice No. 1 for the City of Coon Rapids, PWSID 1020017, for Amending the Wellhead Protection Plan, Letter from Amal Djerrari of the MDH to City of Coon Rapids, May 7, 2015.

Minnesota Department of Health (MDH), 2016a. Letter from Amal M. Djerrari of the MDH to Kory Jorgensen of the City of Coon Rapids approving the Part 1 Wellhead Protection Plan Amendment, dated March 24, 2016.

Minnesota Department of Health (MDH), 2016b. Scoping 2 Decision Notice and Meeting Summary – City of Coon Rapids – PWSID 1020017, Letter from John Freitag of the MDH to Kory Jorgensen of the City of Coon Rapids, October 14, 2016.

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Tables

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Table 1

Municipal Well Construction Summary
City of Coon Rapids WHPP Amendment

Local Well ID	Unique Number	Use/ Status[1]	Casing Diameter (in.)	Casing Depth (ft.)	Well Depth (ft.)	Year Constructed	Aquifer	Well Vulnerability
1	202926	S	12	220	462	1957	CTCW	Not Vulnerable
2	202929	S	12	226	788	1957	CTCG-CMTS	Not Vulnerable
4	202972	S	20 x 16	233	605	1960	CTCG-CMTS	Not Vulnerable
5	202951	S	24 x 16	242	695	1961	CTCG-CMTS	Not Vulnerable
6	202937	S	20	118	158	1960	CTCG	Vulnerable
7	202943	S	24 x 16	189	632	1964	CTCG-CMTS	Vulnerable
8	202932	P	24 x 16	283	700	1965	CTCG-CMTS	Not Vulnerable
9	202931	P	24 x 16	294	500	1969	CTCW	Not Vulnerable
10	202930	P	30 x 24 x 16	272	684	1970	CTCG-CMTS	Not Vulnerable
11	202965	P	24	157	627	1972	CTCG-CMTS	Vulnerable
12	168721	S	24 x 16	208	604	1975	CTCG-CMTS	Not Vulnerable
13	168720	P	24 x 16	395	693	1977	CTCG-CMTS	Not Vulnerable
14	110460	P	30 x 20	328	613	1977	CTCG-CMTS	Not Vulnerable
15	110461	P	30 x 20	225	615	1976	CTCG-CMTS	Vulnerable
16	161413	S	30 x 24 x 18	395	653	1981	CWON-CMTS	Not Vulnerable
17	150357	P	30	81	121	1981	QBAA	Vulnerable
18	110469	S	36 x 30 x 24	575	637	1986	CMTS	Not Vulnerable
19	110475	P	30 x 20	115	135	1987	QBAA	Vulnerable
20	420956	P	30 x 20	95	135	1988	QBAA	Vulnerable
21	474384	P	24 x 18	170	203	1990	QBAA	Vulnerable
22	474385	S	24	80	105	1990	QBAA	Vulnerable
23	463020	S	30 x 24	93	128	1991	QBAA	Vulnerable
24	674478	P	36 x 30 x 24	241	388	2003	CTCW	Vulnerable
25	674479	P	36 x 24	229	388	2003	CTCW	Vulnerable

[1] P = Primary , S = Seasonal

Aquifer Codes:
CTCW = Tunnel City Group-Wonewoc Sandstone
CMTS = Mt. Simon Sandstone
CTCG = Tunnel City Group
CMSH = Mt. Simon and Hinckley Sandstones
CWON = Wonewoc Sandstone
QBAA = Quaternary Buried Artesian Aquifer
QWTA = Quaternary Water Table Aquifer

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Table 2

Annual Volume of Water Pumped
City of Coon Rapids WHPP Amendment

		Total Annual Withdrawal (gal/yr)				
Unique Number	**Well Name**	**2010**	**2011**	**2012**	**2013**	**2014**
202926	1	2,474,000	2,056,000	5,603,000	11,794,000	3,625,000
202929	2	2,510,000	2,107,000	5,257,000	16,688,000	3,438,000
202972	4	454,000	237,000	328,000	4,995,000	2,330,000
202951	5	11,664,000	10,940,000	18,240,000	23,187,000	2,019,000
202937	6	11,404,000	14,692,000	18,891,000	28,209,000	2,022,000
202943	7	8,143,000	15,479,000	19,480,000	36,111,000	2,966,000
202932	8	266,464,000	146,631,000	124,262,000	87,333,000	153,358,000
202931	9	154,980,000	279,287,000	296,930,000	240,707,000	234,551,000
202930	10	289,927,000	321,549,000	329,619,000	260,648,000	48,304,000
202965	11	292,273,000	335,685,000	301,213,000	227,880,000	230,392,000
168721	12	8,107,000	13,305,000	19,113,000	26,242,000	1,961,000
168720	13	26,545,000	79,698,000	42,333,000	56,801,000	84,661,000
110460	14	82,530,000	65,386,000	104,955,000	97,452,000	89,025,000
110461	15	141,580,000	132,889,000	284,911,000	279,754,000	341,462,000
161413	16	6,637,000	268,000	1,340,000	1,462,000	859,000
150357	17	166,967,000	324,602,000	238,277,000	210,720,000	263,843,000
110469	18	1,461,000	1,264,000	1,103,000	3,664,000	2,340,000
110475	19	309,781,000	333,579,000	206,674,000	222,999,000	190,172,000
420956	20	348,896,000	275,096,000	157,449,000	146,620,000	161,888,000
474384	21	300,898,000	327,105,000	300,839,000	218,424,000	227,594,000
474385	22	2,315,000	33,171,000	34,297,000	23,168,000	45,768,000
463020	23	1,482,000	7,167,000	16,255,000	12,440,000	18,061,000
674478	24	229,680,000	20,193,000	218,647,000	220,698,000	160,699,000
674479	25	210,722,000	18,157,000	213,137,000	204,520,000	161,852,000
	Totals	2,877,894,000	2,760,543,000	2,959,153,000	2,662,516,000	2,433,190,000

Source: City water use records

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Table 3

Summary of Potential Sources of Contaminants and Assigned Management Priority
City of Coon Rapids WHPP Amendment

Potential Contaminant Source Category	Total Number in DWSMAs[1]	Number Within IWMZ (Priority Assigned)	Number Within ERZ (Priority Assigned)	Number Within Remainder of the DWSMAs (Priority Assigned)
Chemical Storage Sites	22	MVZ – 5[3] (Mod.) HVZ - 0	MVZ - 4(High) HVZ – 1[3](Mod.)	MVZ – 12(Mod.) HVZ -0
Leaking Tank Sites				
Closed	31	MVZ - 0 HVZ - 0	MVZ – 4(Low) HVZ - 0	MVZ – 27(Low) HVZ - 0
Registered Storage Tank Sites				
Status = Active	33	MVZ - 0 HVZ - 0	MVZ – 8(High) HVZ - 0	MVZ – 25(Mod.) HVZ - 0
Status = Inactive or Unknown	38	MVZ - 0 HVZ - 0	MVZ – 5(Mod.) HVZ - 0	MVZ – 33(Low) HVZ - 0
Wells (status = Active, Inactive, or Unknown)				
Completed in a source water aquifer	65[2]	LVZ - 0 MVZ – 2[3](Mod.) HVZ - 0	LVZ - 0 MVZ – 10(High[4]) HVZ - 0	LVZ – 1(High) MVZ – 51(High) HVZ – 1(High)
Not completed in or penetrating source water aquifer	116	LVZ - 0 MVZ – 1(Mod.) HVZ – 1(Mod.)	LVZ - 0 MVZ – 3(Mod.) HVZ - 0	LVZ - 8(Mod.) MVZ – 103(Mod.) HVZ - 0
Potential Class V Wells	23	LVZ - 0 MVZ - 0 HVZ - 0	LVZ - 0 MVZ – 7(Mod.) HVZ - 0	LVZ – 1(Low) MVZ – 15(Mod.) HVZ - 0

HVZ High aquifer vulnerability zone MVZ Moderate aquifer vulnerability zone LVZ Low aquifer vulnerability zone
ERZ Emergency Response Zone: defined as portion of the WHPA within the 1-year groundwater time of travel area.
IWMZ Inner Wellhead Management Zone: defined in MR4720.5100 subpart 19 as the area within 200 feet of a public water supply well.
[1] Total number of each potential contaminant source type identified during the PCSI.
[2] Total number does not include the 24 Coon Rapids municipal water supply wells.
[3] Sites are under City control so priority is set as moderate.
[4] Three of these wells are under City control and priority for the wells would be considered moderate.

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Table 4

High Capacity Wells within One Mile of the DWSMAs
City of Coon Rapids WHPP Amendment

PCSI ID[1]	Unique ID	Status	Permittee	Use	Aquifer	Permitted Volume MGY
1	202926	Active	Coon Rapids, City Of	Municipal/Public Water Supply	CTCW	3200
2	202929	Active	Coon Rapids, City Of	Municipal/Public Water Supply	CTCG-CMTS	3200
4	202972	Active	Coon Rapids, City Of	Municipal/Public Water Supply	CTCG-CMTS	3200
5	202951	Active	Coon Rapids, City Of	Municipal/Public Water Supply	CTCG-CMTS	3200
6	202937	Active	Coon Rapids, City Of	Municipal/Public Water Supply	CTCG	3200
7	202943	Active	Coon Rapids, City Of	Municipal/Public Water Supply	CTCG-CMTS	3200
8	202932	Active	Coon Rapids, City Of	Municipal/Public Water Supply	CTCG-CMTS	3200
9	202931	Active	Coon Rapids, City Of	Municipal/Public Water Supply	CTCW	3200
10	202930	Active	Coon Rapids, City Of	Municipal/Public Water Supply	CTCG-CMTS	3200
11	202965	Active	Coon Rapids, City Of	Municipal/Public Water Supply	CTCG-CMTS	3200
12	168721	Active	Coon Rapids, City Of	Municipal/Public Water Supply	CTCG-CMTS	3200
13	168720	Active	Coon Rapids, City Of	Municipal/Public Water Supply	CTCG-CMTS	3200
14	110460	Active	Coon Rapids, City Of	Municipal/Public Water Supply	CTCG-CMTS	3200
15	110461	Active	Coon Rapids, City Of	Municipal/Public Water Supply	CTCG-CMTS	3200
16	161413	Active	Coon Rapids, City Of	Municipal/Public Water Supply	CWON-CMTS	3200
17	150357	Active	Coon Rapids, City Of	Municipal/Public Water Supply	QBAA	3200
18	110469	Active	Coon Rapids, City Of	Municipal/Public Water Supply	CMTS	3200
19	110475	Active	Coon Rapids, City Of	Municipal/Public Water Supply	QBAA	3200
20	420956	Active	Coon Rapids, City Of	Municipal/Public Water Supply	QBAA	3200
21	474384	Active	Coon Rapids, City Of	Municipal/Public Water Supply	QBAA	3200
22	474385	Active	Coon Rapids, City Of	Municipal/Public Water Supply	QBAA	3200
23	463020	Active	Coon Rapids, City Of	Municipal/Public Water Supply	QWTA	3200
24	674478	Active	Coon Rapids, City Of	Municipal/Public Water Supply	CTCW	3200
25	674479	Active	Coon Rapids, City Of	Municipal/Public Water Supply	CTCW	3200
42	228438	Active	Champlin, City of	Municipal/Public Water Supply	CTCG-CMTS	1131

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Table 4

High Capacity Wells Within One Mile of the DWSMAs
City of Coon Rapids

PCSI ID[1]	Unique ID	Status	Permittee	Use	Aquifer	Permitted Volume MGY
59	420970	Active	Brooklyn Park, City of - Public Works Dept	Municipal/Public Water Supply	CMTS	3560
121	686058	Active	Pheasant Ridge Townhomes Association	Landscaping/Athletic Field Irrigation	CTCG	1.4
133	503723	Active	Reisling Park North Iii	Landscaping/Athletic Field Irrigation	CTCG	4.1
165	706843	Active	Anoka-Hennepin ISD 11	Landscaping/Athletic Field Irrigation	CTCW	9.2
167	778604	Active	Natureview Vista Association	Landscaping/Athletic Field Irrigation	CTCG	5
173	473464	Active	Mnscu Anoka-Ramsey Community College	Landscaping/Athletic Field Irrigation	QBAA	15
151587	151587	Active	Blaine, City of	Municipal/Public Water Supply	CTCW	3337
191909	191909	Active	Brooklyn Park, City of - Public Works Dept	Landscaping/Athletic Field Irrigation	CTCW	15
202971	202971	Active	Anoka, City Of	Municipal/Public Water Supply	CTCG-CMTS	1200
208611	208611	Active	Anoka-Hennepin ISD 11	Landscaping/Athletic Field Irrigation	CTCW	16
208615	208615	Active	Blaine, City of	Municipal/Public Water Supply	CTCG-CMTS	3337
208616	208616	Active	Blaine, City of	Municipal/Public Water Supply	CTCW	3337
208628	208628	Active	Blaine, City of	Municipal/Public Water Supply	CTCG-CMTS	3337
208629	208629	Active	Blaine, City of	Municipal/Public Water Supply	CTCG-CMTS	3337
208630	208630	Active	Blaine, City of	Municipal/Public Water Supply	CTCW	3337
209305	209305	Active	Federal Cartridge Co	Non-metallic Processing (rubber, plastic, glass, concrete)	CTCW	158.5
209305	209305	Active	Federal Cartridge Co	Other Industrial Processing	CTCW	158.5
209306	209306	Active	Federal Cartridge Co	Non-metallic Processing (rubber, plastic, glass, concrete)	CTCW	158.5
209306	209306	Active	Federal Cartridge Co	Other Industrial Processing	CTCW	158.5
209308	209308	Active	Federal Cartridge Co	Non-metallic Processing (rubber, plastic, glass, concrete)	CTCW	159
209308	209308	Active	Federal Cartridge Co	Other Industrial Processing	CTCW	159
231864	231864	Active	Bunker Hills Golf Club	Golf Course Irrigation	QBAA	195
231866	231866	Active	Bunker Hills Golf Club	Golf Course Irrigation	QBAA	195
431681	431681	Active	Anoka County Parks And Recreation	Basin (Lake) Level Maintenance	CTCW	7

Table 4

High Capacity Wells Within One Mile of the DWSMAs
City of Coon Rapids

PCSI ID[1]	Unique ID	Status	Permittee	Use	Aquifer	Permitted Volume MGY
431681	431681	Active	Anoka County Parks And Recreation	Other Water Level Maintenance	CTCW	7
462964	462964	Active	Anoka-Hennepin ISD 11	Landscaping/Athletic Field Irrigation	QWTA	6
462967	462967	Active	Anoka-Hennepin ISD 11	Landscaping/Athletic Field Irrigation	QBUA	20
482893	482893	Active	Champlin, City of	Landscaping/Athletic Field Irrigation	CTCW	24
500696	500696	Active	Bunker Hills Golf Club	Golf Course Irrigation	QBAA	195
503670	503670	Active	Pheasant Ridge Townhomes Association	Landscaping/Athletic Field Irrigation	CTCG	1.4
674482	674482	Active	Brooklyn Park, City of - Public Works Dept	Landscaping/Athletic Field Irrigation	CTCW	22.8
676414	676414	Active	Anoka-Hennepin ISD 11	Landscaping/Athletic Field Irrigation	CTCW	23
676448	676448	Active	Anoka-Hennepin ISD 11	Landscaping/Athletic Field Irrigation	CTCW	9
711531	711531	Active	Realife Cooperative of Coon Rapids	Landscaping/Athletic Field Irrigation	QBAA	3
768685	768685	Active	Saint Therese At Oxbow Lake Inc	Landscaping/Athletic Field Irrigation	QBAA	5
NA1	Not Available	Active	Centerpoint Energy	Construction Dewatering	Not Available	13

[1] PCSI ID refers to Figure 4

Aquifer/Formation Codes:
CTCW = Tunnel City Group-Wonewoc Sandstone
CMTS = Mt. Simon Sandstone
CTCG = Tunnel City Group
QBAA = Quaternary Buried Artesian Aquifer
QBUA = Quaternary Buried Unconfined Aquifer
QWTA = Quaternary Water Table Aquifer

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Figures

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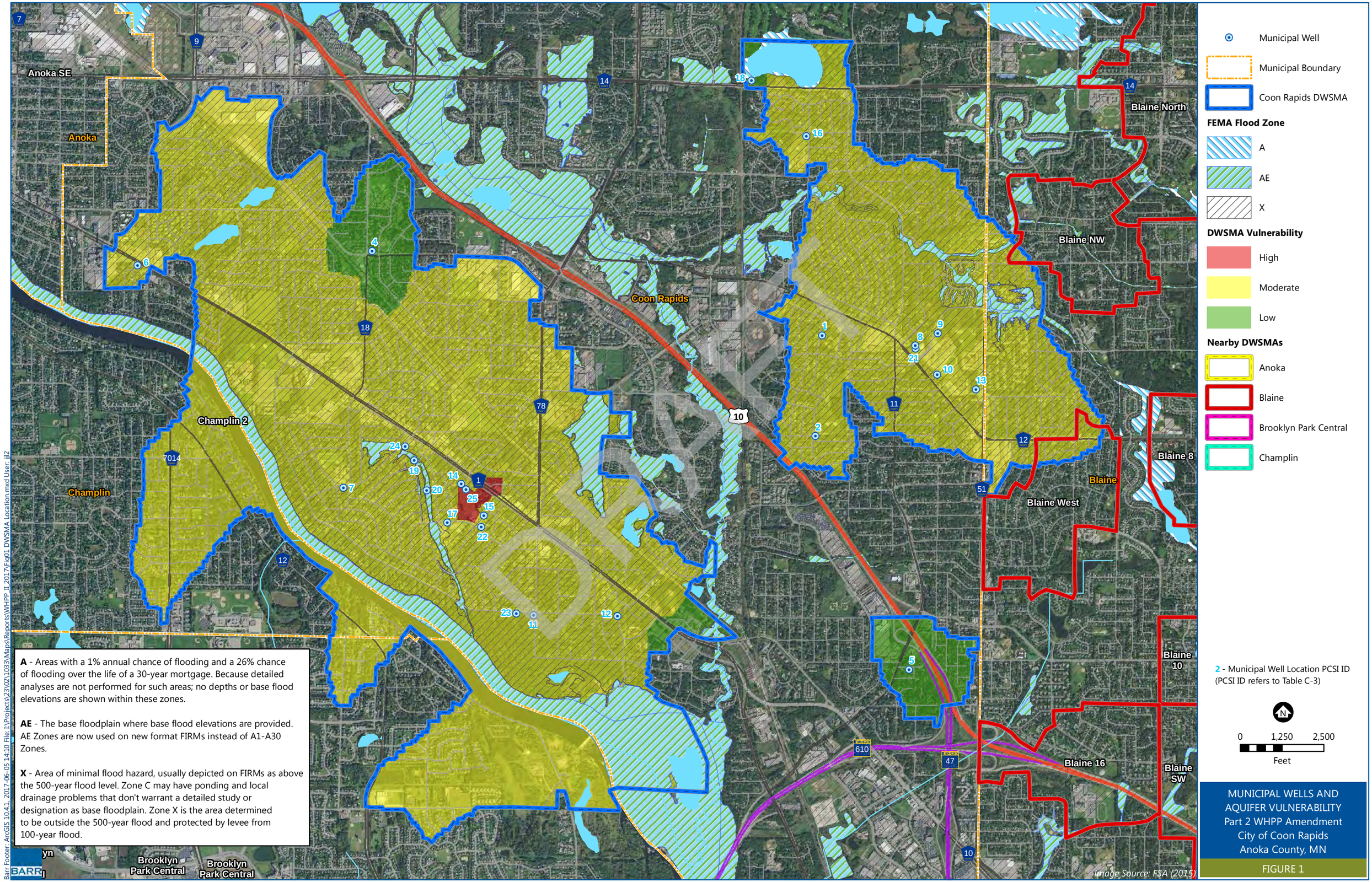


A - Areas with a 1% annual chance of flooding and a 26% chance of flooding over the life of a 30-year mortgage. Because detailed analyses are not performed for such areas; no depths or base flood elevations are shown within these zones.

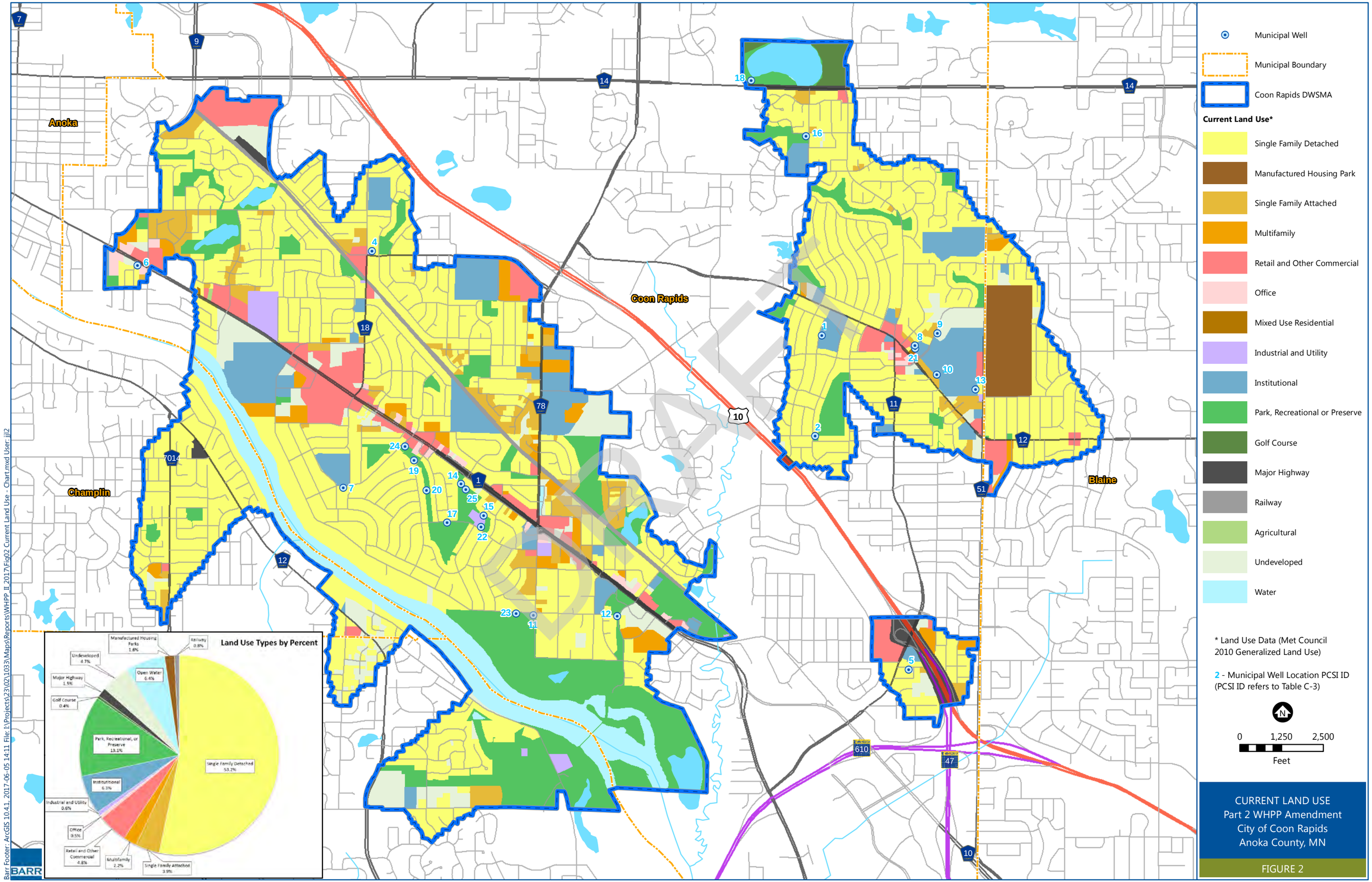
AE - The base floodplain where base flood elevations are provided. AE Zones are now used on new format FIRMs instead of A1-A30 Zones.

X - Area of minimal flood hazard, usually depicted on FIRMs as above the 500-year flood level. Zone C may have ponding and local drainage problems that don't warrant a detailed study or designation as base floodplain. Zone X is the area determined to be outside the 500-year flood and protected by levee from 100-year flood.

MUNICIPAL WELLS AND AQUIFER VULNERABILITY
Part 2 WHPP Amendment
City of Coon Rapids
Anoka County, MN

FIGURE 1

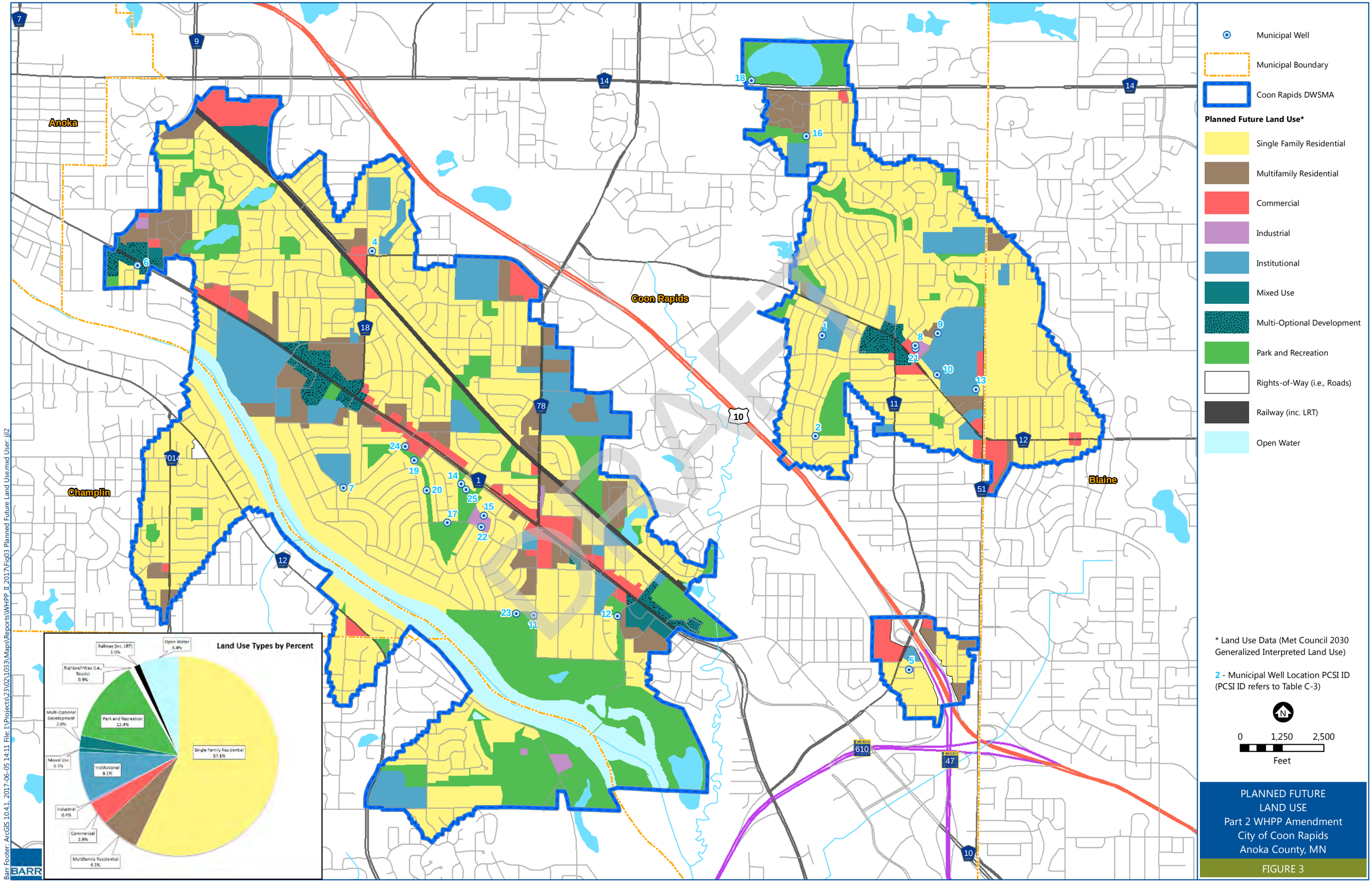
Barr Footer: ArcGIS 10.4.1, 2017-06-05 14:10 File: I:\Projects\23\02\1033\Maps\Reports\WHPP_II_2017\Fig01 DWSMA Location.mxd User: jjl2



CURRENT LAND USE
Part 2 WHPP Amendment
City of Coon Rapids
Anoka County, MN

FIGURE 2

Barr Footer: ArcGIS 10.4.1, 2017-06-05 14:11 File: I:\Projects\23\02\1033\Maps\Reports\WHPP_II_2017\Fig02 Current Land Use - Chart.mxd User: jil2


Municipal Well
Municipal Boundary
Coon Rapids DWSMA
Planned Future Land Use*
Single Family Residential
Multifamily Residential
Commercial
Industrial
Institutional
Mixed Use
Multi-Optional Development
Park and Recreation
Rights-of-Way (i.e., Roads)
Railway (inc. LRT)
Open Water
Anoka
Coon Rapids
Champlin
Blaine
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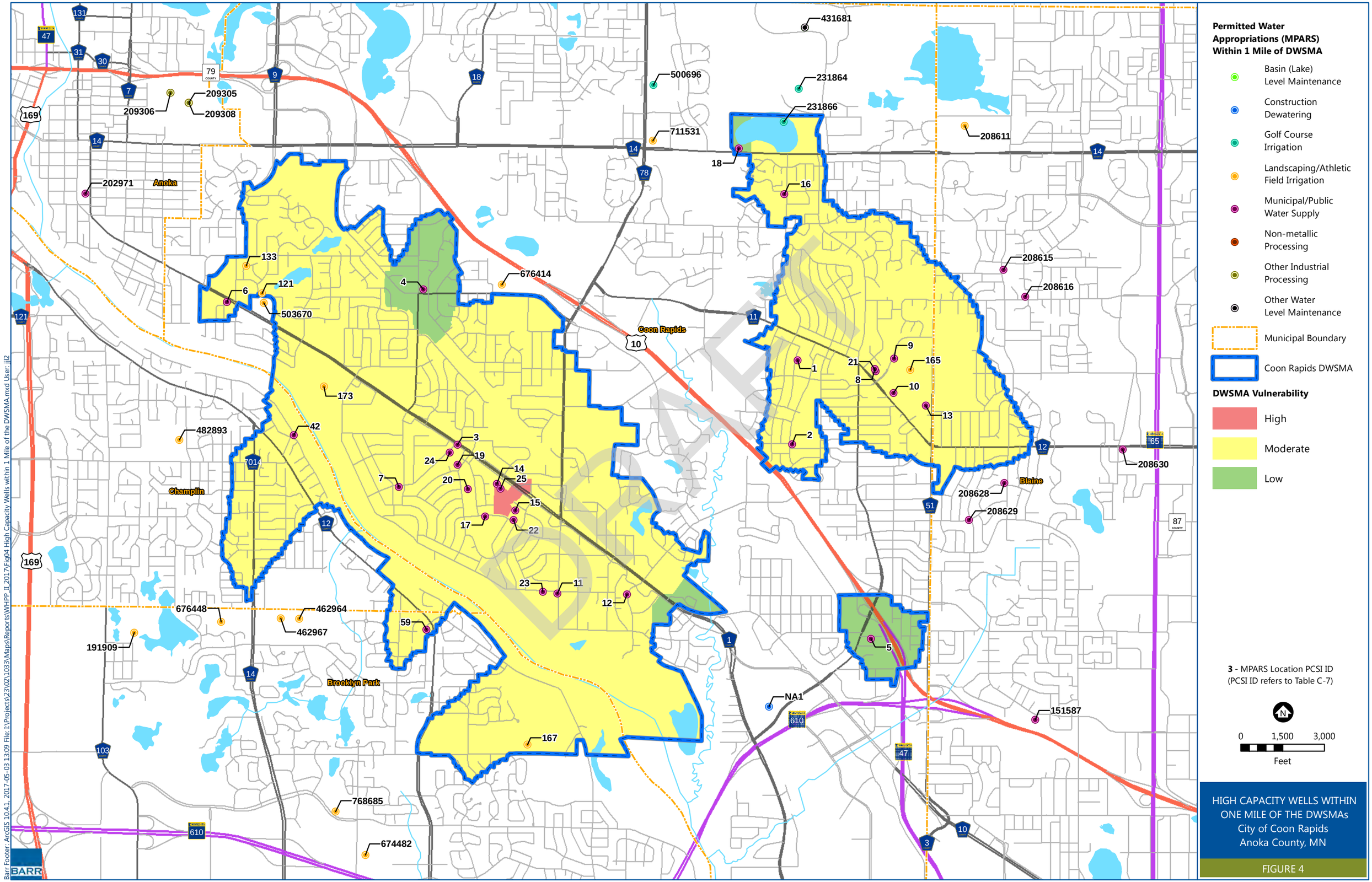
Land Use Types by Percent
Single Family Residential 57.1%
Park and Recreation 13.4%
Institutional 8.1%
Multifamily Residential 4.1%
Commercial 3.9%
Industrial 0.4%
Mixed Use 0.2%
Multi-Optional Development 2.0%
Rights-of-Way (i.e., Roads) 0.9%
Railway (inc. LRT) 1.0%
Open Water 6.4%
* Land Use Data (Met Council 2030 Generalized Interpreted Land Use)
2 - Municipal Well Location PCSI ID (PCSI ID refers to Table C-3)
0 1,250 2,500
Feet
PLANNED FUTURE LAND USE
Part 2 WHPP Amendment
City of Coon Rapids
Anoka County, MN
FIGURE 3
BARR
Barr Footer: ArcGIS 10.4.1, 2017-06-05 14:11 File: I:\Projects\23\02\1033\Maps\Reports\WHPP_II_2017\Fig03 Planned Future Land Use.mxd User: jil2



Barr Footer: ArcGIS 10.4.1, 2017-05-03 13:09 File: I:\Projects\23\02\1033\Maps\Reports\WHPP_II_2017\Fig04 High Capacity Wells within 1 Mile of the DWSMA.mxd User: jjl2

HIGH CAPACITY WELLS WITHIN ONE MILE OF THE DWSMAs
City of Coon Rapids
Anoka County, MN

FIGURE 4

Appendix A

Well Construction Records

Unique No. 00202926	MINNESOTA DEPARTMENT OF HEALTH	Update Date 2007/02/06
County Name Anoka	**WELL AND BORING RECORD**	Entry Date 1991/04/15
	Minnesota Statutes Chapter 1031	

Township Name	Township	Range	Dir	Section	Subsection
	31	24	W	13	BCCABD

Well Depth	Depth Completed	Date Well Completed
462 ft.	462 ft.	1957/09/00

Well Name COON RAPIDS 1

Drilling Method Cable Tool

Well Owner's Name COON RAPIDS 1
11349 NORWAY NW ST
COON RAPIDS MN 55433

Drilling Fluid

Well Hydrofractured? ☐ Yes ☐ No
From ft. to ft.

Use Community Supply (municipal)

Contact's Name CITY OF COON RAPIDS
11155 ROBINSON NW DR
COON RAPIDS MN 55433

Casing **Drive Shoe?** ☐ Yes ☐ N

Hole Diameter
0 in. t 462 ft

Casing Diameter **Weight(lbs/ft)**
12 in. t 220 ft

GEOLOGICAL MATERIAL	COLOR	HARDNESS	FROM	TO
SAND			0	35
CLAY	BLUE		35	50
SANDY CLAY			50	91
HARDPAN			91	114
SAND			114	135
SAND & CLAY			135	138
SAND & GRAVEL			138	158
HARDPAN			158	167
SANDROCK		SOFT	167	173
SANDROCK		SOFT	173	197
SANDROCK & SHALE			197	213
SANDROCK & SHALE			213	242
SANDROCK & SHALE			242	355
CLAY RED			355	360
SHALE & SANDROCK			360	385
SHALE & SANDROCK			385	386
SANDROCK WITH SOME SH			386	398
SANDROCK VERY SOFT			398	434
SANDROCK WITH SOME SH			434	458
SHALE			458	462

Screen N

Open Hole From 220 ft. to 462 ft.

Make Type

Static Water Level 28 ft. from Land surface Date 1957/09/00

PUMPING LEVEL (below land surface)
78 ft. after hrs. pumping 880 g.p.m.

Well Head Completion
Pitless adapter mfr Model
Casing Protection ☐ 12 in. above grade
☐ At-grade(Environmental Wells and Borings ONLY)

Grouting Information Well grouted? ☐ Yes ☐ No

Nearest Known Source of Contamination
ft. direction type
Well disinfected upon completion? ☐ Yes ☐ No

Pump ☐ Not Installed Date Installed Y
Mfr nam FAIRBANKS MORSE
Model HP 50 Volts 220
Drop Pipe Length ft. Capacity 600 g.p.m
Type T

Any not in use and not sealed well(s) on property? ☐ Yes ☐ No

Was a variance granted from the MDH for this Well? ☐ Yes ☐ No

REMARKS, ELEVATION, SOURCE OF DATA, etc.

GAMMA LOGGED & TV 5-15-1995. LOGGED & TV BY GEOSHPERE.

USGS Quad Coon Rapids Elevation 891
Aquifer: MTPL Alt Id: 80-6139

Well CONTRACTOR CERTIFICATION Lic. Or Reg. No. 62012
License Business Name
Name of Driller BRANDON, J.

Report Copy

Unique No.	00202926	MINNESOTA DEPARTMENT OF HEALTH	Update Date	2007/02/06
County Name	Anoka	**WELL AND BORING RECORD** *Minnesota Statutes Chapter 1031*	Entry Date	1991/04/15

Township Name	Township	Range	Dir	Section	Subsection	Well Depth		Depth Completed		Date Well Completed
	31	24	W	13	BCCABD	462	ft.	462	ft.	1957/09/00

Well Name	COON RAPIDS 1	**Lic. Or Reg. No.**	62012	**Name of Driller**	BRANDON, J.		
USGS Quad	Coon Rapi	**Elevation**	891	**Aquifer**	MTPL	**Alternative Id**	80-6139

GEOLOGICAL MATERIAL	COLOR	HARDNESS	FROM	TO	STRAT	LITH PRIM	LITH SEC	LITH MINOR
SAND			0	35	QFUU	SAND		
QFUU = Sand	SAND = Sand							
CLAY	BLUE		35	50	QCUG	CLAY		
QCUG = Clay	CLAY = Clay							
SANDY CLAY			50	91	QLUU	CLAY	SAND	
QLUU = Clay & sand	CLAY = Clay		SAND = Sand					
HARDPAN			91	114	QPUU	HDPN		
QPUU = Pebbly sand/silt/clay	HDPN = Hardpan							
SAND			114	135	QFUU	SAND		
QFUU = Sand	SAND = Sand							
SAND & CLAY			135	138	QLUU	SAND	CLAY	
QLUU = Clay & sand	SAND = Sand		CLAY = Clay					
SAND & GRAVEL			138	158	QHUU	SAND	GRVL	
QHUU = Sand & larger	SAND = Sand		GRVL = Gravel					
HARDPAN			158	167	QPUU	HDPN		
QPUU = Pebbly sand/silt/clay	HDPN = Hardpan							
SANDROCK		SOFT	167	173	QFUU	SAND		
QFUU = Sand	SAND = Sand							
SANDROCK		SOFT	173	197	CJDN	SNDS		
CJDN = Jordan	SNDS = Sandstone							
SANDROCK & SHALE			197	213	CJDN	SNDS		
CJDN = Jordan	SNDS = Sandstone							
SANDROCK & SHALE			213	242	CSTL	SLSN	DLMT	
CSTL = St.Lawrence	SLSN = Siltstone		DLMT = Dolomite					
SANDROCK & SHALE			242	355	CFRN	SNDS	SHLE	DLMT
CFRN = Franconia	SNDS = Sandstone		SHLE = Shale			DLMT = Dolomite		
CLAY RED			355	360	CFRN	SNDS	SHLE	DLMT
CFRN = Franconia	SNDS = Sandstone		SHLE = Shale			DLMT = Dolomite		

Unique No.	00202926	MINNESOTA DEPARTMENT OF HEALTH	Update Date	2007/02/06
County Name	Anoka	**WELL AND BORING RECORD** *Minnesota Statutes Chapter 1031*	Entry Date	1991/04/15

Township Name	Township	Range	Dir	Section	Subsection	Well Depth		Depth Completed		Date Well Completed
	31	24	W	13	BCCABD	462	ft.	462	ft.	1957/09/00

Well Name	COON RAPIDS 1	**Lic. Or Reg. No.**	62012	**Name of Driller**	BRANDON, J.		
USGS Quad	Coon Rapi	**Elevation**	891	**Aquifer**	MTPL	**Alternative Id**	80-6139

GEOLOGICAL MATERIAL	COLOR	HARDNESS	FROM	TO	STRAT	LITH PRIM	LITH SEC	LITH MINOR
SHALE & SANDROCK			360	385	CFRN	SNDS	SHLE	DLMT
CFRN = Franconia	SNDS = Sandstone		SHLE = Shale			DLMT = Dolomite		
SHALE & SANDROCK			385	386	CIGL	SNDS		
CIGL = Ironton-Galesville	SNDS = Sandstone							
SANDROCK WITH SOME SHALE			386	398	CIGL	SNDS		
CIGL = Ironton-Galesville	SNDS = Sandstone							
SANDROCK VERY SOFT			398	434	CIGL	SNDS		
CIGL = Ironton-Galesville	SNDS = Sandstone							
SANDROCK WITH SOME SHALE			434	458	CECR	SHLE	SNDS	
CECR = Eau Claire	SHLE = Shale		SNDS = Sandstone					
SHALE			458	462	CECR	SHLE	SNDS	
CECR = Eau Claire	SHLE = Shale		SNDS = Sandstone					

Unique No. 00202929

County Name Anoka

MINNESOTA DEPARTMENT OF HEALTH

WELL AND BORING RECORD

Minnesota Statutes Chapter 1031

Update Date 2007/02/06

Entry Date 1991/04/15

Township Name	Township	Range	Dir	Section	Subsection
	31	24	W	13	CCCCAD

Well Depth	Depth Completed	Date Well Completed
788 ft.	788 ft.	1957/06/00

Well Name COON RAPIDS 2

Drilling Method Cable Tool

Contact's Name CITY OF COON RAPIDS
11155 ROBINSON NW DR
COON RAPIDS MN 55433

Drilling Fluid

Well Hydrofractured? ☐ Yes ☐ No
From ft. to ft.

Well Owner's Name COON RAPIDS 2
10911 MAGNOLIA ST
COON RAPIDS MN 55433

Use Community Supply (municipal)

Casing **Drive Shoe?** ☐ Yes ☐ N

Hole Diameter
in. t 704 ft
in. t 788 ft

Casing Diameter **Weight(lbs/ft)**
12 in. t 226 ft

GEOLOGICAL MATERIAL	COLOR	HARDNESS	FROM	TO
SAND			0	36
CLAY			36	48
CLAY & GRAVEL			48	136
HARDPAN			136	145
CLAY & SAND			145	163
SAND			163	175
SAND & GRAVEL			175	218
SHALE			218	219
LIMEROCK & SHALE			219	221
LIMEROCK & SHALE			221	243
LIMEROCK & SHALE			243	258
SANDROCK & SHALE			258	391
SANDROCK & SHALE			391	439
SANDROCK & SHALE			439	472
SHALE			472	498
SANDROCK & SHALE			498	545
SANDROCK & SHALE			545	594
SANDROCK			594	670
CAVING RED SHALE			670	704
RED ROCK & SHALE			704	726
RED ROCK			726	770
SHALE			770	778
RED ROCK			778	788

Screen N

Open Hole From 226 ft. to 788 ft.

Make Type

Static Water Level 24 ft. from Land surface Date 1957/06/00

PUMPING LEVEL (below land surface)
33.5 ft. after hrs. pumping 302 g.p.m.

Well Head Completion
Pitless adapter mfr Model
Casing Protection ☑ 12 in. above grade
☐ At-grade(Environmental Wells and Borings ONLY)

Grouting Information Well grouted? ☐ Yes ☐ No

Nearest Known Source of Contamination
ft. direction type
Well disinfected upon completion? ☐ Yes ☐ No

Pump ☐ Not Installed Date Installed Y
Mfr nam FAIRBANKS MORSE
Model HP 30 Volts 220
Drop Pipe Length 187 ft. Capacity 500 g.p.m
Type T

Any not in use and not sealed well(s) on property? ☐ Yes ☐ No

Was a variance granted from the MDH for this Well? ☐ Yes ☐ No

REMARKS, ELEVATION, SOURCE OF DATA, etc.

TWO OTHER PUM TESTS AT DEPTHS OF 673 & 466 FT.

PUMPING TEST NO. 3 RECORDED AT 685 FT.

M.G.S. NO. 156. GAMMA LOGGED & TV 5-15-1995. OLD PA. NO. 61-0225.

WELL WAS BACK FILLED TO 685 FT.

LOGGED & TV BY GEOSPHERE.

USGS Quad	Coon Rapids	Elevation	885
Aquifer:	MTPL	Alt Id:	80-6139

Report Copy

Well CONTRACTOR CERTIFICATION Lic. Or Reg. No. 62012

License Business Name

Name of Driller BRANDON, J.

HE-01205-06 (Rev. 9/96)

Unique No.	00202929	MINNESOTA DEPARTMENT OF HEALTH	Update Date	2007/02/06
County Name	Anoka	**WELL AND BORING RECORD** *Minnesota Statutes Chapter 1031*	Entry Date	1991/04/15

Township Name	Township	Range	Dir	Section	Subsection	Well Depth		Depth Completed		Date Well Completed
	31	24	W	13	CCCCAD	788	ft.	788	ft.	1957/06/00

Well Name	COON RAPIDS 2	**Lic. Or Reg. No.**	62012	**Name of Driller**	BRANDON, J.		
USGS Quad	Coon Rapi	**Elevation**	885	**Aquifer**	MTPL	**Alternative Id**	80-6139

GEOLOGICAL MATERIAL	COLOR	HARDNESS	FROM	TO	STRAT	LITH PRIM	LITH SEC	LITH MINOR
SAND			0	36	QFUU	SAND		
QFUU = Sand	SAND = Sand							
CLAY			36	48	QCUU	CLAY		
QCUU = Clay	CLAY = Clay							
CLAY & GRAVEL			48	136	QPUU	CLAY	GRVL	
QPUU = Pebbly sand/silt/clay	CLAY = Clay		GRVL = Gravel					
HARDPAN			136	145	QPUU	HDPN		
QPUU = Pebbly sand/silt/clay	HDPN = Hardpan							
CLAY & SAND			145	163	QLUU	CLAY	SAND	
QLUU = Clay & sand	CLAY = Clay		SAND = Sand					
SAND			163	175	QFUU	SAND		
QFUU = Sand	SAND = Sand							
SAND & GRAVEL			175	218	QHUU	SAND	GRVL	
QHUU = Sand & larger	SAND = Sand		GRVL = Gravel					
SHALE			218	219	QCUU	CLAY		
QCUU = Clay	CLAY = Clay							
LIMEROCK & SHALE			219	221	QUUU	DRFT		
QUUU = Unknown deposit type	DRFT = Drift							
LIMEROCK & SHALE			221	243	CSTL	DLMT	SLSN	
CSTL = St.Lawrence	DLMT = Dolomite		SLSN = Siltstone					
LIMEROCK & SHALE			243	258	CFRN	SNDS	SHLE	DLMT
CFRN = Franconia	SNDS = Sandstone		SHLE = Shale				DLMT = Dolomite	
SANDROCK & SHALE			258	391	CFRN	SNDS	SHLE	DLMT
CFRN = Franconia	SNDS = Sandstone		SHLE = Shale				DLMT = Dolomite	
SANDROCK & SHALE			391	439	CIGL	SNDS		
CIGL = Ironton-Galesville	SNDS = Sandstone							
SANDROCK & SHALE			439	472	CECR	SHLE	SNDS	
CECR = Eau Claire	SHLE = Shale		SNDS = Sandstone					

Unique No.	00202929	MINNESOTA DEPARTMENT OF HEALTH	Update Date	2007/02/06
County Name	Anoka	**WELL AND BORING RECORD** *Minnesota Statutes Chapter 1031*	Entry Date	1991/04/15

Township Name	Township	Range	Dir	Section	Subsection	Well Depth		Depth Completed		Date Well Completed
	31	24	W	13	CCCCAD	788	ft.	788	ft.	1957/06/00

Well Name	COON RAPIDS 2	**Lic. Or Reg. No.**	62012	**Name of Driller**	BRANDON, J.		
USGS Quad	Coon Rapi	**Elevation**	885	**Aquifer**	MTPL	**Alternative Id**	80-6139

GEOLOGICAL MATERIAL	COLOR	HARDNESS	FROM	TO	STRAT	LITH PRIM	LITH SEC	LITH MINOR
SHALE			472	498	CECR	SHLE	SNDS	
CECR = Eau Claire	SHLE = Shale		SNDS = Sandstone					
SANDROCK & SHALE			498	545	CECR	SHLE	SNDS	
CECR = Eau Claire	SHLE = Shale		SNDS = Sandstone					
SANDROCK & SHALE			545	594	CMTS	SNDS		
CMTS = Mt.Simon	SNDS = Sandstone							
SANDROCK			594	670	CMTS	SNDS		
CMTS = Mt.Simon	SNDS = Sandstone							
CAVING RED SHALE			670	704	PMSC	SHLE		
PMSC = Solor Church Formation	SHLE = Shale							
RED ROCK & SHALE			704	726	PMSC	SHLE		
PMSC = Solor Church Formation	SHLE = Shale							
RED ROCK			726	770	PMSC	SHLE		
PMSC = Solor Church Formation	SHLE = Shale							
SHALE			770	778	PMSC	SHLE		
PMSC = Solor Church Formation	SHLE = Shale							
RED ROCK			778	788	PMSC	SHLE		
PMSC = Solor Church Formation	SHLE = Shale							

Unique No. 00202972	MINNESOTA DEPARTMENT OF HEALTH	Update Date 2007/03/12
County Name Anoka	**WELL AND BORING RECORD**	Entry Date 1991/04/15
	Minnesota Statutes Chapter 1031	

Township Name	Township	Range	Dir	Section	Subsection
	31	24	W	9	DCCCCD

Well Depth	Depth Completed	Date Well Completed
605 ft.	605 ft.	1960/08/19

Well Name COON RAPIDS 4

Drilling Method Cable Tool

Well Owner's Name COON RAPIDS 4
2731 NORTHDALE BL
COON RAPIDS MN 55433

Drilling Fluid

Well Hydrofractured? ☐ Yes ☐ No
From ft. to ft.

Use Community Supply (municipal)

Contact's Name CITY OF COON RAPIDS
11155 ROBINSON NW DR
COON RAPIDS MN 55433

Casing **Drive Shoe?** ☐ Yes ☐ N

Hole Diameter

Casing Diameter **Weight(lbs/ft)**

20	in. t	158	ft
16	in. t	233	ft

GEOLOGICAL MATERIAL	COLOR	HARDNESS	FROM	TO
DRIFT			0	158
DOLOMITE		HARD	158	170
JORDAN SANDSTONE			170	220
SHALE	GREE		220	310
SANDSTONE WITH THIN SH			310	369
SANDY SHALE			369	425
HARD SANDSTONE, SHALE			425	435
HARD SANDSTONE, SHALE			435	475
SHALEY SANDSTONE			475	520
HARD SANDSTONE, COARS			520	587
SHALE			587	605

Screen N

Open Hole From 233 ft. to 605 ft.

Make Type

Static Water Level 23 ft. from Land surface Date 1960/08/19

PUMPING LEVEL (below land surface)
142 ft. after 24 hrs. pumping 1000 g.p.m.

Well Head Completion
Pitless adapter mfr Model
Casing Protection ☑ 12 in. above grade
☐ At-grade(Environmental Wells and Borings ONLY)

Grouting Information Well grouted? ☑ Yes ☐ No

Material	From	To (ft.)	Amount(yds/bags)
	0	233	

Nearest Known Source of Contamination
ft. direction type
Well disinfected upon completion? ☐ Yes ☐ No

Pump ☐ Not Installed Date Installed Y
Mfr nam FAIRBANKS MORSE
Model 6977 HP 100 Volts 240
Drop Pipe Length 180 ft. Capacity g.p.m
Type T

Any not in use and not sealed well(s) on property? ☐ Yes ☐ No

Was a variance granted from the MDH for this Well? ☐ Yes ☐ No

REMARKS, ELEVATION, SOURCE OF DATA, etc.

M.G.S. NO. 168. GAMMA LOGGED 3-31-1998. LOGGED BY JIM TRAEN.

OLD PA. NO. 60-0350.

USGS Quad Coon Rapids Elevation 869
Aquifer: CFMS Alt Id: 80-6139

Well CONTRACTOR CERTIFICATION Lic. Or Reg. No. 27118
License Business Name
Name of Driller BENEKE, R.

Report Copy

Unique No.	00202972	MINNESOTA DEPARTMENT OF HEALTH	Update Date	2007/03/12
County Name	Anoka	**WELL AND BORING RECORD** *Minnesota Statutes Chapter 1031*	Entry Date	1991/04/15

Township Name	Township	Range	Dir	Section	Subsection	Well Depth		Depth Completed		Date Well Completed
	31	24	W	9	DCCCCD	605	ft.	605	ft.	1960/08/19

Well Name	COON RAPIDS 4	**Lic. Or Reg. No.**	27118	**Name of Driller**	BENEKE, R.		
USGS Quad	Coon Rapi	**Elevation**	869	**Aquifer**	CFMS	**Alternative Id**	80-6139

GEOLOGICAL MATERIAL	COLOR	HARDNESS	FROM	TO	STRAT	LITH PRIM	LITH SEC	LITH MINOR
DRIFT			0	158	QUUU	DRFT		
QUUU = Unknown deposit type	DRFT = Drift							
DOLOMITE		HARD	158	170	CSTL	DLMT	SNDS	
CSTL = St.Lawrence	DLMT = Dolomite		SNDS = Sandstone					
JORDAN SANDSTONE			170	220	CFRN	SNDS	SHLE	
CFRN = Franconia	SNDS = Sandstone		SHLE = Shale					
SHALE	GREEN		220	310	CFRN	SHLE	SNDS	DLMT
CFRN = Franconia	SHLE = Shale		SNDS = Sandstone				DLMT = Dolomite	
SANDSTONE WITH THIN SHALE LENSES			310	369	CIGL	SNDS		
CIGL = Ironton-Galesville	SNDS = Sandstone							
SANDY SHALE			369	425	CECR	SHLE	SNDS	
CECR = Eau Claire	SHLE = Shale		SNDS = Sandstone					
HARD SANDSTONE, SHALE LENSES			425	435	CECR	SHLE	SNDS	
CECR = Eau Claire	SHLE = Shale		SNDS = Sandstone					
HARD SANDSTONE, SHALE LENSES			435	475	CMTS	SNDS		
CMTS = Mt.Simon	SNDS = Sandstone							
SHALEY SANDSTONE			475	520	CMTS	SNDS		
CMTS = Mt.Simon	SNDS = Sandstone							
HARD SANDSTONE, COARSE			520	587	CMTS	SNDS		
CMTS = Mt.Simon	SNDS = Sandstone							
SHALE			587	605	PMRC	SHLE		
PMRC = Red Clastic Series	SHLE = Shale							

Unique No. 00202951

County Name Anoka

MINNESOTA DEPARTMENT OF HEALTH

WELL AND BORING RECORD

Minnesota Statutes Chapter 1031

Update Date 2007/02/07

Entry Date 1991/04/15

Township Name	Township	Range	Dir	Section	Subsection
	31	24	W	25	ACBBDD

Well Depth 695 ft. **Depth Completed** 695 ft. **Date Well Completed** 1961/09/00

Well Name COON RAPIDS 5

Drilling Method Cable Tool

Well Owner's Name COON RAPIDS 5
99TH NW LA
COON RAPIDS MN 55433

Drilling Fluid

Well Hydrofractured? ☐ Yes ☐ No
From ft. to ft.

Contact's Name CITY OF COON RAPIDS
11155 ROBINSON NW DR
COON RAPIDS MN 55433

Use Community Supply (municipal)

Casing **Drive Shoe?** ☐ Yes ☐ N

Hole Diameter
0 in. t 695 ft

Casing Diameter **Weight(lbs/ft)**
24 in. t 200 ft
16 in. t 242 ft

GEOLOGICAL MATERIAL	COLOR	HARDNESS	FROM	TO
SAND, GRAVEL, SHALE			0	190
SHALE, SANDROCK			190	200
SANDROCK		HARD	200	201
SANDROCK		HARD	201	215
SHALE			215	225
HARD SANDROCK & SHALE			225	248
HARD SANDROCK & SHALE			248	255
HARD SHALE & LIMEROCK			255	279
SANDROCK			279	293
LIMEROCK			293	295
HARD GREEN SHALE & LIM			295	374
SHALE			374	387
LIMEROCK			387	390
SHALE, LAYERS OF LIME	GREE	HARD	390	404
SHALE, LAYERS OF LIME	GREE	HARD	404	410
SANDROCK & SHALE			410	424
SANDROCK			424	449
HARD SANDROCK & SHALE			449	454
HARD SHALE, LAYERS OF L			454	459
HARD SHALE, LAYERS OF L			459	465
STICK GREEN SHALE			465	477
SHALE	RED		477	497
BLUE-GREEN SHALE			497	525
HARD GRAY SHALE, SOME			525	529
HARD GRAY SHALE, SOME			529	555
HARD SHALE & SANDROCK			555	625
SANDROCK			625	685
RED CLASTICS			685	695
GNEISS AT 695'			695	695

Screen N

Open Hole From 242 ft. to 695 ft.

Make Type

Static Water Level 68 ft. from Land surface Date 1961/07/11

PUMPING LEVEL (below land surface)
188 ft. after 26 hrs. pumping 1200 g.p.m.

Well Head Completion
Pitless adapter mfr Model
Casing Protection ☑ 12 in. above grade
☐ At-grade(Environmental Wells and Borings ONLY)

Grouting Information Well grouted? ☐ Yes ☐ No

Nearest Known Source of Contamination
ft. direction type
Well disinfected upon completion? ☐ Yes ☐ No

Pump ☐ Not Installed Date Installed
Mfr name
Model HP Volts

Drop Pipe Length ft. Capacity g.p.m
Type

REMARKS, ELEVATION, SOURCE OF DATA, etc.

SAMPLES INDICATE BASALT AT 695 FT.

Any not in use and not sealed well(s) on property? ☐ Yes ☐ No

M.G.S. NO. 199. 190-203 FT. LOOKS LIKE REWORKED JORDAN.

GAMMA LOGGED 2-13-2006 TO 580 FT BY JIM TRAEN.

USGS Quad	Coon Rapids	Elevation	910
Aquifer:	CFMS	Alt Id:	80-6139

Report Copy

Was a variance granted from the MDH for this Well? ☐ Yes ☐ No

Well CONTRACTOR CERTIFICATION Lic. Or Reg. No. 27058

License Business Name

Name of Driller

HE-01205-06 (Rev. 9/96)

Unique No.	00202951	MINNESOTA DEPARTMENT OF HEALTH	Update Date	2007/02/07
County Name	Anoka	**WELL AND BORING RECORD** *Minnesota Statutes Chapter 1031*	Entry Date	1991/04/15

Township Name	Township	Range	Dir	Section	Subsection	Well Depth		Depth Completed		Date Well Completed
	31	24	W	25	ACBBDD	695	ft.	695	ft.	1961/09/00

Well Name	COON RAPIDS 5	**Lic. Or Reg. No.**	27058	**Name of Driller**			
USGS Quad	Coon Rapi	**Elevation**	910	**Aquifer**	CFMS	**Alternative Id**	80-6139

GEOLOGICAL MATERIAL	COLOR	HARDNESS	FROM	TO	STRAT	LITH PRIM	LITH SEC	LITH MINOR
SAND, GRAVEL, SHALE			0	190	QPUU	SAND	GRVL	CLAY
QPUU = Pebbly sand/silt/clay	SAND = Sand		GRVL = Gravel				CLAY = Clay	
SHALE, SANDROCK			190	200	QLUU	CLAY	SAND	
QLUU = Clay & sand	CLAY = Clay		SAND = Sand					
SANDROCK		HARD	200	201	QFUU	SAND		
QFUU = Sand	SAND = Sand							
SANDROCK		HARD	201	215	CSTL	DLMT	SNDS	
CSTL = St.Lawrence	DLMT = Dolomite		SNDS = Sandstone					
SHALE			215	225	CSTL	SHLE	SLSN	
CSTL = St.Lawrence	SHLE = Shale		SLSN = Siltstone					
HARD SANDROCK & SHALE			225	248	CSTL	DLMT	SNDS	
CSTL = St.Lawrence	DLMT = Dolomite		SNDS = Sandstone					
HARD SANDROCK & SHALE			248	255	CFRN	SNDS	SHLE	DLMT
CFRN = Franconia	SNDS = Sandstone		SHLE = Shale				DLMT = Dolomite	
HARD SHALE & LIMEROCK			255	279	CFRN	SNDS	SHLE	DLMT
CFRN = Franconia	SNDS = Sandstone		SHLE = Shale				DLMT = Dolomite	
SANDROCK			279	293	CFRN	SNDS		
CFRN = Franconia	SNDS = Sandstone							
LIMEROCK			293	295	CFRN	DLMT		
CFRN = Franconia	DLMT = Dolomite							
HARD GREEN SHALE & LIMEROCK			295	374	CFRN	SHLE	DLMT	
CFRN = Franconia	SHLE = Shale		DLMT = Dolomite					
SHALE			374	387	CFRN	SHLE		
CFRN = Franconia	SHLE = Shale							
LIMEROCK			387	390	CFRN	DLMT		
CFRN = Franconia	DLMT = Dolomite							
SHALE, LAYERS OF LIME	GREEN	HARD	390	404	CFRN	SHLE	DLMT	
CFRN = Franconia	SHLE = Shale		DLMT = Dolomite					

Unique No.	00202951	MINNESOTA DEPARTMENT OF HEALTH	Update Date	2007/02/07
County Name	Anoka	**WELL AND BORING RECORD** *Minnesota Statutes Chapter 1031*	Entry Date	1991/04/15

Township Name	Township	Range	Dir	Section	Subsection	Well Depth		Depth Completed		Date Well Completed
	31	24	W	25	ACBBDD	695	ft.	695	ft.	1961/09/00

Well Name	COON RAPIDS 5	Lic. Or Reg. No.	27058	Name of Driller	
USGS Quad	Coon Rapi	Elevation	910	Aquifer	CFMS	Alternative Id	80-6139

GEOLOGICAL MATERIAL	COLOR	HARDNESS	FROM	TO	STRAT	LITH PRIM	LITH SEC	LITH MINOR
SHALE, LAYERS OF LIME	GREEN	HARD	404	410	CIGL	SNDS		
CIGL = Ironton-Galesville	SNDS = Sandstone							
SANDROCK & SHALE			410	424	CIGL	SNDS	SHLE	
CIGL = Ironton-Galesville	SNDS = Sandstone		SHLE = Shale					
SANDROCK			424	449	CIGL	SNDS		
CIGL = Ironton-Galesville	SNDS = Sandstone							
HARD SANDROCK & SHALE			449	454	CIGL	SNDS	SHLE	
CIGL = Ironton-Galesville	SNDS = Sandstone		SHLE = Shale					
HARD SHALE, LAYERS OF LIME			454	459	CIGL	SNDS		
CIGL = Ironton-Galesville	SNDS = Sandstone							
HARD SHALE, LAYERS OF LIME			459	465	CECR	SHLE	SNDS	DLMT
CECR = Eau Claire	SHLE = Shale		SNDS = Sandstone			DLMT = Dolomite		
STICK GREEN SHALE			465	477	CECR	SHLE	SNDS	
CECR = Eau Claire	SHLE = Shale		SNDS = Sandstone					
SHALE	RED		477	497	CECR	SHLE	SNDS	
CECR = Eau Claire	SHLE = Shale		SNDS = Sandstone					
BLUE-GREEN SHALE			497	525	CECR	SHLE	SNDS	
CECR = Eau Claire	SHLE = Shale		SNDS = Sandstone					
HARD GRAY SHALE, SOME SANDROCK			525	529	CECR	SHLE	SNDS	
CECR = Eau Claire	SHLE = Shale		SNDS = Sandstone					
HARD GRAY SHALE, SOME SANDROCK			529	555	CMTS	SHLE	SNDS	
CMTS = Mt.Simon	SHLE = Shale		SNDS = Sandstone					
HARD SHALE & SANDROCK			555	625	CMTS	SHLE	SNDS	
CMTS = Mt.Simon	SHLE = Shale		SNDS = Sandstone					
SANDROCK			625	685	CMTS	SNDS		
CMTS = Mt.Simon	SNDS = Sandstone							
RED CLASTICS			685	695	PMRC	SHLE	SNDS	
PMRC = Red Clastic Series	SHLE = Shale		SNDS = Sandstone					

Unique No.	00202951	MINNESOTA DEPARTMENT OF HEALTH	Update Date	2007/02/07
County Name	Anoka	**WELL AND BORING RECORD** *Minnesota Statutes Chapter 1031*	Entry Date	1991/04/15

Township Name	Township	Range	Dir	Section	Subsection	Well Depth		Depth Completed		Date Well Completed
	31	24	W	25	ACBBDD	695	ft.	695	ft.	1961/09/00

Well Name	COON RAPIDS 5	**Lic. Or Reg. No.**	27058	**Name of Driller**			
USGS Quad	Coon Rapi	**Elevation**	910	**Aquifer**	CFMS	**Alternative Id**	80-6139

GEOLOGICAL MATERIAL	COLOR	HARDNESS	FROM	TO	STRAT	LITH PRIM	LITH SEC	LITH MINOR
GNEISS AT 695'			695	695	PAUD	BSLT		

PAUD = Archean Rocks Undivided BSLT = Basalt

Unique No. 00202937

County Name Anoka

MINNESOTA DEPARTMENT OF HEALTH

WELL AND BORING RECORD

Minnesota Statutes Chapter 1031

Update Date 2010/03/15

Entry Date 1991/04/15

Township Name	Township	Range	Dir	Section	Subsection
	31	24	W	17	BBAACC

Well Depth	Depth Completed	Date Well Completed
158 ft.	158 ft.	1960/11/00

Well Name COON RAPIDS 6

Drilling Method Cable Tool

Well Owner's Name COON RAPIDS 6
11611 YUCCA NW ST
COON RAPIDS MN 55433

Drilling Fluid

Well Hydrofractured? ☐ Yes ☐ No
From ft. to ft.

Contact's Name CITY OF COON RAPIDS
11155 ROBINSON NW DR
COON RAPIDS MN 55433

Use Community Supply (municipal)

Casing **Drive Shoe?** ☐ Yes ☐ N

Hole Diameter
0 in. t 158 ft

Casing Diameter **Weight(lbs/ft)**
20 in. t 118 ft

GEOLOGICAL MATERIAL	COLOR	HARDNESS	FROM	TO
SAND & GRAVEL			0	57
CLAY			57	67
SAND & GRAVEL			67	82
HARDPAN			82	94
HARDPAN			94	102
SANDROCK			102	158

Screen N

Open Hole From 118 ft. to 158 ft.

Make Type

Static Water Level 22 ft. from Land surface Date 1960/11/00

PUMPING LEVEL (below land surface)
24.5 ft. after hrs. pumping 151 g.p.m.

Well Head Completion
Pitless adapter mfr Model
Casing Protection ☑ 12 in. above grade
☐ At-grade(Environmental Wells and Borings ONLY)

Grouting Information Well grouted? ☐ Yes ☐ No

Nearest Known Source of Contamination
ft. direction type
Well disinfected upon completion? ☐ Yes ☐ No

Pump ☐ Not Installed Date Installed
Mfr name
Model HP Volts
Drop Pipe Length ft. Capacity g.p.m
Type

Any not in use and not sealed well(s) on property? ☐ Yes ☐ No

Was a variance granted from the MDH for this Well? ☐ Yes ☐ No

REMARKS, ELEVATION, SOURCE OF DATA, etc.

BASED ON SAMPLES AIR LIFTED FROM WELL 5-6-1993 FRANCONIA FM. PRESENT.

GAMMA LOGGED 12-1-1992.

GAMMA LOGGED 5-6-1993. LOGGED BY GEOSPHERE.

OLD P.A. 60-0743.

USGS Quad Coon Rapids Elevation 870
Aquifer: CFRN Alt Id: 80-6139

Well CONTRACTOR CERTIFICATION Lic. Or Reg. No. 62012
License Business Name
Name of Driller KEMPER, R

Report Copy

Unique No.	00202937	MINNESOTA DEPARTMENT OF HEALTH	Update Date	2010/03/15
County Name	Anoka	**WELL AND BORING RECORD** *Minnesota Statutes Chapter 1031*	Entry Date	1991/04/15

Township Name	Township	Range	Dir	Section	Subsection	Well Depth		Depth Completed		Date Well Completed
	31	24	W	17	BBAACC	158	ft.	158	ft.	1960/11/00

Well Name	COON RAPIDS 6	**Lic. Or Reg. No.**	62012	**Name of Driller**	KEMPER, R.		
USGS Quad	Coon Rapi	**Elevation**	870	**Aquifer**	CFRN	**Alternative Id**	80-6139

GEOLOGICAL MATERIAL	COLOR	HARDNESS	FROM	TO	STRAT	LITH PRIM	LITH SEC	LITH MINOR
SAND & GRAVEL			0	57	QHUU	SAND	GRVL	
QHUU = Sand & larger	SAND = Sand		GRVL = Gravel					
CLAY			57	67	QCUU	CLAY		
QCUU = Clay	CLAY = Clay							
SAND & GRAVEL			67	82	QHUU	SAND	GRVL	
QHUU = Sand & larger	SAND = Sand		GRVL = Gravel					
HARDPAN			82	94	QPUU	HDPN		
QPUU = Pebbly sand/silt/clay	HDPN = Hardpan							
HARDPAN			94	102	CFRN	SNDS	SHLE	
CFRN = Franconia	SNDS = Sandstone		SHLE = Shale					
SANDROCK			102	158	CFRN	SNDS	SHLE	DLMT
CFRN = Franconia	SNDS = Sandstone		SHLE = Shale				DLMT = Dolomite	

Unique No. 00202943

County Name Anoka

MINNESOTA DEPARTMENT OF HEALTH

WELL AND BORING RECORD

Minnesota Statutes Chapter 1031

Update Date 2008/12/30

Entry Date 1991/04/15

Township Name	Township	Range	Dir	Section	Subsection
	31	24	W	21	BDACBB

Well Depth	Depth Completed	Date Well Completed
632 ft.	632 ft.	1964/04/00

Well Name COON RAPIDS 7

Drilling Method Cable Tool

Well Owner's Name COON RAPIDS 7
10617 DIRECT RIVER DR
COON RAPIDS MN 55433

Drilling Fluid

Well Hydrofractured? ☐ Yes ☐ No
From ft. to ft.

Contact's Name CITY OF COON RAPIDS
11155 ROBINSON NW DR
COON RAPIDS MN 55433

Use Community Supply (municipal)

Casing **Drive Shoe?** ☐ Yes ☐ N

Hole Diameter

Casing Diameter **Weight(lbs/ft)**

24 in. t 163 ft

16 in. t 189 ft

GEOLOGICAL MATERIAL	COLOR	HARDNESS	FROM	TO
SAND & CLAY			0	78
CLAY			78	90
FINE SAND			90	130
SANDSTONE			130	161
GREENSHALE	GREE		161	165
DOLOMITIC CLAY			165	190
SHALE & SANDSTONE			190	295
GRAY SHALE	GRAY		295	300
BROWN SHALE	BROW		300	315
SHALE	RED		315	325
SHALE	GRAY		325	330
SHALE	GRAY		330	345
SANDSTONE	GRAY		345	380
GRAY SHALE	GRAY		380	398
SHALE	GRAY		398	400
RED ROCK	RED		400	425
GRAY & RED SHALE	GRY/R		425	440
GRAY & BROWN ROCK	GRY/B		440	475
COARSE SAND	GRAY		475	477
COARSE SAND	GRAY		477	480
FINE SAND	GRAY		480	520
FINE SAND	GRAY		520	560
COARSE SAND	WHITE		560	590
HARD GOLD GRAINS COAR	WHITE		590	600
SHALE	RED		600	610
RED & GRAY SHALE	RED/G		610	615
SHALE	RED		615	632

Screen N

Open Hole From 189 ft. to 632 ft.

Make Type

Static Water Level 31 ft. from Land surface Date 1964/04/00

PUMPING LEVEL (below land surface)

71 ft. after hrs. pumping 1600 g.p.m.

Well Head Completion

Pitless adapter mfr Model

Casing Protection ☑ 12 in. above grade

☐ At-grade(Environmental Wells and Borings ONLY)

Grouting Information Well grouted? ☐ Yes ☐ No

Nearest Known Source of Contamination

ft. direction type

Well disinfected upon completion? ☐ Yes ☐ No

Pump ☐ Not Installed Date Installed

Mfr name

Model HP Volts

Drop Pipe Length ft. Capacity g.p.m

Type

REMARKS, ELEVATION, SOURCE OF DATA, etc.

JIM TRAEN HAS TWO DATES ON LOG 1-18-04 AND 1-18-05.

GAMMA LOGGED 1-18-04 BY JIM TRAEN

Any not in use and not sealed well(s) on property? ☐ Yes ☐ No

Was a variance granted from the MDH for this Well? ☐ Yes ☐ No

USGS Quad Coon Rapids Elevation 868

Aquifer: CFMS Alt Id: 80-6139

Well CONTRACTOR CERTIFICATION Lic. Or Reg. No. 96460

Unique No.	00202943	MINNESOTA DEPARTMENT OF HEALTH	Update Date	2008/12/30
County Name	Anoka	**WELL AND BORING RECORD** *Minnesota Statutes Chapter 1031*	Entry Date	1991/04/15

Township Name	Township	Range	Dir	Section	Subsection	Well Depth		Depth Completed		Date Well Completed
	31	24	W	21	BDACBB	632	ft.	632	ft.	1964/04/00

Well Name	COON RAPIDS 7	**Lic. Or Reg. No.**	96460	**Name of Driller**			
USGS Quad	Coon Rapi	**Elevation**	868	**Aquifer**	CFMS	**Alternative Id**	80-6139

GEOLOGICAL MATERIAL	COLOR	HARDNESS	FROM	TO	STRAT	LITH PRIM	LITH SEC	LITH MINOR
SAND & CLAY			0	78	QLUU	SAND	CLAY	
QLUU = Clay & sand	SAND = Sand		CLAY = Clay					
CLAY			78	90	QCUU	CLAY		
QCUU = Clay	CLAY = Clay							
FINE SAND			90	130	QFUU	SAND		
QFUU = Sand	SAND = Sand							
SANDSTONE			130	161	CJDN	SNDS		
CJDN = Jordan	SNDS = Sandstone							
GREENSHALE	GREEN		161	165	CSTL	SHLE	SLSN	
CSTL = St.Lawrence	SHLE = Shale		SLSN = Siltstone					
DOLOMITIC CLAY			165	190	CSTL	DLMT	SLSN	
CSTL = St.Lawrence	DLMT = Dolomite		SLSN = Siltstone					
SHALE & SANDSTONE			190	295	CFRN	SHLE	SNDS	
CFRN = Franconia	SHLE = Shale		SNDS = Sandstone					
GRAY SHALE	GRAY		295	300	CFRN	SHLE	SNDS	DLMT
CFRN = Franconia	SHLE = Shale		SNDS = Sandstone				DLMT = Dolomite	
BROWN SHALE	BROWN		300	315	CFRN	SHLE	SNDS	DLMT
CFRN = Franconia	SHLE = Shale		SNDS = Sandstone				DLMT = Dolomite	
SHALE	RED		315	325	CFRN	SHLE	SNDS	DLMT
CFRN = Franconia	SHLE = Shale		SNDS = Sandstone				DLMT = Dolomite	
SHALE	GRAY		325	330	CFRN	SHLE	SNDS	DLMT
CFRN = Franconia	SHLE = Shale		SNDS = Sandstone				DLMT = Dolomite	
SHALE	GRAY		330	345	CIGL	SNDS		
CIGL = Ironton-Galesville	SNDS = Sandstone							
SANDSTONE	GRAY		345	380	CIGL	SNDS		
CIGL = Ironton-Galesville	SNDS = Sandstone							
GRAY SHALE	GRAY		380	398	CIGL	SNDS		
CIGL = Ironton-Galesville	SNDS = Sandstone							

Unique No.	00202943	MINNESOTA DEPARTMENT OF HEALTH	Update Date	2008/12/30
County Name	Anoka	**WELL AND BORING RECORD** *Minnesota Statutes Chapter 1031*	Entry Date	1991/04/15

Township Name	Township	Range	Dir	Section	Subsection	Well Depth		Depth Completed		Date Well Completed
	31	24	W	21	BDACBB	632	ft.	632	ft.	1964/04/00

Well Name	COON RAPIDS 7	**Lic. Or Reg. No.**	96460	**Name of Driller**			
USGS Quad	Coon Rapi	**Elevation**	868	**Aquifer**	CFMS	**Alternative Id**	80-6139

GEOLOGICAL MATERIAL	COLOR	HARDNESS	FROM	TO	STRAT	LITH PRIM	LITH SEC	LITH MINOR
SHALE	GRAY		398	400	CECR	SHLE	SNDS	
CECR = Eau Claire	SHLE = Shale			SNDS = Sandstone				
RED ROCK	RED		400	425	CECR	SHLE	SNDS	
CECR = Eau Claire	SHLE = Shale			SNDS = Sandstone				
GRAY & RED SHALE	GRY/RED		425	440	CECR	SHLE	SNDS	
CECR = Eau Claire	SHLE = Shale			SNDS = Sandstone				
GRAY & BROWN ROCK	GRY/BRN		440	475	CECR	SHLE	SNDS	
CECR = Eau Claire	SHLE = Shale			SNDS = Sandstone				
COARSE SAND	GRAY		475	477	CECR	SHLE	SNDS	
CECR = Eau Claire	SHLE = Shale			SNDS = Sandstone				
COARSE SAND	GRAY		477	480	CMTS	SNDS		
CMTS = Mt.Simon	SNDS = Sandstone							
FINE SAND	GRAY		480	520	CMTS	SNDS		
CMTS = Mt.Simon	SNDS = Sandstone							
FINE SAND	GRAY		520	560	CMTS	SNDS		
CMTS = Mt.Simon	SNDS = Sandstone							
COARSE SAND	WHITE		560	590	CMTS	SNDS		
CMTS = Mt.Simon	SNDS = Sandstone							
HARD GOLD GRAINS COARSE SAND	WHITE		590	600	CMTS	SNDS		
CMTS = Mt.Simon	SNDS = Sandstone							
SHALE	RED		600	610	PMSU	SHLE		
PMSU = Mid.Proterozoic Sedimentary	SHLE = Shale							
RED & GRAY SHALE	RED/GRY		610	615	PMSU	SHLE		
PMSU = Mid.Proterozoic Sedimentary	SHLE = Shale							
SHALE	RED		615	632	PMSU	SHLE		
PMSU = Mid.Proterozoic Sedimentary	SHLE = Shale							

Unique No. 00202932	MINNESOTA DEPARTMENT OF HEALTH	Update Date 2007/02/06
County Name Anoka	**WELL AND BORING RECORD**	Entry Date 1991/04/15
	Minnesota Statutes Chapter 1031	

Township Name	Township	Range	Dir	Section	Subsection
	31	24	W	13	ACCDBD

Well Depth	Depth Completed	Date Well Completed
700 ft.	700 ft.	1965/05/07

Well Name COON RAPIDS 8

Drilling Method Cable Tool

Well Owner's Name COON RAPIDS 8
269 NORTHDALE BL
COON RAPIDS MN 55433

Drilling Fluid

Well Hydrofractured? ☐ Yes ☐ No
From ft. to ft.

Contact's Name CITY OF COON RAPIDS
11155 ROBINSON NW DR
COON RAPIDS MN 55433

Use Community Supply (municipal)

Casing **Drive Shoe?** ☐ Yes ☐ N

Hole Diameter
in. t 700 ft

Casing Diameter **Weight(lbs/ft)**
24 in. t 258 ft
16 in. t 283 ft

GEOLOGICAL MATERIAL	COLOR	HARDNESS	FROM	TO
DRIFT			0	212
SANDROCK, SHALE, GRAV			212	243
LIMEROCK, SHALE			243	249
LIMEROCK, SHALE			249	263
SANDROCK, SHALE			263	409
SANDROCK, SHALE			409	418
SANDROCK			418	445
SHALEY SANDROCK			445	469
SHALEY SANDROCK			469	473
SHALE			473	518
SHALE & SANDROCK			518	533
SHALEY SANDROCK			533	545
SHALE			545	549
SANDROCK			549	594
SHALE			594	598
SANDROCK			598	694
SHALE			694	700

Screen N

Open Hole From 283 ft. to 700 ft.

Make Type

Static Water Level 42 ft. from Land surface Date 1965/05/07

PUMPING LEVEL (below land surface)
132.3 ft. after hrs. pumping 922 g.p.m.

Well Head Completion
Pitless adapter mfr Model
Casing Protection ☑ 12 in. above grade
☐ At-grade(Environmental Wells and Borings ONLY)

Grouting Information Well grouted? ☑ Yes ☐ No

Material	From	To (ft.)	Amount(yds/bags)	
G	0	283	24	Y

Nearest Known Source of Contamination
ft. direction type
Well disinfected upon completion? ☐ Yes ☐ No

Pump ☐ Not Installed Date Installed
Mfr nam
Model HP Volts
Drop Pipe Length ft. Capacity g.p.m
Type

Any not in use and not sealed well(s) on property? ☐ Yes ☐ No

Was a variance granted from the MDH for this Well? ☐ Yes ☐ No

REMARKS, ELEVATION, SOURCE OF DATA, etc.

OLD PA. NO. 65-0095.

GAMMA LOGGED 2-6-2004 BY JIM TRAEN

USGS Quad Coon Rapids Elevation 897
Aquifer: CFMS Alt Id: 80-6139

Well CONTRACTOR CERTIFICATION Lic. Or Reg. No. 62012
License Business Name
Name of Driller O'BRIEN, F.

Report Copy

Unique No.	00202932	MINNESOTA DEPARTMENT OF HEALTH	Update Date	2007/02/06
County Name	Anoka	**WELL AND BORING RECORD** *Minnesota Statutes Chapter 1031*	Entry Date	1991/04/15

Township Name	Township	Range	Dir	Section	Subsection	Well Depth		Depth Completed		Date Well Completed
	31	24	W	13	ACCDBD	700	ft.	700	ft.	1965/05/07

Well Name	COON RAPIDS 8	**Lic. Or Reg. No.**	62012	**Name of Driller**	O'BRIEN, F.		
USGS Quad	Coon Rapi	**Elevation**	897	**Aquifer**	CFMS	**Alternative Id**	80-6139

GEOLOGICAL MATERIAL	COLOR	HARDNESS	FROM	TO	STRAT	LITH PRIM	LITH SEC	LITH MINOR
DRIFT			0	212	QUUU	DRFT		
QUUU = Unknown deposit type	DRFT = Drift							
SANDROCK, SHALE, GRAVEL			212	243	QPUU	SAND	CLAY	GRVL
QPUU = Pebbly sand/silt/clay	SAND = Sand		CLAY = Clay				GRVL = Gravel	
LIMEROCK, SHALE			243	249	QUUU	COBL		
QUUU = Unknown deposit type	COBL = Cobble							
LIMEROCK, SHALE			249	263	CFRN	SHLE	DLMT	SNDS
CFRN = Franconia	SHLE = Shale		DLMT = Dolomite				SNDS = Sandstone	
SANDROCK, SHALE			263	409	CFRN	SNDS	SHLE	DLMT
CFRN = Franconia	SNDS = Sandstone		SHLE = Shale				DLMT = Dolomite	
SANDROCK, SHALE			409	418	CIGL	SNDS		
CIGL = Ironton-Galesville	SNDS = Sandstone							
SANDROCK			418	445	CIGL	SNDS		
CIGL = Ironton-Galesville	SNDS = Sandstone							
SHALEY SANDROCK			445	469	CIGL	SNDS	SHLE	
CIGL = Ironton-Galesville	SNDS = Sandstone		SHLE = Shale					
SHALEY SANDROCK			469	473	CECR	SNDS	SHLE	
CECR = Eau Claire	SNDS = Sandstone		SHLE = Shale					
SHALE			473	518	CECR	SHLE		
CECR = Eau Claire	SHLE = Shale							
SHALE & SANDROCK			518	533	CECR	SHLE	SNDS	
CECR = Eau Claire	SHLE = Shale		SNDS = Sandstone					
SHALEY SANDROCK			533	545	CECR	SNDS		
CECR = Eau Claire	SNDS = Sandstone							
SHALE			545	549	CECR	SHLE	SLSN	
CECR = Eau Claire	SHLE = Shale		SLSN = Siltstone					
SANDROCK			549	594	CMTS	SNDS		
CMTS = Mt.Simon	SNDS = Sandstone							

Unique No.	00202932	MINNESOTA DEPARTMENT OF HEALTH	Update Date	2007/02/06
County Name	Anoka	**WELL AND BORING RECORD** *Minnesota Statutes Chapter 1031*	Entry Date	1991/04/15

Township Name	Township	Range	Dir	Section	Subsection	Well Depth		Depth Completed		Date Well Completed
	31	24	W	13	ACCDBD	700	ft.	700	ft.	1965/05/07

Well Name	COON RAPIDS 8	**Lic. Or Reg. No.**	62012	**Name of Driller**	O'BRIEN, F.		
USGS Quad	Coon Rapi	**Elevation**	897	**Aquifer**	CFMS	**Alternative Id**	80-6139

GEOLOGICAL MATERIAL	COLOR	HARDNESS	FROM	TO	STRAT	LITH PRIM	LITH SEC	LITH MINOR
SHALE			594	598	CMTS	SHLE	SNDS	
CMTS = Mt.Simon	SHLE = Shale		SNDS = Sandstone					
SANDROCK			598	694	CMTS	SNDS		
CMTS = Mt.Simon	SNDS = Sandstone							
SHALE			694	700	PMRC	SLSN	SHLE	
PMRC = Red Clastic Series	SLSN = Siltstone		SHLE = Shale					

Unique No.	00202931	MINNESOTA DEPARTMENT OF HEALTH	Update Date	2008/12/30
County Name	Anoka	**WELL AND BORING RECORD** *Minnesota Statutes Chapter 1031*	Entry Date	1991/04/15

Township Name	Township	Range	Dir	Section	Subsection
	31	24	W	13	ACDAAB

Well Depth	Depth Completed	Date Well Completed
500 ft.	500 ft.	1969/04/07

Well Name COON RAPIDS 9

Drilling Method Cable Tool

Well Owner's Name COON RAPIDS 9
11399 DOGWOOD NW ST
COON RAPIDS MN 55433

Drilling Fluid

Well Hydrofractured? ☐ Yes ☐ No
From ft. to ft.

Contact's Name CITY OF COON RAPIDS
11155 ROBINSON NW DR
COON RAPIDS MN 55433

Use Community Supply (municipal)

Casing **Drive Shoe?** ☐ Yes ☐ N

Hole Diameter

Casing Diameter **Weight(lbs/ft)**

24 in. t 268 ft
16 in. t 294 ft

GEOLOGICAL MATERIAL	COLOR	HARDNESS	FROM	TO
SAND			0	20
SAND	RED		20	39
CLAY	BLUE		39	63
SAND	RED		63	83
SAND	RED		83	89
CLAY	GREE		89	98
CLAY	BLUE		98	109
GRAVEL			109	123
GRAVEL	GRAY		123	135
GRAVEL & ROCKS			135	140
SAND	GREE		140	146
CLAY & ROCKS			146	166
GREEN CLAY & ROCKS			166	173
CLAY	RED		173	235
RED CLAY & ROCK	RED		235	245
RED CLAY & SAND	RED		245	250
RED CLAY & SAND	RED		250	252
SHALE	GREE		252	255
LIMEROCK & SHALE			255	263
LIMEROCK & SHALE			263	265
LIMEROCK & SHALE			265	266
LIMEROCK & SHALE			266	271
SANDSTONE & SHALE			271	275
HARD SHALE & SAND			275	302
HARD SHALE & SAND			302	316
SANDSTONE		HARD	316	320
SANDSTONE & SHALE			320	353
SANDSTONE			353	356
SHALE SOME SAND			356	371
SHALE & SANDSTONE			371	388
SHALE			388	396
SHALE & SANDSTONE			396	405

Screen N

Open Hole From 294 ft. to 500 ft.

Make Type

Static Water Level 47 ft. from Land surface Date 1969/04/07

PUMPING LEVEL (below land surface)

ft. after hrs. pumping g.p.m.

Well Head Completion

Pitless adapter mfr Model

Casing Protection ☑ 12 in. above grade

☐ At-grade(Environmental Wells and Borings ONLY)

Grouting Information Well grouted? ☑ Yes ☐ No

Material	From	To (ft.)	Amount(yds/bags)	
G			24	Y

Nearest Known Source of Contamination

ft. direction type

Well disinfected upon completion? ☐ Yes ☐ No

Pump ☐ Not Installed Date Installed

Mfr nam

Model HP Volts

SANDY SHALE	405	410
SANDY SHALE	410	415
SANDY SHALE	415	425
SANDY SHALE	425	454
SANDY SHALE	454	458
SANDY SHALE	458	462
BLUE & RED SHALE	462	475
SANDY SHALE	475	478
SANDY SHALE	478	482
SANDY SHALE	482	492
RED & GREEN SHALE	492	500

REMARKS, ELEVATION, SOURCE OF DATA, etc.

M.G.S. NO. 459.

GAMMA LOGGED 2-13-2004. LOGGED BY JIM TRAEN.

USGS Quad	Coon Rapids	Elevation	897
Aquifer:	CFIE	Alt Id:	80-6139

Report Copy

Drop Pipe Length ft. Capacity g.p.m

Type

Any not in use and not sealed well(s) on property? ☐ Yes ☐ No

Was a variance granted from the MDH for this Well? ☐ Yes ☐ No

Well CONTRACTOR CERTIFICATION Lic. Or Reg. No. 27010

License Business Name

Name of Driller OLZESKE, T.

HE-01205-06 (Rev. 9/96)

Unique No.	00202931	MINNESOTA DEPARTMENT OF HEALTH	Update Date	2008/12/30
County Name	Anoka	**WELL AND BORING RECORD** *Minnesota Statutes Chapter 1031*	Entry Date	1991/04/15

Township Name	Township	Range	Dir	Section	Subsection	Well Depth		Depth Completed		Date Well Completed
	31	24	W	13	ACDAAB	500	ft.	500	ft.	1969/04/07

Well Name	COON RAPIDS 9	**Lic. Or Reg. No.**	27010	**Name of Driller**	OLZESKE, T.		
USGS Quad	Coon Rapi	**Elevation**	897	**Aquifer**	CFIE	**Alternative Id**	80-6139

GEOLOGICAL MATERIAL	COLOR	HARDNESS	FROM	TO	STRAT	LITH PRIM	LITH SEC	LITH MINOR
SAND			0	20	QFUU	SAND		
QFUU = Sand	SAND = Sand							
SAND	RED		20	39	QFUR	SAND		
QFUR = Sand	SAND = Sand							
CLAY	BLUE		39	63	QCUG	CLAY		
QCUG = Clay	CLAY = Clay							
SAND	RED		63	83	QFUR	SAND		
QFUR = Sand	SAND = Sand							
SAND	RED		83	89	QFUR	SAND		
QFUR = Sand	SAND = Sand							
CLAY	GREEN		89	98	QCUL	CLAY		
QCUL = Clay	CLAY = Clay							
CLAY	BLUE		98	109	QCUG	CLAY		
QCUG = Clay	CLAY = Clay							
GRAVEL			109	123	QGUU	GRVL		
QGUU = Gravel (+larger)	GRVL = Gravel							
GRAVEL	GRAY		123	135	QGUG	GRVL		
QGUG = Gravel (+larger)	GRVL = Gravel							
GRAVEL & ROCKS			135	140	QGUU	GRVL	COBL	
QGUU = Gravel (+larger)	GRVL = Gravel		COBL = Cobble					
SAND	GREEN		140	146	QFUL	SAND		
QFUL = Sand	SAND = Sand							
CLAY & ROCKS			146	166	QPUU	CLAY	COBL	
QPUU = Pebbly sand/silt/clay	CLAY = Clay		COBL = Cobble					
GREEN CLAY & ROCKS			166	173	QPUL	CLAY	COBL	
QPUL = Pebbly sand/silt/clay	CLAY = Clay		COBL = Cobble					
CLAY	RED		173	235	QCUR	CLAY		
QCUR = Clay	CLAY = Clay							

Unique No.	00202931	MINNESOTA DEPARTMENT OF HEALTH	Update Date	2008/12/30
County Name	Anoka	**WELL AND BORING RECORD** *Minnesota Statutes Chapter 1031*	Entry Date	1991/04/15

Township Name	Township	Range	Dir	Section	Subsection	Well Depth		Depth Completed		Date Well Completed
	31	24	W	13	ACDAAB	500	ft.	500	ft.	1969/04/07

Well Name	COON RAPIDS 9	**Lic. Or Reg. No.**	27010	**Name of Driller**	OLZESKE, T.		
USGS Quad	Coon Rapi	**Elevation**	897	**Aquifer**	CFIE	**Alternative Id**	80-6139

GEOLOGICAL MATERIAL	COLOR	HARDNESS	FROM	TO	STRAT	LITH PRIM	LITH SEC	LITH MINOR
RED CLAY & ROCK	RED		235	245	QPUR	CLAY	COBL	
QPUR = Pebbly sand/silt/clay	CLAY = Clay		COBL = Cobble					
RED CLAY & SAND	RED		245	250	QLUR	CLAY	SAND	
QLUR = Clay & sand	CLAY = Clay		SAND = Sand					
RED CLAY & SAND	RED		250	252	QLUR	CLAY	SAND	
QLUR = Clay & sand	CLAY = Clay		SAND = Sand					
SHALE	GREEN		252	255	QCUL	CLAY		
QCUL = Clay	CLAY = Clay							
LIMEROCK & SHALE			255	263	QPUU	COBL	CLAY	
QPUU = Pebbly sand/silt/clay	COBL = Cobble		CLAY = Clay					
LIMEROCK & SHALE			263	265	QPUU	COBL	CLAY	
QPUU = Pebbly sand/silt/clay	COBL = Cobble		CLAY = Clay					
LIMEROCK & SHALE			265	266	QPUU	COBL	CLAY	
QPUU = Pebbly sand/silt/clay	COBL = Cobble		CLAY = Clay					
LIMEROCK & SHALE			266	271	CFRN	DLMT	SHLE	SNDS
CFRN = Franconia	DLMT = Dolomite		SHLE = Shale				SNDS = Sandstone	
SANDSTONE & SHALE			271	275	CFRN	SNDS	SHLE	DLMT
CFRN = Franconia	SNDS = Sandstone		SHLE = Shale				DLMT = Dolomite	
HARD SHALE & SAND			275	302	CFRN	SHLE	SNDS	DLMT
CFRN = Franconia	SHLE = Shale		SNDS = Sandstone				DLMT = Dolomite	
HARD SHALE & SAND			302	316	CFRN	SHLE	SNDS	DLMT
CFRN = Franconia	SHLE = Shale		SNDS = Sandstone				DLMT = Dolomite	
SANDSTONE		HARD	316	320	CFRN	SNDS	DLMT	
CFRN = Franconia	SNDS = Sandstone		DLMT = Dolomite					
SANDSTONE & SHALE			320	353	CFRN	SNDS	SHLE	DLMT
CFRN = Franconia	SNDS = Sandstone		SHLE = Shale				DLMT = Dolomite	
SANDSTONE			353	356	CFRN	SNDS	SHLE	
CFRN = Franconia	SNDS = Sandstone		SHLE = Shale					

Unique No.	00202931	MINNESOTA DEPARTMENT OF HEALTH	Update Date	2008/12/30
County Name	Anoka	**WELL AND BORING RECORD** *Minnesota Statutes Chapter 1031*	Entry Date	1991/04/15

Township Name	Township	Range	Dir	Section	Subsection	Well Depth		Depth Completed		Date Well Completed
	31	24	W	13	ACDAAB	500	ft.	500	ft.	1969/04/07

Well Name	COON RAPIDS 9	**Lic. Or Reg. No.**	27010	**Name of Driller**	OLZESKE, T.		
USGS Quad	Coon Rapi	**Elevation**	897	**Aquifer**	CFIE	**Alternative Id**	80-6139

GEOLOGICAL MATERIAL	COLOR	HARDNESS	FROM	TO	STRAT	LITH PRIM	LITH SEC	LITH MINOR
SHALE SOME SAND			356	371	CFRN	SHLE	SNDS	DLMT
CFRN = Franconia	SHLE = Shale		SNDS = Sandstone			DLMT = Dolomite		
SHALE & SANDSTONE			371	388	CFRN	SHLE	SNDS	DLMT
CFRN = Franconia	SHLE = Shale		SNDS = Sandstone			DLMT = Dolomite		
SHALE			388	396	CFRN	SHLE	SNDS	
CFRN = Franconia	SHLE = Shale		SNDS = Sandstone					
SHALE & SANDSTONE			396	405	CFRN	SHLE	SNDS	
CFRN = Franconia	SHLE = Shale		SNDS = Sandstone					
SANDY SHALE			405	410	CFRN	SNDS	SHLE	DLMT
CFRN = Franconia	SNDS = Sandstone		SHLE = Shale			DLMT = Dolomite		
SANDY SHALE			410	415	CIGL	SNDS		
CIGL = Ironton-Galesville	SNDS = Sandstone							
SANDY SHALE			415	425	CIGL	SNDS		
CIGL = Ironton-Galesville	SNDS = Sandstone							
SANDY SHALE			425	454	CIGL	SNDS		
CIGL = Ironton-Galesville	SNDS = Sandstone							
SANDY SHALE			454	458	CIGL	SNDS		
CIGL = Ironton-Galesville	SNDS = Sandstone							
SANDY SHALE			458	462	CECR	SHLE	SNDS	
CECR = Eau Claire	SHLE = Shale		SNDS = Sandstone					
BLUE & RED SHALE			462	475	CECR	SHLE	SNDS	
CECR = Eau Claire	SHLE = Shale		SNDS = Sandstone					
SANDY SHALE			475	478	CECR	SHLE	SNDS	
CECR = Eau Claire	SHLE = Shale		SNDS = Sandstone					
SANDY SHALE			478	482	CECR	SHLE	SNDS	
CECR = Eau Claire	SHLE = Shale		SNDS = Sandstone					
SANDY SHALE			482	492	CECR	SHLE	SNDS	
CECR = Eau Claire	SHLE = Shale		SNDS = Sandstone					

Unique No.	00202931	MINNESOTA DEPARTMENT OF HEALTH	Update Date	2008/12/30
County Name	Anoka	**WELL AND BORING RECORD** *Minnesota Statutes Chapter 1031*	Entry Date	1991/04/15

Township Name	Township	Range	Dir	Section	Subsection	Well Depth		Depth Completed		Date Well Completed
	31	24	W	13	ACDAAB	500	ft.	500	ft.	1969/04/07

Well Name	COON RAPIDS 9	**Lic. Or Reg. No.**	27010	**Name of Driller**	OLZESKE, T.		
USGS Quad	Coon Rapi	**Elevation**	897	**Aquifer**	CFIE	**Alternative Id**	80-6139

GEOLOGICAL MATERIAL	COLOR	HARDNESS	FROM	TO	STRAT	LITH PRIM	LITH SEC	LITH MINOR
RED & GREEN SHALE			492	500	CECR	SHLE	SNDS	

CECR = Eau Claire SHLE = Shale SNDS = Sandstone

Unique No.	00202930	MINNESOTA DEPARTMENT OF HEALTH	Update Date	2007/02/07
County Name	Anoka	**WELL AND BORING RECORD**	Entry Date	1991/04/15

Minnesota Statutes Chapter 1031

Township Name	Township	Range	Dir	Section	Subsection
	31	24	W	13	DBADDC

Well Depth	Depth Completed	Date Well Completed
684 ft.	684 ft.	1970/05/05

Well Name COON RAPIDS 10

Drilling Method Cable Tool

Well Owner's Name COON RAPIDS 10
203 NORTHDALE BL
COON RAPIDS MN 55433

Drilling Fluid

Well Hydrofractured? ☐ Yes ☐ No
From ft. to ft.

Contact's Name CITY OF COON RAPIDS
11155 ROBINSON NW DR
COON RAPIDS MN 55433

Use Community Supply (municipal)

Casing **Drive Shoe?** ☐ Yes ☐ N

Hole Diameter

Casing Diameter		Weight(lbs/ft)	
30 in. t	80 ft		
24 in. t	259 ft		
16 in. t	272 ft		

GEOLOGICAL MATERIAL	COLOR	HARDNESS	FROM	TO
GLACIAL DRIFT			0	250
SANDY LIMESTONE			250	262
SANDY LIMESTONE			262	295
SANDSTONE WITH BEDS O			295	375
SANDSTONE SLATE	BROW		375	396
SANDSTONE SLATE	BROW		396	442
SANDSTONE SLATE BROW	BROW		442	455
HARD RED SHALE			455	457
HARD RED SHALE			457	495
SANDSTONE, SLATE	BROW		495	522
SANDSTONE, SLATE	BROW		522	662
SANDSTONE			662	679
RED SHALE			679	684

Screen N

Open Hole From 272 ft. to 684 ft.

Make Type

Static Water Level 51 ft. from Land surface Date 1970/05/05

PUMPING LEVEL (below land surface)
185 ft. after 49 hrs. pumping 1875 g.p.m.

Well Head Completion
Pitless adapter mfr Model
Casing Protection ☑ 12 in. above grade
☐ At-grade(Environmental Wells and Borings ONLY)

Grouting Information Well grouted? ☑ Yes ☐ No

Material	From	To (ft.)	Amount(yds/bags)
G	0	272	

Nearest Known Source of Contamination
ft. direction type
Well disinfected upon completion? ☐ Yes ☐ No

Pump ☐ Not Installed Date Installed Y
Mfr nam
Model HP 100 Volts
Drop Pipe Length ft. Capacity g.p.m
Type T

Any not in use and not sealed well(s) on property? ☐ Yes ☐ No

Was a variance granted from the MDH for this Well? ☐ Yes ☐ No

REMARKS, ELEVATION, SOURCE OF DATA, etc.

M.G.S. NO. 558. OLD PA. NO. 71-0825.

GAMMA LOGGED 5-3-2004. LOGGED BY JIM TRAEN.

USGS Quad Coon Rapids Elevation 899
Aquifer: CFMS Alt Id: 80-6139

Well CONTRACTOR CERTIFICATION Lic. Or Reg. No. 27118
License Business Name
Name of Driller BENEKE, R.

Report Copy

Unique No.	00202930	MINNESOTA DEPARTMENT OF HEALTH	Update Date	2007/02/07
County Name	Anoka	**WELL AND BORING RECORD** *Minnesota Statutes Chapter 1031*	Entry Date	1991/04/15

Township Name	Township	Range	Dir	Section	Subsection	Well Depth		Depth Completed		Date Well Completed
	31	24	W	13	DBADDC	684	ft.	684	ft.	1970/05/05

Well Name	COON RAPIDS 10	**Lic. Or Reg. No.**	27118	**Name of Driller**	BENEKE, R.		
USGS Quad	Coon Rapi	**Elevation**	899	**Aquifer**	CFMS	**Alternative Id**	80-6139

GEOLOGICAL MATERIAL	COLOR	HARDNESS	FROM	TO	STRAT	LITH PRIM	LITH SEC	LITH MINOR
GLACIAL DRIFT			0	250	QUUU	DRFT		
QUUU = Unknown deposit type	DRFT = Drift							
SANDY LIMESTONE			250	262	CSTL	SLSN	DLMT	
CSTL = St.Lawrence	SLSN = Siltstone		DLMT = Dolomite					
SANDY LIMESTONE			262	295	CFRN	SNDS	SHLE	DLMT
CFRN = Franconia	SNDS = Sandstone		SHLE = Shale				DLMT = Dolomite	
SANDSTONE WITH BEDS OF GREEN SHAL			295	375	CFRN	SNDS	SHLE	DLMT
CFRN = Franconia	SNDS = Sandstone		SHLE = Shale				DLMT = Dolomite	
SANDSTONE SLATE	BROWN		375	396	CFRN	SNDS	SHLE	DLMT
CFRN = Franconia	SNDS = Sandstone		SHLE = Shale				DLMT = Dolomite	
SANDSTONE SLATE	BROWN		396	442	CIGL	SNDS		
CIGL = Ironton-Galesville	SNDS = Sandstone							
SANDSTONE SLATE BROWN	BROWN		442	455	CIGL	SNDS		
CIGL = Ironton-Galesville	SNDS = Sandstone							
HARD RED SHALE			455	457	CIGL	SNDS		
CIGL = Ironton-Galesville	SNDS = Sandstone							
HARD RED SHALE			457	495	CECR	SHLE	SNDS	
CECR = Eau Claire	SHLE = Shale		SNDS = Sandstone					
SANDSTONE, SLATE	BROWN		495	522	CECR	SHLE	SNDS	
CECR = Eau Claire	SHLE = Shale		SNDS = Sandstone					
SANDSTONE, SLATE	BROWN		522	662	CMTS	SNDS		
CMTS = Mt.Simon	SNDS = Sandstone							
SANDSTONE			662	679	CMTS	SNDS		
CMTS = Mt.Simon	SNDS = Sandstone							
RED SHALE			679	684	PMRC	SHLE		
PMRC = Red Clastic Series	SHLE = Shale							

Unique No. 00202965	MINNESOTA DEPARTMENT OF HEALTH	Update Date 2008/12/30
County Name Anoka	**WELL AND BORING RECORD**	Entry Date 1991/04/15
	Minnesota Statutes Chapter 1031	

Township Name	Township	Range	Dir	Section	Subsection
	31	24	W	27	BAAAAA

Well Depth	Depth Completed	Date Well Completed
627 ft.	627 ft.	1972/05/11

Well Name COON RAPIDS 11

Drilling Method Non-specified Rotary

Well Owner's Name COON RAPIDS 11

COON RAPIDS MN 55433

Drilling Fluid

Well Hydrofractured? ☐ Yes ☐ No

From ft. to ft.

Contact's Name CITY OF COON RAPIDS

11155 ROBINSON NW DR

COON RAPIDS MN 55433

Use Community Supply (municipal)

Casing **Drive Shoe?** ☐ Yes ☐ N

Hole Diameter

in. t 157 ft

in. t 627 ft

Casing Diameter **Weight(lbs/ft)**

24 in. t 157 ft

GEOLOGICAL MATERIAL	COLOR	HARDNESS	FROM	TO
SAND			0	18
SANDY CLAY			18	58
SAND, GRAVEL & BOULDE			58	142
SAND, GRAVEL & BOULDE			142	146
LIME, SHALE			146	199
LIME, SHALE			199	305
SHALEY SANDSTONE			305	318
SHALEY SANDSTONE			318	352
SANDSTONE		SOFT	352	362
SANDSTONE		HARD	362	410
SANDSTONE		HARD	410	423
SHALE			423	434
SANDSTONE-SOME SHALE			434	478
SANDSTONE-SOME SHALE			478	530
SANDSTONE			530	622
SHALE			622	627

Screen N

Open Hole From 157 ft. to 627 ft.

Make Type

Static Water Level 25 ft. from Land surface Date 1972/05/11

PUMPING LEVEL (below land surface)

110 ft. after hrs. pumping 1820 g.p.m.

Well Head Completion

Pitless adapter mfr Model

Casing Protection ☑ 12 in. above grade

☐ At-grade(Environmental Wells and Borings ONLY)

Grouting Information Well grouted? ☑ Yes ☐ No

Material	From	To (ft.)	Amount(yds/bags)	
G	0	157	20	Y

Nearest Known Source of Contamination

ft. direction type

Well disinfected upon completion? ☐ Yes ☐ No

Pump ☐ Not Installed Date Installed

Mfr nam

Model HP Volts

Drop Pipe Length ft. Capacity g.p.m

Type

REMARKS, ELEVATION, SOURCE OF DATA, etc.

M.G.S. NO. 776

GAMMA LOGGED 9-12-1983 BY MGS AND 4-26-2002. LOGGED BY JIM TRAEN.

USGS Quad Coon Rapids Elevation 860

Aquifer: CFMS Alt Id: 80-6139

Any not in use and not sealed well(s) on property? ☐ Yes ☐ No

Was a variance granted from the MDH for this Well? ☐ Yes ☐ No

Well CONTRACTOR CERTIFICATION Lic. Or Reg. No. 62012

License Business Name

Name of Driller GIBSON, E.

Report Copy

Unique No.	00202965	MINNESOTA DEPARTMENT OF HEALTH	Update Date	2008/12/30
County Name	Anoka	**WELL AND BORING RECORD** *Minnesota Statutes Chapter 1031*	Entry Date	1991/04/15

Township Name	Township	Range	Dir	Section	Subsection	Well Depth		Depth Completed		Date Well Completed
	31	24	W	27	BAAAAA	627	ft.	627	ft.	1972/05/11

Well Name	COON RAPIDS 11	Lic. Or Reg. No.	62012	Name of Driller	GIBSON, E.
USGS Quad	Coon Rapi	Elevation	860	Aquifer	CFMS	Alternative Id	80-6139

GEOLOGICAL MATERIAL	COLOR	HARDNESS	FROM	TO	STRAT	LITH PRIM	LITH SEC	LITH MINOR
SAND			0	18	QFUU	SAND		
QFUU = Sand	SAND = Sand							
SANDY CLAY			18	58	QLUU	CLAY	SAND	
QLUU = Clay & sand	CLAY = Clay		SAND = Sand					
SAND, GRAVEL & BOULDERS			58	142	QHUU	SAND	GRVL	BLDR
QHUU = Sand & larger	SAND = Sand		GRVL = Gravel				BLDR = Boulder	
SAND, GRAVEL & BOULDERS			142	146	CSTL	DLMT	SLSN	
CSTL = St.Lawrence	DLMT = Dolomite		SLSN = Siltstone					
LIME, SHALE			146	199	CSTL	DLMT	SLSN	
CSTL = St.Lawrence	DLMT = Dolomite		SLSN = Siltstone					
LIME, SHALE			199	305	CFRN	SNDS	SHLE	DLMT
CFRN = Franconia	SNDS = Sandstone		SHLE = Shale				DLMT = Dolomite	
SHALEY SANDSTONE			305	318	CFRN	SNDS	SHLE	DLMT
CFRN = Franconia	SNDS = Sandstone		SHLE = Shale				DLMT = Dolomite	
SHALEY SANDSTONE			318	352	CIGL	SNDS		
CIGL = Ironton-Galesville	SNDS = Sandstone							
SANDSTONE		SOFT	352	362	CIGL	SNDS		
CIGL = Ironton-Galesville	SNDS = Sandstone							
SANDSTONE		HARD	362	410	CIGL	SNDS		
CIGL = Ironton-Galesville	SNDS = Sandstone							
SANDSTONE		HARD	410	423	CECR	SHLE	SNDS	
CECR = Eau Claire	SHLE = Shale		SNDS = Sandstone					
SHALE			423	434	CECR	SHLE	SNDS	
CECR = Eau Claire	SHLE = Shale		SNDS = Sandstone					
SANDSTONE-SOME SHALE			434	478	CECR	SHLE	SNDS	
CECR = Eau Claire	SHLE = Shale		SNDS = Sandstone					
SANDSTONE-SOME SHALE			478	530	CMTS	SNDS		
CMTS = Mt.Simon	SNDS = Sandstone							

Unique No.	00202965	MINNESOTA DEPARTMENT OF HEALTH	Update Date	2008/12/30
County Name	Anoka	**WELL AND BORING RECORD** *Minnesota Statutes Chapter 1031*	Entry Date	1991/04/15

Township Name	Township	Range	Dir	Section	Subsection	Well Depth		Depth Completed		Date Well Completed
	31	24	W	27	BAAAAA	627	ft.	627	ft.	1972/05/11

Well Name	COON RAPIDS 11	**Lic. Or Reg. No.**	62012	**Name of Driller**	GIBSON, E.		
USGS Quad	Coon Rapi	**Elevation**	860	**Aquifer**	CFMS	**Alternative Id**	80-6139

GEOLOGICAL MATERIAL	COLOR	HARDNESS	FROM	TO	STRAT	LITH PRIM	LITH SEC	LITH MINOR
SANDSTONE			530	622	CMTS	SNDS		
CMTS = Mt.Simon	SNDS = Sandstone							
SHALE			622	627	PMRC	SHLE		
PMRC = Red Clastic Series	SHLE = Shale							

Unique No. 00168721

County Name Anoka

MINNESOTA DEPARTMENT OF HEALTH

WELL AND BORING RECORD

Minnesota Statutes Chapter 1031

Update Date 2007/02/07

Entry Date 1991/04/15

Township Name	Township	Range	Dir	Section	Subsection
	31	24	W	27	AAAAAD

Well Depth		Depth Completed		Date Well Completed
604	ft.	604	ft.	1975/05/14

Well Name COON RAPIDS 12

Drilling Method Cable Tool

Well Owner's Name COON RAPIDS 12

COON RAPIDS MN 55433

Drilling Fluid

Well Hydrofractured? ☐ Yes ☐ No

From ft. to ft.

Contact's Name CITY OF COON RAPIDS

11155 ROBINSON NW DR

COON RAPIDS MN 55433

Use Community Supply (municipal)

Casing **Drive Shoe?** ☐ Yes ☐ N

Hole Diameter

Casing Diameter		Weight(lbs/ft)		
24	in. t	124	ft	94.62
16	in. t	208	ft	62.58

GEOLOGICAL MATERIAL	COLOR	HARDNESS	FROM	TO
SAND FILL	YELLO		0	9
SAND	GRAY		9	20
CLAY	GRAY		20	30
CLAY	RED/B		30	65
SANDY MUCK	BROW		65	100
SHALE	GRAY		100	120
JORDAN SANDROCK	WHITE		120	123
JORDAN SANDROCK	WHITE		123	135
ST. LAWRANCE SANDSTON	YELLO		135	140
ST. LAWRANCE SANDSTON	WHITE		140	170
ST. LAWRENCE SANDSTON	BLU/G		170	171
ST. LAWRANCE SANDSTON	BLU/G		171	180
ST. LAWRANCE SANDSTON	BLU/G		180	185
ST. LAWRANCE SANDSTON	PINK		185	195
ST. LAWRANCE SANDSTON	VARIE		195	208
ST. LAWRANCE SANDSTON	GREE		208	264
HARD LAYER OF SHALE	GREE		264	270
SHALE ROCK	GREE		270	286
SHALE SANDROCK	GREE		286	300
SANDROCK	TAN/G		300	316
SANDROCK	TAN/G		316	385
SHALE SANDSTONE	LIGHT		385	386
SHALE SANDSTONE	LIGHT		386	407
SHALE ROCK	TAN/B		407	420
SHALE	BRN/G		420	458
SHALE	BRN/G		458	480
SHALEY SANDSTONE	WHITE		480	550
SANDSTONE	TAN		550	600
SHALE	RED		600	604

Screen N

Open Hole From 208 ft. to 604 ft.

Make

Type

Static Water Level 47 ft. from Land surface Date 1975/05/14

PUMPING LEVEL (below land surface)

146 ft. after 8 hrs. pumping 1800 g.p.m.

Well Head Completion

Pitless adapter mfr Model

Casing Protection ☑ 12 in. above grade

☐ At-grade(Environmental Wells and Borings ONLY)

Grouting Information Well grouted? ☑ Yes ☐ No

Material	From	To (ft.)	Amount(yds/bags)
G			

Nearest Known Source of Contamination

ft. direction type

Well disinfected upon completion? ☑ Yes ☐ No

Pump ☐ Not Installed Date Installed

Mfr name

Model HP Volts

Drop Pipe Length ft. Capacity g.p.m

Type

REMARKS, ELEVATION, SOURCE OF DATA, etc.

M.G.S. NO.985.

GAMMA LOGGED 1-18-05. LOGGED BY JIM TRAEN.

Any not in use and not sealed well(s) on property? ☐ Yes ☐ No

USGS Quad	Coon Rapids	Elevation	852
Aquifer:	CFMS	Alt Id:	80-6139

Was a variance granted from the MDH for this Well? ☐ Yes ☐ No

Well CONTRACTOR CERTIFICATION Lic. Or Reg. No. 02015

License Business Name

Name of Driller SIGAFOOS, G.

Report Copy

HE-01205-06 (Rev. 9/96)

Unique No.	00168721	MINNESOTA DEPARTMENT OF HEALTH	Update Date	2007/02/07
County Name	Anoka	**WELL AND BORING RECORD** *Minnesota Statutes Chapter 1031*	Entry Date	1991/04/15

Township Name	Township	Range	Dir	Section	Subsection	Well Depth		Depth Completed		Date Well Completed
	31	24	W	27	AAAAAD	604	ft.	604	ft.	1975/05/14

Well Name	COON RAPIDS 12	**Lic. Or Reg. No.**	02015	**Name of Driller**	SIGAFOOS, G.		
USGS Quad	Coon Rapi	**Elevation**	852	**Aquifer**	CFMS	**Alternative Id**	80-6139

GEOLOGICAL MATERIAL	COLOR	HARDNESS	FROM	TO	STRAT	LITH PRIM	LITH SEC	LITH MINOR
SAND FILL	YELLOW		0	9	RMMF	SAND	FILL	
RMMF = Man-made fill	SAND = Sand		FILL = Fill					
SAND	GRAY		9	20	QFUG	SAND		
QFUG = Sand	SAND = Sand							
CLAY	GRAY		20	30	QCUG	CLAY		
QCUG = Clay	CLAY = Clay							
CLAY	RED/BRN		30	65	QCUU	CLAY		
QCUU = Clay	CLAY = Clay							
SANDY MUCK	BROWN		65	100	QNUB	SAND	MUCK	
QNUB = Sand & silt	SAND = Sand		MUCK = Muck					
SHALE	GRAY		100	120	QCUG	CLAY		
QCUG = Clay	CLAY = Clay							
JORDAN SANDROCK	WHITE		120	123	QFUU	SAND		
QFUU = Sand	SAND = Sand							
JORDAN SANDROCK	WHITE		123	135	CJDN	SNDS		
CJDN = Jordan	SNDS = Sandstone							
ST. LAWRANCE SANDSTONE	YELLOW		135	140	CSTL	SLSN	DLMT	SNDS
CSTL = St.Lawrence	SLSN = Siltstone		DLMT = Dolomite				SNDS = Sandstone	
ST. LAWRANCE SANDSTONE	WHITE		140	170	CSTL	SLSN	DLMT	SNDS
CSTL = St.Lawrence	SLSN = Siltstone		DLMT = Dolomite				SNDS = Sandstone	
ST. LAWRENCE SANDSTONE	BLU/GRN		170	171	CSTL	SLSN	DLMT	SNDS
CSTL = St.Lawrence	SLSN = Siltstone		DLMT = Dolomite				SNDS = Sandstone	
ST. LAWRANCE SANDSTONE	BLU/GRN		171	180	CFRN	SNDS	SHLE	DLMT
CFRN = Franconia	SNDS = Sandstone		SHLE = Shale				DLMT = Dolomite	
ST. LAWRANCE SANDSTONE	BLU/GRN		180	185	CFRN	SNDS	SHLE	DLMT
CFRN = Franconia	SNDS = Sandstone		SHLE = Shale				DLMT = Dolomite	
ST. LAWRANCE SANDSTONE	PINK		185	195	CFRN	SNDS	SHLE	DLMT
CFRN = Franconia	SNDS = Sandstone		SHLE = Shale				DLMT = Dolomite	

Unique No.	00168721	MINNESOTA DEPARTMENT OF HEALTH	Update Date	2007/02/07
County Name	Anoka	**WELL AND BORING RECORD** *Minnesota Statutes Chapter 1031*	Entry Date	1991/04/15

Township Name	Township	Range	Dir	Section	Subsection	Well Depth		Depth Completed		Date Well Completed
	31	24	W	27	AAAAAD	604	ft.	604	ft.	1975/05/14

Well Name	COON RAPIDS 12	**Lic. Or Reg. No.**	02015	**Name of Driller**	SIGAFOOS, G.		
USGS Quad	Coon Rapi	**Elevation**	852	**Aquifer**	CFMS	**Alternative Id**	80-6139

GEOLOGICAL MATERIAL	COLOR	HARDNESS	FROM	TO	STRAT	LITH PRIM	LITH SEC	LITH MINOR
ST. LAWRANCE SANDSTONE	VARIED		195	208	CFRN	SNDS	SHLE	DLMT
CFRN = Franconia	SNDS = Sandstone		SHLE = Shale			DLMT = Dolomite		
ST. LAWRANCE SANDSTONE	GREEN		208	264	CFRN	SNDS	SHLE	DLMT
CFRN = Franconia	SNDS = Sandstone		SHLE = Shale			DLMT = Dolomite		
HARD LAYER OF SHALE	GREEN		264	270	CFRN	SNDS	SHLE	DLMT
CFRN = Franconia	SNDS = Sandstone		SHLE = Shale			DLMT = Dolomite		
SHALE ROCK	GREEN		270	286	CFRN	SNDS	SHLE	DLMT
CFRN = Franconia	SNDS = Sandstone		SHLE = Shale			DLMT = Dolomite		
SHALE SANDROCK	GREEN		286	300	CFRN	SNDS	SHLE	DLMT
CFRN = Franconia	SNDS = Sandstone		SHLE = Shale			DLMT = Dolomite		
SANDROCK	TAN/GRN		300	316	CFRN	SNDS	SHLE	DLMT
CFRN = Franconia	SNDS = Sandstone		SHLE = Shale			DLMT = Dolomite		
SANDROCK	TAN/GRN		316	385	CIGL	SNDS		
CIGL = Ironton-Galesville	SNDS = Sandstone							
SHALE SANDSTONE	LIGHT		385	386	CIGL	SNDS		
CIGL = Ironton-Galesville	SNDS = Sandstone							
SHALE SANDSTONE	LIGHT		386	407	CECR	SHLE	SNDS	
CECR = Eau Claire	SHLE = Shale		SNDS = Sandstone					
SHALE ROCK	TAN/BRN		407	420	CECR	SHLE	SNDS	
CECR = Eau Claire	SHLE = Shale		SNDS = Sandstone					
SHALE	BRN/GRN		420	458	CECR	SHLE	SNDS	
CECR = Eau Claire	SHLE = Shale		SNDS = Sandstone					
SHALE	BRN/GRN		458	480	CMTS	SNDS		
CMTS = Mt.Simon	SNDS = Sandstone							
SHALEY SANDSTONE	WHITE		480	550	CMTS	SNDS		
CMTS = Mt.Simon	SNDS = Sandstone							
SANDSTONE	TAN		550	600	CMTS	SNDS		
CMTS = Mt.Simon	SNDS = Sandstone							

Unique No.	00168721	MINNESOTA DEPARTMENT OF HEALTH	Update Date	2007/02/07
County Name	Anoka	**WELL AND BORING RECORD** *Minnesota Statutes Chapter 1031*	Entry Date	1991/04/15

Township Name	Township	Range	Dir	Section	Subsection	Well Depth		Depth Completed		Date Well Completed
	31	24	W	27	AAAAAD	604	ft.	604	ft.	1975/05/14

Well Name	COON RAPIDS 12	**Lic. Or Reg. No.**	02015	**Name of Driller**	SIGAFOOS, G.		
USGS Quad	Coon Rapi	**Elevation**	852	**Aquifer**	CFMS	**Alternative Id**	80-6139

GEOLOGICAL MATERIAL	COLOR	HARDNESS	FROM	TO	STRAT	LITH PRIM	LITH SEC	LITH MINOR
SHALE	RED		600	604	PMSU	SHLE		

PMSU = Mid.Proterozoic Sedimentary SHLE = Shale

Unique No. 00168720

County Name Anoka

MINNESOTA DEPARTMENT OF HEALTH

WELL AND BORING RECORD

Minnesota Statutes Chapter 1031

Update Date 2007/02/07

Entry Date 1991/04/15

Township Name	Township	Range	Dir	Section	Subsection
	31	24	W	13	DADDBC

Well Depth	Depth Completed	Date Well Completed
693 ft.	693 ft.	1977/03/25

Well Name COON RAPIDS 13

Drilling Method Cable Tool

Well Owner's Name COON RAPIDS 13
11100 UNIVERSITY AV
COON RAPIDS MN 55433

Drilling Fluid

Well Hydrofractured? ☐ Yes ☐ No
From ft. to ft.

Contact's Name CITY OF COON RAPIDS
11155 ROBINSON NW DR
COON RAPIDS MN 55433

Use Community Supply (municipal)

Casing **Drive Shoe?** ☑ Yes ☐ N

Hole Diameter

Casing Diameter		Weight(lbs/ft)
24 in. t	252 ft	94.62
16 in. t	395 ft	62.58

GEOLOGICAL MATERIAL	COLOR	HARDNESS	FROM	TO
SAND	BROW		0	55
SANDY CLAY	GRAY		55	75
FINE SAND	GRAY	HARD	75	85
FINE SAND	RED		85	105
CLAY STICKY	RED		105	135
CLAY & STONE	GRAY	HARD	135	160
FINE SAND	RED		160	175
CLAY	GRAY		175	195
SAND & STONES & CLAY	GRAY		195	205
STONES & SAND	DARK		205	215
SHALE & STONES	TAN		215	220
SHALE	TAN		220	245
SANDSTONE SHALE	GRAY		245	250
SHALE	RED		250	257
ST. LAWRANCE GREEN, RE	VARIE		257	260
HARDROCK	TAN		260	267
HARDROCK	TAN		267	268
SANDROCK	LIGHT	HARD	268	298
SANDY ROCK, SHALE	GREE		298	312
SANDROCK, SHALE	LIGHT		312	338
SANDSTONE GREEN-GRAY-			338	403
SANDSTONE GREEN-GRAY-			403	453
SANDSTONE GREEN-GRAY-			453	525
SANDSTONE GREEN-GRAY-			525	672
HINCKLEY SANDSTONE	RED		672	691
HINCKLEY SANDSTONE			691	693

Screen N

Open Hole From 395 ft. to 693 ft.

Make Type

Static Water Level 75 ft. from Land surface Date 1977/03/25

PUMPING LEVEL (below land surface)
158 ft. after 10 hrs. pumping 1000 g.p.m.

Well Head Completion
Pitless adapter mfr Model
Casing Protection ☑ 12 in. above grade
☐ At-grade(Environmental Wells and Borings ONLY)

Grouting Information Well grouted? ☑ Yes ☐ No

Material	From	To (ft.)	Amount(yds/bags)
G			

Nearest Known Source of Contamination
ft. direction type
Well disinfected upon completion? ☐ Yes ☐ No

Pump ☐ Not Installed Date Installed
Mfr name
Model HP Volts

Drop Pipe Length ft. Capacity g.p.m
Type

Any not in use and not sealed well(s) on property? ☐ Yes ☐ No

Was a variance granted from the MDH for this Well? ☐ Yes ☐ No

REMARKS, ELEVATION, SOURCE OF DATA, etc.

M.G.S. NO.1124.

GAMMA LOGGED 2-6-04. LOGGED BY JIM TRAEN.

USGS Quad Coon Rapids Elevation 900
Aquifer: CFMS Alt Id: 80-6139

Well CONTRACTOR CERTIFICATION Lic. Or Reg. No. 02015
License Business Name

Report Copy

Unique No.	00168720	MINNESOTA DEPARTMENT OF HEALTH	Update Date	2007/02/07
County Name	Anoka	**WELL AND BORING RECORD** *Minnesota Statutes Chapter 1031*	Entry Date	1991/04/15

Township Name	Township	Range	Dir	Section	Subsection	Well Depth		Depth Completed		Date Well Completed
	31	24	W	13	DADDBC	693	ft.	693	ft.	1977/03/25

Well Name	COON RAPIDS 13	**Lic. Or Reg. No.**	02015	**Name of Driller**	SIGAFOOS, G.		
USGS Quad	Coon Rapi	**Elevation**	900	**Aquifer**	CFMS	**Alternative Id**	80-6139

GEOLOGICAL MATERIAL	COLOR	HARDNESS	FROM	TO	STRAT	LITH PRIM	LITH SEC	LITH MINOR
SAND	BROWN		0	55	QFUB	SAND		
QFUB = Sand	SAND = Sand							
SANDY CLAY	GRAY		55	75	QLUG	CLAY	SAND	
QLUG = Clay & sand	CLAY = Clay			SAND = Sand				
FINE SAND	GRAY	HARD	75	85	QFUG	SAND		
QFUG = Sand	SAND = Sand							
FINE SAND	RED		85	105	QFUR	SAND		
QFUR = Sand	SAND = Sand							
CLAY STICKY	RED		105	135	QCUR	CLAY		
QCUR = Clay	CLAY = Clay							
CLAY & STONE	GRAY	HARD	135	160	QPUG	CLAY	PEBL	
QPUG = Pebbly sand/silt/clay	CLAY = Clay			PEBL = Pebbles				
FINE SAND	RED		160	175	QFUR	SAND		
QFUR = Sand	SAND = Sand							
CLAY	GRAY		175	195	QCUG	CLAY		
QCUG = Clay	CLAY = Clay							
SAND & STONES & CLAY	GRAY		195	205	QPUG	SAND	PEBL	CLAY
QPUG = Pebbly sand/silt/clay	SAND = Sand			PEBL = Pebbles			CLAY = Clay	
STONES & SAND	DARK		205	215	QHUU	PEBL	SAND	
QHUU = Sand & larger	PEBL = Pebbles			SAND = Sand				
SHALE & STONES	TAN		215	220	QPUU	CLAY	PEBL	
QPUU = Pebbly sand/silt/clay	CLAY = Clay			PEBL = Pebbles				
SHALE	TAN		220	245	QCUU	CLAY		
QCUU = Clay	CLAY = Clay							
SANDSTONE SHALE	GRAY		245	250	QLUG	SAND	CLAY	
QLUG = Clay & sand	SAND = Sand			CLAY = Clay				
SHALE	RED		250	257	QCUR	CLAY		
QCUR = Clay	CLAY = Clay							

Unique No.	00168720	MINNESOTA DEPARTMENT OF HEALTH	Update Date	2007/02/07
County Name	Anoka	**WELL AND BORING RECORD** *Minnesota Statutes Chapter 1031*	Entry Date	1991/04/15

Township Name	Township	Range	Dir	Section	Subsection	Well Depth		Depth Completed		Date Well Completed
	31	24	W	13	DADDBC	693	ft.	693	ft.	1977/03/25

Well Name	COON RAPIDS 13			**Lic. Or Reg. No.**	02015	**Name of Driller**	SIGAFOOS, G.
USGS Quad	Coon Rapi	**Elevation**	900	**Aquifer**	CFMS	**Alternative Id**	80-6139

GEOLOGICAL MATERIAL	COLOR	HARDNESS	FROM	TO	STRAT	LITH PRIM	LITH SEC	LITH MINOR
ST. LAWRANCE GREEN, RED, BLACK	VARIED		257	260	QUUU	SAND	CLAY	COBL
QUUU = Unknown deposit type	SAND = Sand		CLAY = Clay				COBL = Cobble	
HARDROCK	TAN		260	267	QBUU	BLDR		
QBUU = Boulder or boulders	BLDR = Boulder							
HARDROCK	TAN		267	268	CSTL	DLMT	SLSN	
CSTL = St.Lawrence	DLMT = Dolomite		SLSN = Siltstone					
SANDROCK	LIGHT	HARD	268	298	CFRN	SNDS	SHLE	DLMT
CFRN = Franconia	SNDS = Sandstone		SHLE = Shale				DLMT = Dolomite	
SANDY ROCK, SHALE	GREEN		298	312	CFRN	SNDS	SHLE	DLMT
CFRN = Franconia	SNDS = Sandstone		SHLE = Shale				DLMT = Dolomite	
SANDROCK, SHALE	LIGHT		312	338	CFRN	SNDS	SHLE	DLMT
CFRN = Franconia	SNDS = Sandstone		SHLE = Shale				DLMT = Dolomite	
SANDSTONE GREEN-GRAY-RED			338	403	CFRN	SNDS	SHLE	DLMT
CFRN = Franconia	SNDS = Sandstone		SHLE = Shale				DLMT = Dolomite	
SANDSTONE GREEN-GRAY-RED			403	453	CIGL	SNDS		
CIGL = Ironton-Galesville	SNDS = Sandstone							
SANDSTONE GREEN-GRAY-RED			453	525	CECR	SHLE	SNDS	
CECR = Eau Claire	SHLE = Shale		SNDS = Sandstone					
SANDSTONE GREEN-GRAY-RED			525	672	CMTS	SNDS		
CMTS = Mt.Simon	SNDS = Sandstone							
HINCKLEY SANDSTONE	RED		672	691	CMTS	SNDS		
CMTS = Mt.Simon	SNDS = Sandstone							
HINCKLEY SANDSTONE			691	693	PMRC	SHLE		
PMRC = Red Clastic Series	SHLE = Shale							

Unique No. 00110460	MINNESOTA DEPARTMENT OF HEALTH	Update Date 2007/02/07
County Name Anoka	**WELL AND BORING RECORD**	Entry Date 1991/04/15
	Minnesota Statutes Chapter 1031	

Township Name	Township	Range	Dir	Section	Subsection
	31	24	W	22	BCBBDD

Well Depth	Depth Completed	Date Well Completed
613 ft.	613 ft.	1977/03/22

Well Name COON RAPIDS 14

Drilling Method Cable Tool

Well Owner's Name COON RAPIDS 14
2344 COON RAPIDS BL
COON RAPIDS MN 55433

Drilling Fluid

Well Hydrofractured? ☐ Yes ☐ No
From ft. to ft.

Contact's Name CITY OF COON RAPIDS
11155 ROBINSON NW DR
COON RAPIDS MN 55433

Use Community Supply (municipal)

Casing **Drive Shoe?** ☑ Yes ☐ N

Hole Diameter

Casing Diameter **Weight(lbs/ft)**

30 in. t 222 ft

20 in. t 328 ft

GEOLOGICAL MATERIAL	COLOR	HARDNESS	FROM	TO
SAND & GRAVEL			0	60
SAND	LT. BR		60	130
SAND W/SHALE STREAKS	GREE		130	167
SHALE-SANDY	GREE		167	170
SHALE-SANDY	GREE		170	218
SANDSTONE			218	250
SANDY SHALE			250	305
DOLOMITE/SHALE			305	330
SHALE	RED		330	339
SHALE	RED		339	340
SAND	WHITE		340	385
SHALE W/LIMESTONE SEA	VARIE		385	391
SHALE W/LIMESTONE SEA	VARIE		391	450
SANDSTONE W/SHALE	VARIE		450	456
SANDSTONE W/SHALE	VARIE		456	520
SHALE-STICKY			520	570
SHALE W/SAND LAYERS			572	610
SHALE	RED		610	613

Screen N

Open Hole From 328 ft. to 613 ft.

Make Type

Static Water Level 120 ft. from Land surface Date 1977/03/21

PUMPING LEVEL (below land surface)

196 ft. after 8 hrs. pumping 1600 g.p.m.

Well Head Completion

Pitless adapter mfr Model

Casing Protection ☑ 12 in. above grade

☐ At-grade(Environmental Wells and Borings ONLY)

Grouting Information Well grouted? ☑ Yes ☐ No

Material	From	To (ft.)	Amount(yds/bags)	
G	0	328	28	Y

Nearest Known Source of Contamination

ft. direction type

Well disinfected upon completion? ☑ Yes ☐ No

Pump ☐ Not Installed Date Installed Y

Mfr nam

Model HP Volts

Drop Pipe Length ft. Capacity g.p.m

Type T

Any not in use and not sealed well(s) on property? ☐ Yes ☐ No

Was a variance granted from the MDH for this Well? ☐ Yes ☐ No

REMARKS, ELEVATION, SOURCE OF DATA, etc.

GAMMA LOGGED 2-6-1997 & 10-17-2001. M.G.S. NO. 1108.

LOGGED BOTH TIMES BY JIM TRAEN.

USGS Quad Coon Rapids Elevation 869

Aquifer: CFMS Alt Id: 80-6139

Well CONTRACTOR CERTIFICATION Lic. Or Reg. No. 27010

License Business Name

Name of Driller LINDEKE, W.

Report Copy

Unique No.	00110460	MINNESOTA DEPARTMENT OF HEALTH	Update Date	2007/02/07
County Name	Anoka	**WELL AND BORING RECORD** *Minnesota Statutes Chapter 1031*	Entry Date	1991/04/15

Township Name	Township	Range	Dir	Section	Subsection	Well Depth		Depth Completed		Date Well Completed
	31	24	W	22	BCBBDD	613	ft.	613	ft.	1977/03/22

Well Name	COON RAPIDS 14	**Lic. Or Reg. No.**	27010	**Name of Driller**	LINDEKE, W.		
USGS Quad	Coon Rapi	**Elevation**	869	**Aquifer**	CFMS	**Alternative Id**	80-6139

GEOLOGICAL MATERIAL	COLOR	HARDNESS	FROM	TO	STRAT	LITH PRIM	LITH SEC	LITH MINOR
SAND & GRAVEL			0	60	QHUU	SAND	GRVL	
QHUU = Sand & larger	SAND = Sand		GRVL = Gravel					
SAND	LT. BRN		60	130	QFUB	SAND		
QFUB = Sand	SAND = Sand							
SAND W/SHALE STREAKS	GREEN		130	167	QLUL	SAND	CLAY	
QLUL = Clay & sand	SAND = Sand		CLAY = Clay					
SHALE-SANDY	GREEN		167	170	QLUL	CLAY	SAND	
QLUL = Clay & sand	CLAY = Clay		SAND = Sand					
SHALE-SANDY	GREEN		170	218	CFRN	SNDS	SHLE	DLMT
CFRN = Franconia	SNDS = Sandstone		SHLE = Shale				DLMT = Dolomite	
SANDSTONE			218	250	CFRN	SNDS	SHLE	
CFRN = Franconia	SNDS = Sandstone		SHLE = Shale					
SANDY SHALE			250	305	CFRN	SNDS	SLSN	DLMT
CFRN = Franconia	SNDS = Sandstone		SLSN = Siltstone				DLMT = Dolomite	
DOLOMITE/SHALE			305	330	CFRN	SNDS	DLMT	SHLE
CFRN = Franconia	SNDS = Sandstone		DLMT = Dolomite				SHLE = Shale	
SHALE	RED		330	339	CFRN	SHLE	SNDS	DLMT
CFRN = Franconia	SHLE = Shale		SNDS = Sandstone				DLMT = Dolomite	
SHALE	RED		339	340	CIGL	SNDS		
CIGL = Ironton-Galesville	SNDS = Sandstone							
SAND	WHITE		340	385	CIGL	SNDS		
CIGL = Ironton-Galesville	SNDS = Sandstone							
SHALE W/LIMESTONE SEAMS	VARIED		385	391	CIGL	SNDS		
CIGL = Ironton-Galesville	SNDS = Sandstone							
SHALE W/LIMESTONE SEAMS	VARIED		391	450	CECR	SLSN	SHLE	
CECR = Eau Claire	SLSN = Siltstone		SHLE = Shale					
SANDSTONE W/SHALE	VARIED		450	456	CECR	SNDS	SLSN	
CECR = Eau Claire	SNDS = Sandstone		SLSN = Siltstone					

Unique No.	00110460	MINNESOTA DEPARTMENT OF HEALTH	Update Date	2007/02/07
County Name	Anoka	**WELL AND BORING RECORD** *Minnesota Statutes Chapter 1031*	Entry Date	1991/04/15

Township Name	Township	Range	Dir	Section	Subsection	Well Depth		Depth Completed		Date Well Completed
	31	24	W	22	BCBBDD	613	ft.	613	ft.	1977/03/22

Well Name	COON RAPIDS 14	**Lic. Or Reg. No.**	27010	**Name of Driller**	LINDEKE, W.		
USGS Quad	Coon Rapi	**Elevation**	869	**Aquifer**	CFMS	**Alternative Id**	80-6139

GEOLOGICAL MATERIAL	COLOR	HARDNESS	FROM	TO	STRAT	LITH PRIM	LITH SEC	LITH MINOR
SANDSTONE W/SHALE	VARIED		456	520	CMTS	SNDS	SLSN	
CMTS = Mt.Simon	SNDS = Sandstone		SLSN = Siltstone					
SHALE-STICKY			520	570	CMTS	SNDS		
CMTS = Mt.Simon	SNDS = Sandstone							
SHALE W/SAND LAYERS			572	610	CMTS	SNDS		
CMTS = Mt.Simon	SNDS = Sandstone							
SHALE	RED		610	613	PMRC	SHLE		
PMRC = Red Clastic Series	SHLE = Shale							

Unique No.	00110461	MINNESOTA DEPARTMENT OF HEALTH	Update Date	2007/02/07
County Name	Anoka	**WELL AND BORING RECORD**	Entry Date	1991/04/15

Minnesota Statutes Chapter 1031

Township Name	Township	Range	Dir	Section	Subsection
	31	24	W	22	BCDDCA

Well Depth	Depth Completed	Date Well Completed
615 ft.	615 ft.	1976/09/13

Well Name COON RAPIDS 15

Drilling Method Cable Tool

Well Owner's Name COON RAPIDS 15
2231 105TH AV
COON RAPIDS MN 55433

Drilling Fluid

Well Hydrofractured? ☐ Yes ☐ No
From ft. to ft.

Contact's Name CITY OF COON RAPIDS
11155 ROBINSON NW DR
COON RAPIDS MN 55433

Use Community Supply (municipal)

Casing **Drive Shoe?** ☑ Yes ☐ N

Hole Diameter

Casing Diameter **Weight(lbs/ft)**

30 in. t 184 ft
20 in. t 225 ft

GEOLOGICAL MATERIAL	COLOR	HARDNESS	FROM	TO
DIRT	BLACK		0	3
FINE SAND			3	25
SAND & ROCKS			25	35
CLAY		HARD	35	40
CLAY & FINE SAND			40	87
SAND, TRACE OF CLAY			87	97
SAND/GRAVEL/TRACES OF			97	121
FINE SAND, TRACE OF CLA			121	145
SANDSTONE		SOFT	145	160
SHALE	BLUE		160	170
RED SHALE & SANDROCK	RED		170	178
SAND/GRAVEL/TRACE OF S	GREE		178	183
GREEN SHALE & ROCK	GREE		183	194
FRANCONIA SANDSTONE			194	295
FRANCONIA SHALE STREA			295	340
FRANCONIA SHALE STREA			340	348
RED & BLUE SHALE STREA			348	352
IRONTON GALESVILLE SAN			352	405
EAU CLAIRE SHALE			405	485
MT. SIMON			485	510
MT. SIMON, TRACE OF SHA			510	540
MT. SIMON		HARD	540	610
SHALE	RED		610	615

Screen N

Open Hole From 225 ft. to 615 ft.

Make Type

Static Water Level 50 ft. from Land surface Date 1976/09/10

PUMPING LEVEL (below land surface)
148 ft. after 15 hrs. pumping 2400 g.p.m.

Well Head Completion
Pitless adapter mfr Model
Casing Protection ☐ 12 in. above grade
☐ At-grade(Environmental Wells and Borings ONLY)

Grouting Information Well grouted? ☑ Yes ☐ No

Material	From	To (ft.)	Amount(yds/bags)	
G			15	Y

Nearest Known Source of Contamination
ft. direction type
Well disinfected upon completion? ☐ Yes ☐ No

Pump ☐ Not Installed Date Installed
Mfr nam
Model HP Volts
Drop Pipe Length ft. Capacity g.p.m
Type

Any not in use and not sealed well(s) on property? ☐ Yes ☐ No

Was a variance granted from the MDH for this Well? ☐ Yes ☐ No

REMARKS, ELEVATION, SOURCE OF DATA, etc.

GAMMA LOGGED 4-26-2002. M.G.S. NO. 1105. LOGGED BY JIM TRAEN.

USGS Quad Coon Rapids Elevation 870
Aquifer: CFMS Alt Id: 80-6139

Well CONTRACTOR CERTIFICATION Lic. Or Reg. No. 27010
License Business Name
Name of Driller HOLLEN, G.

Report Copy

Unique No.	00110461	MINNESOTA DEPARTMENT OF HEALTH	Update Date	2007/02/07
County Name	Anoka	**WELL AND BORING RECORD** *Minnesota Statutes Chapter 1031*	Entry Date	1991/04/15

Township Name	Township	Range	Dir	Section	Subsection	Well Depth		Depth Completed		Date Well Completed
	31	24	W	22	BCDDCA	615	ft.	615	ft.	1976/09/13

Well Name	COON RAPIDS 15	**Lic. Or Reg. No.**	27010	**Name of Driller**	HOLLEN, G.		
USGS Quad	Coon Rapi	**Elevation**	870	**Aquifer**	CFMS	**Alternative Id**	80-6139

GEOLOGICAL MATERIAL	COLOR	HARDNESS	FROM	TO	STRAT	LITH PRIM	LITH SEC	LITH MINOR
DIRT	BLACK		0	3	RUUK	SOIL	ORGD	
RUUK = Recent Deposit	SOIL = Soil			ORGD = Organic Deposits				
FINE SAND			3	25	QFUU	SAND		
QFUU = Sand	SAND = Sand							
SAND & ROCKS			25	35	QHUU	SAND	COBL	
QHUU = Sand & larger	SAND = Sand			COBL = Cobble				
CLAY		HARD	35	40	QCUU	CLAY		
QCUU = Clay	CLAY = Clay							
CLAY & FINE SAND			40	87	QLUU	CLAY	SAND	
QLUU = Clay & sand	CLAY = Clay			SAND = Sand				
SAND, TRACE OF CLAY			87	97	QLUU	SAND	CLAY	
QLUU = Clay & sand	SAND = Sand			CLAY = Clay				
SAND/GRAVEL/TRACES OF CLAY			97	121	QPUU	SAND	GRVL	CLAY
QPUU = Pebbly sand/silt/clay	SAND = Sand			GRVL = Gravel			CLAY = Clay	
FINE SAND, TRACE OF CLAY			121	145	QLUU	SAND	CLAY	
QLUU = Clay & sand	SAND = Sand			CLAY = Clay				
SANDSTONE		SOFT	145	160	QFUU	SAND		
QFUU = Sand	SAND = Sand							
SHALE	BLUE		160	170	QCUG	CLAY		
QCUG = Clay	CLAY = Clay							
RED SHALE & SANDROCK	RED		170	178	QLUR	CLAY	SAND	
QLUR = Clay & sand	CLAY = Clay			SAND = Sand				
SAND/GRAVEL/TRACE OF SHALE	GREEN		178	183	QHUU	SAND	GRVL	
QHUU = Sand & larger	SAND = Sand			GRVL = Gravel				
GREEN SHALE & ROCK	GREEN		183	194	CFRN	SHLE	DLMT	
CFRN = Franconia	SHLE = Shale			DLMT = Dolomite				
FRANCONIA SANDSTONE			194	295	CFRN	SNDS	SHLE	
CFRN = Franconia	SNDS = Sandstone			SHLE = Shale				

Unique No.	00110461	MINNESOTA DEPARTMENT OF HEALTH	Update Date	2007/02/07
County Name	Anoka	**WELL AND BORING RECORD** *Minnesota Statutes Chapter 1031*	Entry Date	1991/04/15

Township Name	Township	Range	Dir	Section	Subsection	Well Depth		Depth Completed		Date Well Completed
	31	24	W	22	BCDDCA	615	ft.	615	ft.	1976/09/13

Well Name	COON RAPIDS 15	**Lic. Or Reg. No.**	27010	**Name of Driller**	HOLLEN, G.		
USGS Quad	Coon Rapi	**Elevation**	870	**Aquifer**	CFMS	**Alternative Id**	80-6139

GEOLOGICAL MATERIAL	COLOR	HARDNESS	FROM	TO	STRAT	LITH PRIM	LITH SEC	LITH MINOR
FRANCONIA SHALE STREAKS			295	340	CFRN	SNDS	SHLE	DLMT
CFRN = Franconia	SNDS = Sandstone		SHLE = Shale			DLMT = Dolomite		
FRANCONIA SHALE STREAKS			340	348	CIGL	SNDS		
CIGL = Ironton-Galesville	SNDS = Sandstone							
RED & BLUE SHALE STREAKS			348	352	CIGL	SNDS		
CIGL = Ironton-Galesville	SNDS = Sandstone							
IRONTON GALESVILLE SANDSTONE			352	405	CIGL	SNDS		
CIGL = Ironton-Galesville	SNDS = Sandstone							
EAU CLAIRE SHALE			405	485	CECR	SHLE	SNDS	
CECR = Eau Claire	SHLE = Shale		SNDS = Sandstone					
MT. SIMON			485	510	CMTS	SNDS		
CMTS = Mt.Simon	SNDS = Sandstone							
MT. SIMON, TRACE OF SHALE			510	540	CMTS	SNDS		
CMTS = Mt.Simon	SNDS = Sandstone							
MT. SIMON		HARD	540	610	CMTS	SNDS		
CMTS = Mt.Simon	SNDS = Sandstone							
SHALE	RED		610	615	PMRC	SHLE		
PMRC = Red Clastic Series	SHLE = Shale							

Unique No.	00161413	MINNESOTA DEPARTMENT OF HEALTH	Update Date	2007/02/06
County Name	Anoka	**WELL AND BORING RECORD**	Entry Date	1991/04/15

Minnesota Statutes Chapter 1031

Township Name	Township	Range	Dir	Section	Subsection
	31	24	W	11	ADAAAA

Well Depth	Depth Completed	Date Well Completed
653 ft.	653 ft.	1981/04/10

Well Name COON RAPIDS 16

Drilling Method Cable Tool

Well Owner's Name COON RAPIDS 16
12280 OLIVE ST
COON RAPIDS MN 55433

Drilling Fluid

Well Hydrofractured? ☐ Yes ☐ No
From ft. to ft.

Contact's Name CITY OF COON RAPID
11155 ROBINSON NW DR
COON RAPIDS MN 55433

Use Community Supply (municipal)

Casing **Drive Shoe?** ☑ Yes ☐ N

Hole Diameter

Casing Diameter				Weight(lbs/ft)
30	in. t	169	ft	118
24	in. t	270	ft	94.62
18	in. t	395	ft	70.59

GEOLOGICAL MATERIAL	COLOR	HARDNESS	FROM	TO
SAND			0	73
CLAY SAND & GRAVEL			73	112
CLAY & SAND			112	130
WATER, SAND & GRAVEL			130	166
BOULDERS			166	176
GRAVEL W/SANDROCK			176	181
GRAVEL W/SANDROCK			181	187
SHALE			187	239
SHALE			239	252
SANDROCK		SOFT	252	270
SHALE & SANDROCK			270	376
SHALE & SANDROCK			376	435
SANDROCK			435	441
SANDROCK			441	455
SHALE (EAU CLAIRE)			455	517
SANDROCK			517	518
SANDROCK			518	653

Screen N

Open Hole From 395 ft. to 653 ft.

Make Type

Static Water Level 109 ft. from Land surface Date 1981/04/10

PUMPING LEVEL (below land surface)
190 ft. after 34 hrs. pumping 2000 g.p.m.

Well Head Completion
Pitless adapter mfr Model
Casing Protection ☑ 12 in. above grade
☐ At-grade(Environmental Wells and Borings ONLY)

Grouting Information Well grouted? ☑ Yes ☐ No

Material	From	To (ft.)	Amount(yds/bags)
G	0	395	

Nearest Known Source of Contamination
ft. direction type
Well disinfected upon completion? ☑ Yes ☐ No

Pump ☐ Not Installed Date Installed
Mfr nam
Model HP Volts
Drop Pipe Length ft. Capacity g.p.m
Type

Any not in use and not sealed well(s) on property? ☐ Yes ☐ No

Was a variance granted from the MDH for this Well? ☐ Yes ☐ No

REMARKS, ELEVATION, SOURCE OF DATA, etc.

M.G.S. NO. 1608 & 1705. GAMMA LOGGED10-17-2001 BY SUMMIT ENVIRON.

USGS Quad Coon Rapids Elevation 889
Aquifer: CIGM Alt Id: 80-6187

Well CONTRACTOR CERTIFICATION Lic. Or Reg. No. 27058
License Business Name
Name of Driller

Report Copy

Unique No.	00161413	MINNESOTA DEPARTMENT OF HEALTH	Update Date	2007/02/06
County Name	Anoka	**WELL AND BORING RECORD** *Minnesota Statutes Chapter 1031*	Entry Date	1991/04/15

Township Name	Township	Range	Dir	Section	Subsection	Well Depth		Depth Completed		Date Well Completed
	31	24	W	11	ADAAAA	653	ft.	653	ft.	1981/04/10

Well Name	COON RAPIDS 16	**Lic. Or Reg. No.**	27058	**Name of Driller**			
USGS Quad	Coon Rapi	**Elevation**	889	**Aquifer**	CIGM	**Alternative Id**	80-6187

GEOLOGICAL MATERIAL	COLOR	HARDNESS	FROM	TO	STRAT	LITH PRIM	LITH SEC	LITH MINOR
SAND			0	73	QFUU	SAND		
QFUU = Sand	SAND = Sand							
CLAY SAND & GRAVEL			73	112	QPUU	CLAY	SAND	GRVL
QPUU = Pebbly sand/silt/clay	CLAY = Clay		SAND = Sand				GRVL = Gravel	
CLAY & SAND			112	130	QLUU	CLAY	SAND	
QLUU = Clay & sand	CLAY = Clay		SAND = Sand					
WATER, SAND & GRAVEL			130	166	QHUU	SAND	GRVL	
QHUU = Sand & larger	SAND = Sand		GRVL = Gravel					
BOULDERS			166	176	QBUU	BLDR		
QBUU = Boulder or boulders	BLDR = Boulder							
GRAVEL W/SANDROCK			176	181	QGUU	SAND	COBL	
QGUU = Gravel (+larger)	SAND = Sand		COBL = Cobble					
GRAVEL W/SANDROCK			181	187	CSTL	SHLE	DLMT	SNDS
CSTL = St.Lawrence	SHLE = Shale		DLMT = Dolomite				SNDS = Sandstone	
SHALE			187	239	CSTL	SHLE	DLMT	SNDS
CSTL = St.Lawrence	SHLE = Shale		DLMT = Dolomite				SNDS = Sandstone	
SHALE			239	252	CFRN	SNDS	SHLE	DLMT
CFRN = Franconia	SNDS = Sandstone		SHLE = Shale				DLMT = Dolomite	
SANDROCK		SOFT	252	270	CFRN	SNDS	SHLE	DLMT
CFRN = Franconia	SNDS = Sandstone		SHLE = Shale				DLMT = Dolomite	
SHALE & SANDROCK			270	376	CFRN	SNDS	SHLE	DLMT
CFRN = Franconia	SNDS = Sandstone		SHLE = Shale				DLMT = Dolomite	
SHALE & SANDROCK			376	435	CIGL	SNDS		
CIGL = Ironton-Galesville	SNDS = Sandstone							
SANDROCK			435	441	CIGL	SNDS		
CIGL = Ironton-Galesville	SNDS = Sandstone							
SANDROCK			441	455	CECR	SHLE	SNDS	
CECR = Eau Claire	SHLE = Shale		SNDS = Sandstone					

Unique No.	00161413	MINNESOTA DEPARTMENT OF HEALTH	Update Date	2007/02/06
County Name	Anoka	**WELL AND BORING RECORD** *Minnesota Statutes Chapter 1031*	Entry Date	1991/04/15

Township Name	Township	Range	Dir	Section	Subsection	Well Depth		Depth Completed		Date Well Completed
	31	24	W	11	ADAAAA	653	ft.	653	ft.	1981/04/10

Well Name	COON RAPIDS 16	**Lic. Or Reg. No.**	27058	**Name of Driller**			
USGS Quad	Coon Rapi	**Elevation**	889	**Aquifer**	CIGM	**Alternative Id**	80-6187

GEOLOGICAL MATERIAL	COLOR	HARDNESS	FROM	TO	STRAT	LITH PRIM	LITH SEC	LITH MINOR
SHALE (EAU CLAIRE)			455	517	CECR	SHLE	SNDS	
CECR = Eau Claire	SHLE = Shale		SNDS = Sandstone					
SANDROCK			517	518	CECR	SHLE	SNDS	
CECR = Eau Claire	SHLE = Shale		SNDS = Sandstone					
SANDROCK			518	653	CMTS	SNDS		
CMTS = Mt.Simon	SNDS = Sandstone							

Unique No. 00150357

County Name Anoka

MINNESOTA DEPARTMENT OF HEALTH

WELL AND BORING RECORD

Minnesota Statutes Chapter 1031

Update Date 2007/02/07

Entry Date 1991/04/15

Township Name	Township	Range	Dir	Section	Subsection
	31	24	W	21	DAAAAA

Well Depth	Depth Completed	Date Well Completed
121 ft.	121 ft.	1981/12/18

Well Name COON RAPIDS 17

Drilling Method Cable Tool

Well Owner's Name COON RAPIDS 17
2400 105TH NW AV
COON RAPIDS MN 55433

Drilling Fluid

Well Hydrofractured? ☐ Yes ☐ No
From ft. to ft.

Contact's Name CITY OF COON RAPIDS
11155 ROBINSON NW DR
COON RAPIDS MN 55433

Use Community Supply (municipal)

Casing **Drive Shoe?** ☑ Yes ☐ N

Hole Diameter
in. t 121 ft

Casing Diameter **Weight(lbs/ft)**
30 in. t 81 ft 118.6

GEOLOGICAL MATERIAL	COLOR	HARDNESS	FROM	TO
DIRT	BLACK		0	3
SAND & GRAVEL & SOME C			3	59
SANDY CLAY		SOFT	59	70
CLEAN COARSE GRAVEL &	RED		70	98
CLEAN COARSE SAND & G			98	108
MEDIUM GRAVEL SAND &			108	113
COARSE SAND & GRAVEL			113	121

Screen Y

Open Hole From ft. to ft.

Make JOHNSON Type L

Diameter	Slot	Length	Set		Fitting
30	20	40	81	ft. to 121 ft	

Static Water Level 15 ft. from Land surface Date 1981/12/18

PUMPING LEVEL (below land surface)
72 ft. after 4 hrs. pumping 2000 g.p.m.

Well Head Completion
Pitless adapter mfr Model
Casing Protection ☑ 12 in. above grade
☐ At-grade(Environmental Wells and Borings ONLY)

Grouting Information Well grouted? ☐ Yes ☑ No

Nearest Known Source of Contamination
ft. direction type
Well disinfected upon completion? ☑ Yes ☐ No

Pump ☑ Not Installed Date Installed N
Mfr nam
Model HP Volts
Drop Pipe Length ft. Capacity g.p.m
Type

Any not in use and not sealed well(s) on property? ☐ Yes ☐ No

Was a variance granted from the MDH for this Well? ☐ Yes ☐ No

REMARKS, ELEVATION, SOURCE OF DATA, etc.

GAMMA LOGGED 10-23-2001 BY SUMMIT ENVIR.

USGS Quad Coon Rapids Elevation 855
Aquifer: QBAA Alt Id: 80-6139

Well CONTRACTOR CERTIFICATION Lic. Or Reg. No. 27010
License Business Name
Name of Driller KAUITSON, K.

Report Copy

Unique No.	00150357	MINNESOTA DEPARTMENT OF HEALTH	Update Date	2007/02/07
County Name	Anoka	**WELL AND BORING RECORD** *Minnesota Statutes Chapter 1031*	Entry Date	1991/04/15

Township Name	Township	Range	Dir	Section	Subsection	Well Depth		Depth Completed		Date Well Completed
	31	24	W	21	DAAAAA	121	ft.	121	ft.	1981/12/18

Well Name	COON RAPIDS 17			**Lic. Or Reg. No.**	27010	**Name of Driller**	KAUITSON, K.
USGS Quad	Coon Rapi	**Elevation**	855	**Aquifer**	QBAA	**Alternative Id**	80-6139

GEOLOGICAL MATERIAL	COLOR	HARDNESS	FROM	TO	STRAT	LITH PRIM	LITH SEC	LITH MINOR
DIRT	BLACK		0	3	RUUK	SOIL	ORGD	
RUUK = Recent Deposit	SOIL = Soil			ORGD = Organic Deposits				
SAND & GRAVEL & SOME CLAY			3	59	QPUU	SAND	GRVL	CLAY
QPUU = Pebbly sand/silt/clay	SAND = Sand			GRVL = Gravel			CLAY = Clay	
SANDY CLAY		SOFT	59	70	QLUU	CLAY	SAND	
QLUU = Clay & sand	CLAY = Clay			SAND = Sand				
CLEAN COARSE GRAVEL & SAND	RED		70	98	QHUR	GRVL	SAND	
QHUR = Sand & larger	GRVL = Gravel			SAND = Sand				
CLEAN COARSE SAND & GRAVEL			98	108	QHUU	SAND	GRVL	
QHUU = Sand & larger	SAND = Sand			GRVL = Gravel				
MEDIUM GRAVEL SAND & GRAVEL			108	113	QHUU	GRVL	SAND	
QHUU = Sand & larger	GRVL = Gravel			SAND = Sand				
COARSE SAND & GRAVEL			113	121	QHUU	SAND	GRVL	
QHUU = Sand & larger	SAND = Sand			GRVL = Gravel				

Unique No. 00110469	MINNESOTA DEPARTMENT OF HEALTH	Update Date 2008/12/29
County Name Anoka	**WELL AND BORING RECORD**	Entry Date 1991/04/15
	Minnesota Statutes Chapter 1031	

Township Name	Township	Range	Dir	Section	Subsection	Well Depth	Depth Completed	Date Well Completed
	31	24	W	2	DCDCDB	637 ft.	637 ft.	1986/05/00

Well Name COON RAPIDS 18

Drilling Method Cable Tool

Well Owner's Name COON RAPIDS

COON RAPIDS MN 55448

Drilling Fluid

Well Hydrofractured? ☐ Yes ☐ No

From ft. to ft.

Use Community Supply (municipal)

Contact's Name CITY OF COON RAPIDS
11155 ROBINSON NW DR
COON RAPIDS MN 55433

Casing **Drive Shoe?** ☑ Yes ☐ N

Hole Diameter

Casing Diameter **Weight(lbs/ft)**

36 in. t 135 ft

30 in. t 195 ft

24 in. t 575 ft

GEOLOGICAL MATERIAL	COLOR	HARDNESS	FROM	TO
SAND	BROW		0	14
PEAT	BLK/B		14	17
SAND MEDIUM	BROW		17	67
CLAY			67	120
CLAY-SHALE	RED		120	142
CLAY & SAND	RED		142	194
CLAY & SAND	RED		194	198
SHALE & SAND	GRN/G		198	226
SHALE & SAND			226	228
FRANCONIA	GREE		228	367
GALESVILLE			367	429
GALESVILLE			429	432
SHALE			432	486
MT. SIMON			486	509
MT. SIMON			509	593
SHALEY SANDSTON			593	616
MIXED SHALE & SANDSTO			616	631
SANDSTONE	RED		631	637

Screen N

Open Hole From 575 ft. to 637 ft.

Make Type

Static Water Level 140 ft. from Land surface Date 1986/05/00

PUMPING LEVEL (below land surface)

248 ft. after 36 hrs. pumping 1400 g.p.m.

Well Head Completion

Pitless adapter mfr Model

Casing Protection ☑ 12 in. above grade

☐ At-grade(Environmental Wells and Borings ONLY)

Grouting Information Well grouted? ☑ Yes ☐ No

Material	From	To (ft.)	Amount(yds/bags)	
G	0	575	67.5	Y

Nearest Known Source of Contamination

ft. direction type

Well disinfected upon completion? ☐ Yes ☐ No

Pump ☑ Not Installed Date Installed N

Mfr nam

Model HP Volts

Drop Pipe Length ft. Capacity g.p.m

Type

Any not in use and not sealed well(s) on property? ☐ Yes ☐ No

Was a variance granted from the MDH for this Well? ☐ Yes ☐ No

REMARKS, ELEVATION, SOURCE OF DATA, etc.

M.G.S. NO.2048. GAMMA LOGGED 8-28-1985.

GAMMA LOGGED 1-11-2005 BY JIM TRAEN.

USGS Quad Coon Rapids Elevation 890

Aquifer: CMTS Alt Id: 80-6139

Well CONTRACTOR CERTIFICATION Lic. Or Reg. No. 27010

License Business Name

Name of Driller HOLLEN, G.

Report Copy

Unique No.	00110469	MINNESOTA DEPARTMENT OF HEALTH	Update Date	2008/12/29
County Name	Anoka	**WELL AND BORING RECORD** *Minnesota Statutes Chapter 1031*	Entry Date	1991/04/15

Township Name	Township	Range	Dir	Section	Subsection	Well Depth		Depth Completed		Date Well Completed
	31	24	W	2	DCDCDB	637	ft.	637	ft.	1986/05/00

Well Name	COON RAPIDS 18	**Lic. Or Reg. No.**	27010	**Name of Driller**	HOLLEN, G.		
USGS Quad	Coon Rapi	**Elevation**	890	**Aquifer**	CMTS	**Alternative Id**	80-6139

GEOLOGICAL MATERIAL	COLOR	HARDNESS	FROM	TO	STRAT	LITH PRIM	LITH SEC	LITH MINOR
SAND	BROWN		0	14	QFUB	SAND		
QFUB = Sand	SAND = Sand							
PEAT	BLK/BRN		14	17	QSUU	PEAT		
QSUU = Peat	PEAT = Peat							
SAND MEDIUM	BROWN		17	67	QFUB	SAND		
QFUB = Sand	SAND = Sand							
CLAY			67	120	QCUU	CLAY		
QCUU = Clay	CLAY = Clay							
CLAY-SHALE	RED		120	142	QCUR	CLAY		
QCUR = Clay	CLAY = Clay							
CLAY & SAND	RED		142	194	QLUR	CLAY	SAND	
QLUR = Clay & sand	CLAY = Clay		SAND = Sand					
CLAY & SAND	RED		194	198	CSTL	DLMT	SLSN	SHLE
CSTL = St.Lawrence	DLMT = Dolomite		SLSN = Siltstone			SHLE = Shale		
SHALE & SAND	GRN/GRY		198	226	CSTL	DLMT	SLSN	SHLE
CSTL = St.Lawrence	DLMT = Dolomite		SLSN = Siltstone			SHLE = Shale		
SHALE & SAND			226	228	CFRN	SHLE	DLMT	SNDS
CFRN = Franconia	SHLE = Shale		DLMT = Dolomite			SNDS = Sandstone		
FRANCONIA	GREEN		228	367	CFRN	SHLE	DLMT	SNDS
CFRN = Franconia	SHLE = Shale		DLMT = Dolomite			SNDS = Sandstone		
GALESVILLE			367	429	CIGL	SNDS		
CIGL = Ironton-Galesville	SNDS = Sandstone							
GALESVILLE			429	432	CECR	SHLE	SNDS	
CECR = Eau Claire	SHLE = Shale		SNDS = Sandstone					
SHALE			432	486	CECR	SHLE	SNDS	DLMT
CECR = Eau Claire	SHLE = Shale		SNDS = Sandstone			DLMT = Dolomite		
MT. SIMON			486	509	CECR	SHLE	SNDS	DLMT
CECR = Eau Claire	SHLE = Shale		SNDS = Sandstone			DLMT = Dolomite		

Unique No.	00110469	MINNESOTA DEPARTMENT OF HEALTH	Update Date	2008/12/29
County Name	Anoka	**WELL AND BORING RECORD** *Minnesota Statutes Chapter 1031*	Entry Date	1991/04/15

Township Name	Township	Range	Dir	Section	Subsection	Well Depth		Depth Completed		Date Well Completed
	31	24	W	2	DCDCDB	637	ft.	637	ft.	1986/05/00

Well Name	COON RAPIDS 18	**Lic. Or Reg. No.**	27010	**Name of Driller**	HOLLEN, G.		
USGS Quad	Coon Rapi	**Elevation**	890	**Aquifer**	CMTS	**Alternative Id**	80-6139

GEOLOGICAL MATERIAL	COLOR	HARDNESS	FROM	TO	STRAT	LITH PRIM	LITH SEC	LITH MINOR
MT. SIMON			509	593	CMTS	SNDS		
CMTS = Mt.Simon	SNDS = Sandstone							
SHALEY SANDSTON			593	616	CMTS	SNDS	SHLE	
CMTS = Mt.Simon	SNDS = Sandstone		SHLE = Shale					
MIXED SHALE & SANDSTONE			616	631	CMTS	SNDS	SHLE	
CMTS = Mt.Simon	SNDS = Sandstone		SHLE = Shale					
SANDSTONE	RED		631	637	CMTS	SNDS		
CMTS = Mt.Simon	SNDS = Sandstone							

Unique No. 00110475

County Name Anoka

MINNESOTA DEPARTMENT OF HEALTH

WELL AND BORING RECORD

Minnesota Statutes Chapter 1031

Update Date 2009/07/16

Entry Date 1991/04/15

Township Name	Township	Range	Dir	Section	Subsection
	31	24	W	21	AACBDB

Well Depth	Depth Completed	Date Well Completed
143 ft.	135 ft.	1987/10/14

Well Name COON RAPIDS 19

Drilling Method Cable Tool

Well Owner's Name COON RAPIDS 19

COON RAPIDS MN 55433

Drilling Fluid

Well Hydrofractured? ☐ Yes ☐ No

From ft. to ft.

Use Community Supply (municipal)

Contact's Name CITY OF COON RAPIDS

11155 ROBINSON NW DR

COON RAPIDS MN 55433

Casing **Drive Shoe?** ☑ Yes ☐ N

Hole Diameter

Casing Diameter **Weight(lbs/ft)**

30 in. t 30 ft

20 in. t 115 ft

GEOLOGICAL MATERIAL	COLOR	HARDNESS	FROM	TO
TOPSOIL	BLACK		0	3
FINE SAND	BROW		3	25
CLAY & SAND MIX	BROW		25	35
CLAY WITH GRAVEL	BROW		35	83
STICKY CLAY	BLUE		83	105
STICKY CLAY	RED	HARD	105	115
COARSE SAND/GRAVEL			115	138
CLAY		HARD	138	143

Screen Y

Open Hole From ft. to ft.

Make JOHNSON Type L

Diameter	Slot	Length	Set		Fitting
20	70	20	115	ft. to 135	ft

Static Water Level 15 ft. from Land surface Date 1987/10/14

PUMPING LEVEL (below land surface)

84 ft. after 24 hrs. pumping 1200 g.p.m.

Well Head Completion

Pitless adapter mfr Model

Casing Protection ☑ 12 in. above grade

☐ At-grade(Environmental Wells and Borings ONLY)

Grouting Information Well grouted? ☑ Yes ☐ No

Material	From	To (ft.)	Amount(yds/bags)
G	6	25	0

Nearest Known Source of Contamination

ft. direction type

Well disinfected upon completion? ☐ Yes ☐ No

Pump ☑ Not Installed Date Installed N

Mfr nam

Model HP Volts

Drop Pipe Length ft. Capacity g.p.m

Type

Any not in use and not sealed well(s) on property? ☐ Yes ☐ No

Was a variance granted from the MDH for this Well? ☐ Yes ☐ No

REMARKS, ELEVATION, SOURCE OF DATA, etc.

M.G.S. NO.2878.

USGS Quad Coon Rapids Elevation 850

Aquifer: QBAA Alt Id: 80-6139

Well CONTRACTOR CERTIFICATION Lic. Or Reg. No. 27010

License Business Name

Name of Driller HOLLEN, G.

Report Copy

Unique No.	00110475	MINNESOTA DEPARTMENT OF HEALTH	Update Date	2009/07/16
County Name	Anoka	**WELL AND BORING RECORD** *Minnesota Statutes Chapter 1031*	Entry Date	1991/04/15

Township Name	Township	Range	Dir	Section	Subsection	Well Depth		Depth Completed		Date Well Completed
	31	24	W	21	AACBDB	143	ft.	135	ft.	1987/10/14

Well Name	COON RAPIDS 19	**Lic. Or Reg. No.**	27010	**Name of Driller**	HOLLEN, G.		
USGS Quad	Coon Rapi	**Elevation**	850	**Aquifer**	QBAA	**Alternative Id**	80-6139

GEOLOGICAL MATERIAL	COLOR	HARDNESS	FROM	TO	STRAT	LITH PRIM	LITH SEC	LITH MINOR
TOPSOIL	BLACK		0	3	RUUK	SOIL	ORGD	
RUUK = Recent Deposit	SOIL = Soil			ORGD = Organic Deposits				
FINE SAND	BROWN		3	25	QFUB	SAND		
QFUB = Sand	SAND = Sand							
CLAY & SAND MIX	BROWN		25	35	QLUB	CLAY	SAND	
QLUB = Clay & sand	CLAY = Clay			SAND = Sand				
CLAY WITH GRAVEL	BROWN		35	83	QPUB	CLAY	GRVL	
QPUB = Pebbly sand/silt/clay	CLAY = Clay			GRVL = Gravel				
STICKY CLAY	BLUE		83	105	QCUG	CLAY		
QCUG = Clay	CLAY = Clay							
STICKY CLAY	RED	HARD	105	115	QCUR	CLAY		
QCUR = Clay	CLAY = Clay							
COARSE SAND/GRAVEL			115	138	QHUU	SAND	GRVL	
QHUU = Sand & larger	SAND = Sand			GRVL = Gravel				
CLAY		HARD	138	143	QCUU	CLAY		
QCUU = Clay	CLAY = Clay							

Unique No. 00420956

County Name Anoka

MINNESOTA DEPARTMENT OF HEALTH

WELL AND BORING RECORD

Minnesota Statutes Chapter 1031

Update Date 2008/12/30

Entry Date 1991/04/15

Township Name	Township	Range	Dir	Section	Subsection
	31	24	W	21	ADBDAB

Well Depth	Depth Completed	Date Well Completed
135 ft.	135 ft.	1988/04/26

Well Name COON RAPIDS 20

Drilling Method Cable Tool

Well Owner's Name COON RAPIDS 20
XAVIS NW ST
COON RAPIDS MN 55433

Drilling Fluid

Well Hydrofractured? ☐ Yes ☐ No
From ft. to ft.

Contact's Name CITY OF COON RAPIDS
11155 ROBINSON NW DR
COON RAPIDS MN 55433

Use Community Supply (municipal)

Casing **Drive Shoe?** ☑ Yes ☐ N

Hole Diameter
0 in. t 135 ft

Casing Diameter **Weight(lbs/ft)**
30 in. t 95 ft
20 in. t 95 ft

GEOLOGICAL MATERIAL	COLOR	HARDNESS	FROM	TO
TOPSOIL-SAND	BROW		0	14
CLAY WITH GRAVEL	RED		14	18
MIXED LAYERS SAND & CL	BROW		18	40
CLAY	GRAY		40	43
LAYERED SAND & CLAY	GRAY		43	70
STICKY CLAY	BLUE		70	82
COARSE SAND	YELLO		82	93
SAND/GRAVEL	YELLO		93	135

Screen Y

Open Hole From ft. to ft.

Make JOHNSON Type L

Diameter	Slot	Length	Set		Fitting
20		40.8	95	ft. to 135 ft	

Static Water Level 15 ft. from Land surface Date 1988/04/26

PUMPING LEVEL (below land surface)
90 ft. after 8 hrs. pumping 1560 g.p.m.

Well Head Completion
Pitless adapter mfr Model
Casing Protection ☑ 12 in. above grade
☐ At-grade(Environmental Wells and Borings ONLY)

Grouting Information Well grouted? ☑ Yes ☐ No

Material	From	To (ft.)	Amount(yds/bags)	
G	0	40	6	Y

Nearest Known Source of Contamination
ft. direction type
Well disinfected upon completion? ☐ Yes ☐ No

Pump ☑ Not Installed Date Installed N
Mfr nam
Model HP Volts
Drop Pipe Length ft. Capacity g.p.m
Type

Any not in use and not sealed well(s) on property? ☐ Yes ☐ No

Was a variance granted from the MDH for this Well? ☐ Yes ☐ No

REMARKS, ELEVATION, SOURCE OF DATA, etc.

SAME AS NO.420957. 420957 PAPERS ARE LOST.

GAMMA LOGGED 11-14-2002. LOGGED BY JIM TRAEN.

USGS Quad Coon Rapids Elevation 850
Aquifer: QBAA Alt Id: 80-6139

Well CONTRACTOR CERTIFICATION Lic. Or Reg. No. 27010
License Business Name
Name of Driller HOLLEN, G.

Report Copy

Unique No.	00420956	MINNESOTA DEPARTMENT OF HEALTH	Update Date	2008/12/30
County Name	Anoka	**WELL AND BORING RECORD** *Minnesota Statutes Chapter 1031*	Entry Date	1991/04/15

Township Name	Township	Range	Dir	Section	Subsection	Well Depth		Depth Completed		Date Well Completed
	31	24	W	21	ADBDAB	135	ft.	135	ft.	1988/04/26

Well Name	COON RAPIDS 20	**Lic. Or Reg. No.**	27010	**Name of Driller**	HOLLEN, G.		
USGS Quad	Coon Rapi	**Elevation**	850	**Aquifer**	QBAA	**Alternative Id**	80-6139

GEOLOGICAL MATERIAL	COLOR	HARDNESS	FROM	TO	STRAT	LITH PRIM	LITH SEC	LITH MINOR
TOPSOIL-SAND	BROWN		0	14	RUUB	SOIL	ORGD	SAND
RUUB = Recent Deposit-brown	SOIL = Soil			ORGD = Organic Deposits			SAND = Sand	
CLAY WITH GRAVEL	RED		14	18	QPUR	CLAY	GRVL	
QPUR = Pebbly sand/silt/clay	CLAY = Clay			GRVL = Gravel				
MIXED LAYERS SAND & CLAY	BROWN		18	40	QLUB	SAND	CLAY	
QLUB = Clay & sand	SAND = Sand			CLAY = Clay				
CLAY	GRAY		40	43	QCUG	CLAY		
QCUG = Clay	CLAY = Clay							
LAYERED SAND & CLAY	GRAY		43	70	QLUG	SAND	CLAY	
QLUG = Clay & sand	SAND = Sand			CLAY = Clay				
STICKY CLAY	BLUE		70	82	QCUG	CLAY		
QCUG = Clay	CLAY = Clay							
COARSE SAND	YELLOW		82	93	QFUY	SAND		
QFUY = Sand	SAND = Sand							
SAND/GRAVEL	YELLOW		93	135	QHUY	SAND	GRVL	
QHUY = Sand & larger	SAND = Sand			GRVL = Gravel				

Unique No. 00474384	MINNESOTA DEPARTMENT OF HEALTH	Update Date 2007/02/06
County Name Anoka	**WELL AND BORING RECORD**	Entry Date 1992/06/22
	Minnesota Statutes Chapter 1031	

Township Name	Township	Range	Dir	Section	Subsection
	31	24	W	13	ACCDDD

Well Depth	Depth Completed	Date Well Completed
207 ft.	203 ft.	1990/01/26

Well Name COON RAPIDS 21

Drilling Method Cable Tool

Well Owner's Name COON RAPIDS 21
269 NORTHDALE BL
COON RAPIDS MN 55433

Drilling Fluid

Well Hydrofractured? ☐ Yes ☐ No
From ft. to ft.

Use Community Supply (municipal)

Contact's Name CITY OF COON RAPIDS
11155 ROBINSON NW DR
COON RAPIDS MN 55433

Casing **Drive Shoe?** ☐ Yes ☐ N

Hole Diameter

Casing Diameter **Weight(lbs/ft)**

24	in. t	103	ft
18	in. t	170	ft

GEOLOGICAL MATERIAL	COLOR	HARDNESS	FROM	TO
FINE SAND	BROW	SOFT	0	25
FINE SAND	GRAY	SOFT	25	30
SAND & CLAY	GRAY	SOFT	30	32
FINE SAND	BROW	SOFT	32	35
FINE SAND	GRAY	SOFT	35	38
SANDY CLAY	GRAY	SOFT	38	50
CLAY	GRY/B	MEDIUM	50	66
ROCKS & GRAVEL	GRAY	HARD	66	69
FINE SAND & CLAY	BROW	MEDIUM	69	92
CLAY/TRACES OF GRAVEL	BROW	SOFT	92	103
FINE SAND	BROW	SOFT	103	105
COARSE GRAVEL & CLAY	BRN/R	MEDIUM	105	110
MEDIUM GRAVEL & CLAY	BROW	MEDIUM	110	127
MEDIUM TO FINE SAND	BROW	SOFT	127	136
GRAVEL & CLAY	GRAY	SOFT	136	148
CLAY AND ROCKS	LT. YE	SFT-MED	148	150
CLAY/GRAVEL & ROCKS	BLUE	SOFT	150	160
NO RECORD			160	207
CLAY			207	207

Screen Y **Open Hole** From ft. to ft.

Make JOHNSON Type L

Diameter	Slot	Length	Set		Fitting
12	70	33	170	ft. to 203	ft

Static Water Level 66 ft. from Land surface Date 1990/01/26

PUMPING LEVEL (below land surface)
126 ft. after hrs. pumping 1300 g.p.m.

Well Head Completion
Pitless adapter mfr Model
Casing Protection ☑ 12 in. above grade
☐ At-grade(Environmental Wells and Borings ONLY)

Grouting Information Well grouted? ☑ Yes ☐ No

Material	From	To (ft.)	Amount(yds/bags)
G	0	103	

Nearest Known Source of Contamination
ft. direction type
Well disinfected upon completion? ☑ Yes ☐ No

Pump ☐ Not Installed Date Installed
Mfr nam
Model HP Volts
Drop Pipe Length ft. Capacity g.p.m
Type

REMARKS, ELEVATION, SOURCE OF DATA, etc.

GAMMA LOGGED 1-11-04. LOGGED BY JIM TRAEN

Any not in use and not sealed well(s) on property? ☐ Yes ☑ No

Was a variance granted from the MDH for this Well? ☐ Yes ☐ No

USGS Quad Coon Rapids Elevation 899
Aquifer: QBAA Alt Id: 80-6139

Well CONTRACTOR CERTIFICATION Lic. Or Reg. No. 71536
License Business Name
Name of Driller TOM/ROGER

Report Copy

Unique No.	00474384	MINNESOTA DEPARTMENT OF HEALTH	Update Date	2007/02/06
County Name	Anoka	**WELL AND BORING RECORD** *Minnesota Statutes Chapter 1031*	Entry Date	1992/06/22

Township Name	Township	Range	Dir	Section	Subsection	Well Depth		Depth Completed		Date Well Completed
	31	24	W	13	ACCDDD	207	ft.	203	ft.	1990/01/26

Well Name	COON RAPIDS 21			**Lic. Or Reg. No.**	71536	**Name of Driller**	TOM/ROGER
USGS Quad	Coon Rapi	**Elevation**	899	**Aquifer**	QBAA	**Alternative Id**	80-6139

GEOLOGICAL MATERIAL	COLOR	HARDNESS	FROM	TO	STRAT	LITH PRIM	LITH SEC	LITH MINOR
FINE SAND	BROWN	SOFT	0	25	QFUB	SAND		
QFUB = Sand	SAND = Sand							
FINE SAND	GRAY	SOFT	25	30	QFUG	SAND		
QFUG = Sand	SAND = Sand							
SAND & CLAY	GRAY	SOFT	30	32	QLUG	SAND	CLAY	
QLUG = Clay & sand	SAND = Sand			CLAY = Clay				
FINE SAND	BROWN	SOFT	32	35	QFUB	SAND		
QFUB = Sand	SAND = Sand							
FINE SAND	GRAY	SOFT	35	38	QFUG	SAND		
QFUG = Sand	SAND = Sand							
SANDY CLAY	GRAY	SOFT	38	50	QLUG	CLAY	SAND	
QLUG = Clay & sand	CLAY = Clay			SAND = Sand				
CLAY	GRY/BLU	MEDIUM	50	66	QCUG	CLAY		
QCUG = Clay	CLAY = Clay							
ROCKS & GRAVEL	GRAY	HARD	66	69	QGUG	GRVL	COBL	
QGUG = Gravel (+larger)	GRVL = Gravel			COBL = Cobble				
FINE SAND & CLAY	BROWN	MEDIUM	69	92	QLUB	SAND	CLAY	
QLUB = Clay & sand	SAND = Sand			CLAY = Clay				
CLAY/TRACES OF GRAVEL	BROWN	SOFT	92	103	QPUB	CLAY	GRVL	
QPUB = Pebbly sand/silt/clay	CLAY = Clay			GRVL = Gravel				
FINE SAND	BROWN	SOFT	103	105	QFUB	SAND		
QFUB = Sand	SAND = Sand							
COARSE GRAVEL & CLAY	BRN/RED	MEDIUM	105	110	QPUU	GRVL	CLAY	
QPUU = Pebbly sand/silt/clay	GRVL = Gravel			CLAY = Clay				
MEDIUM GRAVEL & CLAY	BROWN	MEDIUM	110	127	QPUB	GRVL	CLAY	
QPUB = Pebbly sand/silt/clay	GRVL = Gravel			CLAY = Clay				
MEDIUM TO FINE SAND	BROWN	SOFT	127	136	QFUB	SAND		
QFUB = Sand	SAND = Sand							

Unique No.	00474384	MINNESOTA DEPARTMENT OF HEALTH	Update Date	2007/02/06
County Name	Anoka	**WELL AND BORING RECORD** *Minnesota Statutes Chapter 1031*	Entry Date	1992/06/22

Township Name	Township	Range	Dir	Section	Subsection	Well Depth		Depth Completed		Date Well Completed
	31	24	W	13	ACCDDD	207	ft.	203	ft.	1990/01/26

Well Name	COON RAPIDS 21	**Lic. Or Reg. No.**	71536	**Name of Driller**	TOM/ROGER		
USGS Quad	Coon Rapi	**Elevation**	899	**Aquifer**	QBAA	**Alternative Id**	80-6139

GEOLOGICAL MATERIAL	COLOR	HARDNESS	FROM	TO	STRAT	LITH PRIM	LITH SEC	LITH MINOR
GRAVEL & CLAY	GRAY	SOFT	136	148	QPUG	GRVL	CLAY	
QPUG = Pebbly sand/silt/clay	GRVL = Gravel			CLAY = Clay				
CLAY AND ROCKS	LT. YEL	SFT-MED	148	150	QPUY	CLAY	COBL	
QPUY = Pebbly sand/silt/clay	CLAY = Clay			COBL = Cobble				
CLAY/GRAVEL & ROCKS	BLUE	SOFT	150	160	QPUG	CLAY	GRVL	COBL
QPUG = Pebbly sand/silt/clay	CLAY = Clay			GRVL = Gravel			COBL = Cobble	
NO RECORD			160	207	QUUU	DRFT		
QUUU = Unknown deposit type	DRFT = Drift							
CLAY			207	207	QCUU	CLAY		
QCUU = Clay	CLAY = Clay							

Unique No. 00474385

County Name Anoka

MINNESOTA DEPARTMENT OF HEALTH

WELL AND BORING RECORD

Minnesota Statutes Chapter 1031

Update Date 2008/12/30

Entry Date 1992/06/22

Township Name	Township	Range	Dir	Section	Subsection
	31	24	W	22	CBABAD

Well Depth	Depth Completed	Date Well Completed
108 ft.	105 ft.	1990/03/15

Well Name COON RAPIDS 22

Drilling Method Cable Tool

Well Owner's Name COON RAPIDS 22
2220 105TH NW AV
COON RAPIDS MN 55433

Drilling Fluid

Well Hydrofractured? ☐ Yes ☐ No
From ft. to ft.

Use Community Supply (municipal)

Contact's Name CITY OF COON RAPIDS
11155 ROBINSON NW DR
COON RAPIDS MN 55433

Casing **Drive Shoe?** ☐ Yes ☐ N

Hole Diameter

Casing Diameter **Weight(lbs/ft)**
24 in. t 80 ft

GEOLOGICAL MATERIAL	COLOR	HARDNESS	FROM	TO
SAND	BROW	SOFT	0	19
ROCKS & BOULDERS	BROW	HARD	19	21
SANDY CLAY	BROW	MEDIUM	21	28
SANDY CLAY/GRAVEL	GRAY	SOFT	28	57
GRAVEL & CLAY	BROW	SOFT	57	70
SANDY CLAY	BROW	SOFT	70	73
FINE SAND	BROW	SOFT	73	83
COARSE SAND	BROW	SOFT	83	93
SAND & GRAVEL	BROW	SOFT	93	98
GRAVEL	BROW	SOFT	98	105
CLAY	BROW	SOFT	105	108

Screen Y

Open Hole From ft. to ft.

Make JOHNSON Type L

Diameter	Slot	Length	Set		Fitting
18	120	25	80	ft. to 105 ft	

Static Water Level 32 ft. from Land surface Date 1990/03/15

PUMPING LEVEL (below land surface)
105 ft. after 1 hrs. pumping 250 g.p.m.

Well Head Completion
Pitless adapter mfr Model
Casing Protection ☑ 12 in. above grade
☐ At-grade(Environmental Wells and Borings ONLY)

Grouting Information Well grouted? ☑ Yes ☐ No

Material	From	To (ft.)	Amount(yds/bags)	
G	0	20	1.5	Y

Nearest Known Source of Contamination
ft. direction type
Well disinfected upon completion? ☑ Yes ☐ No

Pump ☑ Not Installed Date Installed N
Mfr nam
Model HP Volts
Drop Pipe Length ft. Capacity g.p.m
Type

REMARKS, ELEVATION, SOURCE OF DATA, etc.

GAMMA LOGGED 11-14-2002. LOGGED BY JIM TRAEN.

Any not in use and not sealed well(s) on property? ☐ Yes ☐ No

Was a variance granted from the MDH for this Well? ☐ Yes ☐ No

USGS Quad Coon Rapids Elevation 869
Aquifer: QBAA Alt Id: 80-6139

Well CONTRACTOR CERTIFICATION Lic. Or Reg. No. 71536
License Business Name
Name of Driller TOM/ROGER

Report Copy

Unique No.	00474385	MINNESOTA DEPARTMENT OF HEALTH	Update Date	2008/12/30
County Name	Anoka	**WELL AND BORING RECORD** *Minnesota Statutes Chapter 1031*	Entry Date	1992/06/22

Township Name	Township	Range	Dir	Section	Subsection	Well Depth		Depth Completed		Date Well Completed
	31	24	W	22	CBABAD	108	ft.	105	ft.	1990/03/15

Well Name	COON RAPIDS 22	**Lic. Or Reg. No.**	71536	**Name of Driller**	TOM/ROGER		
USGS Quad	Coon Rapi	**Elevation**	869	**Aquifer**	QBAA	**Alternative Id**	80-6139

GEOLOGICAL MATERIAL	COLOR	HARDNESS	FROM	TO	STRAT	LITH PRIM	LITH SEC	LITH MINOR
SAND	BROWN	SOFT	0	19	QFUB	SAND		
QFUB = Sand	SAND = Sand							
ROCKS & BOULDERS	BROWN	HARD	19	21	QBUB	COBL	BLDR	
QBUB = Boulder or boulders	COBL = Cobble			BLDR = Boulder				
SANDY CLAY	BROWN	MEDIUM	21	28	QLUB	CLAY	SAND	
QLUB = Clay & sand	CLAY = Clay			SAND = Sand				
SANDY CLAY/GRAVEL	GRAY	SOFT	28	57	QPUG	CLAY	SAND	GRVL
QPUG = Pebbly sand/silt/clay	CLAY = Clay			SAND = Sand			GRVL = Gravel	
GRAVEL & CLAY	BROWN	SOFT	57	70	QPUB	GRVL	CLAY	
QPUB = Pebbly sand/silt/clay	GRVL = Gravel			CLAY = Clay				
SANDY CLAY	BROWN	SOFT	70	73	QLUB	CLAY	SAND	
QLUB = Clay & sand	CLAY = Clay			SAND = Sand				
FINE SAND	BROWN	SOFT	73	83	QFUB	SAND		
QFUB = Sand	SAND = Sand							
COARSE SAND	BROWN	SOFT	83	93	QFUB	SAND		
QFUB = Sand	SAND = Sand							
SAND & GRAVEL	BROWN	SOFT	93	98	QHUB	SAND	GRVL	
QHUB = Sand & larger	SAND = Sand			GRVL = Gravel				
GRAVEL	BROWN	SOFT	98	105	QGUB	GRVL		
QGUB = Gravel (+larger)	GRVL = Gravel							
CLAY	BROWN	SOFT	105	108	QCUB	CLAY		
QCUB = Clay	CLAY = Clay							

Unique No. 00463020

County Name Anoka

MINNESOTA DEPARTMENT OF HEALTH

WELL AND BORING RECORD

Minnesota Statutes Chapter 1031

Update Date 2007/02/07

Entry Date 1992/06/22

Township Name	Township	Range	Dir	Section	Subsection
	31	24	W	27	BAABBB

Well Depth		Depth Completed		Date Well Completed
151	ft.	128	ft.	1991/12/16

Well Name COON RAPIDS 23

Well Owner's Name COON RAPIDS, CITY OF
2100 COON RAPIDS NW BL
COON RAPIDS MN 55433

Contact's Name CITY OF COON RAPIDS
11155 ROBINSON DR
COON RAPIDS MN 55433

GEOLOGICAL MATERIAL	COLOR	HARDNESS	FROM	TO
SAND	BROW		0	10
CLAY/SAND	BROW		10	34
SAND/GRAVEL	GRAY		34	38
SANDY CLAY	GRAY		38	67
SAND	BROW		67	95
GRAVEL	BROW		95	122
CLAY	GRAY		122	123
GRAVEL	BROW		123	126
SAND	BROW		126	151
CLAY	BROW		151	151

Drilling Method Cable Tool

Drilling Fluid Water

Well Hydrofractured? ☐ Yes ☐ No
From ft. to ft.

Use Community Supply (municipal)

Casing **Drive Shoe?** ☑ Yes ☐ N

Hole Diameter

Casing Diameter				Weight(lbs/ft)
30	in. t	92	ft	118.6
24	in. t	93	ft	94.6

Screen Y

Open Hole From ft. to ft.

Make JOHNSON Type L

Diameter	Slot	Length	Set		Fitting
24	50		94	ft. to	ft
16	70			ft. to 123	ft

Static Water Level 24 ft. from Land surface Date 1991/12/16

PUMPING LEVEL (below land surface)
70 ft. after 8 hrs. pumping 500 g.p.m.

Well Head Completion
Pitless adapter mfr Model
Casing Protection ☑ 12 in. above grade
☐ At-grade(Environmental Wells and Borings ONLY)

Grouting Information Well grouted? ☑ Yes ☐ No

Material	From	To (ft.)	Amount(yds/bags)
G		91	114 S

Nearest Known Source of Contamination
ft. direction type
Well disinfected upon completion? ☑ Yes ☐ No

Pump ☑ Not Installed Date Installed N
Mfr nam
Model HP Volts
Drop Pipe Length ft. Capacity g.p.m
Type

Any not in use and not sealed well(s) on property? ☐ Yes ☑ No

Was a variance granted from the MDH for this Well? ☐ Yes ☐ No

REMARKS, ELEVATION, SOURCE OF DATA, etc.

GAMMA LOGGED 11-14-2002 BY DOWNHOLE WELL SERVICES.

USGS Quad Coon Rapids Elevation 855
Aquifer: QBAA Alt Id: 1020017S24

Well CONTRACTOR CERTIFICATION Lic. Or Reg. No. 71015
License Business Name
Name of Driller FULTON, W.

Report Copy

Unique No.	00463020	MINNESOTA DEPARTMENT OF HEALTH	Update Date	2007/02/07
County Name	Anoka	**WELL AND BORING RECORD** *Minnesota Statutes Chapter 1031*	Entry Date	1992/06/22

Township Name	Township	Range	Dir	Section	Subsection	Well Depth		Depth Completed		Date Well Completed
	31	24	W	27	BAABBB	151	ft.	128	ft.	1991/12/16

Well Name	COON RAPIDS 23	**Lic. Or Reg. No.**	71015	**Name of Driller**	FULTON, W.		
USGS Quad	Coon Rapi	**Elevation**	855	**Aquifer**	QBAA	**Alternative Id**	1020017S24

GEOLOGICAL MATERIAL	COLOR	HARDNESS	FROM	TO	STRAT	LITH PRIM	LITH SEC	LITH MINOR
SAND	BROWN		0	10	QFUB	SAND		
QFUB = Sand	SAND = Sand							
CLAY/SAND	BROWN		10	34	QLUB	SAND	CLAY	
QLUB = Clay & sand	SAND = Sand			CLAY = Clay				
SAND/GRAVEL	GRAY		34	38	QHUG	SAND	GRVL	
QHUG = Sand & larger	SAND = Sand			GRVL = Gravel				
SANDY CLAY	GRAY		38	67	QLUG	CLAY	SAND	
QLUG = Clay & sand	CLAY = Clay			SAND = Sand				
SAND	BROWN		67	95	QFUB	SAND		
QFUB = Sand	SAND = Sand							
GRAVEL	BROWN		95	122	QGUB	GRVL		
QGUB = Gravel (+larger)	GRVL = Gravel							
CLAY	GRAY		122	123	QCUG	CLAY		
QCUG = Clay	CLAY = Clay							
GRAVEL	BROWN		123	126	QGUB	GRVL		
QGUB = Gravel (+larger)	GRVL = Gravel							
SAND	BROWN		126	151	QFUB	SAND		
QFUB = Sand	SAND = Sand							
CLAY	BROWN		151	151	QCUB	CLAY		
QCUB = Clay	CLAY = Clay							

Unique No.	00674478	MINNESOTA DEPARTMENT OF HEALTH	Update Date	2007/05/18
County Name	Anoka	**WELL AND BORING RECORD**	Entry Date	/ / 0

Minnesota Statutes Chapter 1031

Township Name	Township	Range	Dir	Section	Subsection
	31	24	W	21	ABADAB

Well Depth	Depth Completed	Date Well Completed
388 ft.	388 ft.	2003/12/19

Well Name COON RAPIDS 24

Drilling Method Cable Tool

Well Owner's Name COON RAPIDS 24
10845 DIRECT RIVER DR
COON RAPIDS MN 55433

Drilling Fluid Bentonite

Well Hydrofractured? ☐ Yes ☑ No
From ft. to ft.

Contact's Name CITY OF COON RAPIDS
11155 ROBINSON DR
COON RAPIDS MN 55433

Use Community Supply (municipal)

Casing **Drive Shoe?** ☑ Yes ☐ N

Hole Diameter

in. t	85	ft	
in. t	388	ft	
in. t	323	ft	

Casing Diameter **Weight(lbs/ft)**

30	in. t	191	ft	118.65
24	in. t	241	ft	94.62
36	in. t	90	ft	142.68

Screen N

Open Hole From 232 ft. to 388 ft.

Make Type

GEOLOGICAL MATERIAL	COLOR	HARDNESS	FROM	TO
SAND & GRAVEL	BROW	SOFT	0	29
CLAY & GRAVEL	BROW	HARD	29	82
SANDY CLAY	BROW	SOFT	82	87
SAND	BROW	SOFT	87	112
JORDAN S.S.	TAN	MEDIUM	132	149
FRANCONIA S.S.	GRN/B	MED-HRD	149	354
IRONTON/GALESVILLE	GRAY	MEDIUM	354	385
EAU CLAIRE SHALE	GRY/G	HARD	385	388

Static Water Level 60 ft. from Land surface Date 2003/09/18

PUMPING LEVEL (below land surface)
112 ft. after 8 hrs. pumping 1560 g.p.m.

Well Head Completion
Pitless adapter mfr BAKER Model 12.5PS2426
Casing Protection ☑ 12 in. above grade
☐ At-grade(Environmental Wells and Borings ONLY)

Grouting Information Well grouted? ☑ Yes ☐ No

Material	From	To (ft.)	Amount(yds/bags)	
G		85	10	Y
G		232.5	10	Y

Nearest Known Source of Contamination
200 ft. direction N type SDF
Well disinfected upon completion? ☑ Yes ☐ No

Pump ☐ Not Installed Date Installed
Mfr nam GOULD
Model 14RLJC-7 HP 75 Volts 480
Drop Pipe Length 165 ft. Capacity E+03 g.p.m
Type S

Any not in use and not sealed well(s) on property? ☐ Yes ☑ No

Was a variance granted from the MDH for this Well? ☐ Yes ☑ No

REMARKS, ELEVATION, SOURCE OF DATA, etc.

GAMMA LOGGED 6-17-2003. M.G.S. NO. 4242. LOGGED BY JIM TRAEN.

ROGER E. RENNER, MGWC, N-291.

MR. CHRIS CATLIN (651)644-4389.

USGS Quad Coon Rapids Elevation 861
Aquifer: CFIG Alt Id: 4242

Well CONTRACTOR CERTIFICATION Lic. Or Reg. No. 71015
License Business Name
Name of Driller COX, A.

Report Copy

Unique No.	00674478	MINNESOTA DEPARTMENT OF HEALTH	Update Date	2007/05/18
County Name	Anoka	**WELL AND BORING RECORD** *Minnesota Statutes Chapter 1031*	Entry Date	/ / 0

Township Name	Township	Range	Dir	Section	Subsection	Well Depth		Depth Completed		Date Well Completed
	31	24	W	21	ABADAB	388	ft.	388	ft.	2003/12/19

Well Name	COON RAPIDS 24	**Lic. Or Reg. No.**	71015	**Name of Driller**	COX, A.		
USGS Quad	Coon Rapi	**Elevation**	861	**Aquifer**	CFIG	**Alternative Id**	4242

GEOLOGICAL MATERIAL	COLOR	HARDNESS	FROM	TO	STRAT	LITH PRIM	LITH SEC	LITH MINOR
SAND & GRAVEL	BROWN	SOFT	0	29	QHUB	SAND	GRVL	
QHUB = Sand & larger	SAND = Sand			GRVL = Gravel				
CLAY & GRAVEL	BROWN	HARD	29	82	QPUB	CLAY	GRVL	
QPUB = Pebbly sand/silt/clay	CLAY = Clay			GRVL = Gravel				
SANDY CLAY	BROWN	SOFT	82	87	QLUB	CLAY	SAND	
QLUB = Clay & sand	CLAY = Clay			SAND = Sand				
SAND	BROWN	SOFT	87	112	QFUB	SAND		
QFUB = Sand	SAND = Sand							
JORDAN S.S.	TAN	MEDIUM	132	149	QFUB	SAND		
QFUB = Sand	SAND = Sand							
FRANCONIA S.S.	GRN/BRN	MED-HRD	149	354	CFRN	SNDS	SHLE	DLMT
CFRN = Franconia	SNDS = Sandstone			SHLE = Shale			DLMT = Dolomite	
IRONTON/GALESVILLE	GRAY	MEDIUM	354	385	CIGL	SNDS		
CIGL = Ironton-Galesville	SNDS = Sandstone							
EAU CLAIRE SHALE	GRY/GRN	HARD	385	388	CECR	SHLE	SNDS	
CECR = Eau Claire	SHLE = Shale			SNDS = Sandstone				

Unique No. 00674479

County Name Anoka

MINNESOTA DEPARTMENT OF HEALTH

WELL AND BORING RECORD

Minnesota Statutes Chapter 1031

Update Date 2007/01/09

Entry Date 2004/10/11

Township Name	Township	Range	Dir	Section	Subsection
	31	24	W	22	BCBDBA

Well Depth	Depth Completed	Date Well Completed
388 ft.	388 ft.	2003/12/19

Well Name COON RAPIDS 25

Drilling Method Cable Tool

Well Owner's Name COON RAPIDS 25
2324 COON RAPIDS NW BL
COON RAPIDS MN 55433

Drilling Fluid Bentonite

Well Hydrofractured? ☐ Yes ☐ No
From ft. to ft.

Contact's Name CITY OF COON RAPIDS
11155 ROBINSON DR
COON RAPIDS MN 55433

Use Community Supply (municipal)

Casing **Drive Shoe?** ☑ Yes ☐ N

Hole Diameter
in. t 388 ft
in. t 227 ft

Casing Diameter **Weight(lbs/ft)**
36 in. t 196 ft 142.68
24 in. t 229 ft 94.62

GEOLOGICAL MATERIAL	COLOR	HARDNESS	FROM	TO
SAND & GRAVEL	BROW	SOFT	0	29
CLAY & GRAVEL	BROW	HARD	29	82
SANDY CLAY	BROW	SOFT	82	87
SAND	BROW	SOFT	87	112
JORDAN S.S.	TAN	MEDIUM	112	162
ST. LAWRENCE	BRN/G	MEDIUM	162	193
FRANCONIA S.S.	GRN/B	MED-HRD	193	359
IRONTON/GALESVILLE	GRAY	MEDIUM	359	388

Screen N

Open Hole From 225 ft. to 388 ft.

Make Type

Static Water Level 51 ft. from Land surface Date 2003/12/01

PUMPING LEVEL (below land surface)
121.37 ft. after 48 hrs. pumping 1560 g.p.m.

Well Head Completion
Pitless adapter mfr BAKER Model 9.5PS2426
Casing Protection ☑ 12 in. above grade
☐ At-grade(Environmental Wells and Borings ONLY)

Grouting Information Well grouted? ☑ Yes ☐ No

Material	From	To (ft.)	Amount(yds/bags)
G		225	45 Y

Nearest Known Source of Contamination
200 ft. direction N type SDF
Well disinfected upon completion? ☑ Yes ☐ No

Pump ☐ Not Installed Date Installed
Mfr nam GOULDS
Model 14RLJC-7 HP 75 Volts 480
Drop Pipe Length 165 ft. Capacity E+03 g.p.m
Type S

Any not in use and not sealed well(s) on property? ☐ Yes ☑ No

Was a variance granted from the MDH for this Well? ☐ Yes ☑ No

REMARKS, ELEVATION, SOURCE OF DATA, etc.

GAMMA LOGGED 8-29-2003. M.G.S. NO. 4280. LOGGED BY JIM TRAEN.

USGS Quad Coon Rapids Elevation 871
Aquifer: CFIG Alt Id: 80-6137

Well CONTRACTOR CERTIFICATION Lic. Or Reg. No. 71015
License Business Name
Name of Driller COX, A.

Report Copy

Unique No.	00674479	MINNESOTA DEPARTMENT OF HEALTH	Update Date	2007/01/09
County Name	Anoka	**WELL AND BORING RECORD** *Minnesota Statutes Chapter 1031*	Entry Date	2004/10/11

Township Name	Township	Range	Dir	Section	Subsection	Well Depth		Depth Completed		Date Well Completed
	31	24	W	22	BCBDBA	388	ft.	388	ft.	2003/12/19

Well Name	COON RAPIDS 25	**Lic. Or Reg. No.**	71015	**Name of Driller**	COX, A.		
USGS Quad	Coon Rapi	**Elevation**	871	**Aquifer**	CFIG	**Alternative Id**	80-6137

GEOLOGICAL MATERIAL	COLOR	HARDNESS	FROM	TO	STRAT	LITH PRIM	LITH SEC	LITH MINOR
SAND & GRAVEL	BROWN	SOFT	0	29	QHUB	SAND	GRVL	
QHUB = Sand & larger	SAND = Sand			GRVL = Gravel				
CLAY & GRAVEL	BROWN	HARD	29	82	QPUB	CLAY	GRVL	
QPUB = Pebbly sand/silt/clay	CLAY = Clay			GRVL = Gravel				
SANDY CLAY	BROWN	SOFT	82	87	QLUB	CLAY	SAND	
QLUB = Clay & sand	CLAY = Clay			SAND = Sand				
SAND	BROWN	SOFT	87	112	QFUB	SAND		
QFUB = Sand	SAND = Sand							
JORDAN S.S.	TAN	MEDIUM	112	162	CJDN	SNDS		
CJDN = Jordan	SNDS = Sandstone							
ST. LAWRENCE	BRN/GRN	MEDIUM	162	193	CSTL	SLSN	DLMT	
CSTL = St.Lawrence	SLSN = Siltstone			DLMT = Dolomite				
FRANCONIA S.S.	GRN/BRN	MED-HRD	193	359	CFRN	SNDS	SHLE	DLMT
CFRN = Franconia	SNDS = Sandstone			SHLE = Shale			DLMT = Dolomite	
IRONTON/GALESVILLE	GRAY	MEDIUM	359	388	CIGL	SNDS		
CIGL = Ironton-Galesville	SNDS = Sandstone							

Appendix B

Part 1 Wellhead Protection Plan Amendment

City of Coon Rapids Wellhead Protection Plan Amendment

Part I:

Delineation of the Wellhead Protection Area (WHPA), Drinking Water Supply Management Area (DWSMA), and Assessments of Well and DWSMA Vulnerability

Prepared for

March 2016

City of Coon Rapids Wellhead Protection Plan Amendment

Part I:

Delineation of the Wellhead Protection Area (WHPA), Drinking Water Supply Management Area (DWSMA), and Assessments of Well and DWSMA Vulnerability

Prepared for

March 2016

4300 MarketPointe Drive, Suite 200
Minneapolis, MN 55435
Phone: 952.832.2600
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City of Coon Rapids Wellhead Protection Plan Amendment

March 2016

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Certifications

I hereby certify that this plan, document, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Geologist under the laws of the state of Minnesota.

	March 2, 2016
John C. Greer	Date
PG #: 30347	

Public Water Supply Profile

The following persons are the contacts for the Coon Rapids Wellhead Protection Plan:

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General Information

UNIQUE WELL NUMBER(S) Primary: 202932, 202931, 202930, 202965, 161413, 110460, 110461, 150357, 110475, 420956, 474384, 674478, 674479; Seasonal: 202926, 202929, 202972, 202951, 202937, 202943, 168721, 168720, 110469, 474385, 463020

SIZE OF POPULATION SERVED 61,476 (2010 Census)

COUNTY Anoka

1.0 Introduction

In compliance with the Minnesota Wellhead Protection Rules (MN Rules 4720.5100 through 4720.5590), wellhead protection areas (WHPAs) and Drinking Water Supply Management Areas (DWSMAs) were delineated for the City of Coon Rapids in 2003 (Wells 1-23) (MDH, 2003) and in 2006 (Wells 4, 7, 11, 12, 14, 15, 24, 25) (Bonestroo, 2006). Minnesota Rule 4720.5570 states that wellhead protection plans must be reviewed and amended at least every ten years. In addition, the Minnesota Department of Health (MDH) has instituted requirements for inclusion of fracture-flow analysis in the delineation of WHPAs since the last delineation of the City's WHPAs and DWSMAs.

As required by Minnesota Rule 4720.5570, new WHPAs and new DWSMAs have been delineated for the City of Coon Rapids. This report summarizes work completed to update the delineation of the Coon Rapids WHPAs and DWSMAs in compliance with the Minnesota Wellhead Protection Rules and to meet the current MDH requirements. Data elements used in preparation of the report are presented in Table 1.

The City of Coon Rapids currently has 13 primary municipal water supply wells. Wells 9, 24, and 25 (unique numbers 202931, 674478, and 674479, respectively) are completed in the Tunnel City Group-Wonewoc Sandstone (TCW) aquifer (formerly known as the Franconia-Ironton-Galesville, or FIG, aquifer). The open interval of Well 9 also extends into the Eau Claire Formation. Wells 8, 10, 11, 13, 14, and 15 (unique numbers 202932, 202930, 202965, 168720, 110460, and 110461, respectively) are completed in both the TCW and Mt. Simon Sandstone aquifers. Wells 17, 19, 20, and 21 (unique numbers 150357, 110475, 420956, and 474384, respectively) are completed in the confined Quaternary glacial drift aquifer.

The City also has 11 seasonal wells. Well 1 (unique number 202926) is completed in the Tunnel City-Wonewoc aquifer. Wells 2, 4, 5, 7, and 12 (unique numbers 202929, 202972, 202951, 202943, and 168721, respectively) are completed in both the TCW and Mt. Simon Sandstone aquifers. The open intervals of Wells 1 and 2 also intersect the St. Lawrence Formation, and the open interval of Well 1 also intersects the Eau Claire Formation. Well 6 (unique number 202937) is completed in the Tunnel City Group aquifer. Well 16 (unique number 161413) is completed in the Wonewoc Sandstone and Mt. Simon Sandstone aquifers. Well 18 (unique number 110469) is completed in the Mt. Simon Sandstone aquifer. Wells 22 and 23 (unique numbers 474385 and 463020, respectively) are completed in the confined Quaternary glacial drift aquifer.

Well locations are shown on Figure 1. Table 2 summarizes construction, use, and vulnerability information for the Coon Rapids water supply wells. Well logs for the City's wells are presented in Appendix A.

While compiling data for this report, a database discrepancy was identified for Wells 13 and 16. The Minnesota Well Index (MWI) listed unique numbers 168720 for Well 13 and 161413 for Well 16; the Minnesota Department of Natural Resources (MnDNR) Permitting And Reporting System (MPARS) database had unique numbers 161413 for Well 13 and 168720 for Well 16. A check of the unique number tags on the physical wells showed unique number 161413 on Well 13 and 168720 on Well 16; however, through discussions with the MDH and examination of their records it was determined that the unique

number tags for Wells 13 and 16 were transposed when they were installed on the wells (MDH, 2015a). The MWI database was correct; Well 13 is unique number 168720 and Well 16 is unique number 161413.

2.0 Criteria for Wellhead Protection Area Delineation

The following criteria were used to ensure accurate delineation of the WHPAs.

2.1 Time of Travel

A minimum 10-year groundwater time of travel criterion must be used to delineate a WHPA (MN Rule 4720.5510) so there is sufficient reaction time to remediate potential health impacts in the event of contamination of the aquifer. A groundwater time of travel of ten years was considered in this study. As required by the Wellhead Protection Rules, the one-year groundwater time of travel was also determined for each well addressed in this study.

2.2 Aquifer Transmissivity

For this study, transmissivities of the Quaternary glacial drift aquifer, the Tunnel City Group, the Wonewoc Sandstone, and the Mt. Simon Sandstone were estimated using pumping tests conducted at Coon Rapids Wells 19 and 20 (Quaternary), specific capacity data at Well 21 (Quaternary), specific capacity data at Coon Rapids Wells 24 and 25 (Tunnel City and Wonewoc), specific capacity data at Coon Rapids Well 18 (Mt. Simon, and pumping tests at Andover Well 3 (Mt. Simon). Summaries of the aquifer tests are included in Appendix B. See Section 2.5 below for details regarding how these transmissivity values were included in the groundwater model.

A pumping test conducted at Well 19 in 2002 estimated a range of transmissivities from 8,120 ft^2/day (754.4 m^2/day) to 9,420 ft^2/day (875.1 m^2/day) with a geometric mean of 8,700 ft^2/day (808.3 m^2/day) for the confined Quaternary glacial drift aquifer. Pumping tests conducted at Coon Rapids Well 20 in 1999 and 2002 estimated a range of transmissivities from 27,000 ft^2/day (2,508.4 m^2/day) to 66,700 ft^2/day (6,196.6 m^2/day) with a geometric mean of 45,210 ft^2/day (4,200.1 m^2/day) for the confined Quaternary glacial drift aquifer. Coon Rapids Well 21 is located far from the City's other Quaternary wells, and available Quaternary stratigraphy mapping (Meyer et al., 2013) appears to indicate that the confined Quaternary aquifer is not continuous throughout the City. Specific capacity data for Well 21 was used to estimate a transmissivity of 5,750 ft^2/day (534.2 m^2/day) for the confined Quaternary glacial drift aquifer near Well 21.

Analysis of specific capacity data for Wells 24 and 25 using the TGuess Method (Bradbury and Rothschild, 1985) estimated a range of transmissivities from 6,400 ft^2/day (594.6 m^2/day) to 9,400 ft^2/day (873.3 m^2/day) with a geometric mean of 7,700 ft^2/day (715.4 m^2/day) for the combined Tunnel City Group-Wonewoc Sandstone aquifer. The geometric mean value was allocated between the two formations using a ratio determined by comparing mean transmissivities for the two formations in the vicinity of Coon Rapids; see the aquifer test plan for the TCW aquifer in Appendix B for more details. A transmissivity of 5,470 ft^2/day (508.2 m^2/day) was used for the Tunnel City and a transmissivity of 2,230 ft^2/day (207.2 m^2/day) was used for the Wonewoc.

Four single-well pumping tests were conducted at Andover Well 3 in 1987. Mt. Simon Sandstone transmissivities estimated by these tests ranged from 1,600 ft^2/day (148.6 m^2/day) to 2,200 ft^2/day

(204.4 m^2/day). Analysis of specific capacity data at Coon Rapids Well 18 using the TGuess Method (Bradbury and Rothschild, 1985) estimated a transmissivity of 4,700 ft^2/day (436.6 m^2/day) for the Mt. Simon Sandstone. The geometric mean value of 2,310 ft^2/day (214.6 m^2/day) from these tests was used in the model.

2.3 Daily Volume of Water Pumped

Pumping data for the City of Coon Rapids for the period 2010 through 2014 are summarized in Table 3. The largest annual withdrawal for 2010-2014 was 2,959,153,000 gallons in 2012. The City's Comprehensive Water System Plan (Bolton & Menk, 2014) includes projected average daily demands of 8.11 and 8.67 million gallons per year (MGD) for 2019 and 2024, respectively. These values were used to interpolate a 2020 projected average daily demand of 8.22 MGD (3,001,030,000 gallons per year). Projected 2020 pumping rates for each well were calculated by multiplying the total 2020 projected demand by the 2010-2014 average percentage of total withdrawal for each well. The pumping rate used in the model for each Coon Rapids well for the WHPA delineation was either this 2020 projection or the historical maximum for the period 2010-2014, whichever was greater. The maximum 2010-2014 rates were greater than the 2020 projected rates for all wells. Table 3 summarizes the pumping rates used in the model for delineation of the WHPAs. Unaccounted water (the difference between the total volume pumped annually by the City's wells and the total amount billed to users) averaged 12% annually from 2004-2013 (Bolton & Menk, 2014).

2.4 Conceptual Hydrogeologic Model

The regional hydrogeologic conceptual model is presented in Metropolitan Council (2014). Additional geological information is included below, along with discussion of groundwater flow boundaries and flow directions specific to the Coon Rapids area.

2.4.1 Regional Bedrock Geology

A bedrock map derived from the Twin Cities ten-county metropolitan area geologic map (Mossler, 2013) is shown on Figure 1. Locations of three geologic cross sections through the study area are also shown on Figure 1. Geologic cross sections A-A' (Figure 2) and C-C' (Figure 4) are roughly parallel northwest to southeast sections that cross west to east cross section B-B' (Figure 3) at Coon Rapids Well 14 and Well 8, respectively.

The hydrostratigraphic units of importance for this study are described in more detail below.

Mt. Simon Sandstone

The Cambrian-aged Mt. Simon Sandstone consists of multiple beds of medium- to coarse-grained quartz sandstone intermixed with beds of siltstone and feldspathic sandstone (Mossler, 2012). The formation is 125-200 feet thick in Anoka County. The Mt. Simon Sandstone is overlain by the Eau Claire Formation (a confining unit) throughout Coon Rapids.

Eau Claire Formation

The Cambrian-aged Eau Claire Formation is comprised of very fine feldspathic sandstone, siltstone, and shale, and is 75-80 feet thick in Anoka County (Mossler, 2012). It is overlain by the Wonewoc Sandstone throughout Coon Rapids but is the uppermost bedrock just to the northwest of the City in Andover and Anoka. The Eau Claire Formation functions as a regional confining unit where present.

Wonewoc Sandstone (formerly Ironton and Galesville Sandstones)

The Cambrian-aged Wonewoc Sandstone is fine- to coarse-grained, quartzose sandstone, with its upper part coarser-grained than its lower part (Mossler, 2012). It is 50-60 feet thick in Anoka County and is the uppermost bedrock in far northwestern Coon Rapids.

Tunnel City Group (formerly Franconia Formation)

The Cambrian-aged Tunnel City Group is divided into two formations: the Mazomanie Formation and the Lone Rock Formation. The Mazomanie Formation is mostly a fine- to medium-grained friable, quartz sandstone. The Lone Rock Formation underlies the Mazomanie Formation and consists of fine grained glauconitic, feldspathic sandstone and shale with dolostone interclasts (Mossler, 2012). The Tunnel City Group is the uppermost bedrock in northern Coon Rapids and in the bedrock valleys in the central part of the City. It is 135 to 180 feet thick where not eroded. The Mazomanie Formation is present in the uppermost 60-80 feet of the unit.

Quaternary Glacial Drift

The Quaternary-aged sediments that overlie the bedrock in Coon Rapids were deposited by multiple glacial advances during the Pleistocene Epoch (Meyer et al., 2013) and vary in thickness from approximately 90 feet thick where the Jordan Sandstone is the uppermost bedrock to nearly 300 feet thick where the Tunnel City Group is the uppermost bedrock. As shown on Figures 2-4, the upper 30-50 feet of the Quaternary sediments are typically comprised of sand and gravel. The deeper sediments are comprised of discontinuous sequences of fine-grained sediments (i.e., clays and silts) and sands and gravels. Away from the Mississippi River in northeastern Coon Rapids, Figures 3 and 4 indicate a continuous clay unit separating the shallow sands and gravels from discontinuous deeper confined sand and gravel aquifers. Closer to the river, Figures 2 and 3 show a sandier profile overall with more discontinuous local confining units.

2.4.2 Flow Boundaries

The Mississippi River to the southwest of Coon Rapids is a groundwater flow boundary, though not necessarily for all of the hydrostratigraphic units detailed in the previous section. See Section 2.6 below for more discussion.

2.5 Model Description

To accurately delineate the WHPAs, it is necessary to assess how nearby wells, rivers, lakes, and variations in geologic conditions affect groundwater flow directions and velocities in the aquifer. A groundwater model constructed using the finite difference code MODFLOW-NWT (Niswonger, et al., 2011) was used

for this study to simulate groundwater flow in the hydrostratigraphic units from the Quaternary aquifer down to the Mt. Simon Sandstone. MODFLOW-NWT is public domain software that is available at no cost from the United States Geological Survey. The pre- and post-processor Groundwater Vistas (version 6) (Environmental Simulations, Inc., 2011) was used to create the model data files and evaluate the model results.

2.5.1 Base Model

Since the previous Coon Rapids Wellhead Protection Plan was prepared, the Twin Cities Metropolitan Area Regional Groundwater Flow Model, Version 3.0 (Metropolitan Council, 2014) was developed by Barr Engineering for the Metropolitan Council. This regional model includes Coon Rapids and, per discussions at the Pre-Delineation Meeting (MDH, 2015), Metro Model 3 was used as the base model for the new Coon Rapids WHPA delineations.

Metro Model 3 is divided into 9 layers to represent the major hydrostatigraphic units in the Twin Cities Metropolitan Area. In Coon Rapids, the model layers represent the following (ordered from youngest to oldest; i.e., shallowest to deepest):

- Layer 1: Quaternary glacial drift
- Layer 2: St. Peter Sandstone or Quaternary glacial drift (where present)
- Layer 3: Prairie du Chien Group or Quaternary glacial drift (where present)
- Layer 4: Jordan Sandstone or Quaternary glacial drift (where present)
- Layer 5: St. Lawrence Formation or Quaternary glacial drift (where present)
- Layer 6: Tunnel City Group or Quaternary glacial drift (where present)
- Layer 7: Wonewoc Sandstone
- Layer 8: Eau Claire Formation
- Layer 9: Mt. Simon Sandstone

Major rivers near Coon Rapids (i.e., the Mississippi and Rum Rivers) as well as lakes in the area are simulated using the River Package within MODFLOW-NWT. Baseflow measurements for rivers and streams in the area were used during calibration of Metro Model 3.

Recharge for the groundwater flow model was determined using the SWB recharge model (Westenbroek et al., 2010) for the Twin Cities metropolitan area as described in Metropolitan Council (2012).

Modifications made to Metro Model 3 for the Coon Rapids WHPA delineations are discussed in the following section.

2.5.2 Model Modifications and Updates

The following modifications and updates were made to the base model:

- A smaller sub-model centered on Coon Rapids was cut from the full Metro Model 3 using the telescopic mesh refinement (TMR) functionality in Groundwater Vistas. The boundaries of this model are approximately 10 miles from Coon Rapids in all directions. Constant-flux boundary conditions derived from the full Metro Model 3 results were applied to the outer boundaries of

the sub-model. A map of the sub-model domain is shown on Figure C1 in Appendix C. The sub-model will be referred to as "the model" hereafter in this report.

- It was determined at the Pre-delineation Meeting (MDH, 2015b) that several of the Coon Rapids well locations were incorrect in the County Well Index (CWI) (MGS, 2015). With information from the City, the locations of Wells 4, 5, 7, 8, 10, 15, 18, 19, 21, 24, and 25 were adjusted based on aerial photos to better reflect their actual locations (MDH, 2015a).
- The pumping rates for the City's wells were changed to the model input rates shown in Table 3.
- The model grid was refined from the 500-m square cells of the base model down to 125-m square cells within the Coon Rapids city limits. The grid was further refined to 7.81-m square cells in the immediate vicinity of the Coon Rapids wells.
- Edges of partially eroded bedrock units in Coon Rapids (e.g., Jordan Sandstone, St. Lawrence Formation, Tunnel City Group) were re-mapped onto the refined grid using boundaries from the Twin Cities Metro bedrock map (Mossler, 2013).
- Slight differences in model layer contact elevations versus well open intervals noted on the well logs resulted in some of the City's wells drawing water from inappropriate layers in the model. These issues were corrected for the following wells (well name followed by current open layer(s) in the model, followed in parentheses by the original open layers in the model):
    - Well 11, 5 through 9 (6 through 9)
    - Well 13, 7 through 9 (6 through 9)
    - Well 14, 7 through 9 (6 through 9)
    - Well 20, 4 (3 and 4)
    - Well 21, 4 (4 and 5)
    - Well 22, 3 (2 and 3)
    - Well 23, 4 (3 and 4)
- Horizontal hydraulic conductivity values (Kx) were updated so that model layer transmissivities in the vicinity of the Coon Rapids wells match aquifer test transmissivities (Section 2.2; Appendix B) as described below. The ratio of horizontal to vertical hydraulic conductivity (Kx/Kz) in the base Metro Model 3 was preserved when making these changes up to a maximum ratio of 1,000; i.e., new Kz values were calculated from the updated Kx values. (Values of Kx/Kz greater than 1,000 did not seem reasonable, except for the Layer 2 clay unit described below.) See Appendix C for maps of model hydraulic conductivity fields. Since several of Coon Rapids' wells are located close to the eastern city limits, some of the areas of updated hydraulic conductivity had to extend east into Blaine in order to encompass the entire well capture zones. This extended modification boundary has its eastern limit approximately 5 km to the east of the Coon Rapids/Blaine line.
    - <u>Quaternary</u>. Detailed mapping of sand and glacial till units from the Anoka County Geologic Atlas (Meyer et al., 2013) was utilized in the model edits.
        - <u>Layer 2</u>: Layer 2 represents a clayey glacial till unit at most Coon Rapids wells, but some of the Metro Model 3 K values were too high to represent this material. Till unit Ce from the Anoka County Atlas appeared to correspond to the till unit observed on the City's well logs, so the Kx and Kz values for cells representing this till within the extended boundary described above were set

to the Metro Model 3 values in Layer 2 at Well 21 - 2 ft/day and 0.001 ft/day (0.623 m/day and 0.00016 m/day), respectively – which are reasonable for the till.

- Layers 3 and 4: Sand unit Sr appeared to represent the aquifer in which Well 19 is screened. Sand unit Sr also appeared to represent the shallow portion of the sand aquifer in Layer 3 at Well 20. Layer 3 should be clay at Well 19, and till unit Xt appeared to represent this material. Wells 17, 22, and 23 appeared to be screened in sand unit Sx, which overlaped Sr and Sp in the area of the primary Coon Rapids Quaternary well field. Well 21 appeared to be screened in overlapping Sx and Sr units in Layer 4. This information was accounted for in the model as follows:
    - The Layer 3 Kx and Kz values within the till unit Xt extent were set to the values used for till unit Ce in Layer 2.
    - The transmissivity determined from the pumping test at Well 19 was 8,700 ft^2/day (808.3 m^2/day) and the model Layer 4 thickness at Well 19 was 37.4 feet (11.4 m), resulting in an effective Kx of 233 ft/day (71.1 m/day). The Layer 4 Kx values within the "hole" in sand unit Sp around Well 19 were set to this value.
    - Layer 3 Kx values in the sand unit Sr extents that did not overlap till unit Xt were set to 233 ft/day (71.1 m/day).
    - The transmissivity determined from the pumping test at Well 20 was 45,210 ft^2/day (4,200.1 m^2/day), the model Layer 3 thickness at Well 20 was 31.8 ft (9.7 m), and the model Layer 4 thickness at Well 20 was 36.7 ft (11.2 m). Combining this information with the Sr Kx of 71.1 m/day in Layer 3 resulted in an effective Layer 4 Kx of 1,030 ft/day (314.4 m/day) to match the Well 20 transmissivity in Layers 3 and 4. This K value was applied to the combined Sp and Sx extent in Layer 4 that includes Wells 17, 20, 22, and 23.
    - The transmissivity determined from the specific capacity measurement in Well 21 was 5,750 ft^2/day (534.2 m^2/day). The thickness of Layer 4 at Well 21 was 44.9 ft (13.7 m), resulting in an effective Layer 4 Kx of 128 ft/day (39.1 m/day). This value was uniformly assigned to Layer 4 cells within the combined Sr and Sx extents near Well 21.

- St. Lawrence. As noted above, Layer 5 represents the St. Lawrence formation, a regional confining unit, over much of Coon Rapids. Partially due to the remapping of bedrock units described above, some cells representing St. Lawrence Formation in the model ended up with horizontal hydraulic conductivities greater than the largest measured Kx value for the St. Lawrence (46 ft/day or 14 m/day) in Runkel et al. (2003). The Kx was set to 14 m/day in all St. Lawrence cells within the extended boundary described above with original Kx values greater than 14 m/day.
- Tunnel City and Wonewoc. As discussed above in Section 2.2, a transmissivity of 5,470 ft^2/day (508.2 m^2/day) was estimated for the Tunnel City Group and a

transmissivity of 2,230 ft^2/day (207.2 m^2/day) was estimated for the Wonewoc Sandstone. The model thicknesses at Well 24 in Layers 6 and 7 were 113 ft (34.4 m) and 61.0 ft (18.6 m), respectively. Dividing the pumping test T values by these model thicknesses gave effective K values of 48.6 ft/day (14.8 m/day) for the Tunnel City Group and 36.4 ft/day (11.1 m/day) for the Wonewoc sandstone. These K values were uniformly applied to cells representing the Tunnel City Group or Wonewoc Sandstone, respectively, within the extended boundary described above.

- Mt. Simon. Dividing the pumping test transmissivity value of 2,310 ft^2/day (214.6 m^2/day) by the model Layer 9 thickness at Well 18 of 195 ft (59.5 m) gave an effective Mt. Simon K of 11.8 ft/day (3.6 m/day). The Layer 9 Kx values within the extended boundary described above were uniformly set to the calculated effective K.

As discussed at the Pre-Delineation Meeting, no additional recalibration of the model was deemed necessary. Calibration summary plots for the updated model are included in Appendix C (Figures C9 and C10). Full discussion of the Metro Model 3 calibration is presented in Metropolitan Council (2014). MODFLOW files for the updated model are included in Appendix G.

2.6 Groundwater Flow Field

The groundwater flow field used for delineation of the WHPAs was determined by the groundwater flow model; modeled contours for the confined Quaternary glacial drift (model layers 3 and 4), Tunnel City Group, Wonewoc Sandstone, and Mt. Simon Sandstone are shown on Figures 5, 6, 7, 8, and 9, respectively.

In general, Figures 5-8 show southerly to westerly flow directions in the confined Quaternary and Tunnel City-Wonewoc aquifers. No published groundwater contours are known for these aquifers in Anoka County, but the modeled contours seem reasonable since they indicate groundwater flow towards the Mississippi River. Based on this modeled flow toward the regional groundwater discharge zones and the acceptable calibration of the groundwater model, the groundwater flow field was determined to be of acceptable accuracy.

As shown on Figures 5-8, the cones of depression from the western Coon Rapids well field extend under the Mississipppi River, which results in capture zones crossing the river into Champlin and Brooklyn Park (Figure 10). See Section 3.2 below for more discussion.

As expected due to the presence of the Eau Claire Formation aquitard, flow in the Mt. Simon Sandstone is less influenced by the Mississippi River and more dependent on high capacity pumping. Figure 9 shows flow in the Mt. Simon in Coon Rapids to be primarily directed towards the south and southwest. The southerly flow is consistent with the large cone of depression centered on southeastern Hennepin County depicted on the Mt. Simon groundwater contour map included in the Hennepin County Geologic Atlas (Kanivetsky, 1989). In northwestern Coon Rapids, flow directions in the Mt. Simon are influenced by the Champlin well field to the west.

3.0 Delineation of the Wellhead Protection Areas

Delineation of the WHPAs for the Coon Rapids wells involved the evaluation of porous media flow only. Per discussions at the Pre-Delineation Meeting (MDH, 2015b), a fracture flow evaluation was deemed unnecessary.

3.1 Porous Media Flow Evaluation

The groundwater flow model discussed above in Section 2 was used to simulate the groundwater flow field in the vicinity of Coon Rapids. The porous media capture zone for the Coon Rapids well field was delineated using the software program MODPATH (Version 5) with the modeled groundwater flow field. A minimum of 180 particles were tracked from each well. The particles were released from 6 vertical points in each layer along the open interval of each well. These particles were tracked backwards in time for both one and ten years. In plan view, the areas encompassed by the particle traces were then outlined as the 1-year and 10-year porous media time of travel zones for the well field.

Porosity values used for the porous media flow evaluation were as follows (Norvitch et al., 1974, Schwartz and Zhang, 2003):

- Quaternary Glacial Drift = 0.25
- Tunnel City Group = 0.2
- Wonewoc Sandstone = 0.2
- Mt. Simon Sandstone = 0.2

3.1.1 Sensitivity Analysis

A sensitivity analysis was performed to test the sensitivity of the model results to varying hydraulic conductivity in the confined Quaternary glacial drift, TCW, and Mt. Simon aquifers. The ranges of transmissivities estimated for the various aquifers by the pumping test analyses and specific capacity calculations (Appendix B) were used to calculate upper bounds on hydraulic conductivity for the model sensitivity analysis. The original Metro Model 3 hydraulic conductivities in these aquifers were smaller than the values calculated from the lower bounds of the transmissivity ranges, so the Metro Model 3 values were used as the lower bounds for the sensitivity analysis. The ratio of horizontal to vertical hydraulic conductivity in the base Metro Model 3 was preserved for each sensitivity run except where modified as discussed above in Section 2.5.2. The model was most sensitive to lowering the hydraulic conductivity of the TCW and confined Quaternary aquifers. A plot of the sensitivity analysis results is included in Appendix C.

Multiple particle tracking simulations were conducted to account for uncertainty in the groundwater flow model. In addition to the base model run, particle tracking simulations were conducted for the upper and lower conductivity bounds of each sensitivity run. Particle traces from all simulations were used to delineate the 1-year and 10-year porous media capture zones for each well (Figure 10).

3.2 WHPA Delineations

The composite 10-year porous media capture zones define the WHPAs. There are seven distinct WHPAs due to the spacing of the City's wells. The Emergency Response Area (ERA) is delineated for each well by the composite 1-year porous media capture zones. The WHPAs and ERAs are shown on Figure 10.

As mentioned above in Section 2.6, portions of the Coon Rapids WHPA extend under the Mississippi River into Champlin and Brooklyn Park. The particle traces that crossed beneath the River originated at confined Quaternary Wells 17, 20, and 23 and TCW-Mt. Simon Wells 7 and 11. While the traces from the Quaternary wells originated where Layer 4 represents Quaternary sediments, they crossed the River where Layer 4 represents the Jordan Sandstone. The degree of connection between the bedrock aquifers (Jordan and TCW) and the Mississippi River does not appear to be strong enough to prevent the aquifer stress from concentrated high-capacity pumping in Coon Rapids from extending to the west of the River.

3.3 Conjunctive Delineation

As discussed below in section 6.0, a region of High vulnerability is present within one of the Coon Rapids DWSMAs; however, there is no water quality data available that definitively indicates that groundwater pumped from this region is under the influence of surface water. Therefore, delineation of a surface water capture area (i.e., a conjunctive delineation) was not performed. Section 7.0 below discusses recommendations to address this data gap for the next WHPP amendment.

4.0 Delineation of the Drinking Water Supply Management Areas

The Coon Rapids DWSMAs encompass the WHPAs with boundaries that correspond to geographically identifiable features (e.g., roads, parcel boundaries, quarter-quarter section lines). Anoka County 2015 parcel data and Hennepin County 2011 parcel data were used to delineate the DWSMAs. There are three distinct DWSMAs: the West DWSMA encompasses the WHPAs for Wells 4, 6, 7, 11, 12, 14, 15, 17, 19, 20, 22, 23, 24, and 15; the Northeast DWSMA encompasses the WHPAs for Wells 1, 2, 8, 9, 10, 13, 16, 18, and 21; and the Southeast DWSMA encompasses the Well 5 WHPA. The Southeast DWSMA is contained entirely within the Coon Rapids city limits, while the Northeast DWSMA extends east into Blaine and the West DWSMA extends southwest into Champlin and Brooklyn Park. The Coon Rapids DWSMAs are shown on Figure 10. To satisfy Minnesota Rule 4720.5500, Subpart 2, 1:24,000 scale maps of the DWSMAs are included in Appendix D.

5.0 Well Vulnerability Assessment

MDH evaluated the vulnerability of the Coon Rapids municipal wells to contamination from contaminants released at the surface. The evaluation parameters include geology, well construction, pumping rate, and water quality. Coon Rapids Wells 6, 7, 11, 15, 17, 19, 20, 21, 22, 23, and 24 are classified as “vulnerable” and Wells 1, 2, 4, 5, 8, 9, 10, 12, 13, 14, 16, 18, and 25 are classified as “not vulnerable.” Copies of the MDH well vulnerability scoring sheets for the Coon Rapids wells are presented in Appendix E.

6.0 Drinking Water Supply Management Area Vulnerability Assessment

The vulnerabilities of the Quaternary glacial drift, Tunnel City Group, Wonewoc Sandstone, and Mt. Simon Sandstone within the DWSMAs associated with the Coon Rapids wells were evaluated in a manner consistent with MDH guidance for assessing aquifer vulnerability (MDH, 1997) using geologic sensitivities based on L scores computed from boring log data and water quality data for the Coon Rapids wells.

The first step in the assessment is to determine the geologic sensitivity rating of the aquifer. The Minnesota Department of Natural Resources (MnDNR) defines geologic sensitivity based on the travel time of water moving vertically from the surface to the aquifer of interest as follows (see MnDNR, 1991):

- Sensitivity = Very High: vertical travel time is hours to months
- Sensitivity = High: vertical travel time is weeks to years
- Sensitivity = Moderate: vertical travel time is years to decades
- Sensitivity = Low: vertical travel time is several decades to a century
- Sensitivity = Very Low: vertical travel time is more than a century

Geologic logs listed in the CWI for wells in the vicinity of the WHPAs were reviewed and "L scores" based on the thickness of low permeability units at each well location were assigned to each well. [See MnDNR (1991) for a discussion of how to determine L scores]. The MDH L score tool was used to compute the L scores and assign geologic sensitivity ratings. Well logs lacking detail in the Quaternary stratigraphy were excluded from the L score calculations. L score calculations were performed for the uppermost aquifer in each composite WHPA. Figure F1 in Appendix F shows geologic sensitivity for the regions of the WHPAs where the confined Quaternary aquifer is the uppermost aquifer, and Figure F2 shows geologic sensitivity for the regions of the WHPAs where bedrock aquifers (e.g., TCW, Mt. Simon) are the uppermost aquifers.

Quaternary geologic sensitivity in the Coon Rapids WHPAs is primarily Low or Moderate, though there is a region of High geologic sensitivity between Wells 15 and 25. Quaternary Wells 17, 22, and 23 are located in areas of Moderate geologic sensitivity, and Quaternary Wells 19, 20, and 21 are located in areas of Low geologic sensitivity.

Bedrock geologic sensitivity is Low except for approximately the northern two-thirds of the Well 6 WHPA where the geologic sensitivity of the TCW aquifer is Moderate.

The second step in the assessment is to refine the geologic sensitivity using water quality data from the water supply wells. Recent tritium sampling was conducted in summer 2010 at Coon Rapids Wells 11, 17, 20, 23, and 24 (see Appendix E) and in July 2015 at Wells 2, 5, 6, 9, 14, 18, and 21 (MDH, 2015c). Tritium (^3H), a radioactive isotope of hydrogen, has been used extensively to date groundwater. Tritium activities peaked during atmospheric hydrogen bomb testing of the 1950s and 1960s, and values of ^3H in precipitation reached a maximum of approximately 10,000 T.U. (tritium units) in 1963 (Mazor, 2004). Natural production of ^3H in the upper atmosphere introduces approximately 5 T.U. to precipitation each

year (Mazor, 2004). Because ^{3}H has a relatively short half-life of 12.43 years, radioactive decay since the bomb peak has reduced tritium activities to near background levels and ^{3}H is used mostly for relative age dating today. Groundwater that has little or no detectible ^{3}H is stated to be "vintage" or pre-bomb. Groundwater with detectable values of ^{3}H is stated to be "young" or post-bomb. The presence of tritium at concentrations above 1 tritium unit indicates the presence of a significant fraction of post-1954 (i.e., recently infiltrated) water in the groundwater sample. Table 4 summarizes the results of the 2010 and 2015 tritium sampling events. Tritium was not detected in the samples collected at Wells 5 and 18. Tritium was detected at similar concentrations of 2.6, 2.9, 2.7, 1.8, and 2.0 NTU at Wells 2, 9, 11, 14, and 17, respectively, and at higher concentrations of 6.8, 6.9, 8.6, 7.7, and 7.7 NTU at Wells 6, 20, 21, 23, and 24, respectively.

When water quality data does not indicate the presence of tritium or other constituents that are consistent with contamination from the surface the aquifer vulnerability classification and the geologic sensitivity rating can be the same. The presence of tritium in groundwater samples from a well suggests that the water traveled vertically from the ground surface to the aquifer in less than about 50 years. When tritium has been detected in a well, geologic sensitivity ratings of low or very low would not be consistent with water quality data, unless groundwater flow information would indicate a nearby connection to an area of rapid vertical movement of water (e.g., a buried bedrock valley filled with sand and gravel) where water could travel from the surface to the aquifer quickly enough that tritium could be detected in a well with a geologic sensitivity rating of low or very low. If there is no hydraulic connection to an area of rapid vertical movement of water the aquifer vulnerability would need to be classified as moderate to explain the presence of tritium in the well.

Figure 11 shows the final aquifer vulnerability map for the uppermost aquifer supplying water to municipal wells in each of the Coon Rapids DWSMAs. Within the West DWSMA, tritium was detected at Wells 6, 11, 14, 17, 20, 23, and 24. The parcels intersected by the Well 6 WHPA were assigned Moderate vulnerability; while the geologic sensitivity at Well 6 itself was Low, a Moderate vulnerability at minimum must be assigned to this region due to the tritium detection at Well 6. Wells 11, 14, 17, 23, 24, and 25 are located within regions of Moderate geologic sensitivity. The geologic sensitivity is Low at Well 20. Due to the tritium detections at multiple wells, most of the West DWSMA was assigned Moderate vulnerability. The area of High geologic sensitivity near Wells 15 and 25 was assigned High vulnerability; mapping of the boundaries of the High vulnerability area to correspond to geographically identifiable features resulted in Wells 14 and 25 being located in the High vulnerability area. In the absence of recent water quality data for Wells 4 and 12, Low geologic sensitivity was mapped to Low vulnerability where the Well 4 and Well 12 capture zone are the uppermost capture zones in the DWSMA.

The Southeast DWSMA was assigned Low vulnerability due to Low geologic sensitivity in the Well 5 WHPA and a tritium non-detect at Well 5.

Low vulnerability was assigned to the parcels within the Northeast DWSMA that intersect the Well 18 WHPA because the geologic sensitivity of the Mt. Simon Sandstone is Low and no tritium was detected at Well 18. The remainder of the Northeast DWSMA was assigned Moderate vulnerability. Although the geologic sensitivity of this region is primarily low, tritium was detected at Wells 2, 9, and 21, requiring a

minimum Moderate vulnerability. While the tritium value of 8.6 NTU at Well 21 is high, this value is not inconsistent with the definition of Moderate vulnerability (travel times from years to decades) and the Quaternary stratigraphy near Well 21 (Figures 3 and 4) includes some confining units.

7.0 Recommendations

It is recommended that the City work with the MDH to conduct tritium sampling of the municipal wells at least every ten years in order to have current data available when updating the aquifer vulnerability assessment as part of the required decennial wellhead protection plan amendments.

A conjunctive delineation was not performed due to the absence of water quality data that definitively indicate groundwater under the influence of surface water. Per current MDH policy, it is recommended that additional water quality sampling (e.g., oxygen isotopes) be conducted at the City wells nearest the region of High vulnerability and Quaternary wells whose capture zones extend under the Mississippi River (e.g., Wells 14, 15, 17, 20, 22, 23, and 25) during the life of this WHPP in order to assess the need for a conjunctive delineation in the next WHPP amendment.

8.0 Supporting Data Files

The groundwater model files and GIS files are included in Appendix G. (Appendix G can be found in the "Part1" folder on the CD.)

The groundwater model can be reviewed using MODFLOW-NWT (Niswonger et al., 2011). MODPATH files can be reviewed using MODPATH Version 5.

All coordinates in the modeling files are based on UTM NAD 83 Zone 15 N datum. Elevations are in meters above mean sea level (m MSL). Time units are days. Length units are meters.

The GIS files have been named according to the MDH conventions. Shapefiles are in UTM NAD83 Zone 15 N datum.

9.0 References

Bonestroo, Rosene, Anderlik & Associates (Bonestroo), 2006. City of Coon Rapids Wellhead Protection Plan, Part I, Amendment. Prepared for the City of Coon Rapids, February 2006.

Bradbury, K.B., and E.R. Rothschild, 1985. A computerized technique for estimating the hydraulic conductivity of aquifer from specific capacity data. *Ground Water* v. 23, no. 2, pp. 240-246.

Bolton & Menk, 2014. Comprehensive Water System Plan, City of Coon Rapids, Minnesota. Prepared for City of Coon Rapids, Bolton & Menk Project No. N21.107935, October 2014.

Environmental Simulations, Inc., 2011. Guide to using Groundwater Vistas, Version 6, Environmental Simulations Inc.

Kanivetsky, R., 1989. Bedrock Hydrogeology. Plate 6 of 9, *in* Geologic Atlas of Hennepin County, Minnesota: N.H. Balaban (ed.). Minnesota Geological Survey County Atlas Series, Atlas C-4. University of Minnesota, St. Paul.

Mazor, E, 2004. Chemical and Isotopic Groundwater Hydrology, 3rd ed., New York: Marcel Dekker Inc.

Metropolitan Council, 2014. Twin Cities Metropolitan Area Regional Groundwater Flow Model, Version 3.0. Prepared by Barr Engineering. Metropolitan Council: Saint Paul, MN.

Metropolitan Council, 2012. Using the soil water balance model (SWB) to estimate recharge for the Twin Cities Metropolitan Area Groundwater Model Version 3. Prepared by Barr Engineering. Metropolitan Council: Saint Paul, MN.

Meyer, G.N., Tipping, R.G., and R.S. Lively, 2013. Sand Distribution Model. Plate 5 of 6, *in* Geologic Atlas of Anoka County, Minnesota: D.R. Setterholm (ed.). Minnesota Geological Survey County Atlas Series, Atlas C-27. University of Minnesota, St. Paul.

Minnesota Department of Health (MDH), 2015a. *RE: Revised Coon Rapids Well Shapefile Corrected in CWI*. [email] Message from Amal Djerrari of the MDH to Adam Janzen of Barr Engineering and Sean Hunt of the MnDNR. Sent 8/13/2015.

Minnesota Department of Health (MDH), 2015b. Personal communication: Pre-Delineation Meeting with MDH, City of Coon Rapids, and Barr Engineering staffs held on August 11, 2015 at Barr Engineering Company, Edina, MN.

Minnesota Department of Health (MDH), 2015c. *RE: Coon Rapids Tritium*. [email] Message from Amal Djerrari of the MDH to Adam Janzen and John Greer of Barr Engineering. Sent 10/23/2015.

Minnesota Department of Health (MDH), 2003. Wellhead Protection Plan for the City of Coon Rapids, Part I, Delineation of Wellhead Protection Areas, Delineation of Drinking Water Supply Management Areas,

Assessment of Well and Aquifer Vulnerability. Prepared by Stephen W. Robertson of the MDH for the City of Coon Rapids, March 2003.

Minnesota Department of Natural Resources (MnDNR), Division of Waters. 1991. *Criteria and Guidelines for Assessing Geologic Sensitivity of Ground Water Resources in Minnesota*. Prepared for the Legislative Commission on Minnesota Resources, 122 p., June 1991.

Minnesota Geological Survey (MGS), 2015. Minnesota Well Index, update November 2015.

Mossler, J.H., 2012. Bedrock Geology. Plate 2 of 6, *in* Geologic Atlas of Anoka County, Minnesota: D.R. Setterholm (ed.). Minnesota Geological Survey County Atlas Series, Atlas C-27. University of Minnesota, St. Paul.

Mossler, J.H., 2013. Bedrock geology of the Twin Cities ten-county metropolitan area, Minnesota. Miscellaneous Map Series M-194, Minnesota Geological Survey.

Niswonger, R.G., Panday, S., and Ibaraki, M., 2011. MODFLOW-NWT, A Newton formulation for MODFLOW-2005. U.S. Geological Survey Techniques and Methods 6-A37, 44 p.

Norvitch, R.F., Ross, T.G., and A. Brietkrietz, 1974. Water resources outlook for the Minneapolis-St. Paul metropolitan area. Metropolitan Council of the Twin Cities area, 219pp.

Schwartz, F.W. and H. Zhang, 2003. *Fundamentals of Ground Water*. John Wiley and Sons, Inc. New York, New York.

Westenbroek, S.M., V.A. Kelson, W.R. Dripps, R.J. Hunt, and K.R. Bradbury, 2010. SWB – A Modified Thornthwaite-Mather Soil-Water-Balance Code for Estimating Groundwater Recharge, Techniques and Methods 6-A31, U.S. Geological Survey, Groundwater Resources Program, Reston, VA, 72 pp.

Tables

Table 1

Assessment of Data Elements
Coon Rapids WHPP Amendment

Data Element	Present and Future Implications				Data Source
	Use of the Well s	Delineation Criteria	Quality and Quantity of Well Water	Land and Groundwater Use in DWSMA	
Precipitation	M	L	M	M	Minnesota Climatology Working Group
Geology					
Maps and geologic descriptions	M	H	H	H	MGS, CWI
Subsurface data	M	H	H	H	MGS, MDH, CWI
Borehole geophysics	M	M	M	M	MGS
Surface geophysics	L	L	L	L	Not Available
Maps and soil descriptions	L	M	M	M	MGS, NRCS
Eroding lands					
Water Resources					
Watershed units	L	L	L	L	DNR
List of public waters	L	L	L	L	DNR
Shoreland classifications					
Wetlands map					
Floodplain map					
Land Use					
Parcel boundaries map	L	H	L	L	Metropolitan Council, Anoka County
Political boundaries map	L	L	L	L	MNGEO
PLS map	L	L	L	L	DNR
Land use map and inventory					
Comprehensive land use map					
Zoning map					
Public Utility Services					
Transportation routes and corridors	L	M	L	L	MNDOT
Storm/sanitary sewers and PWS system map	L	L	L	L	City of Coon Rapids
Oil and gas pipelines map					

Definitions Used for Assessing Data Elements:

High (H) - the data element has a direct impact
Moderate (M) - the data element has an indirect or marginal impact
Low (L) - the data element has little if any impact
Shaded - the data element was not required by MDH for preparing the WHP plan

CWI – Minnesota County Well Index
DNR – Minnesota Department of Natural Resources
MNGEO - Minnesota Geospatial Information Office
MDH – Minnesota Department of Health
MNDOT – Minnesota Department of Transportation
MPCA – Minnesota Pollution Control Agency
NRCS – Natural Resources Conservation Service
SSURGO – Soil Survey Geographic Database
USGS – United States Geological Survey

Table 1

Assessment of Data Elements (Continued)

Data Element	Present and Future Implications				Data Source
	Use of the Well s	Delineation Criteria	Quality and Quantity of Well Water	Land and Groundwater Use in DWSMA	
Public drainage systems map/lis	L	L	L	L	City of Coon Rapids
Records of well construction, maintenance, and use	H	H	L	L	City of Coon Rapids, CWI, MDH files
Surface Water Quantity					
Stream flow data	L	L	L	L	DNR
Ordinary high water mark data	L	L	L	L	DNR
Permitted withdrawals	L	L	L	L	DNR
Protected levels/flows	L	L	L	L	DNR
Water use conflicts	L	L	L	L	DNR
Groundwater Quantity					
Permitted withdrawals	H	H	H	H	DNR
Groundwater use conflicts	L	L	L	L	DNR
Water levels	H	H	H	H	CWI, MDH
Surface Water Quality					
Stream and lake water quality management classification					
Monitoring data summary	L	L	L	L	MPCA, MDH
Groundwater Quality					
Monitoring data	H	H	H	H	MDH
Isotopic data	H	H	H	H	MDH
Tracer studies	L	L	L	L	Not Available
Contamination site data	L	L	M	M	MPCA, MDH
Property audit data from contamination sites					
MPCA and MDA spills/release reports	L	L	L	L	MDH, MPCA

Definitions Used for Assessing Data Elements:

High (H) - the data element has a direct impact
Moderate (M) - the data element has an indirect or marginal impact
Low (L) - the data element has little if any impact
Shaded - the data element was not required by MDH for preparing the WHP plan

CWI – Minnesota County Well Index
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MDH – Minnesota Department of Health
MNDOT – Minnesota Department of Transportation
MPCA – Minnesota Pollution Control Agency
NRCS – Natural Resources Conservation Service
SSURGO – Soil Survey Geographic Database
USGS – United States Geological Survey

Table 2

Water Supply Well Information
Coon Rapids WHPP Amendment

Local Well ID	Unique Number	Use/ Status[1]	Casing Diameter (in.)	Casing Depth (ft.)	Well Depth (ft.)	Year Constructed	Aquifer	Well Vulnerability
1	202926	S	12	220	462	1957	St. Lawrence – Eau Claire	Not Vulnerable
2	202929	S	12	226	788	1957	St. Lawrence – Mt. Simon	Not Vulnerable
4	202972	S	20 x 16	233	605	1960	Tunnel City – Mt. Simon	Not Vulnerable
5	202951	S	24 x 16	242	695	1961	Tunnel City – Mt. Simon	Not Vulnerable
6	202937	S	20	118	158	1960	Tunnel City	Vulnerable
7	202943	S	24 x 16	189	632	1964	Tunnel City – Mt. Simon	Vulnerable
8	202932	P	24 x 16	283	700	1965	Tunnel City – Mt. Simon	Not Vulnerable
9	202931	P	24 x 16	294	500	1969	Tunnel City – Eau Claire	Not Vulnerable
10	202930	P	30 x 24 x 16	272	684	1970	Tunnel City – Mt. Simon	Not Vulnerable
11	202965	P	24	157	627	1972	Tunnel City – Mt. Simon	Vulnerable
12	168721	S	24 x 16	208	604	1975	Tunnel City – Mt. Simon	Not Vulnerable
13	168720	P	24 x 16	395	693	1977	Tunnel City – Mt. Simon	Not Vulnerable
14	110460	P	30 x 20	328	613	1977	Tunnel City – Mt. Simon	Not Vulnerable
15	110461	P	30 x 20	225	615	1976	Tunnel City – Mt. Simon	Vulnerable
16	161413	S	30 x 24 x 18	395	653	1981	Wonewoc – Mt. Simon	Not Vulnerable

[1] P = Primary, S = Seasonal

Table 2

Water Supply Well Information (continued)
Coon Rapids WHPP Amendment

Local Well ID	Unique Number	Use/ Status[1]	Casing Diameter (in.)	Casing Depth (ft.)	Well Depth (ft.)	Year Constructed	Aquifer	Well Vulnerability
17	150357	P	30	81	121	1981	Confined Quaternary	Vulnerable
18	110469	S	36 x 30 x 24	575	637	1986	Mt. Simon	Not Vulnerable
19	110475	P	30 x 20	115	135	1987	Confined Quaternary	Vulnerable
20	420956	P	30 x 20	95	135	1988	Confined Quaternary	Vulnerable
21	474384	P	24 x 18	170	203	1990	Confined Quaternary	Vulnerable
22	474385	S	24	80	105	1990	Confined Quaternary	Vulnerable
23	463020	S	30 x 24	93	128	1991	Confined Quaternary	Vulnerable
24	674478	P	36 x 30 x 24	241	388	2003	Tunnel City – Wonewoc	Vulnerable
25	674479	P	36 x 24	229	388	2003	Tunnel City – Wonewoc	Vulnerable

[1] P = Primary, S = Seasonal

Table 3

Annual and Projected Pumping Rates for Coon Rapids Wells
Coon Rapids WHPP Amendment

		Total Annual Withdrawal (gal/yr)				
Unique Number	**Well Name**	**2010**	**2011**	**2012**	**2013**	**2014**
202926	1	2,474,000	2,056,000	5,603,000	11,794,000	3,625,000
202929	2	2,510,000	2,107,000	5,257,000	16,688,000	3,438,000
202972	4	454,000	237,000	328,000	4,995,000	2,330,000
202951	5	11,664,000	10,940,000	18,240,000	23,187,000	2,019,000
202937	6	11,404,000	14,692,000	18,891,000	28,209,000	2,022,000
202943	7	8,143,000	15,479,000	19,480,000	36,111,000	2,966,000
202932	8	266,464,000	146,631,000	124,262,000	87,333,000	153,358,000
202931	9	154,980,000	279,287,000	296,930,000	240,707,000	234,551,000
202930	10	289,927,000	321,549,000	329,619,000	260,648,000	48,304,000
202965	11	292,273,000	335,685,000	301,213,000	227,880,000	230,392,000
168721	12	8,107,000	13,305,000	19,113,000	26,242,000	1,961,000
168720	13	26,545,000	79,698,000	42,333,000	56,801,000	84,661,000
110460	14	82,530,000	65,386,000	104,955,000	97,452,000	89,025,000
110461	15	141,580,000	132,889,000	284,911,000	279,754,000	341,462,000
161413	16	6,637,000	268,000	1,340,000	1,462,000	859,000
150357	17	166,967,000	324,602,000	238,277,000	210,720,000	263,843,000
110469	18	1,461,000	1,264,000	1,103,000	3,664,000	2,340,000
110475	19	309,781,000	333,579,000	206,674,000	222,999,000	190,172,000
420956	20	348,896,000	275,096,000	157,449,000	146,620,000	161,888,000
474384	21	300,898,000	327,105,000	300,839,000	218,424,000	227,594,000
474385	22	2,315,000	33,171,000	34,297,000	23,168,000	45,768,000
463020	23	1,482,000	7,167,000	16,255,000	12,440,000	18,061,000
674478	24	229,680,000	20,193,000	218,647,000	220,698,000	160,699,000
674479	25	210,722,000	18,157,000	213,137,000	204,520,000	161,852,000
	Totals	2,877,894,000	2,760,543,000	2,959,153,000	2,662,516,000	2,433,190,000

Source: City water use records

Table 3

Annual and Projected Pumping Rates for Coon Rapids Wells
Coon Rapids WHPP Amendment

		Percentage of Annual Withdrawal					
Unique Number	Well Name	2010	2011	2012	2013	2014	Average Annual % of Withdrawal
202926	1	0.1%	0.1%	0.2%	0.4%	0.1%	0.2%
202929	2	0.1%	0.1%	0.2%	0.6%	0.1%	0.2%
202972	4	0.0%	0.0%	0.0%	0.2%	0.1%	0.1%
202951	5	0.4%	0.4%	0.6%	0.9%	0.1%	0.5%
202937	6	0.4%	0.5%	0.6%	1.1%	0.1%	0.5%
202943	7	0.3%	0.6%	0.7%	1.4%	0.1%	0.6%
202932	8	9.3%	5.3%	4.2%	3.3%	6.3%	5.7%
202931	9	5.4%	10.1%	10.0%	9.0%	9.6%	8.8%
202930	10	10.1%	11.6%	11.1%	9.8%	2.0%	8.9%
202965	11	10.2%	12.2%	10.2%	8.6%	9.5%	10.1%
168721	12	0.3%	0.5%	0.6%	1.0%	0.1%	0.5%
168720	13	0.9%	2.9%	1.4%	2.1%	3.5%	2.2%
110460	14	2.9%	2.4%	3.5%	3.7%	3.7%	3.2%
110461	15	4.9%	4.8%	9.6%	10.5%	14.0%	8.8%
161413	16	0.2%	0.0%	0.0%	0.1%	0.0%	0.1%
150357	17	5.8%	11.8%	8.1%	7.9%	10.8%	8.9%
110469	18	0.1%	0.0%	0.0%	0.1%	0.1%	0.1%
110475	19	10.8%	12.1%	7.0%	8.4%	7.8%	9.2%
420956	20	12.1%	10.0%	5.3%	5.5%	6.7%	7.9%
474384	21	10.5%	11.8%	10.2%	8.2%	9.4%	10.0%
474385	22	0.1%	1.2%	1.2%	0.9%	1.9%	1.0%
463020	23	0.1%	0.3%	0.5%	0.5%	0.7%	0.4%
674478	24	8.0%	0.7%	7.4%	8.3%	6.6%	6.2%
674479	25	7.3%	0.7%	7.2%	7.7%	6.7%	5.9%

Table 3

Annual and Projected Pumping Rates for Coon Rapids Wells
Coon Rapids WHPP Amendment

		Projected Water Use (2020)			Maximum Total Pumping for Model Input[3]		
Unique Number	Well Name	Total[1] (gal/yr)	% of Total Projected Water Use Well[2]	Projected Well Pumpage Based on % (gal/yr)	gal/yr	gal/day	m^3/day
202926	1		0.2%	6,002,060	11,794,000	32,312	122
202929	2		0.2%	6,002,060	16,688,000	45,721	173
202972	4		0.1%	3,001,030	4,995,000	13,685	52
202951	5		0.5%	15,005,150	23,187,000	63,526	240
202937	6		0.5%	15,005,150	28,209,000	77,285	293
202943	7		0.6%	18,006,180	36,111,000	98,934	375
202932	8		5.7%	171,058,710	266,464,000	730,038	2,764
202931	9		8.8%	264,090,640	296,930,000	813,507	3,080
202930	10		8.9%	267,091,670	329,619,000	903,066	3,419
202965	11		10.1%	303,104,030	335,685,000	919,685	3,482
168721	12		0.5%	15,005,150	26,242,000	71,896	272
168720	13		2.2%	66,022,660	84,661,000	231,948	878
110460	14		3.2%	96,032,960	104,955,000	287,548	1,089
110461	15		8.8%	264,090,640	341,462,000	935,512	3,542
161413	16		0.1%	3,001,030	6,637,000	18,184	69
150357	17		8.9%	267,091,670	324,602,000	889,321	3,367
110469	18		0.1%	3,001,030	3,664,000	10,038	38
110475	19		9.2%	276,094,760	333,579,000	913,915	3,460
420956	20		7.9%	237,081,370	348,896,000	955,879	3,619
474384	21		10.0%	300,103,000	327,105,000	896,178	3,393
474385	22		1.0%	30,010,300	45,768,000	125,392	475
463020	23		0.4%	12,004,120	18,061,000	49,482	187
674478	24		6.2%	186,063,860	229,680,000	629,260	2,382
674479	25		5.9%	177,060,770	213,137,000	583,937	2,211
	Totals	3,001,030,000		3,001,030,000	3,758,131,000	10,296,249	38,978

Appropriation 3,200,000,000

[1] 2020 projected average daily demand interpolated from land use-based projections in Coon Rapids Comprehensive Water System Plan (Bolton & Menk, 2014) for 2019 (8.11 MGD) and 2024 (8.67 MGD).

[2] Percentages for all wells are based the average % of annual withdrawal for the period 2010 through 2014

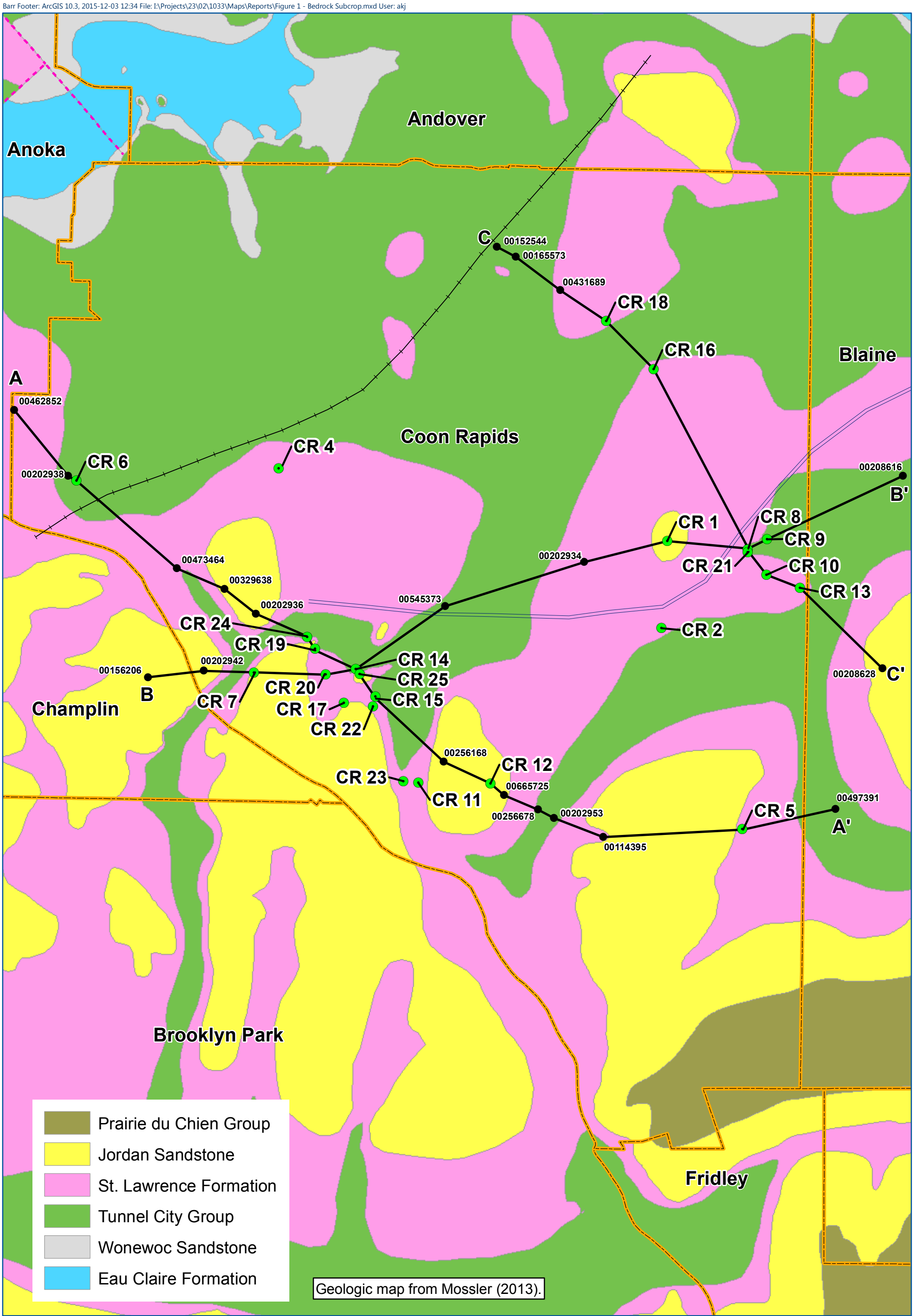
[3] For each well, the greater of the estimated pumpage based on projected 2020 withdrawal and actual annual pumpage for 2010 - 2014.

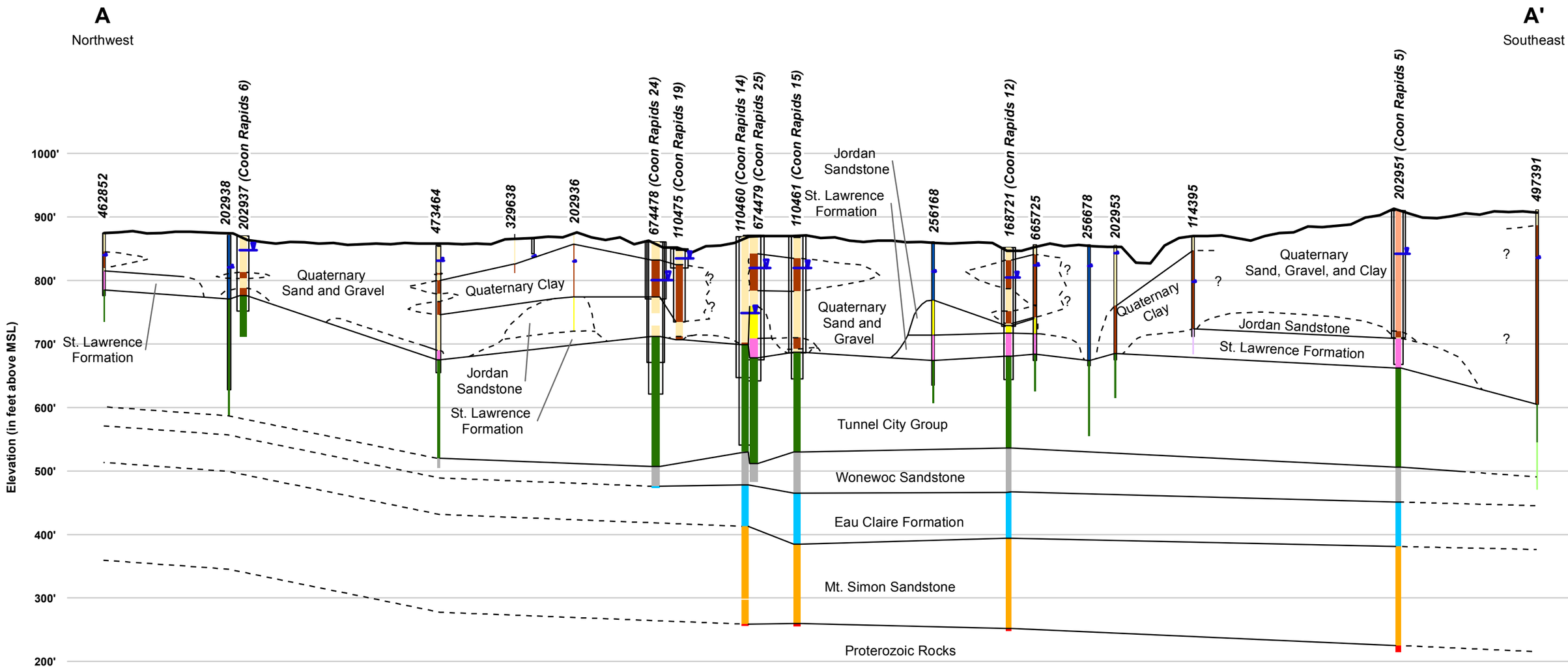
Table 4

Tritium Sampling Results
Coon Rapids WHPP Amendment

Local Well ID	Unique Number	Aquifer	Sample Date	Tritium Concentration (NTU)
2	202929	St. Lawrence – Mt. Simon	7/9/2015	2.6
5	202951	Tunnel City – Mt. Simon	7/9/2015	<.8
6	202937	Tunnel City	7/9/2015	6.8
9	202931	Tunnel City – Eau Claire	7/9/2015	2.9
11	202965	Tunnel City – Mt. Simon	6/8/2010	2.7
14	110460	Tunnel City – Mt. Simon	7/9/2015	1.8
17	150357	Confined Quaternary	6/8/2010	2.0
18	110469	Mt. Simon	7/9/2015	<.8
20	420956	Confined Quaternary	6/8/2010	6.9
21	474384	Confined Quaternary	7/9/2015	8.6
23	463020	Confined Quaternary	6/8/2010	7.7
24	674478	Tunnel City - Wonewoc	7/15/2010	7.7

Figures


Andover
Anoka
Coon Rapids
Blaine
Champlin
Brooklyn Park
Fridley
A
A'
B
B'
C
C'
00462852
00202938
00473464
00329638
00202936
00156206
00202942
00545373
00202934
00152544
00165573
00431689
00208616
00208628
00256168
00665725
00256678
00202953
00114395
00497391
CR 1
CR 2
CR 4
CR 5
CR 6
CR 7
CR 8
CR 9
CR 10
CR 11
CR 12
CR 13
CR 14
CR 15
CR 16
CR 17
CR 18
CR 19
CR 20
CR 21
CR 22
CR 23
CR 24
CR 25
Prairie du Chien Group
Jordan Sandstone
St. Lawrence Formation
Tunnel City Group
Wonewoc Sandstone
Eau Claire Formation
Geologic map from Mossler (2013).
Coon Rapids Municipal Well
Cross Section Well
Cross Section Trace
Municipal Boundary
Monocline
Syncline
Fault
N
0
3,000
6,000
Feet
BARR
BEDROCK SUBCROP
Coon Rapids WHPP Amendment
City of Coon Rapids, MN
FIGURE 1



Static Water Level
Ground Surface
Well Casing

Quaternary Sand and Gravel
Quaternary Clay
Fill and Topsoil
Quaternary Sand, Gravel, and Clay
Undifferentiated Quaternary
Jordan Sandstone
St. Lawrence Formation

St. Lawrence Formation - Tunnel City Group
Tunnel City Group
Tunnel City Group - Wonewoc Sandstone
Wonewoc Sandstone
Eau Claire Formation
Mt. Simon Sandstone
Proterozoic Rocks

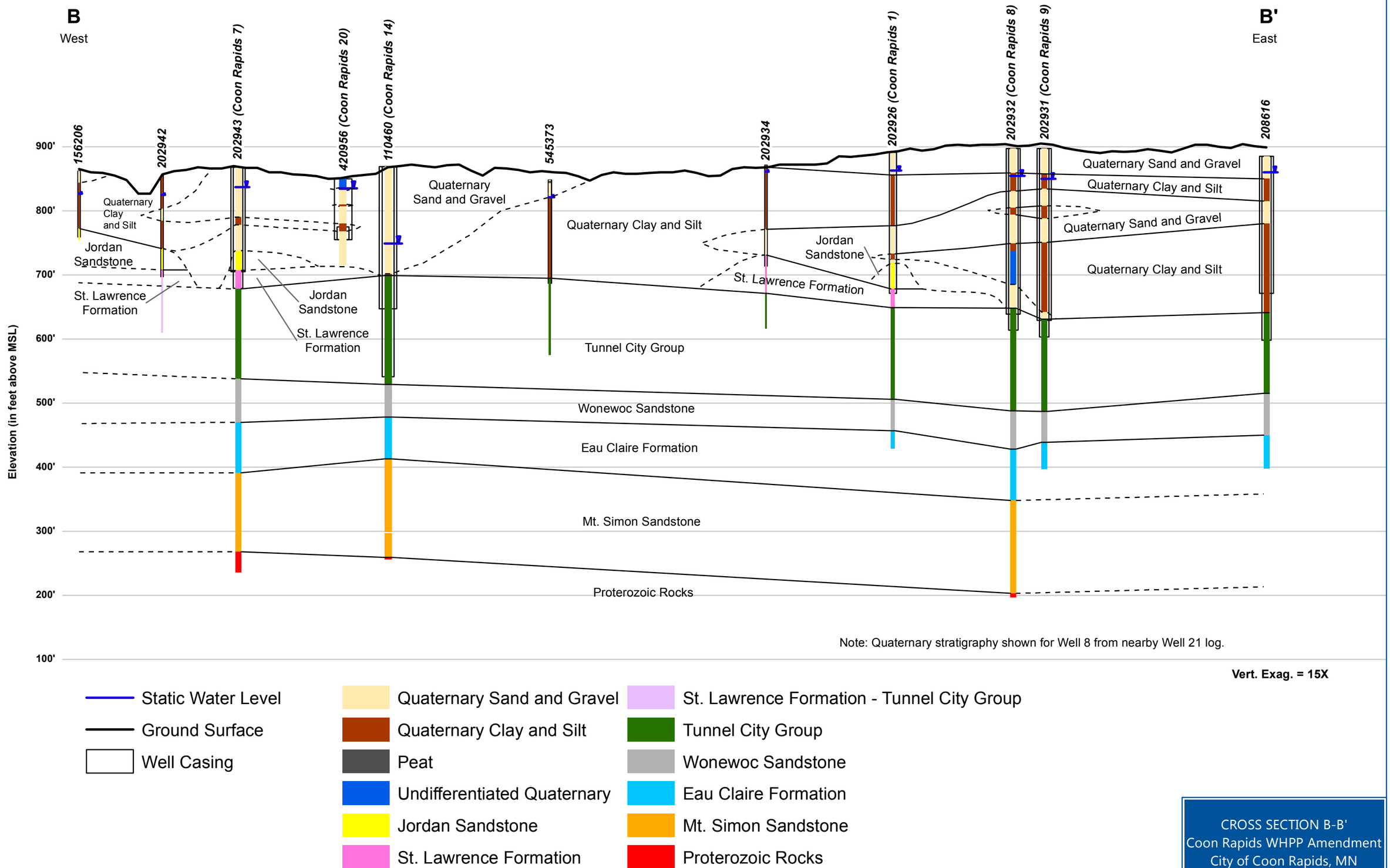
Vert. Exag. = 15X

BARR

CROSS SECTION A-A'
Coon Rapids WHPP Amendment
City of Coon Rapids, MN

FIGURE 2

Barr Footer: ArcGIS 10.3, 2015-12-02 08:08 File: I:\Projects\23\02\1033\Maps\Reports\Figure 2 - Cross Section A-A.mxd User: akj

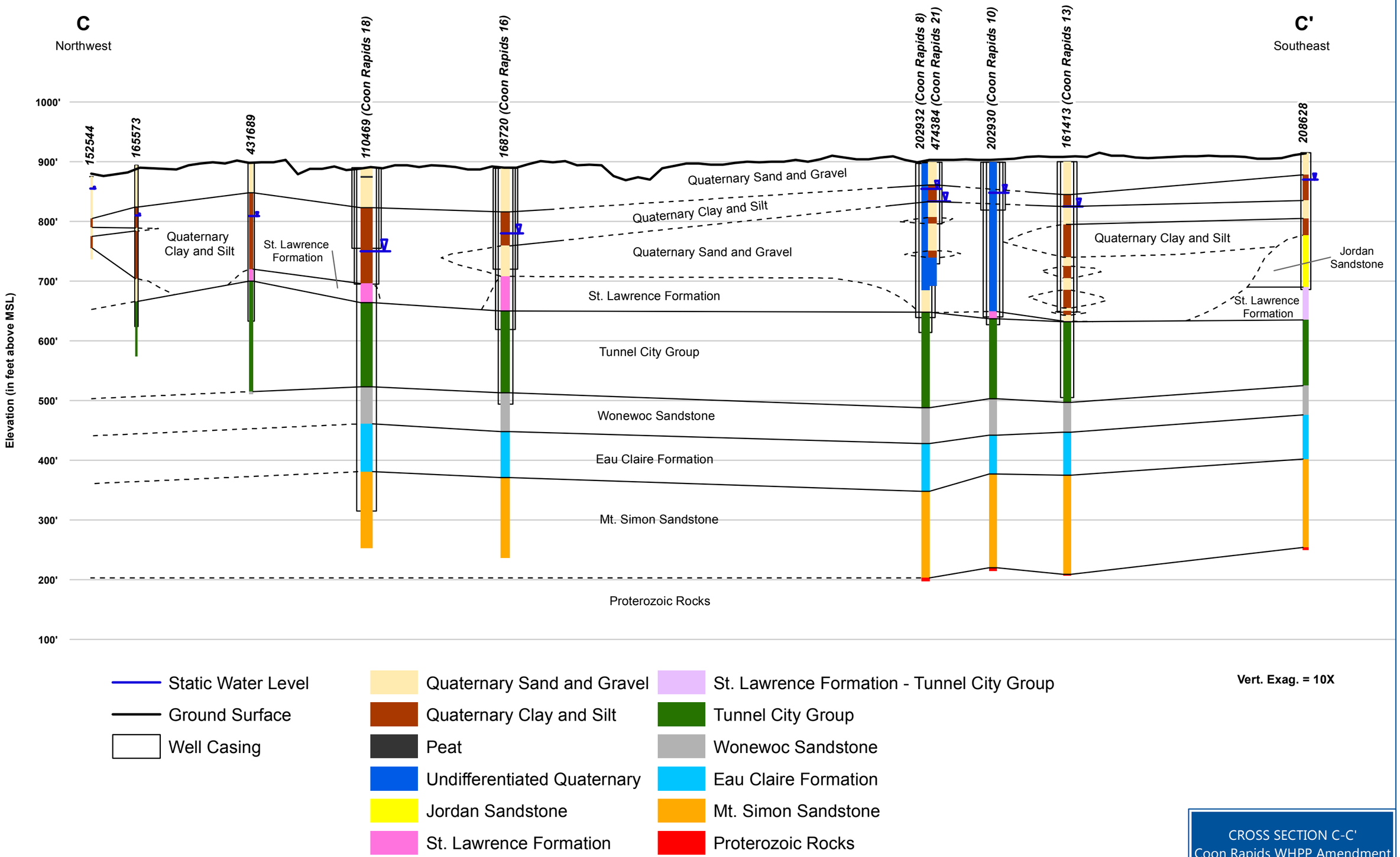


CROSS SECTION B-B'
Coon Rapids WHPP Amendment
City of Coon Rapids, MN

FIGURE 3

BARR

Barr Footer: ArcGIS 10.3, 2015-12-02 09:42 File: I:\Projects\23\02\1033\Maps\Reports\Figure 3 - Cross Section B-B.mxd User: akj

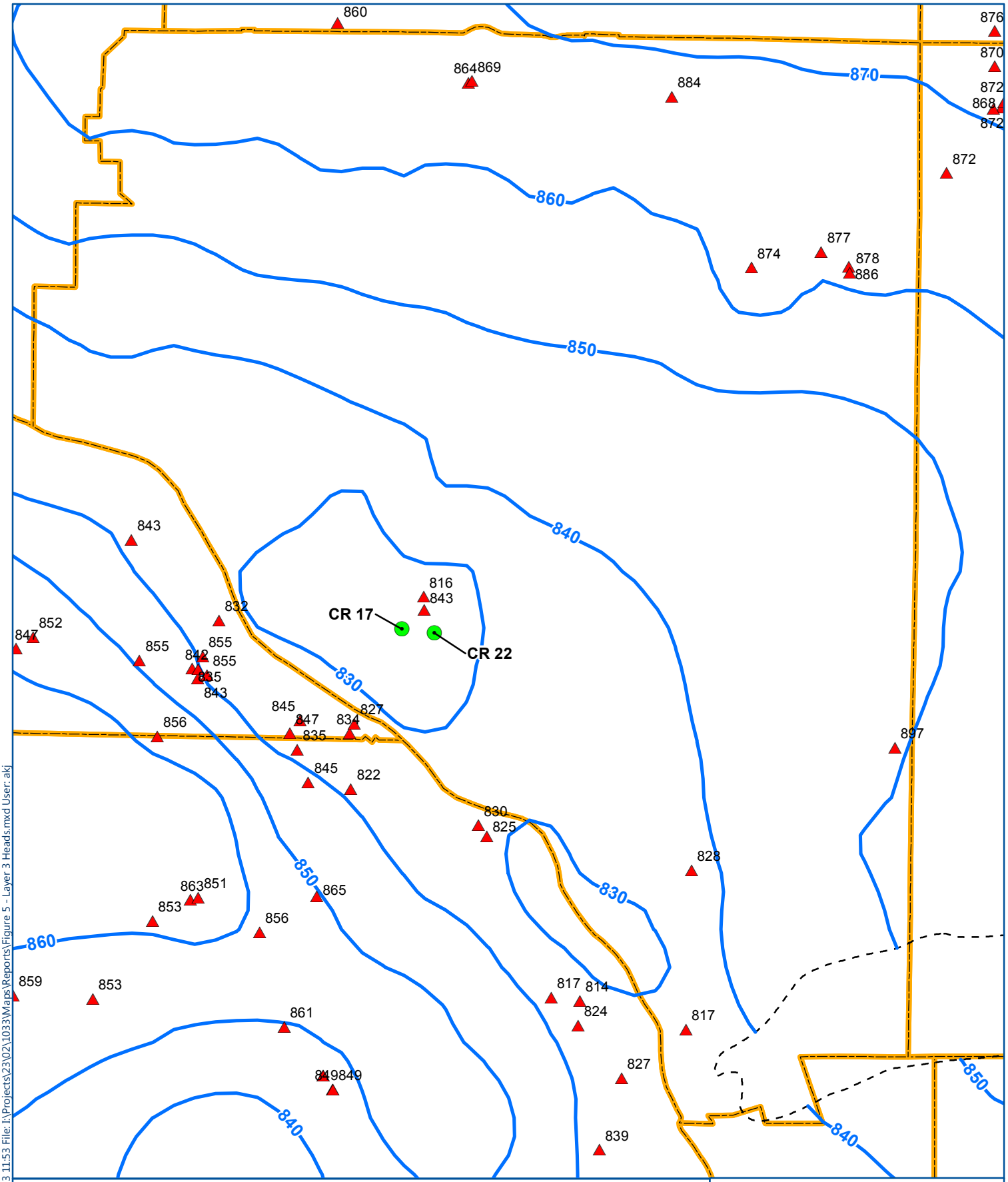


CROSS SECTION C-C'
Coon Rapids WHPP Amendment
City of Coon Rapids, MN

FIGURE 4

BARR

Barr Footer: ArcGIS 10.3, 2015-12-02 09:01 File: I:\Projects\23\02\1033\Maps\Reports\Figure 4 - Cross Section C-C.mxd User: akj



Coon Rapids Municipal Well open to Layer 3

Layer 3 Quaternary Target

Modeled Head (ft MSL)

Prairie du Chien Group Extent

Municipal Boundary

0 4,000

Feet

BARR

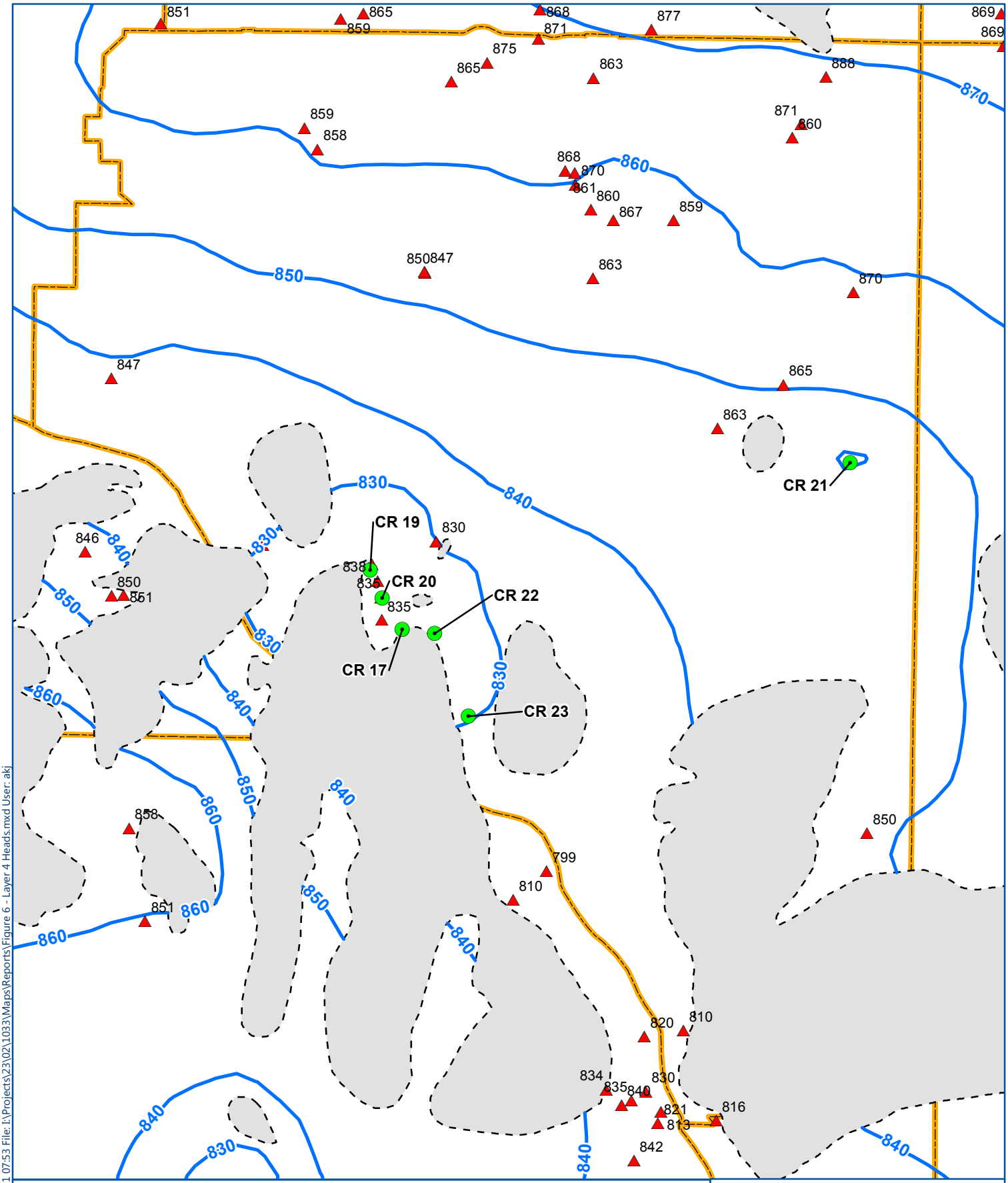
MODELED HEADS IN QUATERNARY GLACIAL DRIFT LAYER 3

Coon Rapids WHPP Amendment

City of Coon Rapids, MN

FIGURE 5

Barr Footer: ArcGIS 10.3, 2015-12-03 11:53 File: I:\Projects\23\02\1033\Maps\Reports\Figure 5 - Layer 3 Heads.mxd User: akj



Coon Rapids Municipal Well open to Layer 4

Layer 4 Quaternary Target

Modeled Head (ft MSL)

Jordan Sandstone Extent

Municipal Boundary

0 4,000 Feet

BARR

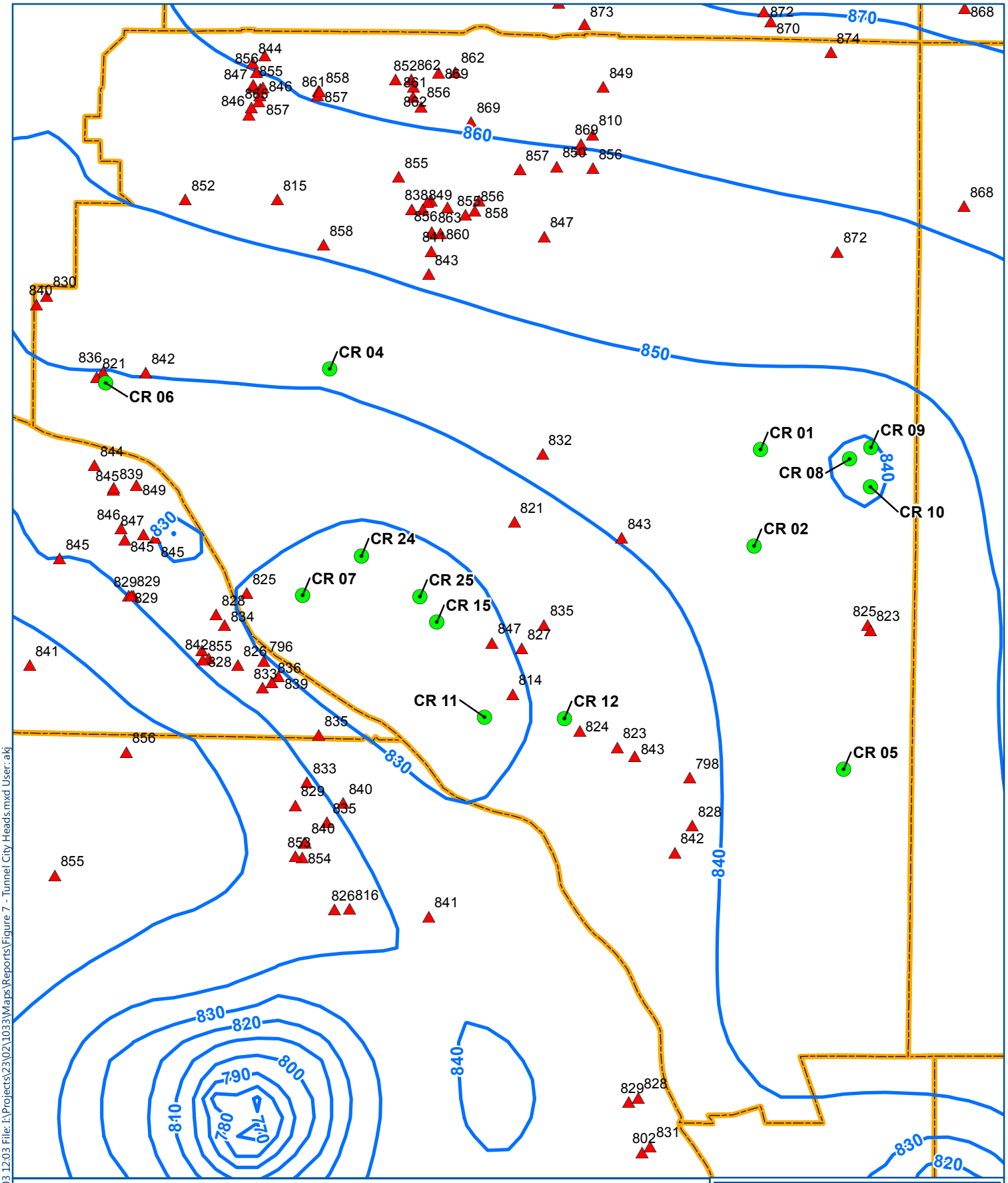
MODELED HEADS IN QUATERNARY GLACIAL DRIFT LAYER 4

Coon Rapids WHPP Amendment

City of Coon Rapids, MN

FIGURE 6

Barr Footer: ArcGIS 10.3, 2016-03-01 07:53 File: I:\Projects\23\02\1033\Maps\Reports\Figure 6 - Layer 4 Heads.mxd User: akj



Coon Rapids Municipal Well open to Tunnel City Group

Layer 6 Tunnel City Target

Modeled Head (ft MSL)

Municipal Boundary

0 4,000

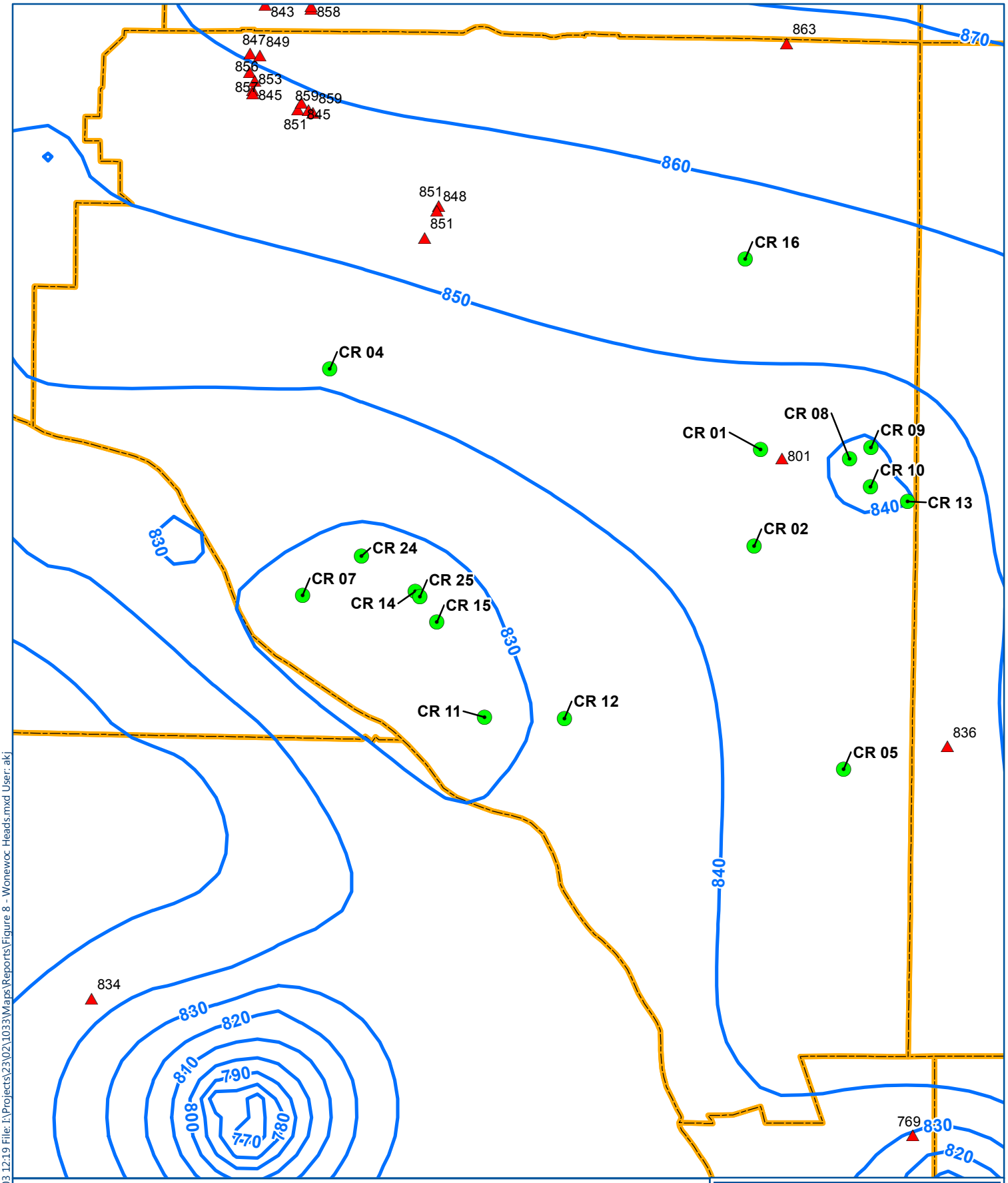
Feet

BARR

MODELED HEADS IN
TUNNEL CITY GROUP
LAYER 6
Coon Rapids WHPP Amendment
City of Coon Rapids, MN

FIGURE 7

Barr Footer: ArcGIS 10.3, 2015-12-03 12:03 File: I:\Projects\23\02\1033\Maps\Reports\Figure 7 - Tunnel City Heads.mxd User: akj



Coon Rapids Municipal Well open to Wonewoc Sandstone

Layer 7 Wonewoc Target

Modeled Head (ft MSL)

Municipal Boundary

0 4,000

Feet

BARR

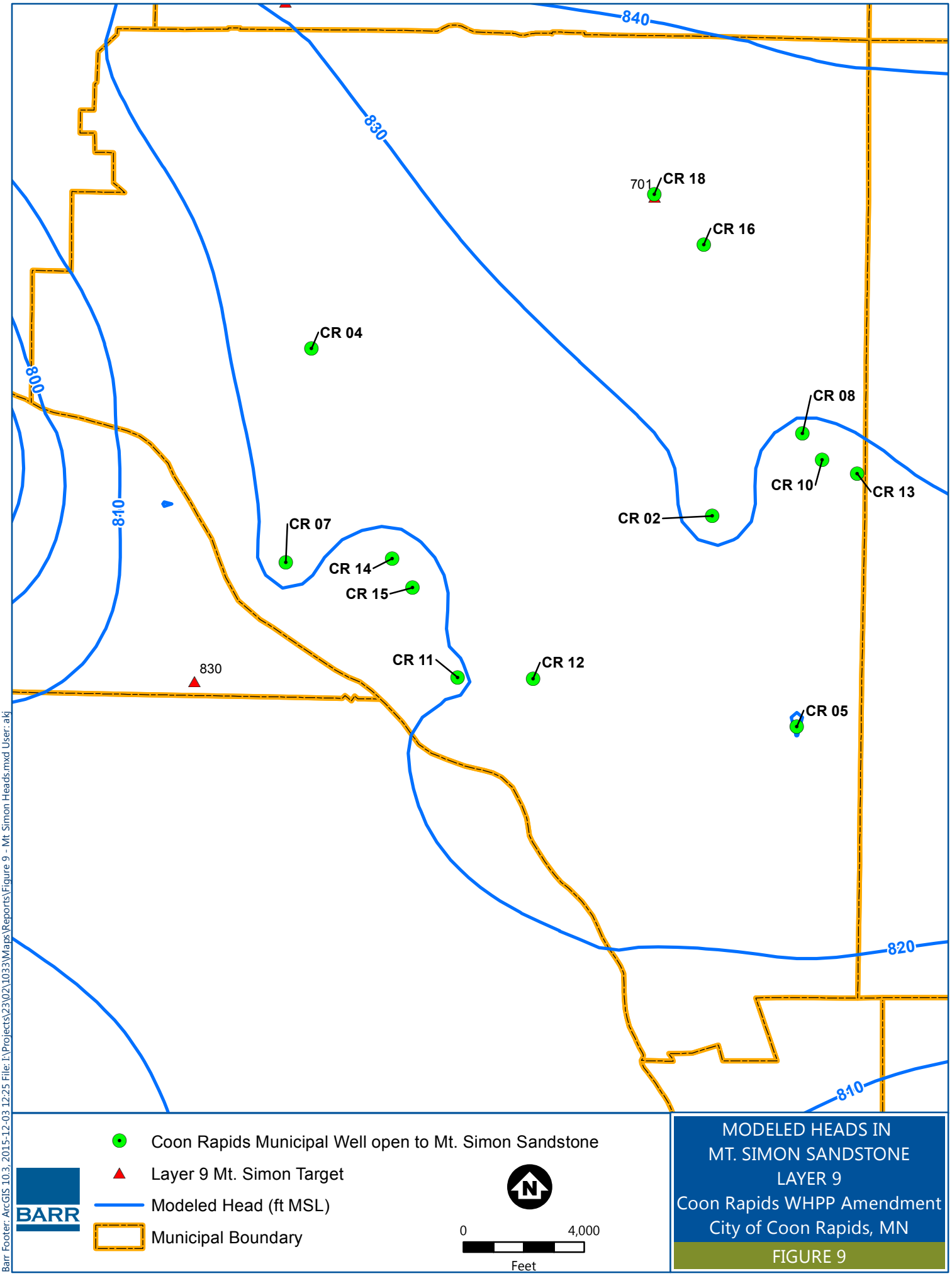
MODELED HEADS IN WONEWOC SANDSTONE LAYER 7

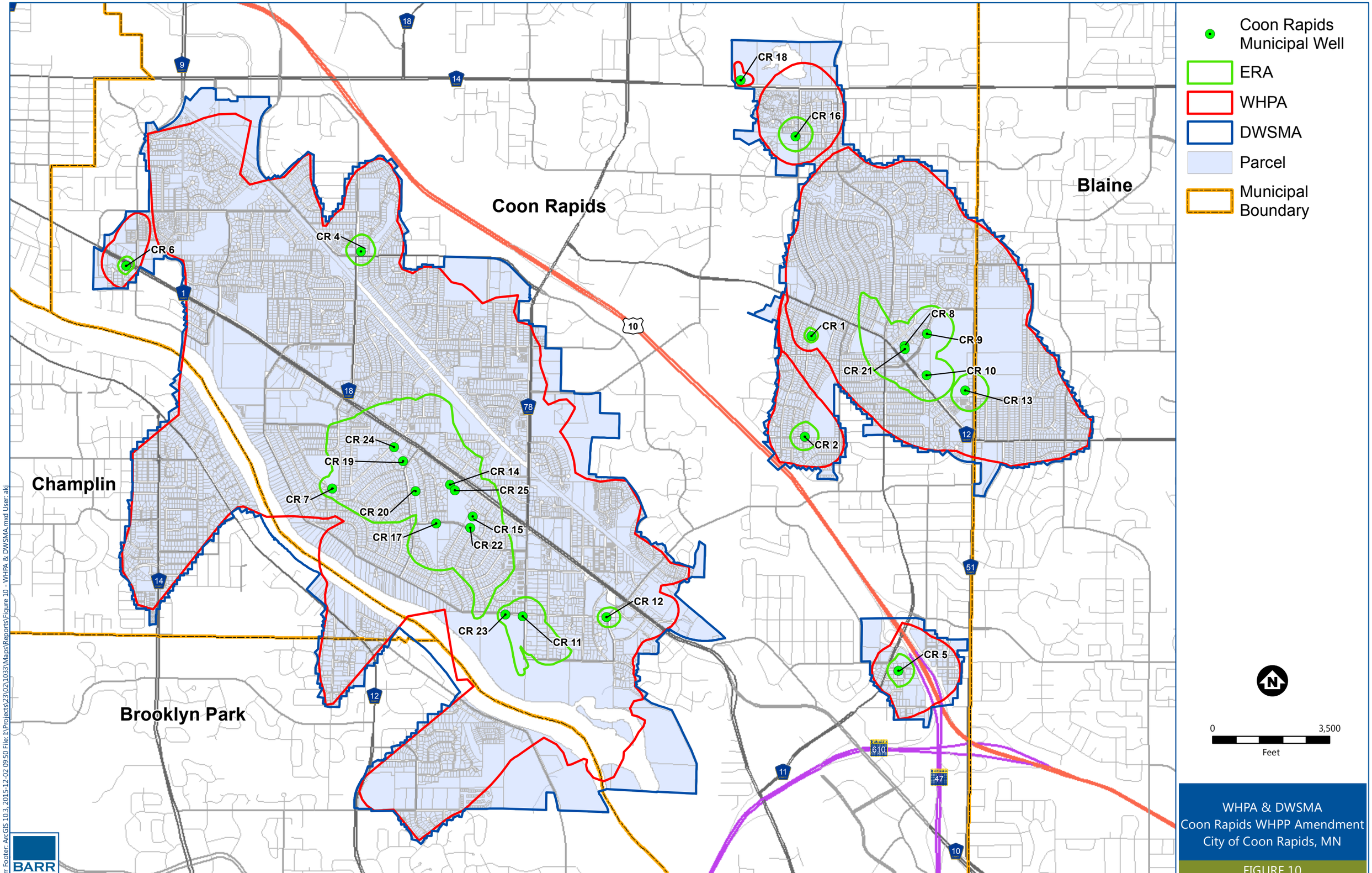
Coon Rapids WHPP Amendment

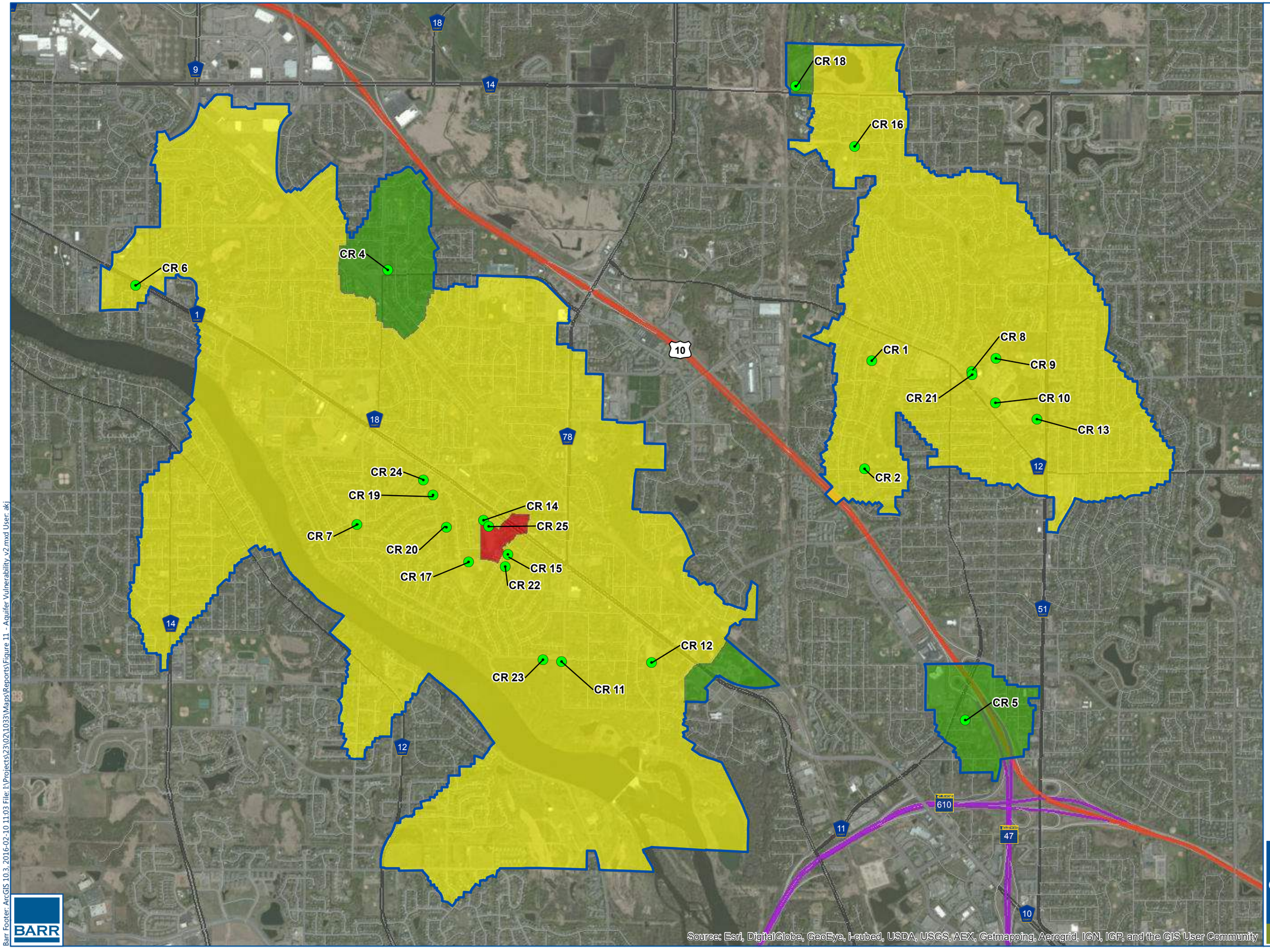
City of Coon Rapids, MN

FIGURE 8

Barr Footer: ArcGIS 10.3, 2015-12-03 12:19 File: I:\Projects\23\02\1033\Maps\Reports\Figure 8 - Wonewoc Heads.mxd User: akj


840
830
820
810
800
701
CR 18
CR 16
CR 04
CR 08
CR 10
CR 13
CR 02
CR 07
CR 14
CR 15
CR 11
CR 12
CR 05
830
Coon Rapids Municipal Well open to Mt. Simon Sandstone
Layer 9 Mt. Simon Target
Modeled Head (ft MSL)
Municipal Boundary
N
0
4,000
Feet
BARR
MODELED HEADS IN
MT. SIMON SANDSTONE
LAYER 9
Coon Rapids WHPP Amendment
City of Coon Rapids, MN
FIGURE 9
Barr Footer: ArcGIS 10.3, 2015-12-03 12:25 File: I:\Projects\23\02\1033\Maps\Reports\Figure 9 - Mt Simon Heads.mxd User: akj


Coon Rapids Municipal Well
ERA
WHPA
DWSMA
Parcel
Municipal Boundary
Coon Rapids
Blaine
Champlin
Brooklyn Park
CR 18
CR 16
CR 4
CR 6
CR 1
CR 8
CR 9
CR 21
CR 10
CR 13
CR 2
CR 24
CR 19
CR 14
CR 25
CR 7
CR 20
CR 15
CR 17
CR 22
CR 12
CR 23
CR 11
CR 5
0
3,500
Feet
WHPA & DWSMA
Coon Rapids WHPP Amendment
City of Coon Rapids, MN
FIGURE 10
BARR
Barr Footer: ArcGIS 10.3, 2015-12-02 09:50 File: I:\Projects\23\02\1033\Maps\Reports\Figure 10 - WHPA & DWSMA.mxd User: akj



Coon Rapids Municipal Well

DWSMA

Vulnerability

High

Moderate

Low

0 3,500

Feet

AQUIFER VULNERABILITY
Coon Rapids WHPP Amendment
City of Coon Rapids, MN

FIGURE 11

BARR

Barr Footer: ArcGIS 10.3, 2016-02-10 11:03 File: I:\Projects\23\02\1033\Maps\Reports\Figure 11 - Aquifer Vulnerability_v2.mxd User: akj

Appendix A

Well Construction Records

Unique No. 00202926	MINNESOTA DEPARTMENT OF HEALTH	Update Date 2007/02/06
County Name Anoka	**WELL AND BORING RECORD**	Entry Date 1991/04/15
	Minnesota Statutes Chapter 1031	

Township Name	Township	Range	Dir	Section	Subsection
	31	24	W	13	BCCABD

Well Depth	Depth Completed	Date Well Completed
462 ft.	462 ft.	1957/09/00

Well Name COON RAPIDS 1

Drilling Method Cable Tool

Well Owner's Name COON RAPIDS 1
11349 NORWAY NW ST
COON RAPIDS MN 55433

Drilling Fluid

Well Hydrofractured? ☐ Yes ☐ No
From ft. to ft.

Use Community Supply (municipal)

Contact's Name CITY OF COON RAPIDS
11155 ROBINSON NW DR
COON RAPIDS MN 55433

Casing **Drive Shoe?** ☐ Yes ☐ N

Hole Diameter
0 in. t 462 ft

Casing Diameter **Weight(lbs/ft)**
12 in. t 220 ft

GEOLOGICAL MATERIAL	COLOR	HARDNESS	FROM	TO
SAND			0	35
CLAY	BLUE		35	50
SANDY CLAY			50	91
HARDPAN			91	114
SAND			114	135
SAND & CLAY			135	138
SAND & GRAVEL			138	158
HARDPAN			158	167
SANDROCK		SOFT	167	173
SANDROCK		SOFT	173	197
SANDROCK & SHALE			197	213
SANDROCK & SHALE			213	242
SANDROCK & SHALE			242	355
CLAY RED			355	360
SHALE & SANDROCK			360	385
SHALE & SANDROCK			385	386
SANDROCK WITH SOME SH			386	398
SANDROCK VERY SOFT			398	434
SANDROCK WITH SOME SH			434	458
SHALE			458	462

Screen N

Open Hole From 220 ft. to 462 ft.

Make Type

Static Water Level 28 ft. from Land surface Date 1957/09/00

PUMPING LEVEL (below land surface)
78 ft. after hrs. pumping 880 g.p.m.

Well Head Completion
Pitless adapter mfr Model
Casing Protection ☐ 12 in. above grade
☐ At-grade(Environmental Wells and Borings ONLY)

Grouting Information Well grouted? ☐ Yes ☐ No

Nearest Known Source of Contamination
ft. direction type
Well disinfected upon completion? ☐ Yes ☐ No

Pump ☐ Not Installed Date Installed Y
Mfr nam FAIRBANKS MORSE
Model HP 50 Volts 220
Drop Pipe Length ft. Capacity 600 g.p.m
Type T

Any not in use and not sealed well(s) on property? ☐ Yes ☐ No

Was a variance granted from the MDH for this Well? ☐ Yes ☐ No

REMARKS, ELEVATION, SOURCE OF DATA, etc.

GAMMA LOGGED & TV 5-15-1995. LOGGED & TV BY GEOSHPERE.

USGS Quad Coon Rapids Elevation 891
Aquifer: MTPL Alt Id: 80-6139

Well CONTRACTOR CERTIFICATION Lic. Or Reg. No. 62012
License Business Name
Name of Driller BRANDON, J.

Report Copy

Unique No.	00202926	MINNESOTA DEPARTMENT OF HEALTH	Update Date	2007/02/06
County Name	Anoka	**WELL AND BORING RECORD** *Minnesota Statutes Chapter 1031*	Entry Date	1991/04/15

Township Name	Township	Range	Dir	Section	Subsection	Well Depth		Depth Completed		Date Well Completed
	31	24	W	13	BCCABD	462	ft.	462	ft.	1957/09/00

Well Name	COON RAPIDS 1	**Lic. Or Reg. No.**	62012	**Name of Driller**	BRANDON, J.		
USGS Quad	Coon Rapi	**Elevation**	891	**Aquifer**	MTPL	**Alternative Id**	80-6139

GEOLOGICAL MATERIAL	COLOR	HARDNESS	FROM	TO	STRAT	LITH PRIM	LITH SEC	LITH MINOR
SAND			0	35	QFUU	SAND		
QFUU = Sand	SAND = Sand							
CLAY	BLUE		35	50	QCUG	CLAY		
QCUG = Clay	CLAY = Clay							
SANDY CLAY			50	91	QLUU	CLAY	SAND	
QLUU = Clay & sand	CLAY = Clay		SAND = Sand					
HARDPAN			91	114	QPUU	HDPN		
QPUU = Pebbly sand/silt/clay	HDPN = Hardpan							
SAND			114	135	QFUU	SAND		
QFUU = Sand	SAND = Sand							
SAND & CLAY			135	138	QLUU	SAND	CLAY	
QLUU = Clay & sand	SAND = Sand		CLAY = Clay					
SAND & GRAVEL			138	158	QHUU	SAND	GRVL	
QHUU = Sand & larger	SAND = Sand		GRVL = Gravel					
HARDPAN			158	167	QPUU	HDPN		
QPUU = Pebbly sand/silt/clay	HDPN = Hardpan							
SANDROCK		SOFT	167	173	QFUU	SAND		
QFUU = Sand	SAND = Sand							
SANDROCK		SOFT	173	197	CJDN	SNDS		
CJDN = Jordan	SNDS = Sandstone							
SANDROCK & SHALE			197	213	CJDN	SNDS		
CJDN = Jordan	SNDS = Sandstone							
SANDROCK & SHALE			213	242	CSTL	SLSN	DLMT	
CSTL = St.Lawrence	SLSN = Siltstone		DLMT = Dolomite					
SANDROCK & SHALE			242	355	CFRN	SNDS	SHLE	DLMT
CFRN = Franconia	SNDS = Sandstone		SHLE = Shale			DLMT = Dolomite		
CLAY RED			355	360	CFRN	SNDS	SHLE	DLMT
CFRN = Franconia	SNDS = Sandstone		SHLE = Shale			DLMT = Dolomite		

Unique No.	00202926	MINNESOTA DEPARTMENT OF HEALTH	Update Date	2007/02/06
County Name	Anoka	**WELL AND BORING RECORD** *Minnesota Statutes Chapter 1031*	Entry Date	1991/04/15

Township Name	Township	Range	Dir	Section	Subsection	Well Depth		Depth Completed		Date Well Completed
	31	24	W	13	BCCABD	462	ft.	462	ft.	1957/09/00

Well Name	COON RAPIDS 1	**Lic. Or Reg. No.**	62012	**Name of Driller**	BRANDON, J.		
USGS Quad	Coon Rapi	**Elevation**	891	**Aquifer**	MTPL	**Alternative Id**	80-6139

GEOLOGICAL MATERIAL	COLOR	HARDNESS	FROM	TO	STRAT	LITH PRIM	LITH SEC	LITH MINOR
SHALE & SANDROCK			360	385	CFRN	SNDS	SHLE	DLMT
CFRN = Franconia	SNDS = Sandstone		SHLE = Shale			DLMT = Dolomite		
SHALE & SANDROCK			385	386	CIGL	SNDS		
CIGL = Ironton-Galesville	SNDS = Sandstone							
SANDROCK WITH SOME SHALE			386	398	CIGL	SNDS		
CIGL = Ironton-Galesville	SNDS = Sandstone							
SANDROCK VERY SOFT			398	434	CIGL	SNDS		
CIGL = Ironton-Galesville	SNDS = Sandstone							
SANDROCK WITH SOME SHALE			434	458	CECR	SHLE	SNDS	
CECR = Eau Claire	SHLE = Shale		SNDS = Sandstone					
SHALE			458	462	CECR	SHLE	SNDS	
CECR = Eau Claire	SHLE = Shale		SNDS = Sandstone					

Unique No. 00202929

County Name Anoka

MINNESOTA DEPARTMENT OF HEALTH

WELL AND BORING RECORD

Minnesota Statutes Chapter 1031

Update Date 2007/02/06

Entry Date 1991/04/15

Township Name	Township	Range	Dir	Section	Subsection
	31	24	W	13	CCCCAD

Well Depth	Depth Completed	Date Well Completed
788 ft.	788 ft.	1957/06/00

Well Name COON RAPIDS 2

Drilling Method Cable Tool

Contact's Name CITY OF COON RAPIDS
11155 ROBINSON NW DR
COON RAPIDS MN 55433

Drilling Fluid

Well Hydrofractured? ☐ Yes ☐ No
From ft. to ft.

Well Owner's Name COON RAPIDS 2
10911 MAGNOLIA ST
COON RAPIDS MN 55433

Use Community Supply (municipal)

Casing **Drive Shoe?** ☐ Yes ☐ N

Hole Diameter
in. t 704 ft
in. t 788 ft

Casing Diameter **Weight(lbs/ft)**
12 in. t 226 ft

GEOLOGICAL MATERIAL	COLOR	HARDNESS	FROM	TO
SAND			0	36
CLAY			36	48
CLAY & GRAVEL			48	136
HARDPAN			136	145
CLAY & SAND			145	163
SAND			163	175
SAND & GRAVEL			175	218
SHALE			218	219
LIMEROCK & SHALE			219	221
LIMEROCK & SHALE			221	243
LIMEROCK & SHALE			243	258
SANDROCK & SHALE			258	391
SANDROCK & SHALE			391	439
SANDROCK & SHALE			439	472
SHALE			472	498
SANDROCK & SHALE			498	545
SANDROCK & SHALE			545	594
SANDROCK			594	670
CAVING RED SHALE			670	704
RED ROCK & SHALE			704	726
RED ROCK			726	770
SHALE			770	778
RED ROCK			778	788

Screen N

Open Hole From 226 ft. to 788 ft.

Make Type

Static Water Level 24 ft. from Land surface Date 1957/06/00

PUMPING LEVEL (below land surface)
33.5 ft. after hrs. pumping 302 g.p.m.

Well Head Completion
Pitless adapter mfr Model
Casing Protection ☑ 12 in. above grade
☐ At-grade(Environmental Wells and Borings ONLY)

Grouting Information Well grouted? ☐ Yes ☐ No

Nearest Known Source of Contamination
ft. direction type
Well disinfected upon completion? ☐ Yes ☐ No

Pump ☐ Not Installed Date Installed Y
Mfr nam FAIRBANKS MORSE
Model HP 30 Volts 220
Drop Pipe Length 187 ft. Capacity 500 g.p.m
Type T

Any not in use and not sealed well(s) on property? ☐ Yes ☐ No

Was a variance granted from the MDH for this Well? ☐ Yes ☐ No

REMARKS, ELEVATION, SOURCE OF DATA, etc.

TWO OTHER PUM TESTS AT DEPTHS OF 673 & 466 FT.

PUMPING TEST NO. 3 RECORDED AT 685 FT.

M.G.S. NO. 156. GAMMA LOGGED & TV 5-15-1995. OLD PA. NO. 61-0225.

WELL WAS BACK FILLED TO 685 FT.

LOGGED & TV BY GEOSPHERE.

USGS Quad	Coon Rapids	Elevation	885
Aquifer:	MTPL	Alt Id:	80-6139

Report Copy

Well CONTRACTOR CERTIFICATION Lic. Or Reg. No. 62012

License Business Name

Name of Driller BRANDON, J.

HE-01205-06 (Rev. 9/96)

Unique No.	00202929	MINNESOTA DEPARTMENT OF HEALTH	Update Date	2007/02/06
County Name	Anoka	**WELL AND BORING RECORD** *Minnesota Statutes Chapter 1031*	Entry Date	1991/04/15

Township Name	Township	Range	Dir	Section	Subsection	Well Depth		Depth Completed		Date Well Completed
	31	24	W	13	CCCCAD	788	ft.	788	ft.	1957/06/00

Well Name	COON RAPIDS 2	**Lic. Or Reg. No.**	62012	**Name of Driller**	BRANDON, J.		
USGS Quad	Coon Rapi	**Elevation**	885	**Aquifer**	MTPL	**Alternative Id**	80-6139

GEOLOGICAL MATERIAL	COLOR	HARDNESS	FROM	TO	STRAT	LITH PRIM	LITH SEC	LITH MINOR
SAND			0	36	QFUU	SAND		
QFUU = Sand	SAND = Sand							
CLAY			36	48	QCUU	CLAY		
QCUU = Clay	CLAY = Clay							
CLAY & GRAVEL			48	136	QPUU	CLAY	GRVL	
QPUU = Pebbly sand/silt/clay	CLAY = Clay		GRVL = Gravel					
HARDPAN			136	145	QPUU	HDPN		
QPUU = Pebbly sand/silt/clay	HDPN = Hardpan							
CLAY & SAND			145	163	QLUU	CLAY	SAND	
QLUU = Clay & sand	CLAY = Clay		SAND = Sand					
SAND			163	175	QFUU	SAND		
QFUU = Sand	SAND = Sand							
SAND & GRAVEL			175	218	QHUU	SAND	GRVL	
QHUU = Sand & larger	SAND = Sand		GRVL = Gravel					
SHALE			218	219	QCUU	CLAY		
QCUU = Clay	CLAY = Clay							
LIMEROCK & SHALE			219	221	QUUU	DRFT		
QUUU = Unknown deposit type	DRFT = Drift							
LIMEROCK & SHALE			221	243	CSTL	DLMT	SLSN	
CSTL = St.Lawrence	DLMT = Dolomite		SLSN = Siltstone					
LIMEROCK & SHALE			243	258	CFRN	SNDS	SHLE	DLMT
CFRN = Franconia	SNDS = Sandstone		SHLE = Shale				DLMT = Dolomite	
SANDROCK & SHALE			258	391	CFRN	SNDS	SHLE	DLMT
CFRN = Franconia	SNDS = Sandstone		SHLE = Shale				DLMT = Dolomite	
SANDROCK & SHALE			391	439	CIGL	SNDS		
CIGL = Ironton-Galesville	SNDS = Sandstone							
SANDROCK & SHALE			439	472	CECR	SHLE	SNDS	
CECR = Eau Claire	SHLE = Shale		SNDS = Sandstone					

Unique No.	00202929	MINNESOTA DEPARTMENT OF HEALTH	Update Date	2007/02/06
County Name	Anoka	**WELL AND BORING RECORD** *Minnesota Statutes Chapter 1031*	Entry Date	1991/04/15

Township Name	Township	Range	Dir	Section	Subsection	Well Depth		Depth Completed		Date Well Completed
	31	24	W	13	CCCCAD	788	ft.	788	ft.	1957/06/00

Well Name	COON RAPIDS 2	**Lic. Or Reg. No.**	62012	**Name of Driller**	BRANDON, J.		
USGS Quad	Coon Rapi	**Elevation**	885	**Aquifer**	MTPL	**Alternative Id**	80-6139

GEOLOGICAL MATERIAL	COLOR	HARDNESS	FROM	TO	STRAT	LITH PRIM	LITH SEC	LITH MINOR
SHALE			472	498	CECR	SHLE	SNDS	
CECR = Eau Claire	SHLE = Shale		SNDS = Sandstone					
SANDROCK & SHALE			498	545	CECR	SHLE	SNDS	
CECR = Eau Claire	SHLE = Shale		SNDS = Sandstone					
SANDROCK & SHALE			545	594	CMTS	SNDS		
CMTS = Mt.Simon	SNDS = Sandstone							
SANDROCK			594	670	CMTS	SNDS		
CMTS = Mt.Simon	SNDS = Sandstone							
CAVING RED SHALE			670	704	PMSC	SHLE		
PMSC = Solor Church Formation	SHLE = Shale							
RED ROCK & SHALE			704	726	PMSC	SHLE		
PMSC = Solor Church Formation	SHLE = Shale							
RED ROCK			726	770	PMSC	SHLE		
PMSC = Solor Church Formation	SHLE = Shale							
SHALE			770	778	PMSC	SHLE		
PMSC = Solor Church Formation	SHLE = Shale							
RED ROCK			778	788	PMSC	SHLE		
PMSC = Solor Church Formation	SHLE = Shale							

Unique No. 00202972	MINNESOTA DEPARTMENT OF HEALTH	Update Date 2007/03/12
County Name Anoka	**WELL AND BORING RECORD**	Entry Date 1991/04/15
	Minnesota Statutes Chapter 1031	

Township Name	Township	Range	Dir	Section	Subsection
	31	24	W	9	DCCCCD

Well Depth	Depth Completed	Date Well Completed
605 ft.	605 ft.	1960/08/19

Well Name COON RAPIDS 4

Drilling Method Cable Tool

Well Owner's Name COON RAPIDS 4
2731 NORTHDALE BL
COON RAPIDS MN 55433

Drilling Fluid

Well Hydrofractured? ☐ Yes ☐ No
From ft. to ft.

Use Community Supply (municipal)

Contact's Name CITY OF COON RAPIDS
11155 ROBINSON NW DR
COON RAPIDS MN 55433

Casing **Drive Shoe?** ☐ Yes ☐ N

Hole Diameter

Casing Diameter **Weight(lbs/ft)**

20	in. t	158	ft
16	in. t	233	ft

GEOLOGICAL MATERIAL	COLOR	HARDNESS	FROM	TO
DRIFT			0	158
DOLOMITE		HARD	158	170
JORDAN SANDSTONE			170	220
SHALE	GREE		220	310
SANDSTONE WITH THIN SH			310	369
SANDY SHALE			369	425
HARD SANDSTONE, SHALE			425	435
HARD SANDSTONE, SHALE			435	475
SHALEY SANDSTONE			475	520
HARD SANDSTONE, COARS			520	587
SHALE			587	605

Screen N

Open Hole From 233 ft. to 605 ft.

Make Type

Static Water Level 23 ft. from Land surface Date 1960/08/19

PUMPING LEVEL (below land surface)
142 ft. after 24 hrs. pumping 1000 g.p.m.

Well Head Completion
Pitless adapter mfr Model
Casing Protection ☑ 12 in. above grade
☐ At-grade(Environmental Wells and Borings ONLY)

Grouting Information Well grouted? ☑ Yes ☐ No

Material	From	To (ft.)	Amount(yds/bags)
	0	233	

Nearest Known Source of Contamination
ft. direction type
Well disinfected upon completion? ☐ Yes ☐ No

Pump ☐ Not Installed Date Installed Y
Mfr nam FAIRBANKS MORSE
Model 6977 HP 100 Volts 240
Drop Pipe Length 180 ft. Capacity g.p.m
Type T

Any not in use and not sealed well(s) on property? ☐ Yes ☐ No

Was a variance granted from the MDH for this Well? ☐ Yes ☐ No

REMARKS, ELEVATION, SOURCE OF DATA, etc.

M.G.S. NO. 168. GAMMA LOGGED 3-31-1998. LOGGED BY JIM TRAEN.

OLD PA. NO. 60-0350.

USGS Quad Coon Rapids Elevation 869
Aquifer: CFMS Alt Id: 80-6139

Well CONTRACTOR CERTIFICATION Lic. Or Reg. No. 27118
License Business Name
Name of Driller BENEKE, R.

Report Copy

Unique No.	00202972	MINNESOTA DEPARTMENT OF HEALTH	Update Date	2007/03/12
County Name	Anoka	**WELL AND BORING RECORD** *Minnesota Statutes Chapter 1031*	Entry Date	1991/04/15

Township Name	Township	Range	Dir	Section	Subsection	Well Depth		Depth Completed		Date Well Completed
	31	24	W	9	DCCCCD	605	ft.	605	ft.	1960/08/19

Well Name	COON RAPIDS 4	**Lic. Or Reg. No.**	27118	**Name of Driller**	BENEKE, R.		
USGS Quad	Coon Rapi	**Elevation**	869	**Aquifer**	CFMS	**Alternative Id**	80-6139

GEOLOGICAL MATERIAL	COLOR	HARDNESS	FROM	TO	STRAT	LITH PRIM	LITH SEC	LITH MINOR
DRIFT			0	158	QUUU	DRFT		
QUUU = Unknown deposit type	DRFT = Drift							
DOLOMITE		HARD	158	170	CSTL	DLMT	SNDS	
CSTL = St.Lawrence	DLMT = Dolomite		SNDS = Sandstone					
JORDAN SANDSTONE			170	220	CFRN	SNDS	SHLE	
CFRN = Franconia	SNDS = Sandstone		SHLE = Shale					
SHALE	GREEN		220	310	CFRN	SHLE	SNDS	DLMT
CFRN = Franconia	SHLE = Shale		SNDS = Sandstone				DLMT = Dolomite	
SANDSTONE WITH THIN SHALE LENSES			310	369	CIGL	SNDS		
CIGL = Ironton-Galesville	SNDS = Sandstone							
SANDY SHALE			369	425	CECR	SHLE	SNDS	
CECR = Eau Claire	SHLE = Shale		SNDS = Sandstone					
HARD SANDSTONE, SHALE LENSES			425	435	CECR	SHLE	SNDS	
CECR = Eau Claire	SHLE = Shale		SNDS = Sandstone					
HARD SANDSTONE, SHALE LENSES			435	475	CMTS	SNDS		
CMTS = Mt.Simon	SNDS = Sandstone							
SHALEY SANDSTONE			475	520	CMTS	SNDS		
CMTS = Mt.Simon	SNDS = Sandstone							
HARD SANDSTONE, COARSE			520	587	CMTS	SNDS		
CMTS = Mt.Simon	SNDS = Sandstone							
SHALE			587	605	PMRC	SHLE		
PMRC = Red Clastic Series	SHLE = Shale							

Unique No. 00202951

County Name Anoka

MINNESOTA DEPARTMENT OF HEALTH

WELL AND BORING RECORD

Minnesota Statutes Chapter 1031

Update Date 2007/02/07

Entry Date 1991/04/15

Township Name	Township	Range	Dir	Section	Subsection
	31	24	W	25	ACBBDD

Well Depth 695 ft. **Depth Completed** 695 ft. **Date Well Completed** 1961/09/00

Well Name COON RAPIDS 5

Drilling Method Cable Tool

Well Owner's Name COON RAPIDS 5
99TH NW LA
COON RAPIDS MN 55433

Drilling Fluid

Well Hydrofractured? ☐ Yes ☐ No
From ft. to ft.

Contact's Name CITY OF COON RAPIDS
11155 ROBINSON NW DR
COON RAPIDS MN 55433

Use Community Supply (municipal)

Casing **Drive Shoe?** ☐ Yes ☐ N

Hole Diameter
0 in. t 695 ft

Casing Diameter **Weight(lbs/ft)**
24 in. t 200 ft
16 in. t 242 ft

GEOLOGICAL MATERIAL	COLOR	HARDNESS	FROM	TO
SAND, GRAVEL, SHALE			0	190
SHALE, SANDROCK			190	200
SANDROCK		HARD	200	201
SANDROCK		HARD	201	215
SHALE			215	225
HARD SANDROCK & SHALE			225	248
HARD SANDROCK & SHALE			248	255
HARD SHALE & LIMEROCK			255	279
SANDROCK			279	293
LIMEROCK			293	295
HARD GREEN SHALE & LIM			295	374
SHALE			374	387
LIMEROCK			387	390
SHALE, LAYERS OF LIME	GREE	HARD	390	404
SHALE, LAYERS OF LIME	GREE	HARD	404	410
SANDROCK & SHALE			410	424
SANDROCK			424	449
HARD SANDROCK & SHALE			449	454
HARD SHALE, LAYERS OF L			454	459
HARD SHALE, LAYERS OF L			459	465
STICK GREEN SHALE			465	477
SHALE	RED		477	497
BLUE-GREEN SHALE			497	525
HARD GRAY SHALE, SOME			525	529
HARD GRAY SHALE, SOME			529	555
HARD SHALE & SANDROCK			555	625
SANDROCK			625	685
RED CLASTICS			685	695
GNEISS AT 695'			695	695

Screen N

Open Hole From 242 ft. to 695 ft.

Make Type

Static Water Level 68 ft. from Land surface Date 1961/07/11

PUMPING LEVEL (below land surface)
188 ft. after 26 hrs. pumping 1200 g.p.m.

Well Head Completion
Pitless adapter mfr Model
Casing Protection ☑ 12 in. above grade
☐ At-grade(Environmental Wells and Borings ONLY)

Grouting Information Well grouted? ☐ Yes ☐ No

Nearest Known Source of Contamination
ft. direction type
Well disinfected upon completion? ☐ Yes ☐ No

Pump ☐ Not Installed Date Installed
Mfr name
Model HP Volts

Drop Pipe Length ft. Capacity g.p.m
Type

REMARKS, ELEVATION, SOURCE OF DATA, etc.

SAMPLES INDICATE BASALT AT 695 FT.

Any not in use and not sealed well(s) on property? ☐ Yes ☐ No

M.G.S. NO. 199. 190-203 FT. LOOKS LIKE REWORKED JORDAN.

GAMMA LOGGED 2-13-2006 TO 580 FT BY JIM TRAEN.

USGS Quad	Coon Rapids	Elevation	910
Aquifer:	CFMS	Alt Id:	80-6139

Report Copy

Was a variance granted from the MDH for this Well? ☐ Yes ☐ No

Well CONTRACTOR CERTIFICATION Lic. Or Reg. No. 27058

License Business Name

Name of Driller

HE-01205-06 (Rev. 9/96)

Unique No.	00202951	MINNESOTA DEPARTMENT OF HEALTH	Update Date	2007/02/07
County Name	Anoka	**WELL AND BORING RECORD** *Minnesota Statutes Chapter 1031*	Entry Date	1991/04/15

Township Name	Township	Range	Dir	Section	Subsection	Well Depth		Depth Completed		Date Well Completed
	31	24	W	25	ACBBDD	695	ft.	695	ft.	1961/09/00

Well Name	COON RAPIDS 5	**Lic. Or Reg. No.**	27058	**Name of Driller**			
USGS Quad	Coon Rapi	**Elevation**	910	**Aquifer**	CFMS	**Alternative Id**	80-6139

GEOLOGICAL MATERIAL	COLOR	HARDNESS	FROM	TO	STRAT	LITH PRIM	LITH SEC	LITH MINOR
SAND, GRAVEL, SHALE			0	190	QPUU	SAND	GRVL	CLAY
QPUU = Pebbly sand/silt/clay	SAND = Sand		GRVL = Gravel				CLAY = Clay	
SHALE, SANDROCK			190	200	QLUU	CLAY	SAND	
QLUU = Clay & sand	CLAY = Clay		SAND = Sand					
SANDROCK		HARD	200	201	QFUU	SAND		
QFUU = Sand	SAND = Sand							
SANDROCK		HARD	201	215	CSTL	DLMT	SNDS	
CSTL = St.Lawrence	DLMT = Dolomite		SNDS = Sandstone					
SHALE			215	225	CSTL	SHLE	SLSN	
CSTL = St.Lawrence	SHLE = Shale		SLSN = Siltstone					
HARD SANDROCK & SHALE			225	248	CSTL	DLMT	SNDS	
CSTL = St.Lawrence	DLMT = Dolomite		SNDS = Sandstone					
HARD SANDROCK & SHALE			248	255	CFRN	SNDS	SHLE	DLMT
CFRN = Franconia	SNDS = Sandstone		SHLE = Shale				DLMT = Dolomite	
HARD SHALE & LIMEROCK			255	279	CFRN	SNDS	SHLE	DLMT
CFRN = Franconia	SNDS = Sandstone		SHLE = Shale				DLMT = Dolomite	
SANDROCK			279	293	CFRN	SNDS		
CFRN = Franconia	SNDS = Sandstone							
LIMEROCK			293	295	CFRN	DLMT		
CFRN = Franconia	DLMT = Dolomite							
HARD GREEN SHALE & LIMEROCK			295	374	CFRN	SHLE	DLMT	
CFRN = Franconia	SHLE = Shale		DLMT = Dolomite					
SHALE			374	387	CFRN	SHLE		
CFRN = Franconia	SHLE = Shale							
LIMEROCK			387	390	CFRN	DLMT		
CFRN = Franconia	DLMT = Dolomite							
SHALE, LAYERS OF LIME	GREEN	HARD	390	404	CFRN	SHLE	DLMT	
CFRN = Franconia	SHLE = Shale		DLMT = Dolomite					

Unique No.	00202951	MINNESOTA DEPARTMENT OF HEALTH	Update Date	2007/02/07
County Name	Anoka	**WELL AND BORING RECORD** *Minnesota Statutes Chapter 1031*	Entry Date	1991/04/15

Township Name	Township	Range	Dir	Section	Subsection	Well Depth		Depth Completed		Date Well Completed
	31	24	W	25	ACBBDD	695	ft.	695	ft.	1961/09/00

Well Name	COON RAPIDS 5	Lic. Or Reg. No.	27058	Name of Driller	
USGS Quad	Coon Rapi	Elevation	910	Aquifer	CFMS	Alternative Id	80-6139

GEOLOGICAL MATERIAL	COLOR	HARDNESS	FROM	TO	STRAT	LITH PRIM	LITH SEC	LITH MINOR
SHALE, LAYERS OF LIME	GREEN	HARD	404	410	CIGL	SNDS		
CIGL = Ironton-Galesville	SNDS = Sandstone							
SANDROCK & SHALE			410	424	CIGL	SNDS	SHLE	
CIGL = Ironton-Galesville	SNDS = Sandstone		SHLE = Shale					
SANDROCK			424	449	CIGL	SNDS		
CIGL = Ironton-Galesville	SNDS = Sandstone							
HARD SANDROCK & SHALE			449	454	CIGL	SNDS	SHLE	
CIGL = Ironton-Galesville	SNDS = Sandstone		SHLE = Shale					
HARD SHALE, LAYERS OF LIME			454	459	CIGL	SNDS		
CIGL = Ironton-Galesville	SNDS = Sandstone							
HARD SHALE, LAYERS OF LIME			459	465	CECR	SHLE	SNDS	DLMT
CECR = Eau Claire	SHLE = Shale		SNDS = Sandstone			DLMT = Dolomite		
STICK GREEN SHALE			465	477	CECR	SHLE	SNDS	
CECR = Eau Claire	SHLE = Shale		SNDS = Sandstone					
SHALE	RED		477	497	CECR	SHLE	SNDS	
CECR = Eau Claire	SHLE = Shale		SNDS = Sandstone					
BLUE-GREEN SHALE			497	525	CECR	SHLE	SNDS	
CECR = Eau Claire	SHLE = Shale		SNDS = Sandstone					
HARD GRAY SHALE, SOME SANDROCK			525	529	CECR	SHLE	SNDS	
CECR = Eau Claire	SHLE = Shale		SNDS = Sandstone					
HARD GRAY SHALE, SOME SANDROCK			529	555	CMTS	SHLE	SNDS	
CMTS = Mt.Simon	SHLE = Shale		SNDS = Sandstone					
HARD SHALE & SANDROCK			555	625	CMTS	SHLE	SNDS	
CMTS = Mt.Simon	SHLE = Shale		SNDS = Sandstone					
SANDROCK			625	685	CMTS	SNDS		
CMTS = Mt.Simon	SNDS = Sandstone							
RED CLASTICS			685	695	PMRC	SHLE	SNDS	
PMRC = Red Clastic Series	SHLE = Shale		SNDS = Sandstone					

Unique No.	00202951	MINNESOTA DEPARTMENT OF HEALTH	Update Date	2007/02/07
County Name	Anoka	**WELL AND BORING RECORD** *Minnesota Statutes Chapter 1031*	Entry Date	1991/04/15

Township Name	Township	Range	Dir	Section	Subsection	Well Depth		Depth Completed		Date Well Completed
	31	24	W	25	ACBBDD	695	ft.	695	ft.	1961/09/00

Well Name	COON RAPIDS 5	**Lic. Or Reg. No.**	27058	**Name of Driller**			
USGS Quad	Coon Rapi	**Elevation**	910	**Aquifer**	CFMS	**Alternative Id**	80-6139

GEOLOGICAL MATERIAL	COLOR	HARDNESS	FROM	TO	STRAT	LITH PRIM	LITH SEC	LITH MINOR
GNEISS AT 695'			695	695	PAUD	BSLT		

PAUD = Archean Rocks Undivided BSLT = Basalt

Unique No. 00202937

County Name Anoka

MINNESOTA DEPARTMENT OF HEALTH

WELL AND BORING RECORD

Minnesota Statutes Chapter 1031

Update Date 2010/03/15

Entry Date 1991/04/15

Township Name	Township	Range	Dir	Section	Subsection
	31	24	W	17	BBAACC

Well Depth	Depth Completed	Date Well Completed
158 ft.	158 ft.	1960/11/00

Well Name COON RAPIDS 6

Drilling Method Cable Tool

Well Owner's Name COON RAPIDS 6
11611 YUCCA NW ST
COON RAPIDS MN 55433

Drilling Fluid

Well Hydrofractured? ☐ Yes ☐ No
From ft. to ft.

Contact's Name CITY OF COON RAPIDS
11155 ROBINSON NW DR
COON RAPIDS MN 55433

Use Community Supply (municipal)

Casing **Drive Shoe?** ☐ Yes ☐ N

Hole Diameter
0 in. t 158 ft

Casing Diameter **Weight(lbs/ft)**
20 in. t 118 ft

GEOLOGICAL MATERIAL	COLOR	HARDNESS	FROM	TO
SAND & GRAVEL			0	57
CLAY			57	67
SAND & GRAVEL			67	82
HARDPAN			82	94
HARDPAN			94	102
SANDROCK			102	158

Screen N

Open Hole From 118 ft. to 158 ft.

Make Type

Static Water Level 22 ft. from Land surface Date 1960/11/00

PUMPING LEVEL (below land surface)
24.5 ft. after hrs. pumping 151 g.p.m.

Well Head Completion
Pitless adapter mfr Model
Casing Protection ☑ 12 in. above grade
☐ At-grade(Environmental Wells and Borings ONLY)

Grouting Information Well grouted? ☐ Yes ☐ No

Nearest Known Source of Contamination
ft. direction type
Well disinfected upon completion? ☐ Yes ☐ No

Pump ☐ Not Installed Date Installed
Mfr name
Model HP Volts
Drop Pipe Length ft. Capacity g.p.m
Type

Any not in use and not sealed well(s) on property? ☐ Yes ☐ No

Was a variance granted from the MDH for this Well? ☐ Yes ☐ No

REMARKS, ELEVATION, SOURCE OF DATA, etc.

BASED ON SAMPLES AIR LIFTED FROM WELL 5-6-1993 FRANCONIA FM. PRESENT.

GAMMA LOGGED 12-1-1992.

GAMMA LOGGED 5-6-1993. LOGGED BY GEOSPHERE.

OLD P.A. 60-0743.

USGS Quad Coon Rapids Elevation 870
Aquifer: CFRN Alt Id: 80-6139

Well CONTRACTOR CERTIFICATION Lic. Or Reg. No. 62012
License Business Name
Name of Driller KEMPER, R

Report Copy

Unique No.	00202937	MINNESOTA DEPARTMENT OF HEALTH	Update Date	2010/03/15
County Name	Anoka	**WELL AND BORING RECORD** *Minnesota Statutes Chapter 1031*	Entry Date	1991/04/15

Township Name	Township	Range	Dir	Section	Subsection	Well Depth		Depth Completed		Date Well Completed
	31	24	W	17	BBAACC	158	ft.	158	ft.	1960/11/00

Well Name	COON RAPIDS 6	**Lic. Or Reg. No.**	62012	**Name of Driller**	KEMPER, R.		
USGS Quad	Coon Rapi	**Elevation**	870	**Aquifer**	CFRN	**Alternative Id**	80-6139

GEOLOGICAL MATERIAL	COLOR	HARDNESS	FROM	TO	STRAT	LITH PRIM	LITH SEC	LITH MINOR
SAND & GRAVEL			0	57	QHUU	SAND	GRVL	
QHUU = Sand & larger	SAND = Sand		GRVL = Gravel					
CLAY			57	67	QCUU	CLAY		
QCUU = Clay	CLAY = Clay							
SAND & GRAVEL			67	82	QHUU	SAND	GRVL	
QHUU = Sand & larger	SAND = Sand		GRVL = Gravel					
HARDPAN			82	94	QPUU	HDPN		
QPUU = Pebbly sand/silt/clay	HDPN = Hardpan							
HARDPAN			94	102	CFRN	SNDS	SHLE	
CFRN = Franconia	SNDS = Sandstone		SHLE = Shale					
SANDROCK			102	158	CFRN	SNDS	SHLE	DLMT
CFRN = Franconia	SNDS = Sandstone		SHLE = Shale				DLMT = Dolomite	

Unique No. 00202943

County Name Anoka

MINNESOTA DEPARTMENT OF HEALTH

WELL AND BORING RECORD

Minnesota Statutes Chapter 1031

Update Date 2008/12/30

Entry Date 1991/04/15

Township Name	Township	Range	Dir	Section	Subsection
	31	24	W	21	BDACBB

Well Depth	Depth Completed	Date Well Completed
632 ft.	632 ft.	1964/04/00

Well Name COON RAPIDS 7

Drilling Method Cable Tool

Well Owner's Name COON RAPIDS 7
10617 DIRECT RIVER DR
COON RAPIDS MN 55433

Drilling Fluid

Well Hydrofractured? ☐ Yes ☐ No
From ft. to ft.

Contact's Name CITY OF COON RAPIDS
11155 ROBINSON NW DR
COON RAPIDS MN 55433

Use Community Supply (municipal)

Casing **Drive Shoe?** ☐ Yes ☐ N

Hole Diameter

Casing Diameter **Weight(lbs/ft)**

24 in. t 163 ft

16 in. t 189 ft

GEOLOGICAL MATERIAL	COLOR	HARDNESS	FROM	TO
SAND & CLAY			0	78
CLAY			78	90
FINE SAND			90	130
SANDSTONE			130	161
GREENSHALE	GREE		161	165
DOLOMITIC CLAY			165	190
SHALE & SANDSTONE			190	295
GRAY SHALE	GRAY		295	300
BROWN SHALE	BROW		300	315
SHALE	RED		315	325
SHALE	GRAY		325	330
SHALE	GRAY		330	345
SANDSTONE	GRAY		345	380
GRAY SHALE	GRAY		380	398
SHALE	GRAY		398	400
RED ROCK	RED		400	425
GRAY & RED SHALE	GRY/R		425	440
GRAY & BROWN ROCK	GRY/B		440	475
COARSE SAND	GRAY		475	477
COARSE SAND	GRAY		477	480
FINE SAND	GRAY		480	520
FINE SAND	GRAY		520	560
COARSE SAND	WHITE		560	590
HARD GOLD GRAINS COAR	WHITE		590	600
SHALE	RED		600	610
RED & GRAY SHALE	RED/G		610	615
SHALE	RED		615	632

Screen N

Open Hole From 189 ft. to 632 ft.

Make Type

Static Water Level 31 ft. from Land surface Date 1964/04/00

PUMPING LEVEL (below land surface)

71 ft. after hrs. pumping 1600 g.p.m.

Well Head Completion

Pitless adapter mfr Model

Casing Protection ☑ 12 in. above grade

☐ At-grade(Environmental Wells and Borings ONLY)

Grouting Information Well grouted? ☐ Yes ☐ No

Nearest Known Source of Contamination

ft. direction type

Well disinfected upon completion? ☐ Yes ☐ No

Pump ☐ Not Installed Date Installed

Mfr name

Model HP Volts

Drop Pipe Length ft. Capacity g.p.m

Type

REMARKS, ELEVATION, SOURCE OF DATA, etc.

JIM TRAEN HAS TWO DATES ON LOG 1-18-04 AND 1-18-05.

GAMMA LOGGED 1-18-04 BY JIM TRAEN

Any not in use and not sealed well(s) on property? ☐ Yes ☐ No

Was a variance granted from the MDH for this Well? ☐ Yes ☐ No

USGS Quad Coon Rapids Elevation 868

Aquifer: CFMS Alt Id: 80-6139

Well CONTRACTOR CERTIFICATION Lic. Or Reg. No. 96460

Unique No.	00202943	MINNESOTA DEPARTMENT OF HEALTH	Update Date	2008/12/30
County Name	Anoka	**WELL AND BORING RECORD** *Minnesota Statutes Chapter 1031*	Entry Date	1991/04/15

Township Name	Township	Range	Dir	Section	Subsection	Well Depth		Depth Completed		Date Well Completed
	31	24	W	21	BDACBB	632	ft.	632	ft.	1964/04/00

Well Name	COON RAPIDS 7	**Lic. Or Reg. No.**	96460	**Name of Driller**			
USGS Quad	Coon Rapi	**Elevation**	868	**Aquifer**	CFMS	**Alternative Id**	80-6139

GEOLOGICAL MATERIAL	COLOR	HARDNESS	FROM	TO	STRAT	LITH PRIM	LITH SEC	LITH MINOR
SAND & CLAY			0	78	QLUU	SAND	CLAY	
QLUU = Clay & sand	SAND = Sand		CLAY = Clay					
CLAY			78	90	QCUU	CLAY		
QCUU = Clay	CLAY = Clay							
FINE SAND			90	130	QFUU	SAND		
QFUU = Sand	SAND = Sand							
SANDSTONE			130	161	CJDN	SNDS		
CJDN = Jordan	SNDS = Sandstone							
GREENSHALE	GREEN		161	165	CSTL	SHLE	SLSN	
CSTL = St.Lawrence	SHLE = Shale		SLSN = Siltstone					
DOLOMITIC CLAY			165	190	CSTL	DLMT	SLSN	
CSTL = St.Lawrence	DLMT = Dolomite		SLSN = Siltstone					
SHALE & SANDSTONE			190	295	CFRN	SHLE	SNDS	
CFRN = Franconia	SHLE = Shale		SNDS = Sandstone					
GRAY SHALE	GRAY		295	300	CFRN	SHLE	SNDS	DLMT
CFRN = Franconia	SHLE = Shale		SNDS = Sandstone				DLMT = Dolomite	
BROWN SHALE	BROWN		300	315	CFRN	SHLE	SNDS	DLMT
CFRN = Franconia	SHLE = Shale		SNDS = Sandstone				DLMT = Dolomite	
SHALE	RED		315	325	CFRN	SHLE	SNDS	DLMT
CFRN = Franconia	SHLE = Shale		SNDS = Sandstone				DLMT = Dolomite	
SHALE	GRAY		325	330	CFRN	SHLE	SNDS	DLMT
CFRN = Franconia	SHLE = Shale		SNDS = Sandstone				DLMT = Dolomite	
SHALE	GRAY		330	345	CIGL	SNDS		
CIGL = Ironton-Galesville	SNDS = Sandstone							
SANDSTONE	GRAY		345	380	CIGL	SNDS		
CIGL = Ironton-Galesville	SNDS = Sandstone							
GRAY SHALE	GRAY		380	398	CIGL	SNDS		
CIGL = Ironton-Galesville	SNDS = Sandstone							

Unique No.	00202943	MINNESOTA DEPARTMENT OF HEALTH	Update Date	2008/12/30
County Name	Anoka	**WELL AND BORING RECORD** *Minnesota Statutes Chapter 1031*	Entry Date	1991/04/15

Township Name	Township	Range	Dir	Section	Subsection	Well Depth		Depth Completed		Date Well Completed
	31	24	W	21	BDACBB	632	ft.	632	ft.	1964/04/00

Well Name	COON RAPIDS 7	**Lic. Or Reg. No.**	96460	**Name of Driller**			
USGS Quad	Coon Rapi	**Elevation**	868	**Aquifer**	CFMS	**Alternative Id**	80-6139

GEOLOGICAL MATERIAL	COLOR	HARDNESS	FROM	TO	STRAT	LITH PRIM	LITH SEC	LITH MINOR
SHALE	GRAY		398	400	CECR	SHLE	SNDS	
CECR = Eau Claire	SHLE = Shale			SNDS = Sandstone				
RED ROCK	RED		400	425	CECR	SHLE	SNDS	
CECR = Eau Claire	SHLE = Shale			SNDS = Sandstone				
GRAY & RED SHALE	GRY/RED		425	440	CECR	SHLE	SNDS	
CECR = Eau Claire	SHLE = Shale			SNDS = Sandstone				
GRAY & BROWN ROCK	GRY/BRN		440	475	CECR	SHLE	SNDS	
CECR = Eau Claire	SHLE = Shale			SNDS = Sandstone				
COARSE SAND	GRAY		475	477	CECR	SHLE	SNDS	
CECR = Eau Claire	SHLE = Shale			SNDS = Sandstone				
COARSE SAND	GRAY		477	480	CMTS	SNDS		
CMTS = Mt.Simon	SNDS = Sandstone							
FINE SAND	GRAY		480	520	CMTS	SNDS		
CMTS = Mt.Simon	SNDS = Sandstone							
FINE SAND	GRAY		520	560	CMTS	SNDS		
CMTS = Mt.Simon	SNDS = Sandstone							
COARSE SAND	WHITE		560	590	CMTS	SNDS		
CMTS = Mt.Simon	SNDS = Sandstone							
HARD GOLD GRAINS COARSE SAND	WHITE		590	600	CMTS	SNDS		
CMTS = Mt.Simon	SNDS = Sandstone							
SHALE	RED		600	610	PMSU	SHLE		
PMSU = Mid.Proterozoic Sedimentary	SHLE = Shale							
RED & GRAY SHALE	RED/GRY		610	615	PMSU	SHLE		
PMSU = Mid.Proterozoic Sedimentary	SHLE = Shale							
SHALE	RED		615	632	PMSU	SHLE		
PMSU = Mid.Proterozoic Sedimentary	SHLE = Shale							

Unique No. 00202932	MINNESOTA DEPARTMENT OF HEALTH	Update Date 2007/02/06
County Name Anoka	**WELL AND BORING RECORD**	Entry Date 1991/04/15
	Minnesota Statutes Chapter 1031	

Township Name	Township	Range	Dir	Section	Subsection
	31	24	W	13	ACCDBD

Well Depth	Depth Completed	Date Well Completed
700 ft.	700 ft.	1965/05/07

Well Name COON RAPIDS 8

Drilling Method Cable Tool

Well Owner's Name COON RAPIDS 8
269 NORTHDALE BL
COON RAPIDS MN 55433

Drilling Fluid

Well Hydrofractured? ☐ Yes ☐ No
From ft. to ft.

Contact's Name CITY OF COON RAPIDS
11155 ROBINSON NW DR
COON RAPIDS MN 55433

Use Community Supply (municipal)

Casing **Drive Shoe?** ☐ Yes ☐ N

Hole Diameter
in. t 700 ft

Casing Diameter **Weight(lbs/ft)**
24 in. t 258 ft
16 in. t 283 ft

GEOLOGICAL MATERIAL	COLOR	HARDNESS	FROM	TO
DRIFT			0	212
SANDROCK, SHALE, GRAV			212	243
LIMEROCK, SHALE			243	249
LIMEROCK, SHALE			249	263
SANDROCK, SHALE			263	409
SANDROCK, SHALE			409	418
SANDROCK			418	445
SHALEY SANDROCK			445	469
SHALEY SANDROCK			469	473
SHALE			473	518
SHALE & SANDROCK			518	533
SHALEY SANDROCK			533	545
SHALE			545	549
SANDROCK			549	594
SHALE			594	598
SANDROCK			598	694
SHALE			694	700

Screen N

Open Hole From 283 ft. to 700 ft.

Make Type

Static Water Level 42 ft. from Land surface Date 1965/05/07

PUMPING LEVEL (below land surface)
132.3 ft. after hrs. pumping 922 g.p.m.

Well Head Completion
Pitless adapter mfr Model
Casing Protection ☑ 12 in. above grade
☐ At-grade(Environmental Wells and Borings ONLY)

Grouting Information Well grouted? ☑ Yes ☐ No

Material	From	To (ft.)	Amount(yds/bags)	
G	0	283	24	Y

Nearest Known Source of Contamination
ft. direction type
Well disinfected upon completion? ☐ Yes ☐ No

Pump ☐ Not Installed Date Installed
Mfr nam
Model HP Volts
Drop Pipe Length ft. Capacity g.p.m
Type

Any not in use and not sealed well(s) on property? ☐ Yes ☐ No

Was a variance granted from the MDH for this Well? ☐ Yes ☐ No

REMARKS, ELEVATION, SOURCE OF DATA, etc.

OLD PA. NO. 65-0095.

GAMMA LOGGED 2-6-2004 BY JIM TRAEN

USGS Quad Coon Rapids Elevation 897
Aquifer: CFMS Alt Id: 80-6139

Well CONTRACTOR CERTIFICATION Lic. Or Reg. No. 62012
License Business Name
Name of Driller O'BRIEN, F.

Report Copy

Unique No.	00202932	MINNESOTA DEPARTMENT OF HEALTH	Update Date	2007/02/06
County Name	Anoka	**WELL AND BORING RECORD** *Minnesota Statutes Chapter 1031*	Entry Date	1991/04/15

Township Name	Township	Range	Dir	Section	Subsection	Well Depth		Depth Completed		Date Well Completed
	31	24	W	13	ACCDBD	700	ft.	700	ft.	1965/05/07

Well Name	COON RAPIDS 8	**Lic. Or Reg. No.**	62012	**Name of Driller**	O'BRIEN, F.		
USGS Quad	Coon Rapi	**Elevation**	897	**Aquifer**	CFMS	**Alternative Id**	80-6139

GEOLOGICAL MATERIAL	COLOR	HARDNESS	FROM	TO	STRAT	LITH PRIM	LITH SEC	LITH MINOR
DRIFT			0	212	QUUU	DRFT		
QUUU = Unknown deposit type	DRFT = Drift							
SANDROCK, SHALE, GRAVEL			212	243	QPUU	SAND	CLAY	GRVL
QPUU = Pebbly sand/silt/clay	SAND = Sand		CLAY = Clay				GRVL = Gravel	
LIMEROCK, SHALE			243	249	QUUU	COBL		
QUUU = Unknown deposit type	COBL = Cobble							
LIMEROCK, SHALE			249	263	CFRN	SHLE	DLMT	SNDS
CFRN = Franconia	SHLE = Shale		DLMT = Dolomite				SNDS = Sandstone	
SANDROCK, SHALE			263	409	CFRN	SNDS	SHLE	DLMT
CFRN = Franconia	SNDS = Sandstone		SHLE = Shale				DLMT = Dolomite	
SANDROCK, SHALE			409	418	CIGL	SNDS		
CIGL = Ironton-Galesville	SNDS = Sandstone							
SANDROCK			418	445	CIGL	SNDS		
CIGL = Ironton-Galesville	SNDS = Sandstone							
SHALEY SANDROCK			445	469	CIGL	SNDS	SHLE	
CIGL = Ironton-Galesville	SNDS = Sandstone		SHLE = Shale					
SHALEY SANDROCK			469	473	CECR	SNDS	SHLE	
CECR = Eau Claire	SNDS = Sandstone		SHLE = Shale					
SHALE			473	518	CECR	SHLE		
CECR = Eau Claire	SHLE = Shale							
SHALE & SANDROCK			518	533	CECR	SHLE	SNDS	
CECR = Eau Claire	SHLE = Shale		SNDS = Sandstone					
SHALEY SANDROCK			533	545	CECR	SNDS		
CECR = Eau Claire	SNDS = Sandstone							
SHALE			545	549	CECR	SHLE	SLSN	
CECR = Eau Claire	SHLE = Shale		SLSN = Siltstone					
SANDROCK			549	594	CMTS	SNDS		
CMTS = Mt.Simon	SNDS = Sandstone							

Unique No.	00202932	MINNESOTA DEPARTMENT OF HEALTH	Update Date	2007/02/06
County Name	Anoka	**WELL AND BORING RECORD** *Minnesota Statutes Chapter 1031*	Entry Date	1991/04/15

Township Name	Township	Range	Dir	Section	Subsection	Well Depth		Depth Completed		Date Well Completed
	31	24	W	13	ACCDBD	700	ft.	700	ft.	1965/05/07

Well Name	COON RAPIDS 8	**Lic. Or Reg. No.**	62012	**Name of Driller**	O'BRIEN, F.		
USGS Quad	Coon Rapi	**Elevation**	897	**Aquifer**	CFMS	**Alternative Id**	80-6139

GEOLOGICAL MATERIAL	COLOR	HARDNESS	FROM	TO	STRAT	LITH PRIM	LITH SEC	LITH MINOR
SHALE			594	598	CMTS	SHLE	SNDS	
CMTS = Mt.Simon	SHLE = Shale		SNDS = Sandstone					
SANDROCK			598	694	CMTS	SNDS		
CMTS = Mt.Simon	SNDS = Sandstone							
SHALE			694	700	PMRC	SLSN	SHLE	
PMRC = Red Clastic Series	SLSN = Siltstone		SHLE = Shale					

Unique No.	00202931	MINNESOTA DEPARTMENT OF HEALTH	Update Date	2008/12/30
County Name	Anoka	**WELL AND BORING RECORD** *Minnesota Statutes Chapter 1031*	Entry Date	1991/04/15

Township Name	Township	Range	Dir	Section	Subsection
	31	24	W	13	ACDAAB

Well Depth	Depth Completed	Date Well Completed
500 ft.	500 ft.	1969/04/07

Well Name COON RAPIDS 9

Drilling Method Cable Tool

Well Owner's Name COON RAPIDS 9
11399 DOGWOOD NW ST
COON RAPIDS MN 55433

Drilling Fluid

Well Hydrofractured? ☐ Yes ☐ No
From ft. to ft.

Contact's Name CITY OF COON RAPIDS
11155 ROBINSON NW DR
COON RAPIDS MN 55433

Use Community Supply (municipal)

Casing **Drive Shoe?** ☐ Yes ☐ N

Hole Diameter

Casing Diameter **Weight(lbs/ft)**

24 in. t 268 ft
16 in. t 294 ft

GEOLOGICAL MATERIAL	COLOR	HARDNESS	FROM	TO
SAND			0	20
SAND	RED		20	39
CLAY	BLUE		39	63
SAND	RED		63	83
SAND	RED		83	89
CLAY	GREE		89	98
CLAY	BLUE		98	109
GRAVEL			109	123
GRAVEL	GRAY		123	135
GRAVEL & ROCKS			135	140
SAND	GREE		140	146
CLAY & ROCKS			146	166
GREEN CLAY & ROCKS			166	173
CLAY	RED		173	235
RED CLAY & ROCK	RED		235	245
RED CLAY & SAND	RED		245	250
RED CLAY & SAND	RED		250	252
SHALE	GREE		252	255
LIMEROCK & SHALE			255	263
LIMEROCK & SHALE			263	265
LIMEROCK & SHALE			265	266
LIMEROCK & SHALE			266	271
SANDSTONE & SHALE			271	275
HARD SHALE & SAND			275	302
HARD SHALE & SAND			302	316
SANDSTONE		HARD	316	320
SANDSTONE & SHALE			320	353
SANDSTONE			353	356
SHALE SOME SAND			356	371
SHALE & SANDSTONE			371	388
SHALE			388	396
SHALE & SANDSTONE			396	405

Screen N

Open Hole From 294 ft. to 500 ft.

Make Type

Static Water Level 47 ft. from Land surface Date 1969/04/07

PUMPING LEVEL (below land surface)

ft. after hrs. pumping g.p.m.

Well Head Completion

Pitless adapter mfr Model

Casing Protection ☑ 12 in. above grade

☐ At-grade(Environmental Wells and Borings ONLY)

Grouting Information Well grouted? ☑ Yes ☐ No

Material	From	To (ft.)	Amount(yds/bags)	
G			24	Y

Nearest Known Source of Contamination

ft. direction type

Well disinfected upon completion? ☐ Yes ☐ No

Pump ☐ Not Installed Date Installed

Mfr nam

Model HP Volts

SANDY SHALE	405	410
SANDY SHALE	410	415
SANDY SHALE	415	425
SANDY SHALE	425	454
SANDY SHALE	454	458
SANDY SHALE	458	462
BLUE & RED SHALE	462	475
SANDY SHALE	475	478
SANDY SHALE	478	482
SANDY SHALE	482	492
RED & GREEN SHALE	492	500

REMARKS, ELEVATION, SOURCE OF DATA, etc.

M.G.S. NO. 459.

GAMMA LOGGED 2-13-2004. LOGGED BY JIM TRAEN.

USGS Quad	Coon Rapids	Elevation	897
Aquifer:	CFIE	Alt Id:	80-6139

Report Copy

Drop Pipe Length ft. Capacity g.p.m

Type

Any not in use and not sealed well(s) on property? ☐ Yes ☐ No

Was a variance granted from the MDH for this Well? ☐ Yes ☐ No

Well CONTRACTOR CERTIFICATION Lic. Or Reg. No. 27010

License Business Name

Name of Driller OLZESKE, T.

HE-01205-06 (Rev. 9/96)

Unique No.	00202931	MINNESOTA DEPARTMENT OF HEALTH	Update Date	2008/12/30
County Name	Anoka	**WELL AND BORING RECORD** *Minnesota Statutes Chapter 1031*	Entry Date	1991/04/15

Township Name	Township	Range	Dir	Section	Subsection	Well Depth		Depth Completed		Date Well Completed
	31	24	W	13	ACDAAB	500	ft.	500	ft.	1969/04/07

Well Name	COON RAPIDS 9	**Lic. Or Reg. No.**	27010	**Name of Driller**	OLZESKE, T.		
USGS Quad	Coon Rapi	**Elevation**	897	**Aquifer**	CFIE	**Alternative Id**	80-6139

GEOLOGICAL MATERIAL	COLOR	HARDNESS	FROM	TO	STRAT	LITH PRIM	LITH SEC	LITH MINOR
SAND			0	20	QFUU	SAND		
QFUU = Sand	SAND = Sand							
SAND	RED		20	39	QFUR	SAND		
QFUR = Sand	SAND = Sand							
CLAY	BLUE		39	63	QCUG	CLAY		
QCUG = Clay	CLAY = Clay							
SAND	RED		63	83	QFUR	SAND		
QFUR = Sand	SAND = Sand							
SAND	RED		83	89	QFUR	SAND		
QFUR = Sand	SAND = Sand							
CLAY	GREEN		89	98	QCUL	CLAY		
QCUL = Clay	CLAY = Clay							
CLAY	BLUE		98	109	QCUG	CLAY		
QCUG = Clay	CLAY = Clay							
GRAVEL			109	123	QGUU	GRVL		
QGUU = Gravel (+larger)	GRVL = Gravel							
GRAVEL	GRAY		123	135	QGUG	GRVL		
QGUG = Gravel (+larger)	GRVL = Gravel							
GRAVEL & ROCKS			135	140	QGUU	GRVL	COBL	
QGUU = Gravel (+larger)	GRVL = Gravel		COBL = Cobble					
SAND	GREEN		140	146	QFUL	SAND		
QFUL = Sand	SAND = Sand							
CLAY & ROCKS			146	166	QPUU	CLAY	COBL	
QPUU = Pebbly sand/silt/clay	CLAY = Clay		COBL = Cobble					
GREEN CLAY & ROCKS			166	173	QPUL	CLAY	COBL	
QPUL = Pebbly sand/silt/clay	CLAY = Clay		COBL = Cobble					
CLAY	RED		173	235	QCUR	CLAY		
QCUR = Clay	CLAY = Clay							

Unique No.	00202931	MINNESOTA DEPARTMENT OF HEALTH	Update Date	2008/12/30
County Name	Anoka	**WELL AND BORING RECORD** *Minnesota Statutes Chapter 1031*	Entry Date	1991/04/15

Township Name	Township	Range	Dir	Section	Subsection	Well Depth		Depth Completed		Date Well Completed
	31	24	W	13	ACDAAB	500	ft.	500	ft.	1969/04/07

Well Name	COON RAPIDS 9	**Lic. Or Reg. No.**	27010	**Name of Driller**	OLZESKE, T.		
USGS Quad	Coon Rapi	**Elevation**	897	**Aquifer**	CFIE	**Alternative Id**	80-6139

GEOLOGICAL MATERIAL	COLOR	HARDNESS	FROM	TO	STRAT	LITH PRIM	LITH SEC	LITH MINOR
RED CLAY & ROCK	RED		235	245	QPUR	CLAY	COBL	
QPUR = Pebbly sand/silt/clay	CLAY = Clay		COBL = Cobble					
RED CLAY & SAND	RED		245	250	QLUR	CLAY	SAND	
QLUR = Clay & sand	CLAY = Clay		SAND = Sand					
RED CLAY & SAND	RED		250	252	QLUR	CLAY	SAND	
QLUR = Clay & sand	CLAY = Clay		SAND = Sand					
SHALE	GREEN		252	255	QCUL	CLAY		
QCUL = Clay	CLAY = Clay							
LIMEROCK & SHALE			255	263	QPUU	COBL	CLAY	
QPUU = Pebbly sand/silt/clay	COBL = Cobble		CLAY = Clay					
LIMEROCK & SHALE			263	265	QPUU	COBL	CLAY	
QPUU = Pebbly sand/silt/clay	COBL = Cobble		CLAY = Clay					
LIMEROCK & SHALE			265	266	QPUU	COBL	CLAY	
QPUU = Pebbly sand/silt/clay	COBL = Cobble		CLAY = Clay					
LIMEROCK & SHALE			266	271	CFRN	DLMT	SHLE	SNDS
CFRN = Franconia	DLMT = Dolomite		SHLE = Shale				SNDS = Sandstone	
SANDSTONE & SHALE			271	275	CFRN	SNDS	SHLE	DLMT
CFRN = Franconia	SNDS = Sandstone		SHLE = Shale				DLMT = Dolomite	
HARD SHALE & SAND			275	302	CFRN	SHLE	SNDS	DLMT
CFRN = Franconia	SHLE = Shale		SNDS = Sandstone				DLMT = Dolomite	
HARD SHALE & SAND			302	316	CFRN	SHLE	SNDS	DLMT
CFRN = Franconia	SHLE = Shale		SNDS = Sandstone				DLMT = Dolomite	
SANDSTONE		HARD	316	320	CFRN	SNDS	DLMT	
CFRN = Franconia	SNDS = Sandstone		DLMT = Dolomite					
SANDSTONE & SHALE			320	353	CFRN	SNDS	SHLE	DLMT
CFRN = Franconia	SNDS = Sandstone		SHLE = Shale				DLMT = Dolomite	
SANDSTONE			353	356	CFRN	SNDS	SHLE	
CFRN = Franconia	SNDS = Sandstone		SHLE = Shale					

Unique No.	00202931	MINNESOTA DEPARTMENT OF HEALTH	Update Date	2008/12/30
County Name	Anoka	**WELL AND BORING RECORD** *Minnesota Statutes Chapter 1031*	Entry Date	1991/04/15

Township Name	Township	Range	Dir	Section	Subsection	Well Depth		Depth Completed		Date Well Completed
	31	24	W	13	ACDAAB	500	ft.	500	ft.	1969/04/07

Well Name	COON RAPIDS 9	**Lic. Or Reg. No.**	27010	**Name of Driller**	OLZESKE, T.		
USGS Quad	Coon Rapi	**Elevation**	897	**Aquifer**	CFIE	**Alternative Id**	80-6139

GEOLOGICAL MATERIAL	COLOR	HARDNESS	FROM	TO	STRAT	LITH PRIM	LITH SEC	LITH MINOR
SHALE SOME SAND			356	371	CFRN	SHLE	SNDS	DLMT
CFRN = Franconia	SHLE = Shale		SNDS = Sandstone			DLMT = Dolomite		
SHALE & SANDSTONE			371	388	CFRN	SHLE	SNDS	DLMT
CFRN = Franconia	SHLE = Shale		SNDS = Sandstone			DLMT = Dolomite		
SHALE			388	396	CFRN	SHLE	SNDS	
CFRN = Franconia	SHLE = Shale		SNDS = Sandstone					
SHALE & SANDSTONE			396	405	CFRN	SHLE	SNDS	
CFRN = Franconia	SHLE = Shale		SNDS = Sandstone					
SANDY SHALE			405	410	CFRN	SNDS	SHLE	DLMT
CFRN = Franconia	SNDS = Sandstone		SHLE = Shale			DLMT = Dolomite		
SANDY SHALE			410	415	CIGL	SNDS		
CIGL = Ironton-Galesville	SNDS = Sandstone							
SANDY SHALE			415	425	CIGL	SNDS		
CIGL = Ironton-Galesville	SNDS = Sandstone							
SANDY SHALE			425	454	CIGL	SNDS		
CIGL = Ironton-Galesville	SNDS = Sandstone							
SANDY SHALE			454	458	CIGL	SNDS		
CIGL = Ironton-Galesville	SNDS = Sandstone							
SANDY SHALE			458	462	CECR	SHLE	SNDS	
CECR = Eau Claire	SHLE = Shale		SNDS = Sandstone					
BLUE & RED SHALE			462	475	CECR	SHLE	SNDS	
CECR = Eau Claire	SHLE = Shale		SNDS = Sandstone					
SANDY SHALE			475	478	CECR	SHLE	SNDS	
CECR = Eau Claire	SHLE = Shale		SNDS = Sandstone					
SANDY SHALE			478	482	CECR	SHLE	SNDS	
CECR = Eau Claire	SHLE = Shale		SNDS = Sandstone					
SANDY SHALE			482	492	CECR	SHLE	SNDS	
CECR = Eau Claire	SHLE = Shale		SNDS = Sandstone					

Unique No.	00202931	MINNESOTA DEPARTMENT OF HEALTH	Update Date	2008/12/30
County Name	Anoka	**WELL AND BORING RECORD** *Minnesota Statutes Chapter 1031*	Entry Date	1991/04/15

Township Name	Township	Range	Dir	Section	Subsection	Well Depth		Depth Completed		Date Well Completed
	31	24	W	13	ACDAAB	500	ft.	500	ft.	1969/04/07

Well Name	COON RAPIDS 9	**Lic. Or Reg. No.**	27010	**Name of Driller**	OLZESKE, T.		
USGS Quad	Coon Rapi	**Elevation**	897	**Aquifer**	CFIE	**Alternative Id**	80-6139

GEOLOGICAL MATERIAL	COLOR	HARDNESS	FROM	TO	STRAT	LITH PRIM	LITH SEC	LITH MINOR
RED & GREEN SHALE			492	500	CECR	SHLE	SNDS	

CECR = Eau Claire SHLE = Shale SNDS = Sandstone

Unique No.	00202930	MINNESOTA DEPARTMENT OF HEALTH	Update Date	2007/02/07
County Name	Anoka	**WELL AND BORING RECORD**	Entry Date	1991/04/15

Minnesota Statutes Chapter 1031

Township Name	Township	Range	Dir	Section	Subsection
	31	24	W	13	DBADDC

Well Depth	Depth Completed	Date Well Completed
684 ft.	684 ft.	1970/05/05

Well Name COON RAPIDS 10

Drilling Method Cable Tool

Well Owner's Name COON RAPIDS 10
203 NORTHDALE BL
COON RAPIDS MN 55433

Drilling Fluid

Well Hydrofractured? ☐ Yes ☐ No
From ft. to ft.

Contact's Name CITY OF COON RAPIDS
11155 ROBINSON NW DR
COON RAPIDS MN 55433

Use Community Supply (municipal)

Casing **Drive Shoe?** ☐ Yes ☐ N

Hole Diameter

Casing Diameter		Weight(lbs/ft)	
30 in. t	80 ft		
24 in. t	259 ft		
16 in. t	272 ft		

GEOLOGICAL MATERIAL	COLOR	HARDNESS	FROM	TO
GLACIAL DRIFT			0	250
SANDY LIMESTONE			250	262
SANDY LIMESTONE			262	295
SANDSTONE WITH BEDS O			295	375
SANDSTONE SLATE	BROW		375	396
SANDSTONE SLATE	BROW		396	442
SANDSTONE SLATE BROW	BROW		442	455
HARD RED SHALE			455	457
HARD RED SHALE			457	495
SANDSTONE, SLATE	BROW		495	522
SANDSTONE, SLATE	BROW		522	662
SANDSTONE			662	679
RED SHALE			679	684

Screen N

Open Hole From 272 ft. to 684 ft.

Make Type

Static Water Level 51 ft. from Land surface Date 1970/05/05

PUMPING LEVEL (below land surface)
185 ft. after 49 hrs. pumping 1875 g.p.m.

Well Head Completion
Pitless adapter mfr Model
Casing Protection ☑ 12 in. above grade
☐ At-grade(Environmental Wells and Borings ONLY)

Grouting Information Well grouted? ☑ Yes ☐ No

Material	From	To (ft.)	Amount(yds/bags)
G	0	272	

Nearest Known Source of Contamination
ft. direction type
Well disinfected upon completion? ☐ Yes ☐ No

Pump ☐ Not Installed Date Installed Y
Mfr nam
Model HP 100 Volts
Drop Pipe Length ft. Capacity g.p.m
Type T

Any not in use and not sealed well(s) on property? ☐ Yes ☐ No

Was a variance granted from the MDH for this Well? ☐ Yes ☐ No

REMARKS, ELEVATION, SOURCE OF DATA, etc.

M.G.S. NO. 558. OLD PA. NO. 71-0825.

GAMMA LOGGED 5-3-2004. LOGGED BY JIM TRAEN.

USGS Quad Coon Rapids Elevation 899
Aquifer: CFMS Alt Id: 80-6139

Well CONTRACTOR CERTIFICATION Lic. Or Reg. No. 27118
License Business Name
Name of Driller BENEKE, R.

Report Copy

Unique No.	00202930	MINNESOTA DEPARTMENT OF HEALTH	Update Date	2007/02/07
County Name	Anoka	**WELL AND BORING RECORD** *Minnesota Statutes Chapter 1031*	Entry Date	1991/04/15

Township Name	Township	Range	Dir	Section	Subsection	Well Depth		Depth Completed		Date Well Completed
	31	24	W	13	DBADDC	684	ft.	684	ft.	1970/05/05

Well Name	COON RAPIDS 10	**Lic. Or Reg. No.**	27118	**Name of Driller**	BENEKE, R.		
USGS Quad	Coon Rapi	**Elevation**	899	**Aquifer**	CFMS	**Alternative Id**	80-6139

GEOLOGICAL MATERIAL	COLOR	HARDNESS	FROM	TO	STRAT	LITH PRIM	LITH SEC	LITH MINOR
GLACIAL DRIFT			0	250	QUUU	DRFT		
QUUU = Unknown deposit type	DRFT = Drift							
SANDY LIMESTONE			250	262	CSTL	SLSN	DLMT	
CSTL = St.Lawrence	SLSN = Siltstone		DLMT = Dolomite					
SANDY LIMESTONE			262	295	CFRN	SNDS	SHLE	DLMT
CFRN = Franconia	SNDS = Sandstone		SHLE = Shale				DLMT = Dolomite	
SANDSTONE WITH BEDS OF GREEN SHAL			295	375	CFRN	SNDS	SHLE	DLMT
CFRN = Franconia	SNDS = Sandstone		SHLE = Shale				DLMT = Dolomite	
SANDSTONE SLATE	BROWN		375	396	CFRN	SNDS	SHLE	DLMT
CFRN = Franconia	SNDS = Sandstone		SHLE = Shale				DLMT = Dolomite	
SANDSTONE SLATE	BROWN		396	442	CIGL	SNDS		
CIGL = Ironton-Galesville	SNDS = Sandstone							
SANDSTONE SLATE BROWN	BROWN		442	455	CIGL	SNDS		
CIGL = Ironton-Galesville	SNDS = Sandstone							
HARD RED SHALE			455	457	CIGL	SNDS		
CIGL = Ironton-Galesville	SNDS = Sandstone							
HARD RED SHALE			457	495	CECR	SHLE	SNDS	
CECR = Eau Claire	SHLE = Shale		SNDS = Sandstone					
SANDSTONE, SLATE	BROWN		495	522	CECR	SHLE	SNDS	
CECR = Eau Claire	SHLE = Shale		SNDS = Sandstone					
SANDSTONE, SLATE	BROWN		522	662	CMTS	SNDS		
CMTS = Mt.Simon	SNDS = Sandstone							
SANDSTONE			662	679	CMTS	SNDS		
CMTS = Mt.Simon	SNDS = Sandstone							
RED SHALE			679	684	PMRC	SHLE		
PMRC = Red Clastic Series	SHLE = Shale							

Unique No. 00202965	MINNESOTA DEPARTMENT OF HEALTH	Update Date 2008/12/30
County Name Anoka	**WELL AND BORING RECORD**	Entry Date 1991/04/15
	Minnesota Statutes Chapter 1031	

Township Name	Township	Range	Dir	Section	Subsection
	31	24	W	27	BAAAAA

Well Depth	Depth Completed	Date Well Completed
627 ft.	627 ft.	1972/05/11

Well Name COON RAPIDS 11

Drilling Method Non-specified Rotary

Well Owner's Name COON RAPIDS 11

COON RAPIDS MN 55433

Drilling Fluid

Well Hydrofractured? ☐ Yes ☐ No

From ft. to ft.

Contact's Name CITY OF COON RAPIDS

11155 ROBINSON NW DR

COON RAPIDS MN 55433

Use Community Supply (municipal)

Casing **Drive Shoe?** ☐ Yes ☐ N

Hole Diameter

in. t 157 ft

in. t 627 ft

Casing Diameter **Weight(lbs/ft)**

24 in. t 157 ft

GEOLOGICAL MATERIAL	COLOR	HARDNESS	FROM	TO
SAND			0	18
SANDY CLAY			18	58
SAND, GRAVEL & BOULDE			58	142
SAND, GRAVEL & BOULDE			142	146
LIME, SHALE			146	199
LIME, SHALE			199	305
SHALEY SANDSTONE			305	318
SHALEY SANDSTONE			318	352
SANDSTONE		SOFT	352	362
SANDSTONE		HARD	362	410
SANDSTONE		HARD	410	423
SHALE			423	434
SANDSTONE-SOME SHALE			434	478
SANDSTONE-SOME SHALE			478	530
SANDSTONE			530	622
SHALE			622	627

Screen N

Open Hole From 157 ft. to 627 ft.

Make Type

Static Water Level 25 ft. from Land surface Date 1972/05/11

PUMPING LEVEL (below land surface)

110 ft. after hrs. pumping 1820 g.p.m.

Well Head Completion

Pitless adapter mfr Model

Casing Protection ☑ 12 in. above grade

☐ At-grade(Environmental Wells and Borings ONLY)

Grouting Information Well grouted? ☑ Yes ☐ No

Material	From	To (ft.)	Amount(yds/bags)	
G	0	157	20	Y

Nearest Known Source of Contamination

ft. direction type

Well disinfected upon completion? ☐ Yes ☐ No

Pump ☐ Not Installed Date Installed

Mfr nam

Model HP Volts

Drop Pipe Length ft. Capacity g.p.m

Type

REMARKS, ELEVATION, SOURCE OF DATA, etc.

M.G.S. NO. 776

GAMMA LOGGED 9-12-1983 BY MGS AND 4-26-2002. LOGGED BY JIM TRAEN.

USGS Quad Coon Rapids Elevation 860

Aquifer: CFMS Alt Id: 80-6139

Any not in use and not sealed well(s) on property? ☐ Yes ☐ No

Was a variance granted from the MDH for this Well? ☐ Yes ☐ No

Well CONTRACTOR CERTIFICATION Lic. Or Reg. No. 62012

License Business Name

Name of Driller GIBSON, E.

Report Copy

Unique No.	00202965	MINNESOTA DEPARTMENT OF HEALTH	Update Date	2008/12/30
County Name	Anoka	**WELL AND BORING RECORD** *Minnesota Statutes Chapter 1031*	Entry Date	1991/04/15

Township Name	Township	Range	Dir	Section	Subsection	Well Depth		Depth Completed		Date Well Completed
	31	24	W	27	BAAAAA	627	ft.	627	ft.	1972/05/11

Well Name	COON RAPIDS 11	Lic. Or Reg. No.	62012	Name of Driller	GIBSON, E.
USGS Quad	Coon Rapi	Elevation	860	Aquifer	CFMS	Alternative Id	80-6139

GEOLOGICAL MATERIAL	COLOR	HARDNESS	FROM	TO	STRAT	LITH PRIM	LITH SEC	LITH MINOR
SAND			0	18	QFUU	SAND		
QFUU = Sand	SAND = Sand							
SANDY CLAY			18	58	QLUU	CLAY	SAND	
QLUU = Clay & sand	CLAY = Clay		SAND = Sand					
SAND, GRAVEL & BOULDERS			58	142	QHUU	SAND	GRVL	BLDR
QHUU = Sand & larger	SAND = Sand		GRVL = Gravel				BLDR = Boulder	
SAND, GRAVEL & BOULDERS			142	146	CSTL	DLMT	SLSN	
CSTL = St.Lawrence	DLMT = Dolomite		SLSN = Siltstone					
LIME, SHALE			146	199	CSTL	DLMT	SLSN	
CSTL = St.Lawrence	DLMT = Dolomite		SLSN = Siltstone					
LIME, SHALE			199	305	CFRN	SNDS	SHLE	DLMT
CFRN = Franconia	SNDS = Sandstone		SHLE = Shale				DLMT = Dolomite	
SHALEY SANDSTONE			305	318	CFRN	SNDS	SHLE	DLMT
CFRN = Franconia	SNDS = Sandstone		SHLE = Shale				DLMT = Dolomite	
SHALEY SANDSTONE			318	352	CIGL	SNDS		
CIGL = Ironton-Galesville	SNDS = Sandstone							
SANDSTONE		SOFT	352	362	CIGL	SNDS		
CIGL = Ironton-Galesville	SNDS = Sandstone							
SANDSTONE		HARD	362	410	CIGL	SNDS		
CIGL = Ironton-Galesville	SNDS = Sandstone							
SANDSTONE		HARD	410	423	CECR	SHLE	SNDS	
CECR = Eau Claire	SHLE = Shale		SNDS = Sandstone					
SHALE			423	434	CECR	SHLE	SNDS	
CECR = Eau Claire	SHLE = Shale		SNDS = Sandstone					
SANDSTONE-SOME SHALE			434	478	CECR	SHLE	SNDS	
CECR = Eau Claire	SHLE = Shale		SNDS = Sandstone					
SANDSTONE-SOME SHALE			478	530	CMTS	SNDS		
CMTS = Mt.Simon	SNDS = Sandstone							

Unique No.	00202965	MINNESOTA DEPARTMENT OF HEALTH	Update Date	2008/12/30
County Name	Anoka	**WELL AND BORING RECORD** *Minnesota Statutes Chapter 1031*	Entry Date	1991/04/15

Township Name	Township	Range	Dir	Section	Subsection	Well Depth		Depth Completed		Date Well Completed
	31	24	W	27	BAAAAA	627	ft.	627	ft.	1972/05/11

Well Name	COON RAPIDS 11	**Lic. Or Reg. No.**	62012	**Name of Driller**	GIBSON, E.		
USGS Quad	Coon Rapi	**Elevation**	860	**Aquifer**	CFMS	**Alternative Id**	80-6139

GEOLOGICAL MATERIAL	COLOR	HARDNESS	FROM	TO	STRAT	LITH PRIM	LITH SEC	LITH MINOR
SANDSTONE			530	622	CMTS	SNDS		
CMTS = Mt.Simon	SNDS = Sandstone							
SHALE			622	627	PMRC	SHLE		
PMRC = Red Clastic Series	SHLE = Shale							

Unique No. 00168721

County Name Anoka

MINNESOTA DEPARTMENT OF HEALTH

WELL AND BORING RECORD

Minnesota Statutes Chapter 1031

Update Date 2007/02/07

Entry Date 1991/04/15

Township Name	Township	Range	Dir	Section	Subsection
	31	24	W	27	AAAAAD

Well Depth		Depth Completed		Date Well Completed
604	ft.	604	ft.	1975/05/14

Well Name COON RAPIDS 12

Drilling Method Cable Tool

Well Owner's Name COON RAPIDS 12

COON RAPIDS MN 55433

Drilling Fluid

Well Hydrofractured? ☐ Yes ☐ No

From ft. to ft.

Contact's Name CITY OF COON RAPIDS

11155 ROBINSON NW DR

COON RAPIDS MN 55433

Use Community Supply (municipal)

Casing **Drive Shoe?** ☐ Yes ☐ N

Hole Diameter

Casing Diameter		Weight(lbs/ft)		
24	in. t	124	ft	94.62
16	in. t	208	ft	62.58

GEOLOGICAL MATERIAL	COLOR	HARDNESS	FROM	TO
SAND FILL	YELLO		0	9
SAND	GRAY		9	20
CLAY	GRAY		20	30
CLAY	RED/B		30	65
SANDY MUCK	BROW		65	100
SHALE	GRAY		100	120
JORDAN SANDROCK	WHITE		120	123
JORDAN SANDROCK	WHITE		123	135
ST. LAWRANCE SANDSTON	YELLO		135	140
ST. LAWRANCE SANDSTON	WHITE		140	170
ST. LAWRENCE SANDSTON	BLU/G		170	171
ST. LAWRANCE SANDSTON	BLU/G		171	180
ST. LAWRANCE SANDSTON	BLU/G		180	185
ST. LAWRANCE SANDSTON	PINK		185	195
ST. LAWRANCE SANDSTON	VARIE		195	208
ST. LAWRANCE SANDSTON	GREE		208	264
HARD LAYER OF SHALE	GREE		264	270
SHALE ROCK	GREE		270	286
SHALE SANDROCK	GREE		286	300
SANDROCK	TAN/G		300	316
SANDROCK	TAN/G		316	385
SHALE SANDSTONE	LIGHT		385	386
SHALE SANDSTONE	LIGHT		386	407
SHALE ROCK	TAN/B		407	420
SHALE	BRN/G		420	458
SHALE	BRN/G		458	480
SHALEY SANDSTONE	WHITE		480	550
SANDSTONE	TAN		550	600
SHALE	RED		600	604

Screen N

Open Hole From 208 ft. to 604 ft.

Make

Type

Static Water Level 47 ft. from Land surface Date 1975/05/14

PUMPING LEVEL (below land surface)

146 ft. after 8 hrs. pumping 1800 g.p.m.

Well Head Completion

Pitless adapter mfr Model

Casing Protection ☑ 12 in. above grade

☐ At-grade(Environmental Wells and Borings ONLY)

Grouting Information Well grouted? ☑ Yes ☐ No

Material	From	To (ft.)	Amount(yds/bags)
G			

Nearest Known Source of Contamination

ft. direction type

Well disinfected upon completion? ☑ Yes ☐ No

Pump ☐ Not Installed Date Installed

Mfr name

Model HP Volts

Drop Pipe Length ft. Capacity g.p.m

Type

REMARKS, ELEVATION, SOURCE OF DATA, etc.

M.G.S. NO.985.

GAMMA LOGGED 1-18-05. LOGGED BY JIM TRAEN.

Any not in use and not sealed well(s) on property? ☐ Yes ☐ No

USGS Quad	Coon Rapids	Elevation	852
Aquifer:	CFMS	Alt Id:	80-6139

Was a variance granted from the MDH for this Well? ☐ Yes ☐ No

Well CONTRACTOR CERTIFICATION Lic. Or Reg. No. 02015

License Business Name

Name of Driller SIGAFOOS, G.

Report Copy

HE-01205-06 (Rev. 9/96)

Unique No.	00168721	MINNESOTA DEPARTMENT OF HEALTH	Update Date	2007/02/07
County Name	Anoka	**WELL AND BORING RECORD** *Minnesota Statutes Chapter 1031*	Entry Date	1991/04/15

Township Name	Township	Range	Dir	Section	Subsection	Well Depth		Depth Completed		Date Well Completed
	31	24	W	27	AAAAAD	604	ft.	604	ft.	1975/05/14

Well Name	COON RAPIDS 12	**Lic. Or Reg. No.**	02015	**Name of Driller**	SIGAFOOS, G.		
USGS Quad	Coon Rapi	**Elevation**	852	**Aquifer**	CFMS	**Alternative Id**	80-6139

GEOLOGICAL MATERIAL	COLOR	HARDNESS	FROM	TO	STRAT	LITH PRIM	LITH SEC	LITH MINOR
SAND FILL	YELLOW		0	9	RMMF	SAND	FILL	
RMMF = Man-made fill	SAND = Sand		FILL = Fill					
SAND	GRAY		9	20	QFUG	SAND		
QFUG = Sand	SAND = Sand							
CLAY	GRAY		20	30	QCUG	CLAY		
QCUG = Clay	CLAY = Clay							
CLAY	RED/BRN		30	65	QCUU	CLAY		
QCUU = Clay	CLAY = Clay							
SANDY MUCK	BROWN		65	100	QNUB	SAND	MUCK	
QNUB = Sand & silt	SAND = Sand		MUCK = Muck					
SHALE	GRAY		100	120	QCUG	CLAY		
QCUG = Clay	CLAY = Clay							
JORDAN SANDROCK	WHITE		120	123	QFUU	SAND		
QFUU = Sand	SAND = Sand							
JORDAN SANDROCK	WHITE		123	135	CJDN	SNDS		
CJDN = Jordan	SNDS = Sandstone							
ST. LAWRANCE SANDSTONE	YELLOW		135	140	CSTL	SLSN	DLMT	SNDS
CSTL = St.Lawrence	SLSN = Siltstone		DLMT = Dolomite				SNDS = Sandstone	
ST. LAWRANCE SANDSTONE	WHITE		140	170	CSTL	SLSN	DLMT	SNDS
CSTL = St.Lawrence	SLSN = Siltstone		DLMT = Dolomite				SNDS = Sandstone	
ST. LAWRENCE SANDSTONE	BLU/GRN		170	171	CSTL	SLSN	DLMT	SNDS
CSTL = St.Lawrence	SLSN = Siltstone		DLMT = Dolomite				SNDS = Sandstone	
ST. LAWRANCE SANDSTONE	BLU/GRN		171	180	CFRN	SNDS	SHLE	DLMT
CFRN = Franconia	SNDS = Sandstone		SHLE = Shale				DLMT = Dolomite	
ST. LAWRANCE SANDSTONE	BLU/GRN		180	185	CFRN	SNDS	SHLE	DLMT
CFRN = Franconia	SNDS = Sandstone		SHLE = Shale				DLMT = Dolomite	
ST. LAWRANCE SANDSTONE	PINK		185	195	CFRN	SNDS	SHLE	DLMT
CFRN = Franconia	SNDS = Sandstone		SHLE = Shale				DLMT = Dolomite	

Unique No.	00168721	MINNESOTA DEPARTMENT OF HEALTH	Update Date	2007/02/07
County Name	Anoka	**WELL AND BORING RECORD** *Minnesota Statutes Chapter 1031*	Entry Date	1991/04/15

Township Name	Township	Range	Dir	Section	Subsection	Well Depth		Depth Completed		Date Well Completed
	31	24	W	27	AAAAAD	604	ft.	604	ft.	1975/05/14

Well Name	COON RAPIDS 12	**Lic. Or Reg. No.**	02015	**Name of Driller**	SIGAFOOS, G.		
USGS Quad	Coon Rapi	**Elevation**	852	**Aquifer**	CFMS	**Alternative Id**	80-6139

GEOLOGICAL MATERIAL	COLOR	HARDNESS	FROM	TO	STRAT	LITH PRIM	LITH SEC	LITH MINOR
ST. LAWRANCE SANDSTONE	VARIED		195	208	CFRN	SNDS	SHLE	DLMT
CFRN = Franconia	SNDS = Sandstone		SHLE = Shale			DLMT = Dolomite		
ST. LAWRANCE SANDSTONE	GREEN		208	264	CFRN	SNDS	SHLE	DLMT
CFRN = Franconia	SNDS = Sandstone		SHLE = Shale			DLMT = Dolomite		
HARD LAYER OF SHALE	GREEN		264	270	CFRN	SNDS	SHLE	DLMT
CFRN = Franconia	SNDS = Sandstone		SHLE = Shale			DLMT = Dolomite		
SHALE ROCK	GREEN		270	286	CFRN	SNDS	SHLE	DLMT
CFRN = Franconia	SNDS = Sandstone		SHLE = Shale			DLMT = Dolomite		
SHALE SANDROCK	GREEN		286	300	CFRN	SNDS	SHLE	DLMT
CFRN = Franconia	SNDS = Sandstone		SHLE = Shale			DLMT = Dolomite		
SANDROCK	TAN/GRN		300	316	CFRN	SNDS	SHLE	DLMT
CFRN = Franconia	SNDS = Sandstone		SHLE = Shale			DLMT = Dolomite		
SANDROCK	TAN/GRN		316	385	CIGL	SNDS		
CIGL = Ironton-Galesville	SNDS = Sandstone							
SHALE SANDSTONE	LIGHT		385	386	CIGL	SNDS		
CIGL = Ironton-Galesville	SNDS = Sandstone							
SHALE SANDSTONE	LIGHT		386	407	CECR	SHLE	SNDS	
CECR = Eau Claire	SHLE = Shale		SNDS = Sandstone					
SHALE ROCK	TAN/BRN		407	420	CECR	SHLE	SNDS	
CECR = Eau Claire	SHLE = Shale		SNDS = Sandstone					
SHALE	BRN/GRN		420	458	CECR	SHLE	SNDS	
CECR = Eau Claire	SHLE = Shale		SNDS = Sandstone					
SHALE	BRN/GRN		458	480	CMTS	SNDS		
CMTS = Mt.Simon	SNDS = Sandstone							
SHALEY SANDSTONE	WHITE		480	550	CMTS	SNDS		
CMTS = Mt.Simon	SNDS = Sandstone							
SANDSTONE	TAN		550	600	CMTS	SNDS		
CMTS = Mt.Simon	SNDS = Sandstone							

Unique No.	00168721	MINNESOTA DEPARTMENT OF HEALTH	Update Date	2007/02/07
County Name	Anoka	**WELL AND BORING RECORD** *Minnesota Statutes Chapter 1031*	Entry Date	1991/04/15

Township Name	Township	Range	Dir	Section	Subsection	Well Depth		Depth Completed		Date Well Completed
	31	24	W	27	AAAAAD	604	ft.	604	ft.	1975/05/14

Well Name	COON RAPIDS 12	**Lic. Or Reg. No.**	02015	**Name of Driller**	SIGAFOOS, G.		
USGS Quad	Coon Rapi	**Elevation**	852	**Aquifer**	CFMS	**Alternative Id**	80-6139

GEOLOGICAL MATERIAL	COLOR	HARDNESS	FROM	TO	STRAT	LITH PRIM	LITH SEC	LITH MINOR
SHALE	RED		600	604	PMSU	SHLE		

PMSU = Mid.Proterozoic Sedimentary SHLE = Shale

Unique No. 00168720

County Name Anoka

MINNESOTA DEPARTMENT OF HEALTH

WELL AND BORING RECORD

Minnesota Statutes Chapter 1031

Update Date 2007/02/07

Entry Date 1991/04/15

Township Name	Township	Range	Dir	Section	Subsection
	31	24	W	13	DADDBC

Well Depth	Depth Completed	Date Well Completed
693 ft.	693 ft.	1977/03/25

Well Name COON RAPIDS 13

Drilling Method Cable Tool

Well Owner's Name COON RAPIDS 13
11100 UNIVERSITY AV
COON RAPIDS MN 55433

Drilling Fluid

Well Hydrofractured? ☐ Yes ☐ No
From ft. to ft.

Contact's Name CITY OF COON RAPIDS
11155 ROBINSON NW DR
COON RAPIDS MN 55433

Use Community Supply (municipal)

Casing **Drive Shoe?** ☑ Yes ☐ N

Hole Diameter

Casing Diameter		Weight(lbs/ft)
24 in. t	252 ft	94.62
16 in. t	395 ft	62.58

GEOLOGICAL MATERIAL	COLOR	HARDNESS	FROM	TO
SAND	BROW		0	55
SANDY CLAY	GRAY		55	75
FINE SAND	GRAY	HARD	75	85
FINE SAND	RED		85	105
CLAY STICKY	RED		105	135
CLAY & STONE	GRAY	HARD	135	160
FINE SAND	RED		160	175
CLAY	GRAY		175	195
SAND & STONES & CLAY	GRAY		195	205
STONES & SAND	DARK		205	215
SHALE & STONES	TAN		215	220
SHALE	TAN		220	245
SANDSTONE SHALE	GRAY		245	250
SHALE	RED		250	257
ST. LAWRANCE GREEN, RE	VARIE		257	260
HARDROCK	TAN		260	267
HARDROCK	TAN		267	268
SANDROCK	LIGHT	HARD	268	298
SANDY ROCK, SHALE	GREE		298	312
SANDROCK, SHALE	LIGHT		312	338
SANDSTONE GREEN-GRAY-			338	403
SANDSTONE GREEN-GRAY-			403	453
SANDSTONE GREEN-GRAY-			453	525
SANDSTONE GREEN-GRAY-			525	672
HINCKLEY SANDSTONE	RED		672	691
HINCKLEY SANDSTONE			691	693

Screen N

Open Hole From 395 ft. to 693 ft.

Make Type

Static Water Level 75 ft. from Land surface Date 1977/03/25

PUMPING LEVEL (below land surface)
158 ft. after 10 hrs. pumping 1000 g.p.m.

Well Head Completion
Pitless adapter mfr Model
Casing Protection ☑ 12 in. above grade
☐ At-grade(Environmental Wells and Borings ONLY)

Grouting Information Well grouted? ☑ Yes ☐ No

Material	From	To (ft.)	Amount(yds/bags)
G			

Nearest Known Source of Contamination
ft. direction type
Well disinfected upon completion? ☐ Yes ☐ No

Pump ☐ Not Installed Date Installed
Mfr name
Model HP Volts

Drop Pipe Length ft. Capacity g.p.m
Type

Any not in use and not sealed well(s) on property? ☐ Yes ☐ No

Was a variance granted from the MDH for this Well? ☐ Yes ☐ No

REMARKS, ELEVATION, SOURCE OF DATA, etc.

M.G.S. NO.1124.

GAMMA LOGGED 2-6-04. LOGGED BY JIM TRAEN.

USGS Quad Coon Rapids Elevation 900
Aquifer: CFMS Alt Id: 80-6139

Well CONTRACTOR CERTIFICATION Lic. Or Reg. No. 02015
License Business Name

Report Copy

Unique No.	00168720	MINNESOTA DEPARTMENT OF HEALTH	Update Date	2007/02/07
County Name	Anoka	**WELL AND BORING RECORD** *Minnesota Statutes Chapter 1031*	Entry Date	1991/04/15

Township Name	Township	Range	Dir	Section	Subsection	Well Depth		Depth Completed		Date Well Completed
	31	24	W	13	DADDBC	693	ft.	693	ft.	1977/03/25

Well Name	COON RAPIDS 13	**Lic. Or Reg. No.**	02015	**Name of Driller**	SIGAFOOS, G.		
USGS Quad	Coon Rapi	**Elevation**	900	**Aquifer**	CFMS	**Alternative Id**	80-6139

GEOLOGICAL MATERIAL	COLOR	HARDNESS	FROM	TO	STRAT	LITH PRIM	LITH SEC	LITH MINOR
SAND	BROWN		0	55	QFUB	SAND		
QFUB = Sand	SAND = Sand							
SANDY CLAY	GRAY		55	75	QLUG	CLAY	SAND	
QLUG = Clay & sand	CLAY = Clay			SAND = Sand				
FINE SAND	GRAY	HARD	75	85	QFUG	SAND		
QFUG = Sand	SAND = Sand							
FINE SAND	RED		85	105	QFUR	SAND		
QFUR = Sand	SAND = Sand							
CLAY STICKY	RED		105	135	QCUR	CLAY		
QCUR = Clay	CLAY = Clay							
CLAY & STONE	GRAY	HARD	135	160	QPUG	CLAY	PEBL	
QPUG = Pebbly sand/silt/clay	CLAY = Clay			PEBL = Pebbles				
FINE SAND	RED		160	175	QFUR	SAND		
QFUR = Sand	SAND = Sand							
CLAY	GRAY		175	195	QCUG	CLAY		
QCUG = Clay	CLAY = Clay							
SAND & STONES & CLAY	GRAY		195	205	QPUG	SAND	PEBL	CLAY
QPUG = Pebbly sand/silt/clay	SAND = Sand			PEBL = Pebbles			CLAY = Clay	
STONES & SAND	DARK		205	215	QHUU	PEBL	SAND	
QHUU = Sand & larger	PEBL = Pebbles			SAND = Sand				
SHALE & STONES	TAN		215	220	QPUU	CLAY	PEBL	
QPUU = Pebbly sand/silt/clay	CLAY = Clay			PEBL = Pebbles				
SHALE	TAN		220	245	QCUU	CLAY		
QCUU = Clay	CLAY = Clay							
SANDSTONE SHALE	GRAY		245	250	QLUG	SAND	CLAY	
QLUG = Clay & sand	SAND = Sand			CLAY = Clay				
SHALE	RED		250	257	QCUR	CLAY		
QCUR = Clay	CLAY = Clay							

Unique No.	00168720	MINNESOTA DEPARTMENT OF HEALTH	Update Date	2007/02/07
County Name	Anoka	**WELL AND BORING RECORD** *Minnesota Statutes Chapter 1031*	Entry Date	1991/04/15

Township Name	Township	Range	Dir	Section	Subsection	Well Depth		Depth Completed		Date Well Completed
	31	24	W	13	DADDBC	693	ft.	693	ft.	1977/03/25

Well Name	COON RAPIDS 13			**Lic. Or Reg. No.**	02015	**Name of Driller**	SIGAFOOS, G.
USGS Quad	Coon Rapi	**Elevation**	900	**Aquifer**	CFMS	**Alternative Id**	80-6139

GEOLOGICAL MATERIAL	COLOR	HARDNESS	FROM	TO	STRAT	LITH PRIM	LITH SEC	LITH MINOR
ST. LAWRANCE GREEN, RED, BLACK	VARIED		257	260	QUUU	SAND	CLAY	COBL
QUUU = Unknown deposit type	SAND = Sand		CLAY = Clay				COBL = Cobble	
HARDROCK	TAN		260	267	QBUU	BLDR		
QBUU = Boulder or boulders	BLDR = Boulder							
HARDROCK	TAN		267	268	CSTL	DLMT	SLSN	
CSTL = St.Lawrence	DLMT = Dolomite		SLSN = Siltstone					
SANDROCK	LIGHT	HARD	268	298	CFRN	SNDS	SHLE	DLMT
CFRN = Franconia	SNDS = Sandstone		SHLE = Shale				DLMT = Dolomite	
SANDY ROCK, SHALE	GREEN		298	312	CFRN	SNDS	SHLE	DLMT
CFRN = Franconia	SNDS = Sandstone		SHLE = Shale				DLMT = Dolomite	
SANDROCK, SHALE	LIGHT		312	338	CFRN	SNDS	SHLE	DLMT
CFRN = Franconia	SNDS = Sandstone		SHLE = Shale				DLMT = Dolomite	
SANDSTONE GREEN-GRAY-RED			338	403	CFRN	SNDS	SHLE	DLMT
CFRN = Franconia	SNDS = Sandstone		SHLE = Shale				DLMT = Dolomite	
SANDSTONE GREEN-GRAY-RED			403	453	CIGL	SNDS		
CIGL = Ironton-Galesville	SNDS = Sandstone							
SANDSTONE GREEN-GRAY-RED			453	525	CECR	SHLE	SNDS	
CECR = Eau Claire	SHLE = Shale		SNDS = Sandstone					
SANDSTONE GREEN-GRAY-RED			525	672	CMTS	SNDS		
CMTS = Mt.Simon	SNDS = Sandstone							
HINCKLEY SANDSTONE	RED		672	691	CMTS	SNDS		
CMTS = Mt.Simon	SNDS = Sandstone							
HINCKLEY SANDSTONE			691	693	PMRC	SHLE		
PMRC = Red Clastic Series	SHLE = Shale							

Unique No. 00110460	MINNESOTA DEPARTMENT OF HEALTH	Update Date 2007/02/07
County Name Anoka	**WELL AND BORING RECORD**	Entry Date 1991/04/15
	Minnesota Statutes Chapter 1031	

Township Name	Township	Range	Dir	Section	Subsection
	31	24	W	22	BCBBDD

Well Depth	Depth Completed	Date Well Completed
613 ft.	613 ft.	1977/03/22

Well Name COON RAPIDS 14

Drilling Method Cable Tool

Well Owner's Name COON RAPIDS 14
2344 COON RAPIDS BL
COON RAPIDS MN 55433

Drilling Fluid

Well Hydrofractured? ☐ Yes ☐ No
From ft. to ft.

Contact's Name CITY OF COON RAPIDS
11155 ROBINSON NW DR
COON RAPIDS MN 55433

Use Community Supply (municipal)

Casing **Drive Shoe?** ☑ Yes ☐ N

Hole Diameter

Casing Diameter **Weight(lbs/ft)**

30 in. t 222 ft

20 in. t 328 ft

GEOLOGICAL MATERIAL	COLOR	HARDNESS	FROM	TO
SAND & GRAVEL			0	60
SAND	LT. BR		60	130
SAND W/SHALE STREAKS	GREE		130	167
SHALE-SANDY	GREE		167	170
SHALE-SANDY	GREE		170	218
SANDSTONE			218	250
SANDY SHALE			250	305
DOLOMITE/SHALE			305	330
SHALE	RED		330	339
SHALE	RED		339	340
SAND	WHITE		340	385
SHALE W/LIMESTONE SEA	VARIE		385	391
SHALE W/LIMESTONE SEA	VARIE		391	450
SANDSTONE W/SHALE	VARIE		450	456
SANDSTONE W/SHALE	VARIE		456	520
SHALE-STICKY			520	570
SHALE W/SAND LAYERS			572	610
SHALE	RED		610	613

Screen N

Open Hole From 328 ft. to 613 ft.

Make Type

Static Water Level 120 ft. from Land surface Date 1977/03/21

PUMPING LEVEL (below land surface)

196 ft. after 8 hrs. pumping 1600 g.p.m.

Well Head Completion

Pitless adapter mfr Model

Casing Protection ☑ 12 in. above grade

☐ At-grade(Environmental Wells and Borings ONLY)

Grouting Information Well grouted? ☑ Yes ☐ No

Material	From	To (ft.)	Amount(yds/bags)	
G	0	328	28	Y

Nearest Known Source of Contamination

ft. direction type

Well disinfected upon completion? ☑ Yes ☐ No

Pump ☐ Not Installed Date Installed Y

Mfr nam

Model HP Volts

Drop Pipe Length ft. Capacity g.p.m

Type T

Any not in use and not sealed well(s) on property? ☐ Yes ☐ No

Was a variance granted from the MDH for this Well? ☐ Yes ☐ No

REMARKS, ELEVATION, SOURCE OF DATA, etc.

GAMMA LOGGED 2-6-1997 & 10-17-2001. M.G.S. NO. 1108.

LOGGED BOTH TIMES BY JIM TRAEN.

USGS Quad Coon Rapids Elevation 869

Aquifer: CFMS Alt Id: 80-6139

Well CONTRACTOR CERTIFICATION Lic. Or Reg. No. 27010

License Business Name

Name of Driller LINDEKE, W.

Report Copy

Unique No.	00110460	MINNESOTA DEPARTMENT OF HEALTH	Update Date	2007/02/07
County Name	Anoka	**WELL AND BORING RECORD** *Minnesota Statutes Chapter 1031*	Entry Date	1991/04/15

Township Name	Township	Range	Dir	Section	Subsection	Well Depth		Depth Completed		Date Well Completed
	31	24	W	22	BCBBDD	613	ft.	613	ft.	1977/03/22

Well Name	COON RAPIDS 14	**Lic. Or Reg. No.**	27010	**Name of Driller**	LINDEKE, W.		
USGS Quad	Coon Rapi	**Elevation**	869	**Aquifer**	CFMS	**Alternative Id**	80-6139

GEOLOGICAL MATERIAL	COLOR	HARDNESS	FROM	TO	STRAT	LITH PRIM	LITH SEC	LITH MINOR
SAND & GRAVEL			0	60	QHUU	SAND	GRVL	
QHUU = Sand & larger	SAND = Sand		GRVL = Gravel					
SAND	LT. BRN		60	130	QFUB	SAND		
QFUB = Sand	SAND = Sand							
SAND W/SHALE STREAKS	GREEN		130	167	QLUL	SAND	CLAY	
QLUL = Clay & sand	SAND = Sand		CLAY = Clay					
SHALE-SANDY	GREEN		167	170	QLUL	CLAY	SAND	
QLUL = Clay & sand	CLAY = Clay		SAND = Sand					
SHALE-SANDY	GREEN		170	218	CFRN	SNDS	SHLE	DLMT
CFRN = Franconia	SNDS = Sandstone		SHLE = Shale				DLMT = Dolomite	
SANDSTONE			218	250	CFRN	SNDS	SHLE	
CFRN = Franconia	SNDS = Sandstone		SHLE = Shale					
SANDY SHALE			250	305	CFRN	SNDS	SLSN	DLMT
CFRN = Franconia	SNDS = Sandstone		SLSN = Siltstone				DLMT = Dolomite	
DOLOMITE/SHALE			305	330	CFRN	SNDS	DLMT	SHLE
CFRN = Franconia	SNDS = Sandstone		DLMT = Dolomite				SHLE = Shale	
SHALE	RED		330	339	CFRN	SHLE	SNDS	DLMT
CFRN = Franconia	SHLE = Shale		SNDS = Sandstone				DLMT = Dolomite	
SHALE	RED		339	340	CIGL	SNDS		
CIGL = Ironton-Galesville	SNDS = Sandstone							
SAND	WHITE		340	385	CIGL	SNDS		
CIGL = Ironton-Galesville	SNDS = Sandstone							
SHALE W/LIMESTONE SEAMS	VARIED		385	391	CIGL	SNDS		
CIGL = Ironton-Galesville	SNDS = Sandstone							
SHALE W/LIMESTONE SEAMS	VARIED		391	450	CECR	SLSN	SHLE	
CECR = Eau Claire	SLSN = Siltstone		SHLE = Shale					
SANDSTONE W/SHALE	VARIED		450	456	CECR	SNDS	SLSN	
CECR = Eau Claire	SNDS = Sandstone		SLSN = Siltstone					

Unique No.	00110460	MINNESOTA DEPARTMENT OF HEALTH	Update Date	2007/02/07
County Name	Anoka	**WELL AND BORING RECORD** *Minnesota Statutes Chapter 1031*	Entry Date	1991/04/15

Township Name	Township	Range	Dir	Section	Subsection	Well Depth		Depth Completed		Date Well Completed
	31	24	W	22	BCBBDD	613	ft.	613	ft.	1977/03/22

Well Name	COON RAPIDS 14	**Lic. Or Reg. No.**	27010	**Name of Driller**	LINDEKE, W.		
USGS Quad	Coon Rapi	**Elevation**	869	**Aquifer**	CFMS	**Alternative Id**	80-6139

GEOLOGICAL MATERIAL	COLOR	HARDNESS	FROM	TO	STRAT	LITH PRIM	LITH SEC	LITH MINOR
SANDSTONE W/SHALE	VARIED		456	520	CMTS	SNDS	SLSN	
CMTS = Mt.Simon	SNDS = Sandstone		SLSN = Siltstone					
SHALE-STICKY			520	570	CMTS	SNDS		
CMTS = Mt.Simon	SNDS = Sandstone							
SHALE W/SAND LAYERS			572	610	CMTS	SNDS		
CMTS = Mt.Simon	SNDS = Sandstone							
SHALE	RED		610	613	PMRC	SHLE		
PMRC = Red Clastic Series	SHLE = Shale							

Unique No.	00110461	MINNESOTA DEPARTMENT OF HEALTH	Update Date	2007/02/07
County Name	Anoka	**WELL AND BORING RECORD**	Entry Date	1991/04/15

Minnesota Statutes Chapter 1031

Township Name	Township	Range	Dir	Section	Subsection
	31	24	W	22	BCDDCA

Well Depth	Depth Completed	Date Well Completed
615 ft.	615 ft.	1976/09/13

Well Name COON RAPIDS 15

Drilling Method Cable Tool

Well Owner's Name COON RAPIDS 15
2231 105TH AV
COON RAPIDS MN 55433

Drilling Fluid

Well Hydrofractured? ☐ Yes ☐ No
From ft. to ft.

Contact's Name CITY OF COON RAPIDS
11155 ROBINSON NW DR
COON RAPIDS MN 55433

Use Community Supply (municipal)

Casing **Drive Shoe?** ☑ Yes ☐ N

Hole Diameter

Casing Diameter **Weight(lbs/ft)**

30 in. t 184 ft
20 in. t 225 ft

GEOLOGICAL MATERIAL	COLOR	HARDNESS	FROM	TO
DIRT	BLACK		0	3
FINE SAND			3	25
SAND & ROCKS			25	35
CLAY		HARD	35	40
CLAY & FINE SAND			40	87
SAND, TRACE OF CLAY			87	97
SAND/GRAVEL/TRACES OF			97	121
FINE SAND, TRACE OF CLA			121	145
SANDSTONE		SOFT	145	160
SHALE	BLUE		160	170
RED SHALE & SANDROCK	RED		170	178
SAND/GRAVEL/TRACE OF S	GREE		178	183
GREEN SHALE & ROCK	GREE		183	194
FRANCONIA SANDSTONE			194	295
FRANCONIA SHALE STREA			295	340
FRANCONIA SHALE STREA			340	348
RED & BLUE SHALE STREA			348	352
IRONTON GALESVILLE SAN			352	405
EAU CLAIRE SHALE			405	485
MT. SIMON			485	510
MT. SIMON, TRACE OF SHA			510	540
MT. SIMON		HARD	540	610
SHALE	RED		610	615

Screen N

Open Hole From 225 ft. to 615 ft.

Make Type

Static Water Level 50 ft. from Land surface Date 1976/09/10

PUMPING LEVEL (below land surface)
148 ft. after 15 hrs. pumping 2400 g.p.m.

Well Head Completion
Pitless adapter mfr Model
Casing Protection ☐ 12 in. above grade
☐ At-grade(Environmental Wells and Borings ONLY)

Grouting Information Well grouted? ☑ Yes ☐ No

Material	From	To (ft.)	Amount(yds/bags)	
G			15	Y

Nearest Known Source of Contamination
ft. direction type
Well disinfected upon completion? ☐ Yes ☐ No

Pump ☐ Not Installed Date Installed
Mfr nam
Model HP Volts
Drop Pipe Length ft. Capacity g.p.m
Type

Any not in use and not sealed well(s) on property? ☐ Yes ☐ No

Was a variance granted from the MDH for this Well? ☐ Yes ☐ No

REMARKS, ELEVATION, SOURCE OF DATA, etc.

GAMMA LOGGED 4-26-2002. M.G.S. NO. 1105. LOGGED BY JIM TRAEN.

USGS Quad Coon Rapids Elevation 870
Aquifer: CFMS Alt Id: 80-6139

Well CONTRACTOR CERTIFICATION Lic. Or Reg. No. 27010
License Business Name
Name of Driller HOLLEN, G.

Report Copy

Unique No.	00110461	MINNESOTA DEPARTMENT OF HEALTH	Update Date	2007/02/07
County Name	Anoka	**WELL AND BORING RECORD** *Minnesota Statutes Chapter 1031*	Entry Date	1991/04/15

Township Name	Township	Range	Dir	Section	Subsection	Well Depth		Depth Completed		Date Well Completed
	31	24	W	22	BCDDCA	615	ft.	615	ft.	1976/09/13

Well Name	COON RAPIDS 15	**Lic. Or Reg. No.**	27010	**Name of Driller**	HOLLEN, G.		
USGS Quad	Coon Rapi	**Elevation**	870	**Aquifer**	CFMS	**Alternative Id**	80-6139

GEOLOGICAL MATERIAL	COLOR	HARDNESS	FROM	TO	STRAT	LITH PRIM	LITH SEC	LITH MINOR
DIRT	BLACK		0	3	RUUK	SOIL	ORGD	
RUUK = Recent Deposit	SOIL = Soil			ORGD = Organic Deposits				
FINE SAND			3	25	QFUU	SAND		
QFUU = Sand	SAND = Sand							
SAND & ROCKS			25	35	QHUU	SAND	COBL	
QHUU = Sand & larger	SAND = Sand			COBL = Cobble				
CLAY		HARD	35	40	QCUU	CLAY		
QCUU = Clay	CLAY = Clay							
CLAY & FINE SAND			40	87	QLUU	CLAY	SAND	
QLUU = Clay & sand	CLAY = Clay			SAND = Sand				
SAND, TRACE OF CLAY			87	97	QLUU	SAND	CLAY	
QLUU = Clay & sand	SAND = Sand			CLAY = Clay				
SAND/GRAVEL/TRACES OF CLAY			97	121	QPUU	SAND	GRVL	CLAY
QPUU = Pebbly sand/silt/clay	SAND = Sand			GRVL = Gravel			CLAY = Clay	
FINE SAND, TRACE OF CLAY			121	145	QLUU	SAND	CLAY	
QLUU = Clay & sand	SAND = Sand			CLAY = Clay				
SANDSTONE		SOFT	145	160	QFUU	SAND		
QFUU = Sand	SAND = Sand							
SHALE	BLUE		160	170	QCUG	CLAY		
QCUG = Clay	CLAY = Clay							
RED SHALE & SANDROCK	RED		170	178	QLUR	CLAY	SAND	
QLUR = Clay & sand	CLAY = Clay			SAND = Sand				
SAND/GRAVEL/TRACE OF SHALE	GREEN		178	183	QHUU	SAND	GRVL	
QHUU = Sand & larger	SAND = Sand			GRVL = Gravel				
GREEN SHALE & ROCK	GREEN		183	194	CFRN	SHLE	DLMT	
CFRN = Franconia	SHLE = Shale			DLMT = Dolomite				
FRANCONIA SANDSTONE			194	295	CFRN	SNDS	SHLE	
CFRN = Franconia	SNDS = Sandstone			SHLE = Shale				

Unique No.	00110461	MINNESOTA DEPARTMENT OF HEALTH	Update Date	2007/02/07
County Name	Anoka	**WELL AND BORING RECORD** *Minnesota Statutes Chapter 1031*	Entry Date	1991/04/15

Township Name	Township	Range	Dir	Section	Subsection	Well Depth		Depth Completed		Date Well Completed
	31	24	W	22	BCDDCA	615	ft.	615	ft.	1976/09/13

Well Name	COON RAPIDS 15	**Lic. Or Reg. No.**	27010	**Name of Driller**	HOLLEN, G.		
USGS Quad	Coon Rapi	**Elevation**	870	**Aquifer**	CFMS	**Alternative Id**	80-6139

GEOLOGICAL MATERIAL	COLOR	HARDNESS	FROM	TO	STRAT	LITH PRIM	LITH SEC	LITH MINOR
FRANCONIA SHALE STREAKS			295	340	CFRN	SNDS	SHLE	DLMT
CFRN = Franconia	SNDS = Sandstone		SHLE = Shale			DLMT = Dolomite		
FRANCONIA SHALE STREAKS			340	348	CIGL	SNDS		
CIGL = Ironton-Galesville	SNDS = Sandstone							
RED & BLUE SHALE STREAKS			348	352	CIGL	SNDS		
CIGL = Ironton-Galesville	SNDS = Sandstone							
IRONTON GALESVILLE SANDSTONE			352	405	CIGL	SNDS		
CIGL = Ironton-Galesville	SNDS = Sandstone							
EAU CLAIRE SHALE			405	485	CECR	SHLE	SNDS	
CECR = Eau Claire	SHLE = Shale		SNDS = Sandstone					
MT. SIMON			485	510	CMTS	SNDS		
CMTS = Mt.Simon	SNDS = Sandstone							
MT. SIMON, TRACE OF SHALE			510	540	CMTS	SNDS		
CMTS = Mt.Simon	SNDS = Sandstone							
MT. SIMON		HARD	540	610	CMTS	SNDS		
CMTS = Mt.Simon	SNDS = Sandstone							
SHALE	RED		610	615	PMRC	SHLE		
PMRC = Red Clastic Series	SHLE = Shale							

Unique No.	00161413	MINNESOTA DEPARTMENT OF HEALTH	Update Date	2007/02/06
County Name	Anoka	**WELL AND BORING RECORD**	Entry Date	1991/04/15

Minnesota Statutes Chapter 1031

Township Name	Township	Range	Dir	Section	Subsection
	31	24	W	11	ADAAAA

Well Depth	Depth Completed	Date Well Completed
653 ft.	653 ft.	1981/04/10

Well Name COON RAPIDS 16

Drilling Method Cable Tool

Well Owner's Name COON RAPIDS 16
12280 OLIVE ST
COON RAPIDS MN 55433

Drilling Fluid

Well Hydrofractured? ☐ Yes ☐ No
From ft. to ft.

Contact's Name CITY OF COON RAPID
11155 ROBINSON NW DR
COON RAPIDS MN 55433

Use Community Supply (municipal)

Casing **Drive Shoe?** ☑ Yes ☐ N

Hole Diameter

Casing Diameter				Weight(lbs/ft)
30	in. t	169	ft	118
24	in. t	270	ft	94.62
18	in. t	395	ft	70.59

GEOLOGICAL MATERIAL	COLOR	HARDNESS	FROM	TO
SAND			0	73
CLAY SAND & GRAVEL			73	112
CLAY & SAND			112	130
WATER, SAND & GRAVEL			130	166
BOULDERS			166	176
GRAVEL W/SANDROCK			176	181
GRAVEL W/SANDROCK			181	187
SHALE			187	239
SHALE			239	252
SANDROCK		SOFT	252	270
SHALE & SANDROCK			270	376
SHALE & SANDROCK			376	435
SANDROCK			435	441
SANDROCK			441	455
SHALE (EAU CLAIRE)			455	517
SANDROCK			517	518
SANDROCK			518	653

Screen N

Open Hole From 395 ft. to 653 ft.

Make Type

Static Water Level 109 ft. from Land surface Date 1981/04/10

PUMPING LEVEL (below land surface)
190 ft. after 34 hrs. pumping 2000 g.p.m.

Well Head Completion
Pitless adapter mfr Model
Casing Protection ☑ 12 in. above grade
☐ At-grade(Environmental Wells and Borings ONLY)

Grouting Information Well grouted? ☑ Yes ☐ No

Material	From	To (ft.)	Amount(yds/bags)
G	0	395	

Nearest Known Source of Contamination
ft. direction type
Well disinfected upon completion? ☑ Yes ☐ No

Pump ☐ Not Installed Date Installed
Mfr nam
Model HP Volts
Drop Pipe Length ft. Capacity g.p.m
Type

Any not in use and not sealed well(s) on property? ☐ Yes ☐ No

Was a variance granted from the MDH for this Well? ☐ Yes ☐ No

REMARKS, ELEVATION, SOURCE OF DATA, etc.

M.G.S. NO. 1608 & 1705. GAMMA LOGGED10-17-2001 BY SUMMIT ENVIRON.

USGS Quad Coon Rapids Elevation 889
Aquifer: CIGM Alt Id: 80-6187

Well CONTRACTOR CERTIFICATION Lic. Or Reg. No. 27058
License Business Name
Name of Driller

Report Copy

Unique No.	00161413	MINNESOTA DEPARTMENT OF HEALTH	Update Date	2007/02/06
County Name	Anoka	**WELL AND BORING RECORD** *Minnesota Statutes Chapter 1031*	Entry Date	1991/04/15

Township Name	Township	Range	Dir	Section	Subsection	Well Depth		Depth Completed		Date Well Completed
	31	24	W	11	ADAAAA	653	ft.	653	ft.	1981/04/10

Well Name	COON RAPIDS 16	**Lic. Or Reg. No.**	27058	**Name of Driller**			
USGS Quad	Coon Rapi	**Elevation**	889	**Aquifer**	CIGM	**Alternative Id**	80-6187

GEOLOGICAL MATERIAL	COLOR	HARDNESS	FROM	TO	STRAT	LITH PRIM	LITH SEC	LITH MINOR
SAND			0	73	QFUU	SAND		
QFUU = Sand	SAND = Sand							
CLAY SAND & GRAVEL			73	112	QPUU	CLAY	SAND	GRVL
QPUU = Pebbly sand/silt/clay	CLAY = Clay		SAND = Sand				GRVL = Gravel	
CLAY & SAND			112	130	QLUU	CLAY	SAND	
QLUU = Clay & sand	CLAY = Clay		SAND = Sand					
WATER, SAND & GRAVEL			130	166	QHUU	SAND	GRVL	
QHUU = Sand & larger	SAND = Sand		GRVL = Gravel					
BOULDERS			166	176	QBUU	BLDR		
QBUU = Boulder or boulders	BLDR = Boulder							
GRAVEL W/SANDROCK			176	181	QGUU	SAND	COBL	
QGUU = Gravel (+larger)	SAND = Sand		COBL = Cobble					
GRAVEL W/SANDROCK			181	187	CSTL	SHLE	DLMT	SNDS
CSTL = St.Lawrence	SHLE = Shale		DLMT = Dolomite				SNDS = Sandstone	
SHALE			187	239	CSTL	SHLE	DLMT	SNDS
CSTL = St.Lawrence	SHLE = Shale		DLMT = Dolomite				SNDS = Sandstone	
SHALE			239	252	CFRN	SNDS	SHLE	DLMT
CFRN = Franconia	SNDS = Sandstone		SHLE = Shale				DLMT = Dolomite	
SANDROCK		SOFT	252	270	CFRN	SNDS	SHLE	DLMT
CFRN = Franconia	SNDS = Sandstone		SHLE = Shale				DLMT = Dolomite	
SHALE & SANDROCK			270	376	CFRN	SNDS	SHLE	DLMT
CFRN = Franconia	SNDS = Sandstone		SHLE = Shale				DLMT = Dolomite	
SHALE & SANDROCK			376	435	CIGL	SNDS		
CIGL = Ironton-Galesville	SNDS = Sandstone							
SANDROCK			435	441	CIGL	SNDS		
CIGL = Ironton-Galesville	SNDS = Sandstone							
SANDROCK			441	455	CECR	SHLE	SNDS	
CECR = Eau Claire	SHLE = Shale		SNDS = Sandstone					

Unique No.	00161413	MINNESOTA DEPARTMENT OF HEALTH	Update Date	2007/02/06
County Name	Anoka	**WELL AND BORING RECORD** *Minnesota Statutes Chapter 1031*	Entry Date	1991/04/15

Township Name	Township	Range	Dir	Section	Subsection	Well Depth		Depth Completed		Date Well Completed
	31	24	W	11	ADAAAA	653	ft.	653	ft.	1981/04/10

Well Name	COON RAPIDS 16	**Lic. Or Reg. No.**	27058	**Name of Driller**			
USGS Quad	Coon Rapi	**Elevation**	889	**Aquifer**	CIGM	**Alternative Id**	80-6187

GEOLOGICAL MATERIAL	COLOR	HARDNESS	FROM	TO	STRAT	LITH PRIM	LITH SEC	LITH MINOR
SHALE (EAU CLAIRE)			455	517	CECR	SHLE	SNDS	
CECR = Eau Claire	SHLE = Shale		SNDS = Sandstone					
SANDROCK			517	518	CECR	SHLE	SNDS	
CECR = Eau Claire	SHLE = Shale		SNDS = Sandstone					
SANDROCK			518	653	CMTS	SNDS		
CMTS = Mt.Simon	SNDS = Sandstone							

Unique No. 00150357

County Name Anoka

MINNESOTA DEPARTMENT OF HEALTH

WELL AND BORING RECORD

Minnesota Statutes Chapter 1031

Update Date 2007/02/07

Entry Date 1991/04/15

Township Name	Township	Range	Dir	Section	Subsection
	31	24	W	21	DAAAAA

Well Depth	Depth Completed	Date Well Completed
121 ft.	121 ft.	1981/12/18

Well Name COON RAPIDS 17

Drilling Method Cable Tool

Well Owner's Name COON RAPIDS 17
2400 105TH NW AV
COON RAPIDS MN 55433

Drilling Fluid

Well Hydrofractured? ☐ Yes ☐ No
From ft. to ft.

Contact's Name CITY OF COON RAPIDS
11155 ROBINSON NW DR
COON RAPIDS MN 55433

Use Community Supply (municipal)

Casing **Drive Shoe?** ☑ Yes ☐ N

Hole Diameter
in. t 121 ft

Casing Diameter **Weight(lbs/ft)**
30 in. t 81 ft 118.6

GEOLOGICAL MATERIAL	COLOR	HARDNESS	FROM	TO
DIRT	BLACK		0	3
SAND & GRAVEL & SOME C			3	59
SANDY CLAY		SOFT	59	70
CLEAN COARSE GRAVEL &	RED		70	98
CLEAN COARSE SAND & G			98	108
MEDIUM GRAVEL SAND &			108	113
COARSE SAND & GRAVEL			113	121

Screen Y

Open Hole From ft. to ft.

Make JOHNSON Type L

Diameter	Slot	Length	Set		Fitting
30	20	40	81	ft. to 121 ft	

Static Water Level 15 ft. from Land surface Date 1981/12/18

PUMPING LEVEL (below land surface)
72 ft. after 4 hrs. pumping 2000 g.p.m.

Well Head Completion
Pitless adapter mfr Model
Casing Protection ☑ 12 in. above grade
☐ At-grade(Environmental Wells and Borings ONLY)

Grouting Information Well grouted? ☐ Yes ☑ No

Nearest Known Source of Contamination
ft. direction type
Well disinfected upon completion? ☑ Yes ☐ No

Pump ☑ Not Installed Date Installed N
Mfr nam
Model HP Volts
Drop Pipe Length ft. Capacity g.p.m
Type

Any not in use and not sealed well(s) on property? ☐ Yes ☐ No

Was a variance granted from the MDH for this Well? ☐ Yes ☐ No

REMARKS, ELEVATION, SOURCE OF DATA, etc.

GAMMA LOGGED 10-23-2001 BY SUMMIT ENVIR.

USGS Quad Coon Rapids Elevation 855
Aquifer: QBAA Alt Id: 80-6139

Well CONTRACTOR CERTIFICATION Lic. Or Reg. No. 27010
License Business Name
Name of Driller KAUITSON, K.

Report Copy

Unique No.	00150357	MINNESOTA DEPARTMENT OF HEALTH	Update Date	2007/02/07
County Name	Anoka	**WELL AND BORING RECORD** *Minnesota Statutes Chapter 1031*	Entry Date	1991/04/15

Township Name	Township	Range	Dir	Section	Subsection	Well Depth		Depth Completed		Date Well Completed
	31	24	W	21	DAAAAA	121	ft.	121	ft.	1981/12/18

Well Name	COON RAPIDS 17			**Lic. Or Reg. No.**	27010	**Name of Driller**	KAUITSON, K.
USGS Quad	Coon Rapi	**Elevation**	855	**Aquifer**	QBAA	**Alternative Id**	80-6139

GEOLOGICAL MATERIAL	COLOR	HARDNESS	FROM	TO	STRAT	LITH PRIM	LITH SEC	LITH MINOR
DIRT	BLACK		0	3	RUUK	SOIL	ORGD	
RUUK = Recent Deposit	SOIL = Soil			ORGD = Organic Deposits				
SAND & GRAVEL & SOME CLAY			3	59	QPUU	SAND	GRVL	CLAY
QPUU = Pebbly sand/silt/clay	SAND = Sand			GRVL = Gravel			CLAY = Clay	
SANDY CLAY		SOFT	59	70	QLUU	CLAY	SAND	
QLUU = Clay & sand	CLAY = Clay			SAND = Sand				
CLEAN COARSE GRAVEL & SAND	RED		70	98	QHUR	GRVL	SAND	
QHUR = Sand & larger	GRVL = Gravel			SAND = Sand				
CLEAN COARSE SAND & GRAVEL			98	108	QHUU	SAND	GRVL	
QHUU = Sand & larger	SAND = Sand			GRVL = Gravel				
MEDIUM GRAVEL SAND & GRAVEL			108	113	QHUU	GRVL	SAND	
QHUU = Sand & larger	GRVL = Gravel			SAND = Sand				
COARSE SAND & GRAVEL			113	121	QHUU	SAND	GRVL	
QHUU = Sand & larger	SAND = Sand			GRVL = Gravel				

Unique No. 00110469	MINNESOTA DEPARTMENT OF HEALTH	Update Date 2008/12/29
County Name Anoka	**WELL AND BORING RECORD**	Entry Date 1991/04/15
	Minnesota Statutes Chapter 1031	

Township Name	Township	Range	Dir	Section	Subsection	Well Depth	Depth Completed	Date Well Completed
	31	24	W	2	DCDCDB	637 ft.	637 ft.	1986/05/00

Well Name COON RAPIDS 18

Drilling Method Cable Tool

Well Owner's Name COON RAPIDS

COON RAPIDS MN 55448

Drilling Fluid

Well Hydrofractured? ☐ Yes ☐ No

From ft. to ft.

Use Community Supply (municipal)

Contact's Name CITY OF COON RAPIDS
11155 ROBINSON NW DR
COON RAPIDS MN 55433

Casing **Drive Shoe?** ☑ Yes ☐ N

Hole Diameter

Casing Diameter **Weight(lbs/ft)**

36 in. t 135 ft

30 in. t 195 ft

24 in. t 575 ft

GEOLOGICAL MATERIAL	COLOR	HARDNESS	FROM	TO
SAND	BROW		0	14
PEAT	BLK/B		14	17
SAND MEDIUM	BROW		17	67
CLAY			67	120
CLAY-SHALE	RED		120	142
CLAY & SAND	RED		142	194
CLAY & SAND	RED		194	198
SHALE & SAND	GRN/G		198	226
SHALE & SAND			226	228
FRANCONIA	GREE		228	367
GALESVILLE			367	429
GALESVILLE			429	432
SHALE			432	486
MT. SIMON			486	509
MT. SIMON			509	593
SHALEY SANDSTON			593	616
MIXED SHALE & SANDSTO			616	631
SANDSTONE	RED		631	637

Screen N

Open Hole From 575 ft. to 637 ft.

Make Type

Static Water Level 140 ft. from Land surface Date 1986/05/00

PUMPING LEVEL (below land surface)

248 ft. after 36 hrs. pumping 1400 g.p.m.

Well Head Completion

Pitless adapter mfr Model

Casing Protection ☑ 12 in. above grade

☐ At-grade(Environmental Wells and Borings ONLY)

Grouting Information Well grouted? ☑ Yes ☐ No

Material	From	To (ft.)	Amount(yds/bags)	
G	0	575	67.5	Y

Nearest Known Source of Contamination

ft. direction type

Well disinfected upon completion? ☐ Yes ☐ No

Pump ☑ Not Installed Date Installed N

Mfr nam

Model HP Volts

Drop Pipe Length ft. Capacity g.p.m

Type

Any not in use and not sealed well(s) on property? ☐ Yes ☐ No

Was a variance granted from the MDH for this Well? ☐ Yes ☐ No

REMARKS, ELEVATION, SOURCE OF DATA, etc.

M.G.S. NO.2048. GAMMA LOGGED 8-28-1985.

GAMMA LOGGED 1-11-2005 BY JIM TRAEN.

USGS Quad Coon Rapids Elevation 890

Aquifer: CMTS Alt Id: 80-6139

Well CONTRACTOR CERTIFICATION Lic. Or Reg. No. 27010

License Business Name

Name of Driller HOLLEN, G.

Report Copy

Unique No.	00110469	MINNESOTA DEPARTMENT OF HEALTH	Update Date	2008/12/29
County Name	Anoka	**WELL AND BORING RECORD** *Minnesota Statutes Chapter 1031*	Entry Date	1991/04/15

Township Name	Township	Range	Dir	Section	Subsection	Well Depth		Depth Completed		Date Well Completed
	31	24	W	2	DCDCDB	637	ft.	637	ft.	1986/05/00

Well Name	COON RAPIDS 18	**Lic. Or Reg. No.**	27010	**Name of Driller**	HOLLEN, G.		
USGS Quad	Coon Rapi	**Elevation**	890	**Aquifer**	CMTS	**Alternative Id**	80-6139

GEOLOGICAL MATERIAL	COLOR	HARDNESS	FROM	TO	STRAT	LITH PRIM	LITH SEC	LITH MINOR
SAND	BROWN		0	14	QFUB	SAND		
QFUB = Sand	SAND = Sand							
PEAT	BLK/BRN		14	17	QSUU	PEAT		
QSUU = Peat	PEAT = Peat							
SAND MEDIUM	BROWN		17	67	QFUB	SAND		
QFUB = Sand	SAND = Sand							
CLAY			67	120	QCUU	CLAY		
QCUU = Clay	CLAY = Clay							
CLAY-SHALE	RED		120	142	QCUR	CLAY		
QCUR = Clay	CLAY = Clay							
CLAY & SAND	RED		142	194	QLUR	CLAY	SAND	
QLUR = Clay & sand	CLAY = Clay		SAND = Sand					
CLAY & SAND	RED		194	198	CSTL	DLMT	SLSN	SHLE
CSTL = St.Lawrence	DLMT = Dolomite		SLSN = Siltstone			SHLE = Shale		
SHALE & SAND	GRN/GRY		198	226	CSTL	DLMT	SLSN	SHLE
CSTL = St.Lawrence	DLMT = Dolomite		SLSN = Siltstone			SHLE = Shale		
SHALE & SAND			226	228	CFRN	SHLE	DLMT	SNDS
CFRN = Franconia	SHLE = Shale		DLMT = Dolomite			SNDS = Sandstone		
FRANCONIA	GREEN		228	367	CFRN	SHLE	DLMT	SNDS
CFRN = Franconia	SHLE = Shale		DLMT = Dolomite			SNDS = Sandstone		
GALESVILLE			367	429	CIGL	SNDS		
CIGL = Ironton-Galesville	SNDS = Sandstone							
GALESVILLE			429	432	CECR	SHLE	SNDS	
CECR = Eau Claire	SHLE = Shale		SNDS = Sandstone					
SHALE			432	486	CECR	SHLE	SNDS	DLMT
CECR = Eau Claire	SHLE = Shale		SNDS = Sandstone			DLMT = Dolomite		
MT. SIMON			486	509	CECR	SHLE	SNDS	DLMT
CECR = Eau Claire	SHLE = Shale		SNDS = Sandstone			DLMT = Dolomite		

Unique No.	00110469	MINNESOTA DEPARTMENT OF HEALTH	Update Date	2008/12/29
County Name	Anoka	**WELL AND BORING RECORD** *Minnesota Statutes Chapter 1031*	Entry Date	1991/04/15

Township Name	Township	Range	Dir	Section	Subsection	Well Depth		Depth Completed		Date Well Completed
	31	24	W	2	DCDCDB	637	ft.	637	ft.	1986/05/00

Well Name	COON RAPIDS 18	**Lic. Or Reg. No.**	27010	**Name of Driller**	HOLLEN, G.		
USGS Quad	Coon Rapi	**Elevation**	890	**Aquifer**	CMTS	**Alternative Id**	80-6139

GEOLOGICAL MATERIAL	COLOR	HARDNESS	FROM	TO	STRAT	LITH PRIM	LITH SEC	LITH MINOR
MT. SIMON			509	593	CMTS	SNDS		
CMTS = Mt.Simon	SNDS = Sandstone							
SHALEY SANDSTON			593	616	CMTS	SNDS	SHLE	
CMTS = Mt.Simon	SNDS = Sandstone		SHLE = Shale					
MIXED SHALE & SANDSTONE			616	631	CMTS	SNDS	SHLE	
CMTS = Mt.Simon	SNDS = Sandstone		SHLE = Shale					
SANDSTONE	RED		631	637	CMTS	SNDS		
CMTS = Mt.Simon	SNDS = Sandstone							

Unique No. 00110475

County Name Anoka

MINNESOTA DEPARTMENT OF HEALTH

WELL AND BORING RECORD

Minnesota Statutes Chapter 1031

Update Date 2009/07/16

Entry Date 1991/04/15

Township Name	Township	Range	Dir	Section	Subsection
	31	24	W	21	AACBDB

Well Depth	Depth Completed	Date Well Completed
143 ft.	135 ft.	1987/10/14

Well Name COON RAPIDS 19

Drilling Method Cable Tool

Well Owner's Name COON RAPIDS 19

COON RAPIDS MN 55433

Drilling Fluid

Well Hydrofractured? ☐ Yes ☐ No

From ft. to ft.

Use Community Supply (municipal)

Contact's Name CITY OF COON RAPIDS

11155 ROBINSON NW DR

COON RAPIDS MN 55433

Casing **Drive Shoe?** ☑ Yes ☐ N

Hole Diameter

Casing Diameter **Weight(lbs/ft)**

30 in. t 30 ft

20 in. t 115 ft

GEOLOGICAL MATERIAL	COLOR	HARDNESS	FROM	TO
TOPSOIL	BLACK		0	3
FINE SAND	BROW		3	25
CLAY & SAND MIX	BROW		25	35
CLAY WITH GRAVEL	BROW		35	83
STICKY CLAY	BLUE		83	105
STICKY CLAY	RED	HARD	105	115
COARSE SAND/GRAVEL			115	138
CLAY		HARD	138	143

Screen Y

Open Hole From ft. to ft.

Make JOHNSON Type L

Diameter	Slot	Length	Set		Fitting
20	70	20	115	ft. to 135	ft

Static Water Level 15 ft. from Land surface Date 1987/10/14

PUMPING LEVEL (below land surface)

84 ft. after 24 hrs. pumping 1200 g.p.m.

Well Head Completion

Pitless adapter mfr Model

Casing Protection ☑ 12 in. above grade

☐ At-grade(Environmental Wells and Borings ONLY)

Grouting Information Well grouted? ☑ Yes ☐ No

Material	From	To (ft.)	Amount(yds/bags)
G	6	25	0

Nearest Known Source of Contamination

ft. direction type

Well disinfected upon completion? ☐ Yes ☐ No

Pump ☑ Not Installed Date Installed N

Mfr nam

Model HP Volts

Drop Pipe Length ft. Capacity g.p.m

Type

Any not in use and not sealed well(s) on property? ☐ Yes ☐ No

Was a variance granted from the MDH for this Well? ☐ Yes ☐ No

REMARKS, ELEVATION, SOURCE OF DATA, etc.

M.G.S. NO.2878.

USGS Quad Coon Rapids Elevation 850

Aquifer: QBAA Alt Id: 80-6139

Well CONTRACTOR CERTIFICATION Lic. Or Reg. No. 27010

License Business Name

Name of Driller HOLLEN, G.

Report Copy

Unique No.	00110475	MINNESOTA DEPARTMENT OF HEALTH	Update Date	2009/07/16
County Name	Anoka	**WELL AND BORING RECORD** *Minnesota Statutes Chapter 1031*	Entry Date	1991/04/15

Township Name	Township	Range	Dir	Section	Subsection	Well Depth		Depth Completed		Date Well Completed
	31	24	W	21	AACBDB	143	ft.	135	ft.	1987/10/14

Well Name	COON RAPIDS 19	**Lic. Or Reg. No.**	27010	**Name of Driller**	HOLLEN, G.		
USGS Quad	Coon Rapi	**Elevation**	850	**Aquifer**	QBAA	**Alternative Id**	80-6139

GEOLOGICAL MATERIAL	COLOR	HARDNESS	FROM	TO	STRAT	LITH PRIM	LITH SEC	LITH MINOR
TOPSOIL	BLACK		0	3	RUUK	SOIL	ORGD	
RUUK = Recent Deposit	SOIL = Soil			ORGD = Organic Deposits				
FINE SAND	BROWN		3	25	QFUB	SAND		
QFUB = Sand	SAND = Sand							
CLAY & SAND MIX	BROWN		25	35	QLUB	CLAY	SAND	
QLUB = Clay & sand	CLAY = Clay			SAND = Sand				
CLAY WITH GRAVEL	BROWN		35	83	QPUB	CLAY	GRVL	
QPUB = Pebbly sand/silt/clay	CLAY = Clay			GRVL = Gravel				
STICKY CLAY	BLUE		83	105	QCUG	CLAY		
QCUG = Clay	CLAY = Clay							
STICKY CLAY	RED	HARD	105	115	QCUR	CLAY		
QCUR = Clay	CLAY = Clay							
COARSE SAND/GRAVEL			115	138	QHUU	SAND	GRVL	
QHUU = Sand & larger	SAND = Sand			GRVL = Gravel				
CLAY		HARD	138	143	QCUU	CLAY		
QCUU = Clay	CLAY = Clay							

Unique No. 00420956

County Name Anoka

MINNESOTA DEPARTMENT OF HEALTH

WELL AND BORING RECORD

Minnesota Statutes Chapter 1031

Update Date 2008/12/30

Entry Date 1991/04/15

Township Name	Township	Range	Dir	Section	Subsection
	31	24	W	21	ADBDAB

Well Depth	Depth Completed	Date Well Completed
135 ft.	135 ft.	1988/04/26

Well Name COON RAPIDS 20

Drilling Method Cable Tool

Well Owner's Name COON RAPIDS 20
XAVIS NW ST
COON RAPIDS MN 55433

Drilling Fluid

Well Hydrofractured? ☐ Yes ☐ No
From ft. to ft.

Contact's Name CITY OF COON RAPIDS
11155 ROBINSON NW DR
COON RAPIDS MN 55433

Use Community Supply (municipal)

Casing **Drive Shoe?** ☑ Yes ☐ N

Hole Diameter
0 in. t 135 ft

Casing Diameter **Weight(lbs/ft)**
30 in. t 95 ft
20 in. t 95 ft

GEOLOGICAL MATERIAL	COLOR	HARDNESS	FROM	TO
TOPSOIL-SAND	BROW		0	14
CLAY WITH GRAVEL	RED		14	18
MIXED LAYERS SAND & CL	BROW		18	40
CLAY	GRAY		40	43
LAYERED SAND & CLAY	GRAY		43	70
STICKY CLAY	BLUE		70	82
COARSE SAND	YELLO		82	93
SAND/GRAVEL	YELLO		93	135

Screen Y

Open Hole From ft. to ft.

Make JOHNSON Type L

Diameter	Slot	Length	Set		Fitting
20		40.8	95	ft. to 135 ft	

Static Water Level 15 ft. from Land surface Date 1988/04/26

PUMPING LEVEL (below land surface)
90 ft. after 8 hrs. pumping 1560 g.p.m.

Well Head Completion
Pitless adapter mfr Model
Casing Protection ☑ 12 in. above grade
☐ At-grade(Environmental Wells and Borings ONLY)

Grouting Information Well grouted? ☑ Yes ☐ No

Material	From	To (ft.)	Amount(yds/bags)	
G	0	40	6	Y

Nearest Known Source of Contamination
ft. direction type
Well disinfected upon completion? ☐ Yes ☐ No

Pump ☑ Not Installed Date Installed N
Mfr nam
Model HP Volts
Drop Pipe Length ft. Capacity g.p.m
Type

Any not in use and not sealed well(s) on property? ☐ Yes ☐ No

Was a variance granted from the MDH for this Well? ☐ Yes ☐ No

REMARKS, ELEVATION, SOURCE OF DATA, etc.

SAME AS NO.420957. 420957 PAPERS ARE LOST.

GAMMA LOGGED 11-14-2002. LOGGED BY JIM TRAEN.

USGS Quad Coon Rapids Elevation 850
Aquifer: QBAA Alt Id: 80-6139

Well CONTRACTOR CERTIFICATION Lic. Or Reg. No. 27010
License Business Name
Name of Driller HOLLEN, G.

Report Copy

Unique No.	00420956	MINNESOTA DEPARTMENT OF HEALTH	Update Date	2008/12/30
County Name	Anoka	**WELL AND BORING RECORD** *Minnesota Statutes Chapter 1031*	Entry Date	1991/04/15

Township Name	Township	Range	Dir	Section	Subsection	Well Depth		Depth Completed		Date Well Completed
	31	24	W	21	ADBDAB	135	ft.	135	ft.	1988/04/26

Well Name	COON RAPIDS 20	**Lic. Or Reg. No.**	27010	**Name of Driller**	HOLLEN, G.		
USGS Quad	Coon Rapi	**Elevation**	850	**Aquifer**	QBAA	**Alternative Id**	80-6139

GEOLOGICAL MATERIAL	COLOR	HARDNESS	FROM	TO	STRAT	LITH PRIM	LITH SEC	LITH MINOR
TOPSOIL-SAND	BROWN		0	14	RUUB	SOIL	ORGD	SAND
RUUB = Recent Deposit-brown	SOIL = Soil			ORGD = Organic Deposits			SAND = Sand	
CLAY WITH GRAVEL	RED		14	18	QPUR	CLAY	GRVL	
QPUR = Pebbly sand/silt/clay	CLAY = Clay			GRVL = Gravel				
MIXED LAYERS SAND & CLAY	BROWN		18	40	QLUB	SAND	CLAY	
QLUB = Clay & sand	SAND = Sand			CLAY = Clay				
CLAY	GRAY		40	43	QCUG	CLAY		
QCUG = Clay	CLAY = Clay							
LAYERED SAND & CLAY	GRAY		43	70	QLUG	SAND	CLAY	
QLUG = Clay & sand	SAND = Sand			CLAY = Clay				
STICKY CLAY	BLUE		70	82	QCUG	CLAY		
QCUG = Clay	CLAY = Clay							
COARSE SAND	YELLOW		82	93	QFUY	SAND		
QFUY = Sand	SAND = Sand							
SAND/GRAVEL	YELLOW		93	135	QHUY	SAND	GRVL	
QHUY = Sand & larger	SAND = Sand			GRVL = Gravel				

Unique No. 00474384	MINNESOTA DEPARTMENT OF HEALTH	Update Date 2007/02/06
County Name Anoka	**WELL AND BORING RECORD**	Entry Date 1992/06/22
	Minnesota Statutes Chapter 1031	

Township Name	Township	Range	Dir	Section	Subsection
	31	24	W	13	ACCDDD

Well Depth	Depth Completed	Date Well Completed
207 ft.	203 ft.	1990/01/26

Well Name COON RAPIDS 21

Drilling Method Cable Tool

Well Owner's Name COON RAPIDS 21
269 NORTHDALE BL
COON RAPIDS MN 55433

Drilling Fluid

Well Hydrofractured? ☐ Yes ☐ No
From ft. to ft.

Use Community Supply (municipal)

Contact's Name CITY OF COON RAPIDS
11155 ROBINSON NW DR
COON RAPIDS MN 55433

Casing **Drive Shoe?** ☐ Yes ☐ N

Hole Diameter

Casing Diameter **Weight(lbs/ft)**

24	in. t	103	ft
18	in. t	170	ft

GEOLOGICAL MATERIAL	COLOR	HARDNESS	FROM	TO
FINE SAND	BROW	SOFT	0	25
FINE SAND	GRAY	SOFT	25	30
SAND & CLAY	GRAY	SOFT	30	32
FINE SAND	BROW	SOFT	32	35
FINE SAND	GRAY	SOFT	35	38
SANDY CLAY	GRAY	SOFT	38	50
CLAY	GRY/B	MEDIUM	50	66
ROCKS & GRAVEL	GRAY	HARD	66	69
FINE SAND & CLAY	BROW	MEDIUM	69	92
CLAY/TRACES OF GRAVEL	BROW	SOFT	92	103
FINE SAND	BROW	SOFT	103	105
COARSE GRAVEL & CLAY	BRN/R	MEDIUM	105	110
MEDIUM GRAVEL & CLAY	BROW	MEDIUM	110	127
MEDIUM TO FINE SAND	BROW	SOFT	127	136
GRAVEL & CLAY	GRAY	SOFT	136	148
CLAY AND ROCKS	LT. YE	SFT-MED	148	150
CLAY/GRAVEL & ROCKS	BLUE	SOFT	150	160
NO RECORD			160	207
CLAY			207	207

Screen Y **Open Hole** From ft. to ft.

Make JOHNSON Type L

Diameter	Slot	Length	Set		Fitting
12	70	33	170	ft. to 203	ft

Static Water Level 66 ft. from Land surface Date 1990/01/26

PUMPING LEVEL (below land surface)
126 ft. after hrs. pumping 1300 g.p.m.

Well Head Completion
Pitless adapter mfr Model
Casing Protection ☑ 12 in. above grade
☐ At-grade(Environmental Wells and Borings ONLY)

Grouting Information Well grouted? ☑ Yes ☐ No

Material	From	To (ft.)	Amount(yds/bags)
G	0	103	

Nearest Known Source of Contamination
ft. direction type
Well disinfected upon completion? ☑ Yes ☐ No

Pump ☐ Not Installed Date Installed
Mfr nam
Model HP Volts
Drop Pipe Length ft. Capacity g.p.m
Type

REMARKS, ELEVATION, SOURCE OF DATA, etc.

GAMMA LOGGED 1-11-04. LOGGED BY JIM TRAEN

Any not in use and not sealed well(s) on property? ☐ Yes ☑ No

Was a variance granted from the MDH for this Well? ☐ Yes ☐ No

USGS Quad Coon Rapids Elevation 899
Aquifer: QBAA Alt Id: 80-6139

Well CONTRACTOR CERTIFICATION Lic. Or Reg. No. 71536
License Business Name
Name of Driller TOM/ROGER

Report Copy

Unique No.	00474384	MINNESOTA DEPARTMENT OF HEALTH	Update Date	2007/02/06
County Name	Anoka	**WELL AND BORING RECORD** *Minnesota Statutes Chapter 1031*	Entry Date	1992/06/22

Township Name	Township	Range	Dir	Section	Subsection	Well Depth		Depth Completed		Date Well Completed
	31	24	W	13	ACCDDD	207	ft.	203	ft.	1990/01/26

Well Name	COON RAPIDS 21			**Lic. Or Reg. No.**	71536	**Name of Driller**	TOM/ROGER
USGS Quad	Coon Rapi	**Elevation**	899	**Aquifer**	QBAA	**Alternative Id**	80-6139

GEOLOGICAL MATERIAL	COLOR	HARDNESS	FROM	TO	STRAT	LITH PRIM	LITH SEC	LITH MINOR
FINE SAND	BROWN	SOFT	0	25	QFUB	SAND		
QFUB = Sand	SAND = Sand							
FINE SAND	GRAY	SOFT	25	30	QFUG	SAND		
QFUG = Sand	SAND = Sand							
SAND & CLAY	GRAY	SOFT	30	32	QLUG	SAND	CLAY	
QLUG = Clay & sand	SAND = Sand			CLAY = Clay				
FINE SAND	BROWN	SOFT	32	35	QFUB	SAND		
QFUB = Sand	SAND = Sand							
FINE SAND	GRAY	SOFT	35	38	QFUG	SAND		
QFUG = Sand	SAND = Sand							
SANDY CLAY	GRAY	SOFT	38	50	QLUG	CLAY	SAND	
QLUG = Clay & sand	CLAY = Clay			SAND = Sand				
CLAY	GRY/BLU	MEDIUM	50	66	QCUG	CLAY		
QCUG = Clay	CLAY = Clay							
ROCKS & GRAVEL	GRAY	HARD	66	69	QGUG	GRVL	COBL	
QGUG = Gravel (+larger)	GRVL = Gravel			COBL = Cobble				
FINE SAND & CLAY	BROWN	MEDIUM	69	92	QLUB	SAND	CLAY	
QLUB = Clay & sand	SAND = Sand			CLAY = Clay				
CLAY/TRACES OF GRAVEL	BROWN	SOFT	92	103	QPUB	CLAY	GRVL	
QPUB = Pebbly sand/silt/clay	CLAY = Clay			GRVL = Gravel				
FINE SAND	BROWN	SOFT	103	105	QFUB	SAND		
QFUB = Sand	SAND = Sand							
COARSE GRAVEL & CLAY	BRN/RED	MEDIUM	105	110	QPUU	GRVL	CLAY	
QPUU = Pebbly sand/silt/clay	GRVL = Gravel			CLAY = Clay				
MEDIUM GRAVEL & CLAY	BROWN	MEDIUM	110	127	QPUB	GRVL	CLAY	
QPUB = Pebbly sand/silt/clay	GRVL = Gravel			CLAY = Clay				
MEDIUM TO FINE SAND	BROWN	SOFT	127	136	QFUB	SAND		
QFUB = Sand	SAND = Sand							

Unique No.	00474384	MINNESOTA DEPARTMENT OF HEALTH	Update Date	2007/02/06
County Name	Anoka	**WELL AND BORING RECORD** *Minnesota Statutes Chapter 1031*	Entry Date	1992/06/22

Township Name	Township	Range	Dir	Section	Subsection	Well Depth		Depth Completed		Date Well Completed
	31	24	W	13	ACCDDD	207	ft.	203	ft.	1990/01/26

Well Name	COON RAPIDS 21	**Lic. Or Reg. No.**	71536	**Name of Driller**	TOM/ROGER		
USGS Quad	Coon Rapi	**Elevation**	899	**Aquifer**	QBAA	**Alternative Id**	80-6139

GEOLOGICAL MATERIAL	COLOR	HARDNESS	FROM	TO	STRAT	LITH PRIM	LITH SEC	LITH MINOR
GRAVEL & CLAY	GRAY	SOFT	136	148	QPUG	GRVL	CLAY	
QPUG = Pebbly sand/silt/clay	GRVL = Gravel			CLAY = Clay				
CLAY AND ROCKS	LT. YEL	SFT-MED	148	150	QPUY	CLAY	COBL	
QPUY = Pebbly sand/silt/clay	CLAY = Clay			COBL = Cobble				
CLAY/GRAVEL & ROCKS	BLUE	SOFT	150	160	QPUG	CLAY	GRVL	COBL
QPUG = Pebbly sand/silt/clay	CLAY = Clay			GRVL = Gravel			COBL = Cobble	
NO RECORD			160	207	QUUU	DRFT		
QUUU = Unknown deposit type	DRFT = Drift							
CLAY			207	207	QCUU	CLAY		
QCUU = Clay	CLAY = Clay							

Unique No. 00474385

County Name Anoka

MINNESOTA DEPARTMENT OF HEALTH

WELL AND BORING RECORD

Minnesota Statutes Chapter 1031

Update Date 2008/12/30

Entry Date 1992/06/22

Township Name	Township	Range	Dir	Section	Subsection
	31	24	W	22	CBABAD

Well Depth	Depth Completed	Date Well Completed
108 ft.	105 ft.	1990/03/15

Well Name COON RAPIDS 22

Drilling Method Cable Tool

Well Owner's Name COON RAPIDS 22
2220 105TH NW AV
COON RAPIDS MN 55433

Drilling Fluid

Well Hydrofractured? ☐ Yes ☐ No
From ft. to ft.

Use Community Supply (municipal)

Contact's Name CITY OF COON RAPIDS
11155 ROBINSON NW DR
COON RAPIDS MN 55433

Casing **Drive Shoe?** ☐ Yes ☐ N

Hole Diameter

Casing Diameter **Weight(lbs/ft)**
24 in. t 80 ft

GEOLOGICAL MATERIAL	COLOR	HARDNESS	FROM	TO
SAND	BROW	SOFT	0	19
ROCKS & BOULDERS	BROW	HARD	19	21
SANDY CLAY	BROW	MEDIUM	21	28
SANDY CLAY/GRAVEL	GRAY	SOFT	28	57
GRAVEL & CLAY	BROW	SOFT	57	70
SANDY CLAY	BROW	SOFT	70	73
FINE SAND	BROW	SOFT	73	83
COARSE SAND	BROW	SOFT	83	93
SAND & GRAVEL	BROW	SOFT	93	98
GRAVEL	BROW	SOFT	98	105
CLAY	BROW	SOFT	105	108

Screen Y

Open Hole From ft. to ft.

Make JOHNSON Type L

Diameter	Slot	Length	Set		Fitting
18	120	25	80	ft. to 105 ft	

Static Water Level 32 ft. from Land surface Date 1990/03/15

PUMPING LEVEL (below land surface)
105 ft. after 1 hrs. pumping 250 g.p.m.

Well Head Completion
Pitless adapter mfr Model
Casing Protection ☑ 12 in. above grade
☐ At-grade(Environmental Wells and Borings ONLY)

Grouting Information Well grouted? ☑ Yes ☐ No

Material	From	To (ft.)	Amount(yds/bags)	
G	0	20	1.5	Y

Nearest Known Source of Contamination
ft. direction type
Well disinfected upon completion? ☑ Yes ☐ No

Pump ☑ Not Installed Date Installed N
Mfr nam
Model HP Volts
Drop Pipe Length ft. Capacity g.p.m
Type

REMARKS, ELEVATION, SOURCE OF DATA, etc.

GAMMA LOGGED 11-14-2002. LOGGED BY JIM TRAEN.

Any not in use and not sealed well(s) on property? ☐ Yes ☐ No

Was a variance granted from the MDH for this Well? ☐ Yes ☐ No

USGS Quad Coon Rapids Elevation 869
Aquifer: QBAA Alt Id: 80-6139

Well CONTRACTOR CERTIFICATION Lic. Or Reg. No. 71536
License Business Name
Name of Driller TOM/ROGER

Report Copy

Unique No.	00474385	MINNESOTA DEPARTMENT OF HEALTH	Update Date	2008/12/30
County Name	Anoka	**WELL AND BORING RECORD** *Minnesota Statutes Chapter 1031*	Entry Date	1992/06/22

Township Name	Township	Range	Dir	Section	Subsection	Well Depth		Depth Completed		Date Well Completed
	31	24	W	22	CBABAD	108	ft.	105	ft.	1990/03/15

Well Name	COON RAPIDS 22	**Lic. Or Reg. No.**	71536	**Name of Driller**	TOM/ROGER		
USGS Quad	Coon Rapi	**Elevation**	869	**Aquifer**	QBAA	**Alternative Id**	80-6139

GEOLOGICAL MATERIAL	COLOR	HARDNESS	FROM	TO	STRAT	LITH PRIM	LITH SEC	LITH MINOR
SAND	BROWN	SOFT	0	19	QFUB	SAND		
QFUB = Sand	SAND = Sand							
ROCKS & BOULDERS	BROWN	HARD	19	21	QBUB	COBL	BLDR	
QBUB = Boulder or boulders	COBL = Cobble			BLDR = Boulder				
SANDY CLAY	BROWN	MEDIUM	21	28	QLUB	CLAY	SAND	
QLUB = Clay & sand	CLAY = Clay			SAND = Sand				
SANDY CLAY/GRAVEL	GRAY	SOFT	28	57	QPUG	CLAY	SAND	GRVL
QPUG = Pebbly sand/silt/clay	CLAY = Clay			SAND = Sand			GRVL = Gravel	
GRAVEL & CLAY	BROWN	SOFT	57	70	QPUB	GRVL	CLAY	
QPUB = Pebbly sand/silt/clay	GRVL = Gravel			CLAY = Clay				
SANDY CLAY	BROWN	SOFT	70	73	QLUB	CLAY	SAND	
QLUB = Clay & sand	CLAY = Clay			SAND = Sand				
FINE SAND	BROWN	SOFT	73	83	QFUB	SAND		
QFUB = Sand	SAND = Sand							
COARSE SAND	BROWN	SOFT	83	93	QFUB	SAND		
QFUB = Sand	SAND = Sand							
SAND & GRAVEL	BROWN	SOFT	93	98	QHUB	SAND	GRVL	
QHUB = Sand & larger	SAND = Sand			GRVL = Gravel				
GRAVEL	BROWN	SOFT	98	105	QGUB	GRVL		
QGUB = Gravel (+larger)	GRVL = Gravel							
CLAY	BROWN	SOFT	105	108	QCUB	CLAY		
QCUB = Clay	CLAY = Clay							

Unique No. 00463020

County Name Anoka

MINNESOTA DEPARTMENT OF HEALTH

WELL AND BORING RECORD

Minnesota Statutes Chapter 1031

Update Date 2007/02/07

Entry Date 1992/06/22

Township Name	Township	Range	Dir	Section	Subsection
	31	24	W	27	BAABBB

Well Depth		Depth Completed		Date Well Completed
151	ft.	128	ft.	1991/12/16

Well Name COON RAPIDS 23

Well Owner's Name COON RAPIDS, CITY OF
2100 COON RAPIDS NW BL
COON RAPIDS MN 55433

Contact's Name CITY OF COON RAPIDS
11155 ROBINSON DR
COON RAPIDS MN 55433

GEOLOGICAL MATERIAL	COLOR	HARDNESS	FROM	TO
SAND	BROW		0	10
CLAY/SAND	BROW		10	34
SAND/GRAVEL	GRAY		34	38
SANDY CLAY	GRAY		38	67
SAND	BROW		67	95
GRAVEL	BROW		95	122
CLAY	GRAY		122	123
GRAVEL	BROW		123	126
SAND	BROW		126	151
CLAY	BROW		151	151

Drilling Method Cable Tool

Drilling Fluid Water

Well Hydrofractured? ☐ Yes ☐ No
From ft. to ft.

Use Community Supply (municipal)

Casing **Drive Shoe?** ☑ Yes ☐ N

Hole Diameter

Casing Diameter				Weight(lbs/ft)
30	in. t	92	ft	118.6
24	in. t	93	ft	94.6

Screen Y

Open Hole From ft. to ft.

Make JOHNSON Type L

Diameter	Slot	Length	Set		Fitting
24	50		94	ft. to	ft
16	70			ft. to 123	ft

Static Water Level 24 ft. from Land surface Date 1991/12/16

PUMPING LEVEL (below land surface)
70 ft. after 8 hrs. pumping 500 g.p.m.

Well Head Completion
Pitless adapter mfr Model
Casing Protection ☑ 12 in. above grade
☐ At-grade(Environmental Wells and Borings ONLY)

Grouting Information Well grouted? ☑ Yes ☐ No

Material	From	To (ft.)	Amount(yds/bags)
G		91	114 S

Nearest Known Source of Contamination
ft. direction type
Well disinfected upon completion? ☑ Yes ☐ No

Pump ☑ Not Installed Date Installed N
Mfr nam
Model HP Volts
Drop Pipe Length ft. Capacity g.p.m
Type

Any not in use and not sealed well(s) on property? ☐ Yes ☑ No

Was a variance granted from the MDH for this Well? ☐ Yes ☐ No

REMARKS, ELEVATION, SOURCE OF DATA, etc.

GAMMA LOGGED 11-14-2002 BY DOWNHOLE WELL SERVICES.

USGS Quad Coon Rapids Elevation 855
Aquifer: QBAA Alt Id: 1020017S24

Well CONTRACTOR CERTIFICATION Lic. Or Reg. No. 71015
License Business Name
Name of Driller FULTON, W.

Report Copy

Unique No.	00463020	MINNESOTA DEPARTMENT OF HEALTH	Update Date	2007/02/07
County Name	Anoka	**WELL AND BORING RECORD** *Minnesota Statutes Chapter 1031*	Entry Date	1992/06/22

Township Name	Township	Range	Dir	Section	Subsection	Well Depth		Depth Completed		Date Well Completed
	31	24	W	27	BAABBB	151	ft.	128	ft.	1991/12/16

Well Name	COON RAPIDS 23	**Lic. Or Reg. No.**	71015	**Name of Driller**	FULTON, W.		
USGS Quad	Coon Rapi	**Elevation**	855	**Aquifer**	QBAA	**Alternative Id**	1020017S24

GEOLOGICAL MATERIAL	COLOR	HARDNESS	FROM	TO	STRAT	LITH PRIM	LITH SEC	LITH MINOR
SAND	BROWN		0	10	QFUB	SAND		
QFUB = Sand	SAND = Sand							
CLAY/SAND	BROWN		10	34	QLUB	SAND	CLAY	
QLUB = Clay & sand	SAND = Sand			CLAY = Clay				
SAND/GRAVEL	GRAY		34	38	QHUG	SAND	GRVL	
QHUG = Sand & larger	SAND = Sand			GRVL = Gravel				
SANDY CLAY	GRAY		38	67	QLUG	CLAY	SAND	
QLUG = Clay & sand	CLAY = Clay			SAND = Sand				
SAND	BROWN		67	95	QFUB	SAND		
QFUB = Sand	SAND = Sand							
GRAVEL	BROWN		95	122	QGUB	GRVL		
QGUB = Gravel (+larger)	GRVL = Gravel							
CLAY	GRAY		122	123	QCUG	CLAY		
QCUG = Clay	CLAY = Clay							
GRAVEL	BROWN		123	126	QGUB	GRVL		
QGUB = Gravel (+larger)	GRVL = Gravel							
SAND	BROWN		126	151	QFUB	SAND		
QFUB = Sand	SAND = Sand							
CLAY	BROWN		151	151	QCUB	CLAY		
QCUB = Clay	CLAY = Clay							

Unique No.	00674478	MINNESOTA DEPARTMENT OF HEALTH	Update Date	2007/05/18
County Name	Anoka	**WELL AND BORING RECORD**	Entry Date	/ / 0

Minnesota Statutes Chapter 1031

Township Name	Township	Range	Dir	Section	Subsection
	31	24	W	21	ABADAB

Well Depth	Depth Completed	Date Well Completed
388 ft.	388 ft.	2003/12/19

Well Name COON RAPIDS 24

Drilling Method Cable Tool

Well Owner's Name COON RAPIDS 24
10845 DIRECT RIVER DR
COON RAPIDS MN 55433

Drilling Fluid Bentonite

Well Hydrofractured? ☐ Yes ☑ No
From ft. to ft.

Contact's Name CITY OF COON RAPIDS
11155 ROBINSON DR
COON RAPIDS MN 55433

Use Community Supply (municipal)

Casing **Drive Shoe?** ☑ Yes ☐ N

Hole Diameter

in. t	85	ft	
in. t	388	ft	
in. t	323	ft	

Casing Diameter **Weight(lbs/ft)**

30	in. t	191	ft	118.65
24	in. t	241	ft	94.62
36	in. t	90	ft	142.68

Screen N

Open Hole From 232 ft. to 388 ft.

Make Type

GEOLOGICAL MATERIAL	COLOR	HARDNESS	FROM	TO
SAND & GRAVEL	BROW	SOFT	0	29
CLAY & GRAVEL	BROW	HARD	29	82
SANDY CLAY	BROW	SOFT	82	87
SAND	BROW	SOFT	87	112
JORDAN S.S.	TAN	MEDIUM	132	149
FRANCONIA S.S.	GRN/B	MED-HRD	149	354
IRONTON/GALESVILLE	GRAY	MEDIUM	354	385
EAU CLAIRE SHALE	GRY/G	HARD	385	388

Static Water Level 60 ft. from Land surface Date 2003/09/18

PUMPING LEVEL (below land surface)
112 ft. after 8 hrs. pumping 1560 g.p.m.

Well Head Completion
Pitless adapter mfr BAKER Model 12.5PS2426
Casing Protection ☑ 12 in. above grade
☐ At-grade(Environmental Wells and Borings ONLY)

Grouting Information Well grouted? ☑ Yes ☐ No

Material	From	To (ft.)	Amount(yds/bags)	
G		85	10	Y
G		232.5	10	Y

Nearest Known Source of Contamination
200 ft. direction N type SDF
Well disinfected upon completion? ☑ Yes ☐ No

Pump ☐ Not Installed Date Installed
Mfr nam GOULD
Model 14RLJC-7 HP 75 Volts 480
Drop Pipe Length 165 ft. Capacity E+03 g.p.m
Type S

Any not in use and not sealed well(s) on property? ☐ Yes ☑ No

Was a variance granted from the MDH for this Well? ☐ Yes ☑ No

REMARKS, ELEVATION, SOURCE OF DATA, etc.

GAMMA LOGGED 6-17-2003. M.G.S. NO. 4242. LOGGED BY JIM TRAEN.

ROGER E. RENNER, MGWC, N-291.

MR. CHRIS CATLIN (651)644-4389.

USGS Quad Coon Rapids Elevation 861
Aquifer: CFIG Alt Id: 4242

Well CONTRACTOR CERTIFICATION Lic. Or Reg. No. 71015
License Business Name
Name of Driller COX, A.

Report Copy

Unique No.	00674478	MINNESOTA DEPARTMENT OF HEALTH	Update Date	2007/05/18
County Name	Anoka	**WELL AND BORING RECORD** *Minnesota Statutes Chapter 1031*	Entry Date	/ / 0

Township Name	Township	Range	Dir	Section	Subsection	Well Depth		Depth Completed		Date Well Completed
	31	24	W	21	ABADAB	388	ft.	388	ft.	2003/12/19

Well Name	COON RAPIDS 24	**Lic. Or Reg. No.**	71015	**Name of Driller**	COX, A.		
USGS Quad	Coon Rapi	**Elevation**	861	**Aquifer**	CFIG	**Alternative Id**	4242

GEOLOGICAL MATERIAL	COLOR	HARDNESS	FROM	TO	STRAT	LITH PRIM	LITH SEC	LITH MINOR
SAND & GRAVEL	BROWN	SOFT	0	29	QHUB	SAND	GRVL	
QHUB = Sand & larger	SAND = Sand			GRVL = Gravel				
CLAY & GRAVEL	BROWN	HARD	29	82	QPUB	CLAY	GRVL	
QPUB = Pebbly sand/silt/clay	CLAY = Clay			GRVL = Gravel				
SANDY CLAY	BROWN	SOFT	82	87	QLUB	CLAY	SAND	
QLUB = Clay & sand	CLAY = Clay			SAND = Sand				
SAND	BROWN	SOFT	87	112	QFUB	SAND		
QFUB = Sand	SAND = Sand							
JORDAN S.S.	TAN	MEDIUM	132	149	QFUB	SAND		
QFUB = Sand	SAND = Sand							
FRANCONIA S.S.	GRN/BRN	MED-HRD	149	354	CFRN	SNDS	SHLE	DLMT
CFRN = Franconia	SNDS = Sandstone			SHLE = Shale			DLMT = Dolomite	
IRONTON/GALESVILLE	GRAY	MEDIUM	354	385	CIGL	SNDS		
CIGL = Ironton-Galesville	SNDS = Sandstone							
EAU CLAIRE SHALE	GRY/GRN	HARD	385	388	CECR	SHLE	SNDS	
CECR = Eau Claire	SHLE = Shale			SNDS = Sandstone				

Unique No. 00674479

County Name Anoka

MINNESOTA DEPARTMENT OF HEALTH

WELL AND BORING RECORD

Minnesota Statutes Chapter 1031

Update Date 2007/01/09

Entry Date 2004/10/11

Township Name	Township	Range	Dir	Section	Subsection
	31	24	W	22	BCBDBA

Well Depth	Depth Completed	Date Well Completed
388 ft.	388 ft.	2003/12/19

Well Name COON RAPIDS 25

Drilling Method Cable Tool

Well Owner's Name COON RAPIDS 25
2324 COON RAPIDS NW BL
COON RAPIDS MN 55433

Drilling Fluid Bentonite

Well Hydrofractured? ☐ Yes ☐ No
From ft. to ft.

Contact's Name CITY OF COON RAPIDS
11155 ROBINSON DR
COON RAPIDS MN 55433

Use Community Supply (municipal)

Casing **Drive Shoe?** ☑ Yes ☐ N

Hole Diameter
in. t 388 ft
in. t 227 ft

Casing Diameter **Weight(lbs/ft)**
36 in. t 196 ft 142.68
24 in. t 229 ft 94.62

GEOLOGICAL MATERIAL	COLOR	HARDNESS	FROM	TO
SAND & GRAVEL	BROW	SOFT	0	29
CLAY & GRAVEL	BROW	HARD	29	82
SANDY CLAY	BROW	SOFT	82	87
SAND	BROW	SOFT	87	112
JORDAN S.S.	TAN	MEDIUM	112	162
ST. LAWRENCE	BRN/G	MEDIUM	162	193
FRANCONIA S.S.	GRN/B	MED-HRD	193	359
IRONTON/GALESVILLE	GRAY	MEDIUM	359	388

Screen N

Open Hole From 225 ft. to 388 ft.

Make Type

Static Water Level 51 ft. from Land surface Date 2003/12/01

PUMPING LEVEL (below land surface)
121.37 ft. after 48 hrs. pumping 1560 g.p.m.

Well Head Completion
Pitless adapter mfr BAKER Model 9.5PS2426
Casing Protection ☑ 12 in. above grade
☐ At-grade(Environmental Wells and Borings ONLY)

Grouting Information Well grouted? ☑ Yes ☐ No

Material	From	To (ft.)	Amount(yds/bags)
G		225	45 Y

Nearest Known Source of Contamination
200 ft. direction N type SDF
Well disinfected upon completion? ☑ Yes ☐ No

Pump ☐ Not Installed Date Installed
Mfr nam GOULDS
Model 14RLJC-7 HP 75 Volts 480
Drop Pipe Length 165 ft. Capacity E+03 g.p.m
Type S

Any not in use and not sealed well(s) on property? ☐ Yes ☑ No

Was a variance granted from the MDH for this Well? ☐ Yes ☑ No

REMARKS, ELEVATION, SOURCE OF DATA, etc.

GAMMA LOGGED 8-29-2003. M.G.S. NO. 4280. LOGGED BY JIM TRAEN.

USGS Quad Coon Rapids Elevation 871
Aquifer: CFIG Alt Id: 80-6137

Well CONTRACTOR CERTIFICATION Lic. Or Reg. No. 71015
License Business Name
Name of Driller COX, A.

Report Copy

Unique No.	00674479	MINNESOTA DEPARTMENT OF HEALTH	Update Date	2007/01/09
County Name	Anoka	**WELL AND BORING RECORD** *Minnesota Statutes Chapter 1031*	Entry Date	2004/10/11

Township Name	Township	Range	Dir	Section	Subsection	Well Depth		Depth Completed		Date Well Completed
	31	24	W	22	BCBDBA	388	ft.	388	ft.	2003/12/19

Well Name	COON RAPIDS 25	**Lic. Or Reg. No.**	71015	**Name of Driller**	COX, A.		
USGS Quad	Coon Rapi	**Elevation**	871	**Aquifer**	CFIG	**Alternative Id**	80-6137

GEOLOGICAL MATERIAL	COLOR	HARDNESS	FROM	TO	STRAT	LITH PRIM	LITH SEC	LITH MINOR
SAND & GRAVEL	BROWN	SOFT	0	29	QHUB	SAND	GRVL	
QHUB = Sand & larger	SAND = Sand			GRVL = Gravel				
CLAY & GRAVEL	BROWN	HARD	29	82	QPUB	CLAY	GRVL	
QPUB = Pebbly sand/silt/clay	CLAY = Clay			GRVL = Gravel				
SANDY CLAY	BROWN	SOFT	82	87	QLUB	CLAY	SAND	
QLUB = Clay & sand	CLAY = Clay			SAND = Sand				
SAND	BROWN	SOFT	87	112	QFUB	SAND		
QFUB = Sand	SAND = Sand							
JORDAN S.S.	TAN	MEDIUM	112	162	CJDN	SNDS		
CJDN = Jordan	SNDS = Sandstone							
ST. LAWRENCE	BRN/GRN	MEDIUM	162	193	CSTL	SLSN	DLMT	
CSTL = St.Lawrence	SLSN = Siltstone			DLMT = Dolomite				
FRANCONIA S.S.	GRN/BRN	MED-HRD	193	359	CFRN	SNDS	SHLE	DLMT
CFRN = Franconia	SNDS = Sandstone			SHLE = Shale			DLMT = Dolomite	
IRONTON/GALESVILLE	GRAY	MEDIUM	359	388	CIGL	SNDS		
CIGL = Ironton-Galesville	SNDS = Sandstone							

Appendix B

Aquifer Test Data and Analysis

MINNESOTA MDH DEPARTMENT of HEALTH
Environmental Health Division
Drinking Water Protection Section
Source Water Protection Unit
P.O. Box 64975
St. Paul, Minnesota 55164-0975

Determination of Aquifer Properties and Aquifer Test Plan (DAP-ATP) Form

Public Water Supply ID:	1020017	PWS Name:	Coon Rapids

Contact Information for Person Completing this Form

Name:	John Greer
Address:	Barr Engineering Company
	4700 West 77th Street, Suite 200
City, State, Zip:	Edina, MN 55435
Phone, Fax, e-mail:	(952) 832-2691

Aquifer Properties Determination Methods

- [x] 1) An existing pumping test that meets the requirements of wellhead protection rule part 4720.5520 and that was previously conducted on a well connected to the public water supply system.
- [ ] 2) An existing pumping test that meets the requirements of wellhead protection rule part 4720.5520 and that was previously conducted on another well in a hydrogeologic setting determined by the department to be equivalent.
- [ ] 3) A proposed new test to be conducted on a new or existing well connected to the public water supply system and that meets the requirements for larger-sized water systems (wellhead protection rule part 4720.5520). A test plan must be approved before conducting the test.
- [ ] 4) A proposed new test to be conducted on a new or existing public well connected to the public water supply system and that meets the requirements for smaller-sized water systems (wellhead protection rule part 4720.5530). A test plan must be approved before conducting the test.
- [ ] 5) An existing pumping test that does not meet the requirements of wellhead protection rule part 4720.5520 and that was previously conducted on: 1) a public water supply well or 2) another well in a hydrogeologic setting determined by the department to be equivalent.
- [ ] 6) Existing specific capacity test(s) conducted on the public water supply well(s) or specific capacity tests conducted on other wells in a hydrogeologic setting determined by the department to be equivalent.
- [ ] 7) An existing published transmissivity value.

- Include all test data and analysis documentation with the estimated transmissivity, ft^2/day, when the aquifer properties determination method is; 1, 2, 5, 6, or 7, listed above.
- Attach detailed aquifer test plan for methods 3 or 4.

Submitted by: John Greer	Prof. License: 30347	Date: 7/31/2015

To request this document in another format, please call our Section Receptionist (651/201-4700) or Division TTY (651/201-5797).

Rationale for: 1) Aquifer Properties Determination or 2) Proposed New Test

Briefly describe the rationale for: 1) selected method to determine aquifer properties from existing data, **or** 2) a new aquifer test to be conducted on the pumped well referenced below. Include unique well numbers of all wells that were (or will be) monitored during data collection. How does the existing or proposed test deviate from the ideal. (e.g. rate, duration, no. of obwells, interfering wells, etc.) Attach documentation as necessary.

Aquifer Name:	Confined Quaternary Aquifer	☑ Confined	☐ Unconfined	☐ Fractured Rock

The MDH conducted a 24.3-hour pumping test at Coon Rapids Well 20 (Unique Number 420956) on March 11-12, 1999. The pumping rate was 1,150 gallons per minute (gpm). Coon Rapids Well 17 (Unique Number 150357) was used as an observation well. Analysis of the pumping and recovery data from the observation well using the Theis and Jacob methods produced a range of transmissivities from 31,800 ft**2/day to 66,700 ft**2/day (see attached).

The MDH conducted pumping tests at Wells 19 (Unique Number 110475) and Well 20 on August 29 - September 2, 2002. Wells 673418 and 673420 were used as observation wells. Well 19 was pumped for approximately 24 hours at 1,220 gpm followed by an approximately 24-hour recovery period, and then Well 20 was pumped at 1,000 gpm for approximately 24 hours followed by a second 24-hour recovery period. Data were analyzed using the Theis and Hantush-Jacob methods. The analysis concluded that the Quaternary aquifer is less transmissive near Well 19 and observation well 673418 (T range 8,120 ft**2day to 9,420 ft**2/day) than near Well 20 and 673420 (T range 27,000 ft**2/day to 55,000 ft**2/day) (see attached).

T values for groundwater model:

Region including Well 19 (2002 test data for 673418):
Geometric mean T = 8,700 ft**2/day
Sensitivity analysis range = 8,120 - 9,420 ft**2/day

Region including Well 20 (1999 data from 150357 and 2002 data from 673418 and 673420):
Geometric mean T = 45,210 ft**2/day
Sensitivity analysis range = 27,000 - 66,700 ft**2/day

Proposed New Test Information Summary

Pumped Well Name (Unique Number):	420956, 110475	**Test Duration (Hours):**	24
Location: X, Y (meters) UTM-Z15N or Lat-Lon (decimal degrees) datum: NAD83	473997, 5001192 (420956) 473885, 5001449 (110475)	**Pump Type:**	unknown
		Discharge Rate:	1150, 1220, 1000 gpm
Number of Observation Wells:	3	**Flow Rate Measuring Device Type:**	flowmeter

- A map showing the location of the pumping well and observation well(s) must be included.

List the unique number of each public water supply well to which this DAP-ATP Form applies

150357					
110475					
420956					
474384					
474385					
463020					

Reviewed by: Amal Djerrari	**Approved:** ◉ Yes ○ No	**Approval Date:** 8/3/2015

Analysis of the Coon Rapids #20 (420956) Aquifer Test
March 11, 1999
Confined Drift Aquifer

Introduction

The MDH is assisting in the delineation of wellhead protection areas by the City of Coon Rapids, Minnesota, around the public water supply wells serving the community. An important part of the delineation process is to determine aquifer properties at the well site as accurately as possible. This is normally accomplished by performing a pumping test.

The pumping test at the Coon Rapids Well #20 was conducted by the MDH as described below. The results were analyzed using standard nonequilibrium and semisteady-state methods, cited in references. Data plots are included in Appendix 1, field data sheets in Appendix2, well logs in Appendix 3, and test results are summarized on Table 1. The analysis shows that the aquifer responds as generally expected from the geologic setting.

Description of the Test

A pressure transducer was placed in the pumping well on March 10, 1999 at about 15:30 to collect background readings prior to the test. The well was pumping at the time the transducer was installed and was turned off at about 22:00 providing an eighteen hour resting period before the start of the test. There were no other nearby wells to cause interference for this test. A transducer was installed in a nearby public water supply well, #17 (150357), to serve as an observation well.

The test started at 11:49:53 on March 11, 1999. Well #20 was pumped at an average rate of 1150 gallons per minute. The flowmeter on the well was used to monitor the discharge. The pumping rate remained fairly constant through out the test. However, there were three short periods of time, possibly one minute or so in length, that the pump discharge decreased or even stopped during the test. This caused small variations in water level that did not cause the data to be unusable.

The pump was turned off at 12:09:00.2 on March 12, 1999 to start the recovery period. The recovery period was carried out 1450 minutes and the wells recovered above static levels caused by recharge from snow melt. There also was an anomalous flattening of the water levels during very early recovery possibly the result of pressure surge prevention equipment.

Summary of Results

A transmissivity value of 38,300 ft^2/day and a storativity value of 0.00094 are chosen as being representative of aquifer properties in the area of these two wells for the capture zone analysis. The aquifer is semi-confined but the leakiness is not large and was obscured by recharge during late recovery.

The test results are fairly consistent between the pumping and observation wells, particularly during the late-time pumping period. The results are also consistent with the conceptual model of a leaky confined drift aquifer.

Problems with the Analysis

Problems not withstanding, the data acquired for this test are of high quality and the results are consistent and representative of the aquifer in the area of the well.

References:

Jacob, C. E. and Lohman, S. W., (1952) Nonsteady Flow to a Well of Constant Drawdown in an Extensive Aquifer, Trans. American Geophysical Union, Vol. 33, No. 4, August, 1952, pp. 559-69.

Theis, C. V., (1935) The Relation Between the Lowering of the Piezometric Surface and the Rate and Duration of Discharge of a Well Using Ground-Water Storage, Trans. American Geophysical Union, 16th Annual Meeting, April, 1935, pp. 519-24.

Table 1.

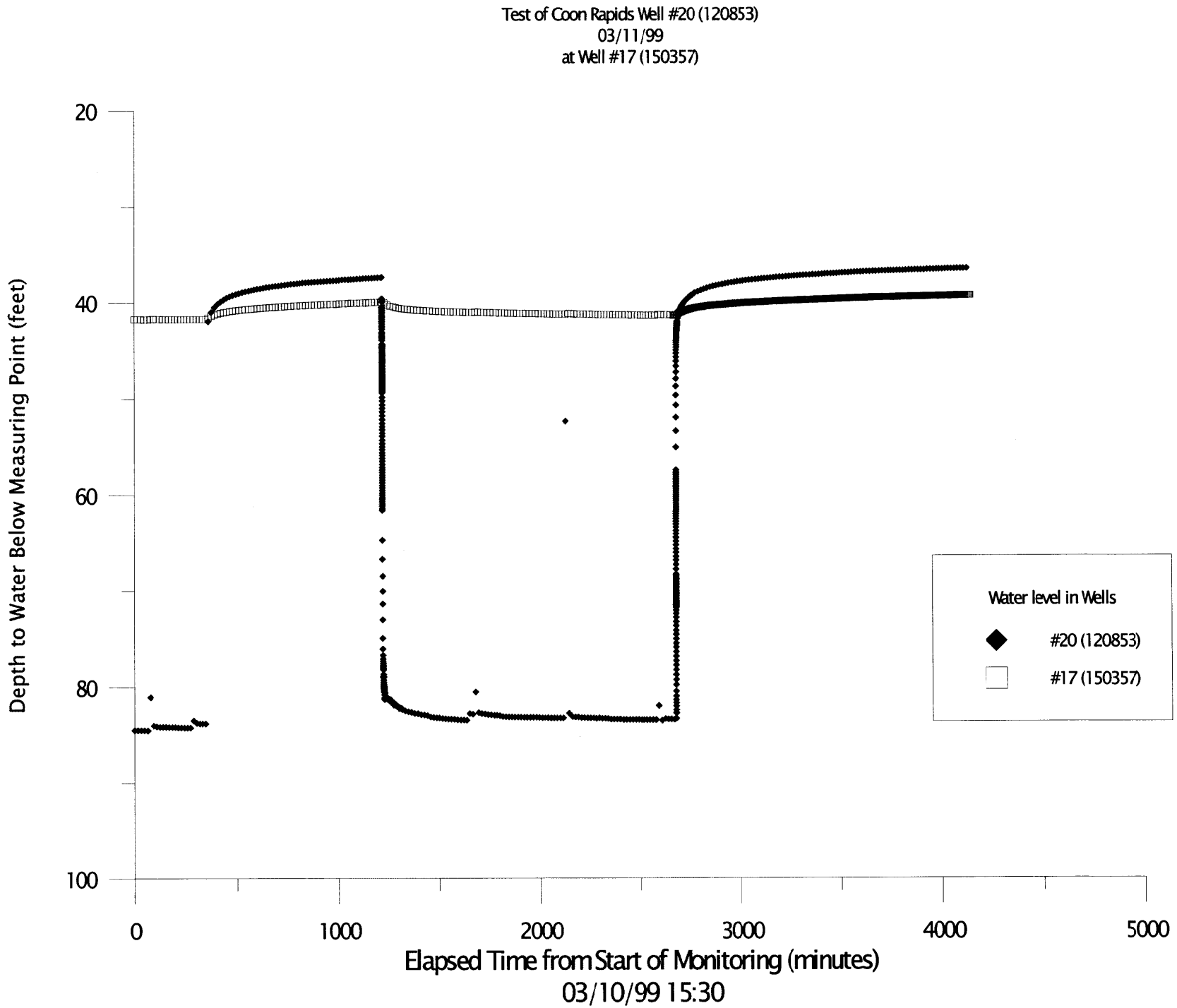
Coon Rapids #20 Aquifer Test
March 11, 1999

	Transmisivity T (ft^2/day)	Storage Coefficient S	Time Period Emphasized	Analysis Method
Pumping Well #20 (420956)	1,470	NA	Early Pumping	Theis
	60,700	NA	Late Pumping	Jacob
	1,470	NA	Early Recovery	Theis
	15,400	NA	Late Recovery	Jacob t/t'
Observation Well #17 (150357)	47,600	1.08e-3	Early Pumping	Theis
	66,700	6.32e-4	Late Pumping	Jacob
	38,300	9.4e-4	Early Recovery	Theis
	31,800	1.5e-4	Late Recovery	Jacob t/t'

Representative aquifer values are best shown by the early-time recovery values for the observation well, giving an average T of 38,300 and S of 0.00094.

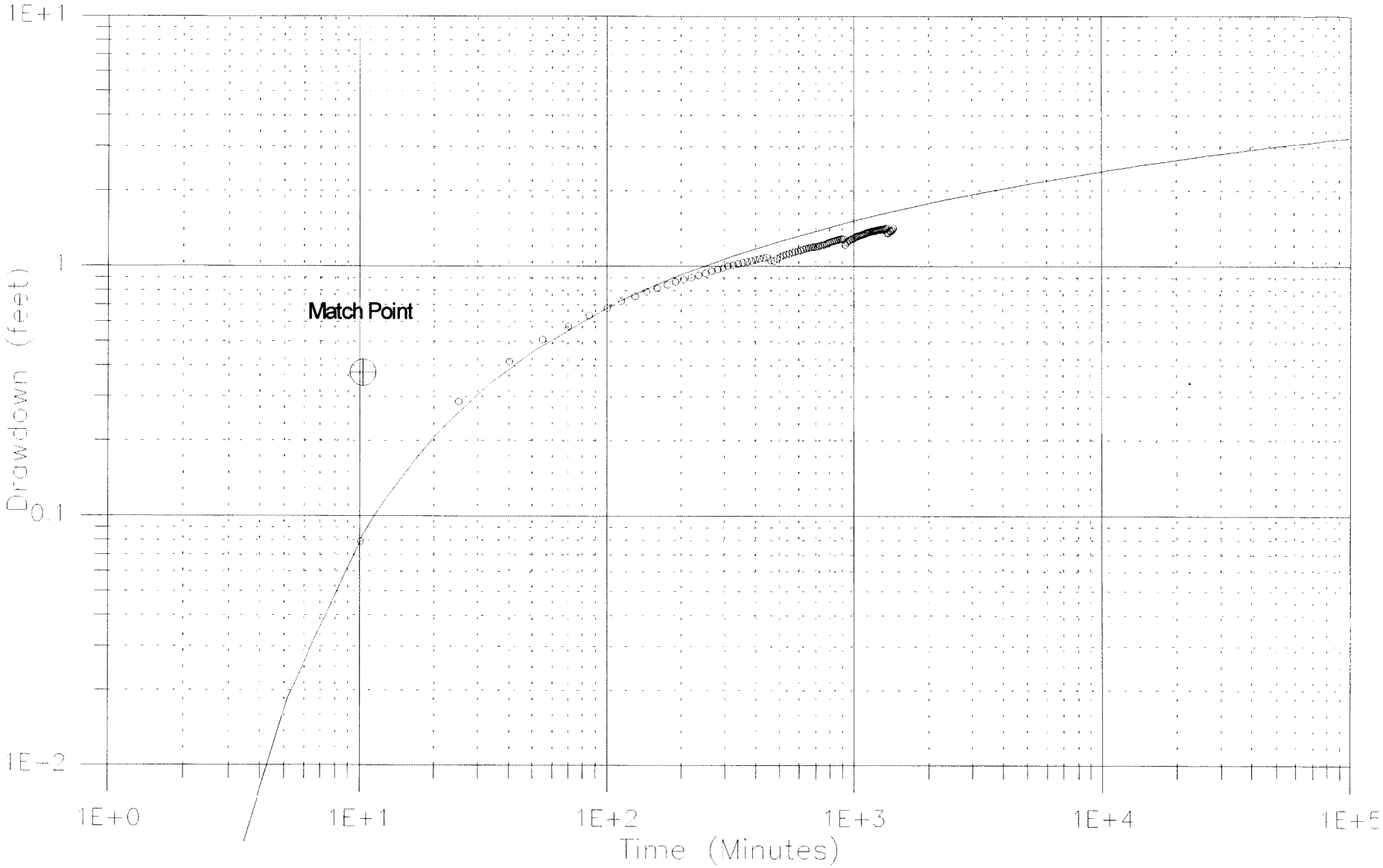
Appendix 1.

Graphical Analysis


Test of Coon Rapids Well #20 (120853)
03/11/99
at Well #17 (150357)
Depth to Water Below Measuring Point (feet)
20
40
60
80
100
0
1000
2000
3000
4000
5000
Elapsed Time from Start of Monitoring (minutes)
03/10/99 15:30
Water level in Wells
#20 (120853)
#17 (150357)

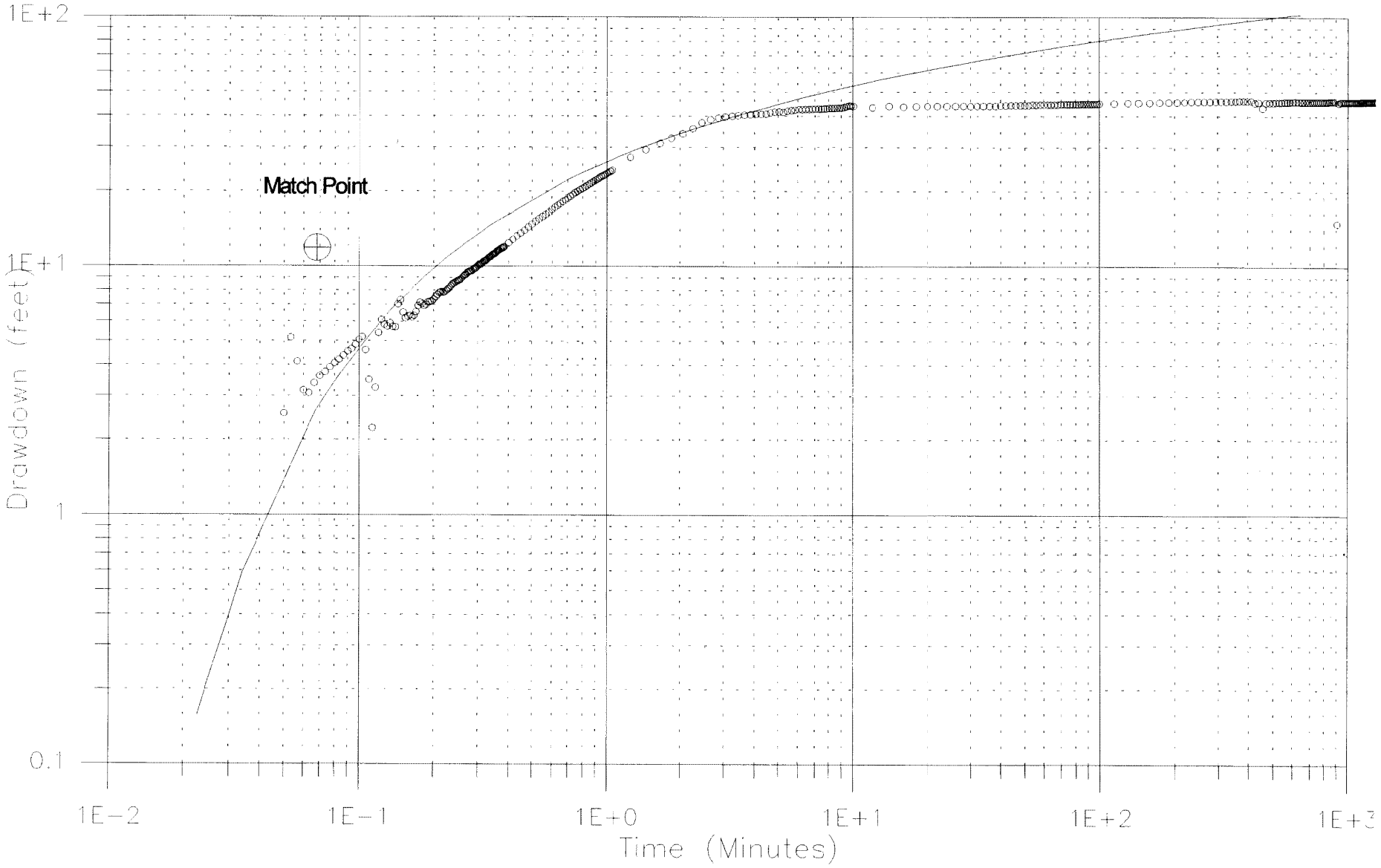
Test of Coon Rapids Well #20 (120853)
03/11/99
at Well #17 (150357)
Pumping

T = 15.3 1152 / 0.37 = 47,600 ft^2/day
S = 47,600 11 / 1163^2 360 = 1.08e-3



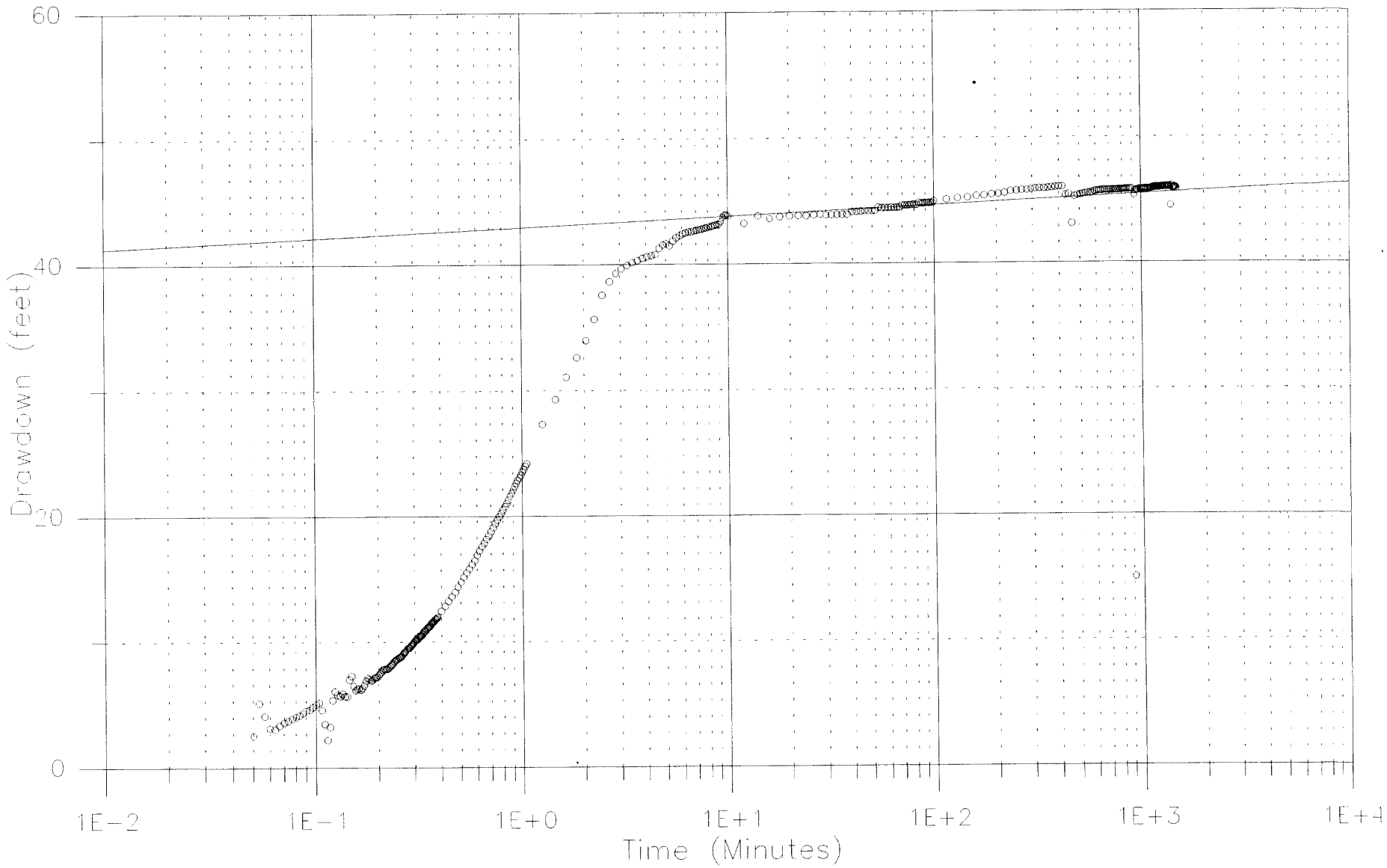
Test of Coon Rapids Well #20 (120853)
03/11/99
Pumping

T = 15.3 1152 / 12 = 1,470 ft^2/day



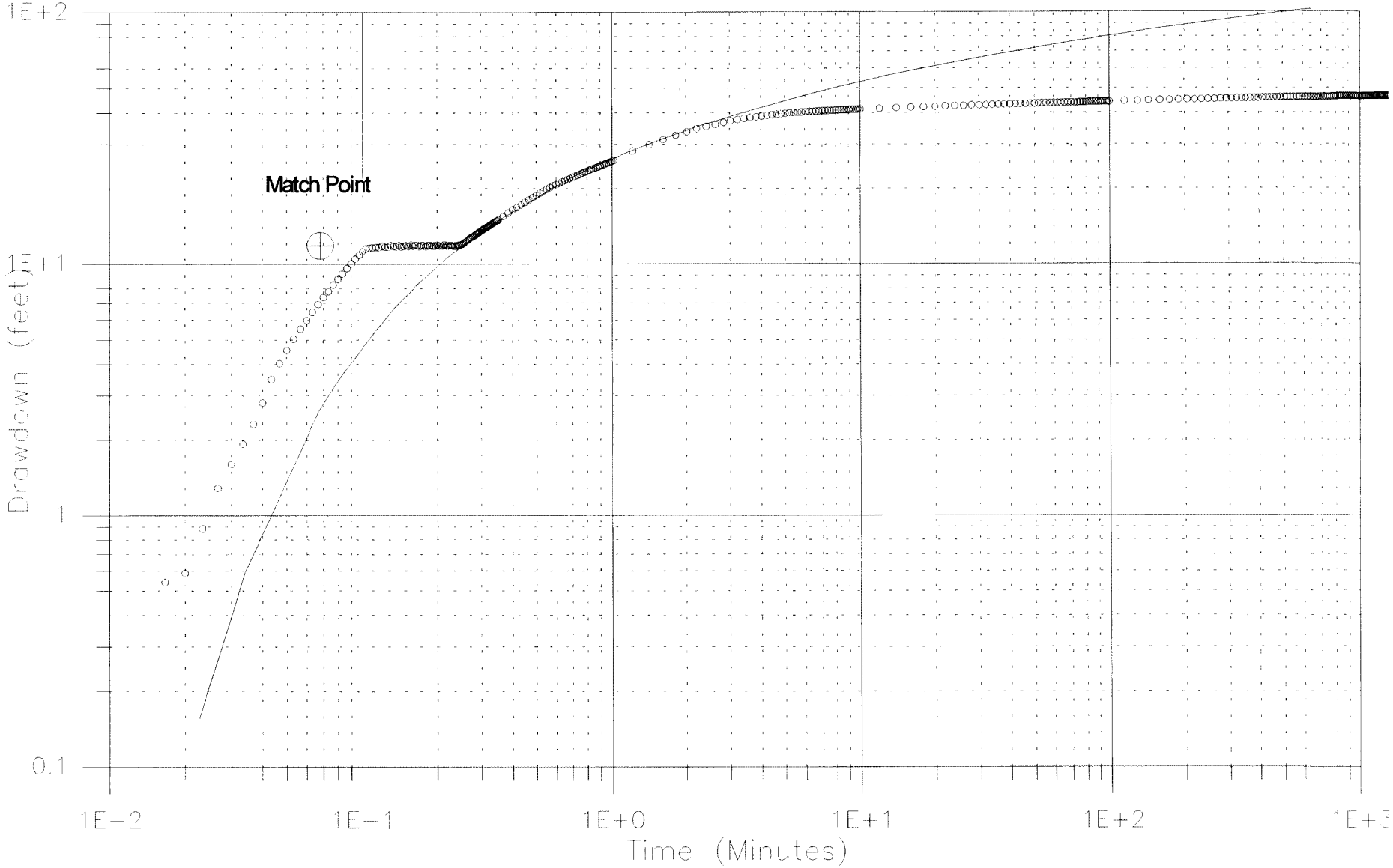
Test of Coon Rapids Well #20 (120853)
03/11/99
Pumping

T = 35.3 1152 / 0.67 = 60,700 ft^2/day



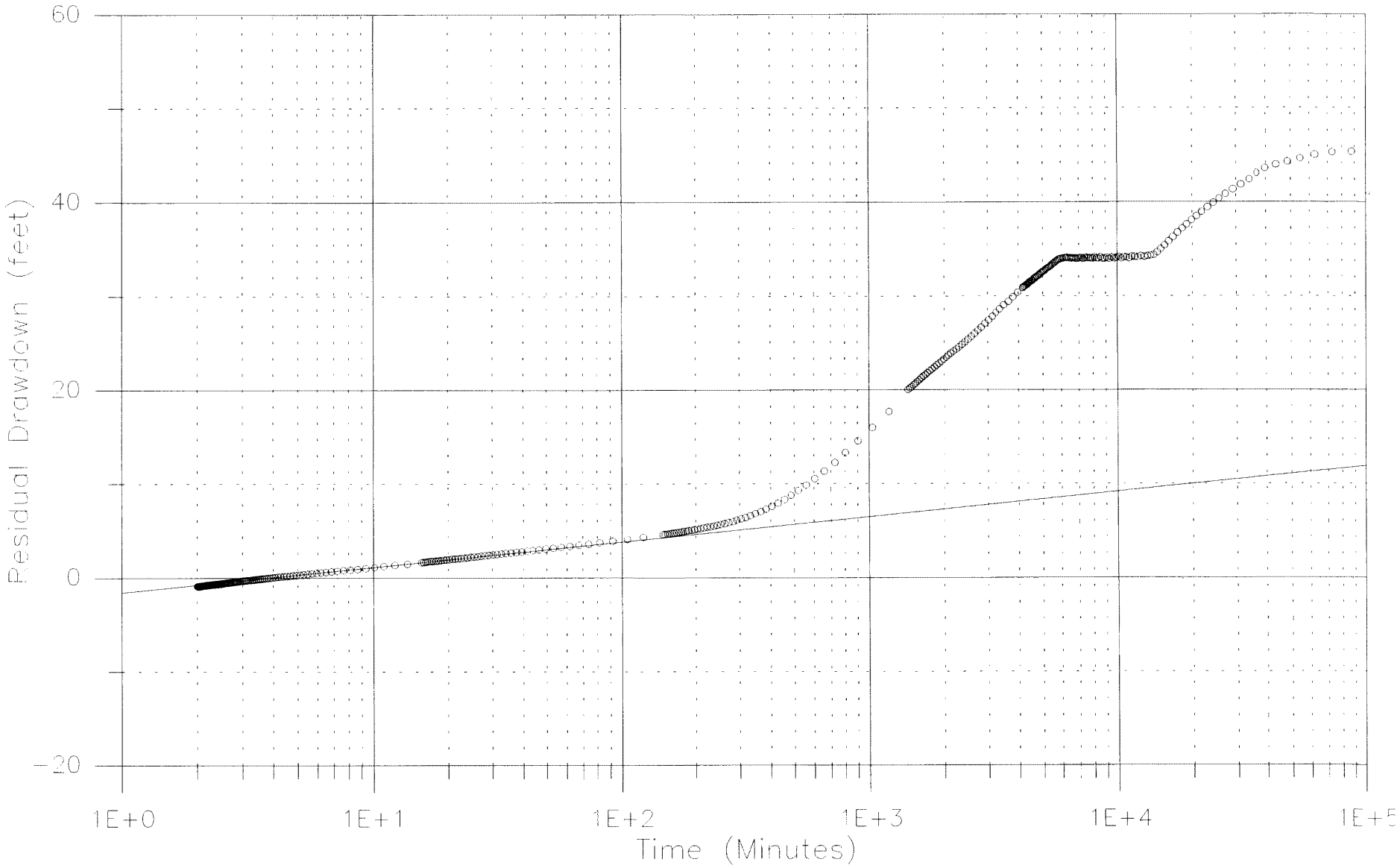
Test of Coon Rapids Well #20 (120853)
03/11/99
Recovery

T = 15.3 1152 / 12 = 1,470 ft^2/day



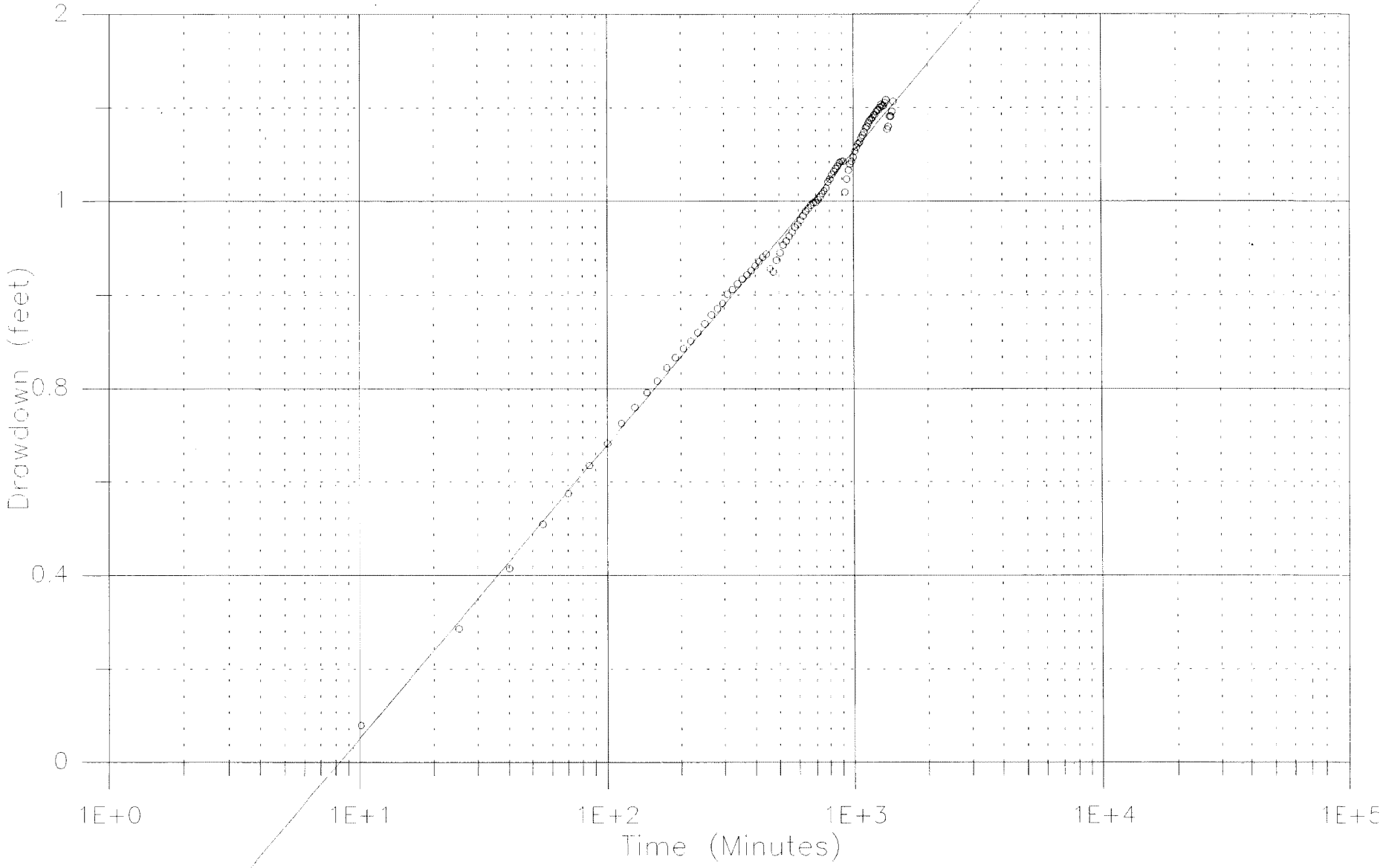
Test of Coon Rapids Well #20 (120853)
03/11/99
Recovery

T = 35.3 1152 / 2.64 = 15,400 ft^2/day



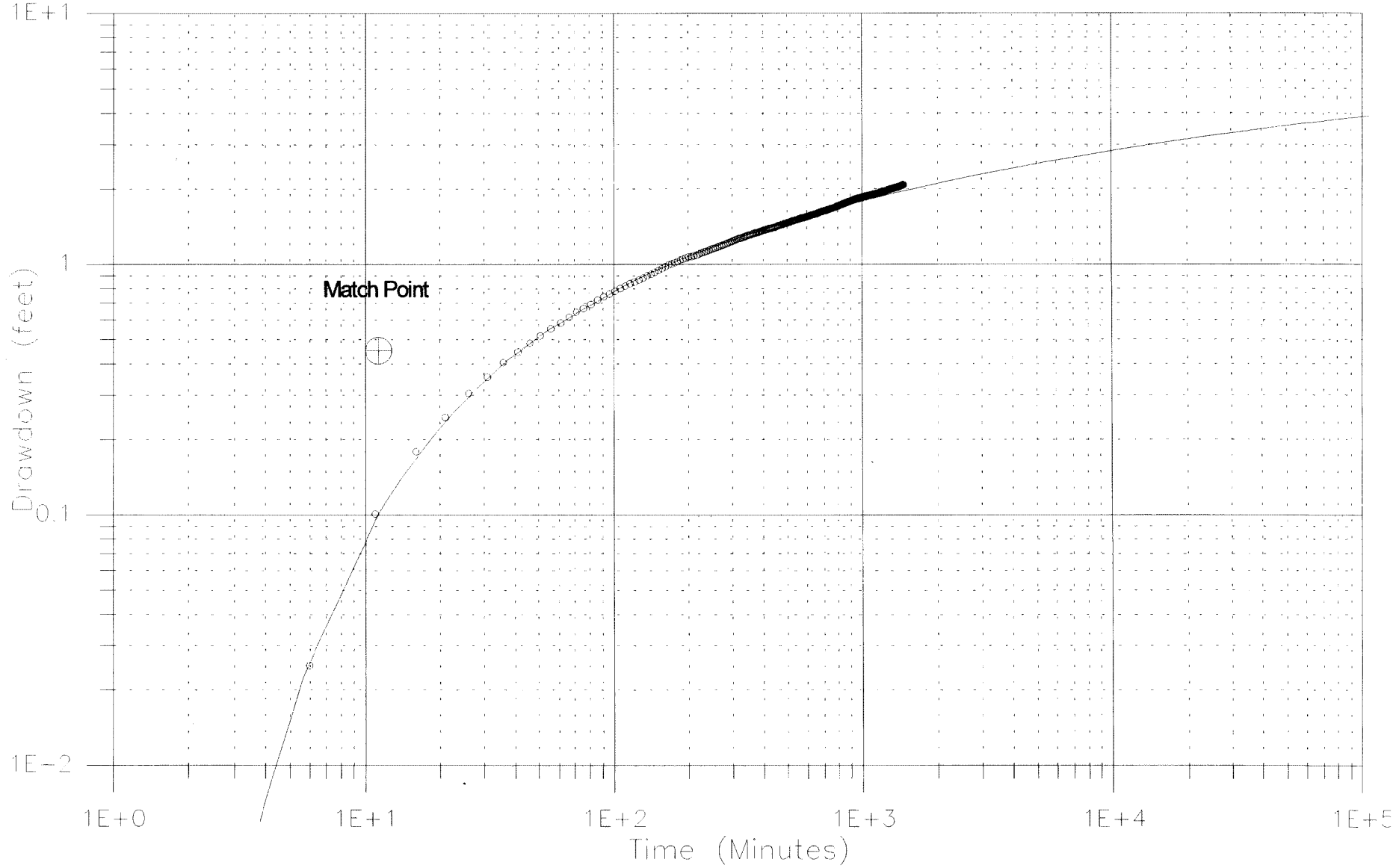
Test of Coon Rapids Well #20 (120853)
03/11/99
at Well #17 (150357)
Pumping

T = 35.3 1152 / 0.61 = 66,700 ft^2/day
S = 66,700 8.2 / 1163^2 640 = 6.32e-4



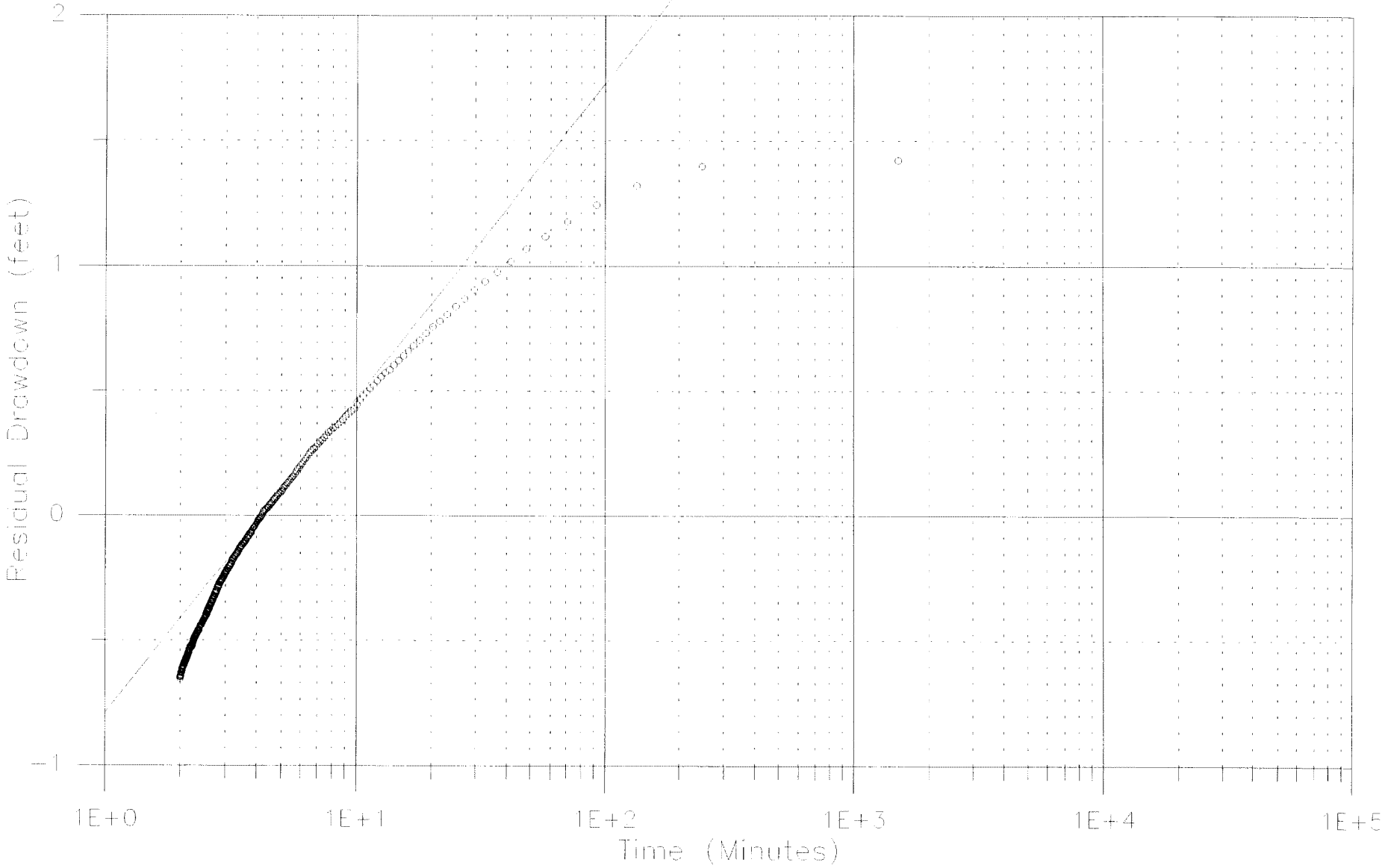
Test of Coon Rapids Well #20 (120853)
03/11/99
at Well #17 (150357)
Recovery

T = 15.3 1152 / 0.46 = 38,300 ft^2/day
S = 38,300 12 / 1163^2 360 = 9.44e-4



Test of Coon Rapids Well #20 (120853)
03/11/99
at Well #17 (150357)
Recovery

T = 35.3 1152 / 1.28 = 31,800 ft^2/day
S = 31,800 4.1 / 1163^2 640 = 1.5e-4



Appendix 2.

Field Data Sheets

Minnesota Department of Health
Special Services Unit
Drinking Water Protection Section
P.O. Box 64975
St. Paul, Minnesota 55164-0975

Test No.

Aquifer Test Information

Test Location Coon Rapids # 20	Well Owner City of Coon Rapids	Test Conducted By J. Blum
Date/Time Test Start 3/11/99 11:49:53.0	Flow Rate (Units) 1152 gpm	Pump Type Turbine
Date/Time Recovery Start 3/12/99 12:09:02	Flow Rate Measuring Device Flowmeter	Pump Intake Depth
Date/Time Test Finish 3/13/99 12:35	Totalizer: End 711442.4 X 1000	Pumped Well Inner Casing Diameter
Notes pre lube ~ 90 sec.	Totalizer: Start 709762	Confined/Unconfined semi confined
	Total Pumped (Units) 1680,400 gallons	Quad Sheet Name/Number 120A Coon Rapids

Unique Well Numbers	Location T, R, S, Quarters	Location N, E	Radial Distance	Open Depth	Transducer Setting	Measuring Point Location	Elevation, Datum
Pumped Well #20 (120853)		N E			~91 ft XD 4.23	vent pipe	
Observation Wells #17 (150357)		N E	1163'		51.85 XD 10.12		
		N E					
		N E					
		N E					
		N E					

Sketch Map of Well Locations

Aquifer Test Data Form

Test: Coon Rapids #20	By: J. Blum	Test Date: 3/11/99	Page 2 of 3

Location (Unique Well No.)	Date Month	Date Day	Date Year	Time Hour	Time Minute	Time Sec.	Elapsed Time (Minutes)	Depth to Water	Drawdown/ Recovery	Discharge	Remarks
#17 (150357)	03	10	99	14	15			41.73			XD 10.12
#20 (120853)				14	20			87.32			on ~ 925 gpm
											XD 4.23
#17	03	11	99					41.36			
#20											XD 81.17
#20	03	13	99	12	30			39.44			XD 36.46
~~#17~~				12	40			39.30			XD 39.28

Minnesota Department of Health
Special Services Unit
Drinking Water Protection Section
P.O. Box 64975
St. Paul, Minnesota 55164-0975

Notes:

IC #140-0523 (5/96)

Aquifer Test Data Form

Test: Coon Rapids #20	By: J. Blim	Test Date: 3/11/99	Page 3 of 3

Location (Unique Well No.)	Date Month	Date Day	Date Year	Time Hour	Time Minute	Time Sec.	Elapsed Time (Minutes)	Depth to Water	Drawdown/ Recovery	Discharge	Remarks
#20 (120853)	03	11	99	11	49	53	0			0	709,762,000
					55		5			1230	768.1
				12			10			1230	774.0
					05		15			1190	780.0
					10		20			1200	- 786.9
					15		25			1190	793.05
					20		30			1180	- 797.8
					25		35			1180	- 803.6
					30		40			1180	- 809.5
					35		45			1180	815.4
					40		50			1180	821.3
					45		55			1170	827.3
					50		60			1180	833.0
				13	50		120			1180	905.1
				14	50		180			1180	977.7
				17	50		360			1180	710018.9
	03	12	99	07	50		1140			1160	711149.9
				12	04		1454			1160	711436.6
				12	09	02	1459			1160	711442.4

Notes:

Minnesota Department of Health
Special Services Unit
Drinking Water Protection Section
P.O. Box 64975
St. Paul, Minnesota 55164-0975

IC #140-0523 (5/96)

Coon Rapids #19
Coon Rapids #14
Coon Rapids #7
Coon Rapids #20
Coon Rapids #15
Coon Rapids #17
Coon Rapids #22

SF-00006-05 (4/86)

DEPARTMENT :Health

STATE OF MINNESOTA

Office Memorandum

DATE : October 8, 2002

TO : City of Coon Rapids WHP File

FROM : Steve Robertson, Source Water Protection Unit, MDH

PHONE : 651-215-1322

SUBJECT : Aquifer Tests at Coon Rapids Well Nos. 19 (110475) and 20 (420956): August 29 - September 3, 2002

INTRODUCTION

The Minnesota Department of Health (MDH) assisted the City of Coon Rapids, Minnesota, by helping to conduct aquifer tests to determine aquifer properties near proposed new well sites. The results of these aquifer tests can be used for many purposes, including providing some of the aquifer characterization information required by MDH for wellhead protection planning.

The pumping test at Coon Rapids Well Nos. 19 and 20 were conducted by the City of Coon Rapids with assistance from H.R. Green and MDH as described below. The results were analyzed using standard nonequilibrium methods, cited in the references. Data plots and associated quantitative analyses are included in Appendix A, field data sheets in Appendix B, well logs in Appendix C. Table 1 summarizes the pumping schedule during the monitoring period and analysis results are summarized on Table 2.

The analysis shows that the aquifer responds in a manner consistent with the geologic setting.

DESCRIPTION OF THE TEST

Water level readings were monitored using pressure transducers in Wells 673418 and 673420 (monitoring wells installed during summer of 2002 for the City). Municipal Well Nos. 17, 19, and 20 are completed in deep buried Quaternary materials, as are the two monitoring wells.

Scheduling prevented gathering pre-test monitoring data over a long period. Collection of monitoring data began on August 29, 2002 and ended September 3, 2002. The test pumping program was conducted using a constant pumping rate, allowing MDH to use the collected data for quantitative aquifer analysis. Figure 1 shows the effects of the pumping on water levels in Well Nos. 673418 and 673420 over the duration of the monitoring period.

Monitoring Wells 673418 and 673420 are located about 551 and 1860 feet, respectively, from Well No. 19. Likewise, Well No. 673418 is 1493 feet and Well No. 673420 is 1289 feet from Coon Rapids Well No. 20. Locations of all wells were established using GPS technology.

The test started at 11:00:32 on August 29, 2002. Well No. 19 was pumped at an average rate of 1218.8 gallons per minute. A flowmeter on the discharge line was used to monitor the discharge. City staff maintained the pumping rate at a relatively constant rate for the duration of the test. Well discharge was pumped into the municipal distribution system.

The pump in Well No. 19 was turned off at 11:04:25 on August 30, 2002, to start the recovery period. After initiating recovery, water levels had mostly recovered after 52 minutes. After a recovery period of approximately 24 hours, pumping commenced in Coon Rapids Well No. 20, which was pumped for 24 hours starting at about 11 a.m. on August 31, 2002. Well No. 20 was also pumped for approximately 24 hours, ending at about 11 a.m. on September 1, 2002. A 24-hour recovery period followed this pumping, after which Well Nos. 17, 19, 20, and 22 were pumped simultaneously. Table 1 presents the pumping chronology.

SUMMARY OF RESULTS

The principal tests of the series were conducted for a period of 24 hours. The available geologic record and static water level information from Well No. 19, Well No. 20, and the test wells indicate the aquifer in the area of these wells is likely confined (Appendix C), although there may be nearby areas in which the deep Quaternary Aquifer is unconfined (i.e., near Coon Rapids Well No. 14 *cf.* 110460; H.R. Green Company, August, 2002).

Pumping Test of Coon Rapids Well No. 19 (110475)

Coon Rapids Well No. 19: No water levels were recorded in the pumping well.

Test Well No. 673418: The water levels in test Well No. 673418 dropped by more than 8 feet during the pumping portion of the Coon Rapids Well No. 19 test. A log-log plot of the response from this well during pumping is shown in Appendix A. The Theis drawdown analysis method was applied to the drawdown data from this well. Data emphasized in the analysis are those collected early in the pumping phase of the test because the late time data appear to be affected by leakage. The Hantush-Jacob method (Hantush, 1956), which accounts for leakage, was also applied to the drawdown data collected in the test well. The results of these analyses are presented in Table 2.

Recovery data from test Well No. 673418 also provide estimates of transmissivity. Water levels during recovery rebounded above the levels observed prior to pumping, probably because antecedent hydraulic conditions in the aquifer probably had not equilibrated prior to the start of the test. Portions of the response curve that were subjected to the Theis recovery analysis are the portions of the curve with T/T' values in the range of 2 to 20. The recovery data analysis is shown on the figures in Appendix A. Table 2 summarizes the quantitative analysis of the results from Well No. 673418.

Test Well No. 473420: The water level data from this well show virtually no response to pumping at Well No. 19 (Figure 1, Appendix A). This could be a result of antecedent pumping conditions, but will be difficult to establish given that background monitoring data are lacking. Data from this well do, however, show a measurable recovery response. Portions of the response curve that were subjected to the Theis recovery analysis are the portions of the curve with T/T' values of 2.5 to 6. Attempts to quantify the recovery data yield results that do not agree with those obtained from the other test well (Table 2), not surprising given the greater radial distance to the pumping well and the leaky conditions in the aquifer. The recovery analysis method does not account for leaky conditions, the presence of which can give rise to overestimates of T at large radial distances. The recovery data analysis are shown on the figure presented in Appendix A. Table 2 summarizes the quantitative analysis of the results from Well No. 673420.

Pumping Test of Coon Rapids Well No. 20 (420956)

Coon Rapids Well No. 20: No water levels were recorded in the pumping well.

Test Well No. 673418: The water levels in test Well No. 673418 dropped by a little less than 1 foot during the pumping portion of the Coon Rapids Well No. 20 test. A log-log plot of the response from this well during pumping is shown in Appendix A. The Theis drawdown analysis method was applied to the drawdown data from this well. Data emphasized in the analysis are those collected early in the pumping phase of the test (i.e., minutes 10 to 200) because the late time data appear to be affected by leakage. The Hantush-Jacob method (Hantush, 1956), which accounts for leakage, was also applied to the drawdown data collected in the test well. The results of these analyses are presented in Table 2.

Recovery data from test Well No. 673418 also provide estimates of transmissivity. Water levels during recovery rebounded above the levels observed prior to pumping, as observed in the test of Coon Rapids Well No. 19. Antecedent hydraulic conditions in the aquifer probably had not equilibrated prior to the start of the test, although it is also possible that the recovery data could reflect external influences that changed during the pumping. Portions of the response curve that were subjected to the Theis recovery analysis are the portions of the curve with T/T' values in the range of 4.2 to 18. The recovery data analysis are shown on the figure in Appendix A. Table 2 summarizes the quantitative analysis of the results from Well No. 673418.

Test Well No. 673420: Unlike during the test of Well No. 19, this test well showed a definite response to pumping of Well No. 20 (Figure 1, Appendix A). A log-log plot of the response from this well during pumping is shown in Appendix A. The Theis drawdown analysis method was applied to the drawdown data from this well. Data emphasized in the analysis are those collected early in the pumping phase of the test (i.e., minutes 40 to 250) because the late time data appear to be affected by leakage. The Hantush-Jacob method (Hantush, 1956), which accounts for leakage, was also applied to the drawdown data collected in the test well. The results of these analyses are presented in Table 2.

Recovery data from test Well No. 673420 also provide estimates of transmissivity. Water levels during recovery rebounded above the levels observed prior to pumping, as observed in Well No. 673418 during both tests. Portions of the response curve that were subjected to the Theis recovery analysis are the portions of the curve with T/T' values of 5.5 to 10. Attempts to quantify the recovery data yield results that do not agree with those obtained from the other test well (Table 2), not surprising given the greater radial distance to the pumping well and the leaky conditions in the aquifer. The recovery data analysis are shown on the figure in Appendix A. Table 2 summarizes the quantitative analysis of the results from Well No. 673420.

Discussion

The principal reason for collecting water level data from the wells was to assess qualitatively the aquifer response to various pumping conditions. That the data could be subjected to quantitative analysis to estimate aquifer hydraulic properties is an incidental benefit. While the results of these analyses are generally fair to good, they suffer from a few problems. First, it is likely that equilibrium hydraulic conditions did not exist prior to the onset of pumping at Coon Rapids Well Nos. 19 and 20. The lack of background data do not allow this to be established conclusively, but the recovery data infer it. Second, the water level data, especially those collected in Well No. 673420, are noisy, suggesting other aquifer

influences nearby. Each of these problems may contribute uncertainty to the analysis results, but the drawdown and recovery responses from the municipal pumping are generally large in comparison to the other influences. Improved results could be obtained by instrumenting the pumping wells and arranging for stable antecedent hydraulic conditions in the aquifer. Moreover, should other monitoring wells exist in the area, it may be worthwhile to measure water level responses during future pumping tests to get a good sense of variations over the scale of the well field and the likely capture zone of the wells.

H.R. Green (2002) and earlier reports prepared for the city of Coon Rapids (i.e., Hickok and Associates, 1986, 1989; Donahue and Associates, 1991) discuss the complex stratigraphic relationships within the unconsolidated materials above bedrock in the Coon Rapids area. The general relationship is of shallow sands, below which there is a fine-grained till which, in turn, covers deep sand and gravel materials. The deep sand and gravel comprise the deep Quaternary materials in which many of the Coon Rapids Quaternary wells are completed. It is clear from the information presented in Hickok (1986, 1989), Donahue (1991) and H.R. Green (2002) that the composition, distribution and geometry of the deep Quaternary Aquifer system is quite variable. From the data presented in those reports, it appears that Well No. 20 (420956), and Well No. 14 (110460) are in the area in which the deep Quaternary Aquifer is at its thickest, but that Well No. 19 (110475) and test Well No. 673418 are in areas where the aquifer begins to thin. This variability likely affected the results obtained in the pumping tests.

The analysis results (Table 2) show that the estimated T values for the aquifer vary from about 8000 to 110,000 ft^2/day. Previous MDH tests on Coon Rapids Well No. 20 (MDH, 1999) concluded the aquifer transmissivity is on the order of 38,300 ft^2/day (and S=0.00094), while Hickok (1989) reports results of 5080 ft^2/day in an area further north in Coon Rapids. For the current tests,, the Hantush-Jacob method, which accounts for leaky conditions in the pumped aquifer, gives transmissivity estimates that are on the low end of the range of the results using other techniques but that are likely the most reliable. The lower T values obtained from Well No. 673418 relative to those estimated from the data collected in Well No. 473420 suggest that the hydraulic properties of the aquifer vary, becoming less transmissive to the northwest. Storage values range from 0.00025 to 0.001. Leakage values from the Hantush-Jacob analyses suggest leakage factors of 725 to 900 feet.

The monitoring period also captured over 10 and nearly 20 feet of drawdown in Well Nos. 673418 and 673420, respectively, during concurrent pumping of Coon Rapids Well Nos. 17, 19, 20 and 22. No recovery from this pumping was recorded.

CONCLUSION

Transmissivity values of the aquifer likely vary over the study area. Evidence suggests the area to the northwest near Well No. 673418 is less transmissive than areas to the east and south. Accordingly, transmissivity values in the range of 8120 ft^2/day to 9420 ft^2/day are probably appropriate for the aquifer in the northwest near Coon Rapids Well No. 19 and testwell 673418, while values of 27,000 ft^2/day to 55,000 ft^2/day may be appropriate near Coon Rapids Well No. 20 and test Well No. 673420. These results compare well with the pumping test results obtained in 1999 from Coon Rapids Well No. 20. Storativity values are about 0.00025 to 0.0007.

References:

Donahue and Associates, 1991, letter to Scott Erickson, P.E., from Stephen D. Pettit, March 4, 1991.

Hantush, M.S., 1956, "Analysis of Data from Pumping Tests in Leaky Aquifers," American Geophysical Union Trans., v. 37, pp. 702-714.

Hickok and Associates, 1986, "Background Hydrogeological Report for the City of Coon Rapids," technical memorandum prepared for the city of Coon Rapids.

Hickok and Associates, 1989, "Coon Rapids Community Water Supply," letter to Tom Marthison, P.E., from Stephen D. Pettit, April 5, 1989.

H.R. Green Company, 2002, (Draft) "Well Siting Report Proposal for the City of Coon Rapids."

Kruseman, G.P. and N.A. de Ridder, 1991, *Analysis and Evaluation of Pumping Test Data*, International Institute for Land Reclamation and Improvement, Wageningen, The Netherlands, p. 377.

Minnesota Department of Health, 1999, "Analysis of the Coon Rapids No. 20 (420956) Aquifer Test."

Theis, C. V., 1935, "The Relation Between the Lowering of the Piezometric Surface and the Rate and Duration of Discharge of a Well Using Ground-Water Storage," Trans. American Geophysical Union, 16th Annual Meeting, April, 1935, pp. 519-24.

Figure 1. Groundwater Fluctuations, August 29 - Sept. 3, 2002
Coon Rapids Test Wells 673418, 673420

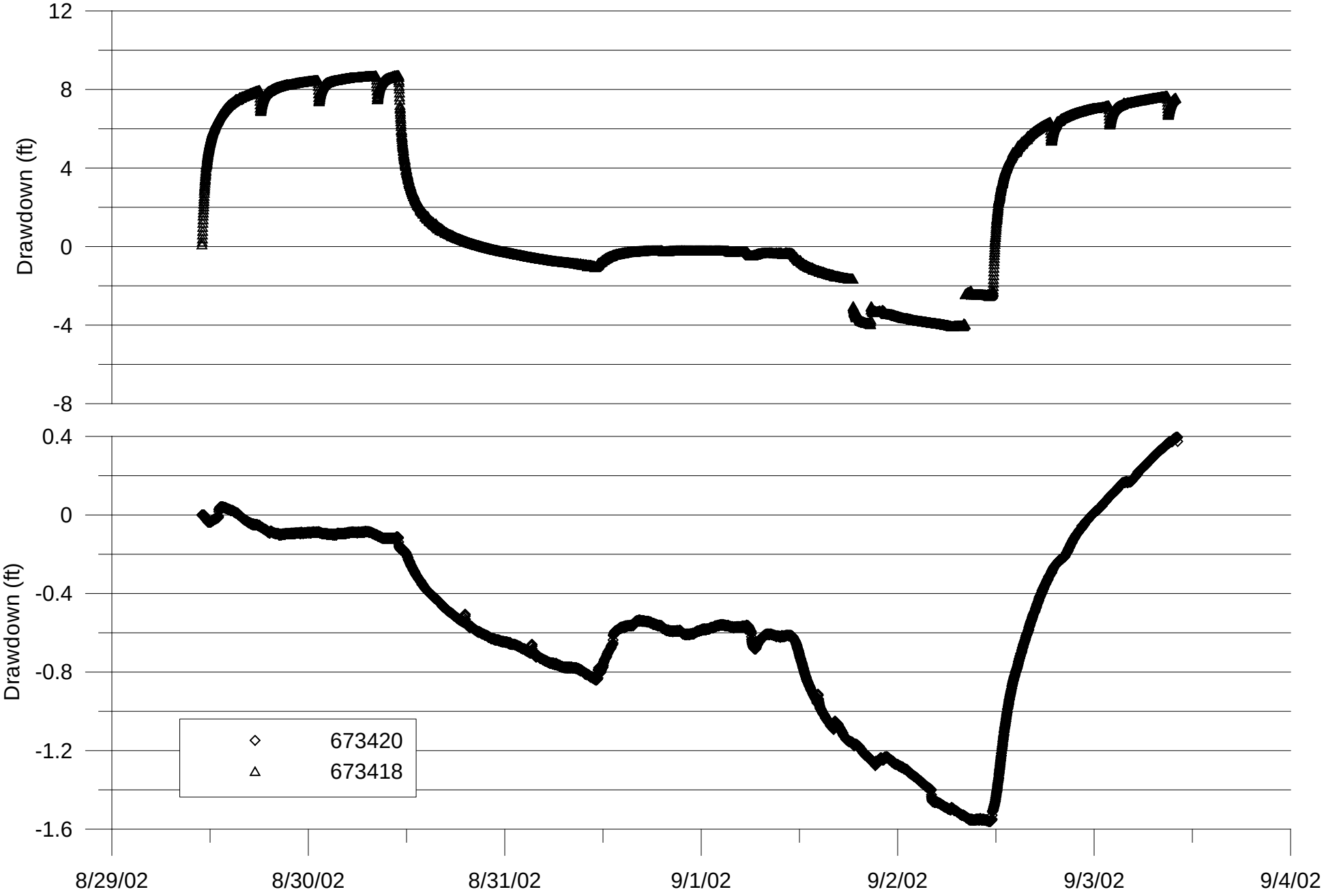


Table 1. Pumping Chronology
(Times approximate)

Date	Time	Action
August 29, 2002	11 am	Coon Rapids Well No 19 (110475) started. Beginning meter reading 201,963,000.
August 30, 2002	11 am	Coon Rapids Well No 19 (110475) stopped. Ending meter reading 203,718,000.
August 31, 2002	11 am	Coon Rapids Well No 20 (420956) started. Beginning meter reading 184,074,000.
September 1, 2002	11 am	Coon Rapids Well No 20 (420956) stopped. Ending meter reading 185,520,000.
September 2, 2002	11 am	Coon Rapids Well Nos. 17 (150357), 19 (110475), 20 (420956), and 22 (474385) started. Beginning meter readings of 90,970,000, 203,728,000, and 185,834,000 in Well Nos. 17, 19, and 20, respectively. No readings for Well No. 22.
September 3, 2002	11 am	Coon Rapids Well Nos. 17 (150357), 19 (110475), 20 (420956), and 22 (474385) stopped. Ending meter readings of 92,745,000, 205,437,000, and 187,521,000 in wells 17, 19, and 20, respectively. No readings for Well No. 22. Well No. 22 reportedly pumps at about 300 gpm.

Note: Information per Dick Dwyer, City of Coon Rapids.

Table 2. Pumping Test Results

Coon Rapids No. 19 (110475) Aquifer Test
August 29-31, 2002

	Transmissivity T (ft^2/day)	Storage Coefficient S	Time Period Emphasized	Analysis Method
	---	---	---	---
Test Well	8,120	0.00026	Minutes 4 - 140	Theis
No. 673418	9,420	NA	T/T' 2-10	Theis Recovery
	8,610	0.00025	Late pumping	Hantush-Jacob
Test Well				
No. 673420	66,000	NA	Minutes 1.5-6	Theis Recovery

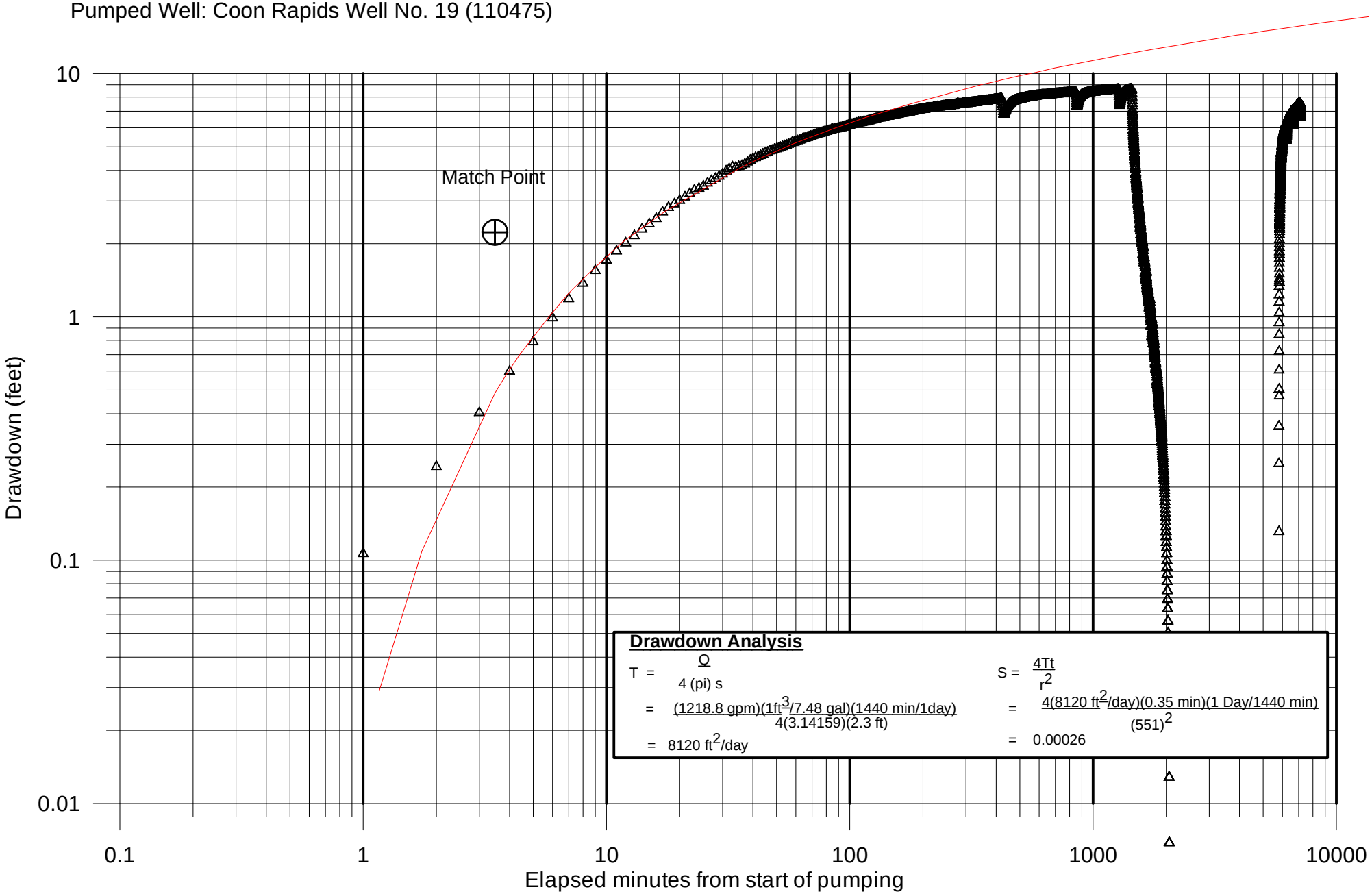
Coon Rapids No. 20 (420956) Aquifer Test
August 31- September 1, 2002

	Transmissivity T (ft^2/day)	Storage Coefficient S	Time Period Emphasized	Analysis Method
	---	---	---	---
Test Well	40,500	0.00067	Minutes 10-200	Theis
No. 673418	27,330	NA	T/T' 4.2-18	Theis Recovery
	26,900	0.0007	Late pumping	Hantush-Jacob
Test Well	110,000	0.00078	Minutes 40-250	Theis
No. 673420	51,350	NA	T/T' 5.5- 10	Theis Recovery
	54,900	0.001	Late Pumping	Hantush-Jacob

Aquifer Test Report Appendix A

Data Analysis

Observed Drawdown in 673418
Pumped Well: Coon Rapids Well No. 19 (110475)



Drawdown Analysis

$$T = \frac{Q}{4\,(pi)\,s} = \frac{(1218.8\ gpm)(1ft^3/7.48\ gal)(1440\ min/1day)}{4(3.14159)(2.3\ ft)} = 8120\ ft^2/day$$

$$S = \frac{4Tt}{r^2} = \frac{4(8120\ ft^2/day)(0.35\ min)(1\ Day/1440\ min)}{(551)^2} = 0.00026$$

UNSTEADY FLOW TO A WELL IN A SEMI-CONFINED AQUIFER WITH NO STORAGE IN OVERLYING AQUITARDS (HANTUSH-JACOB)

This document reads a set of time-drawdown data from disk, calculates a theoretical time-drawdown curve using user-specified parameters, and plots them both in a way that the user can interactively adjust the theoretical curve to obtain a match with the field data. Applied to Monitoring Well 673418 during pumping of Coon Rapids Well No. 19 (110475). Results presented below.

Read the field data and perform the data initialization:

Read data from disk: $A := \mathrm{READPRN}(\text{"673418.prn"})$

Data initializations: $nrows := rows(A)$

$nrows = 1.442 \cdot 10^3$

$i := 0, 1 .. nrows - 1$

$t := A^{<0>} \cdot min$

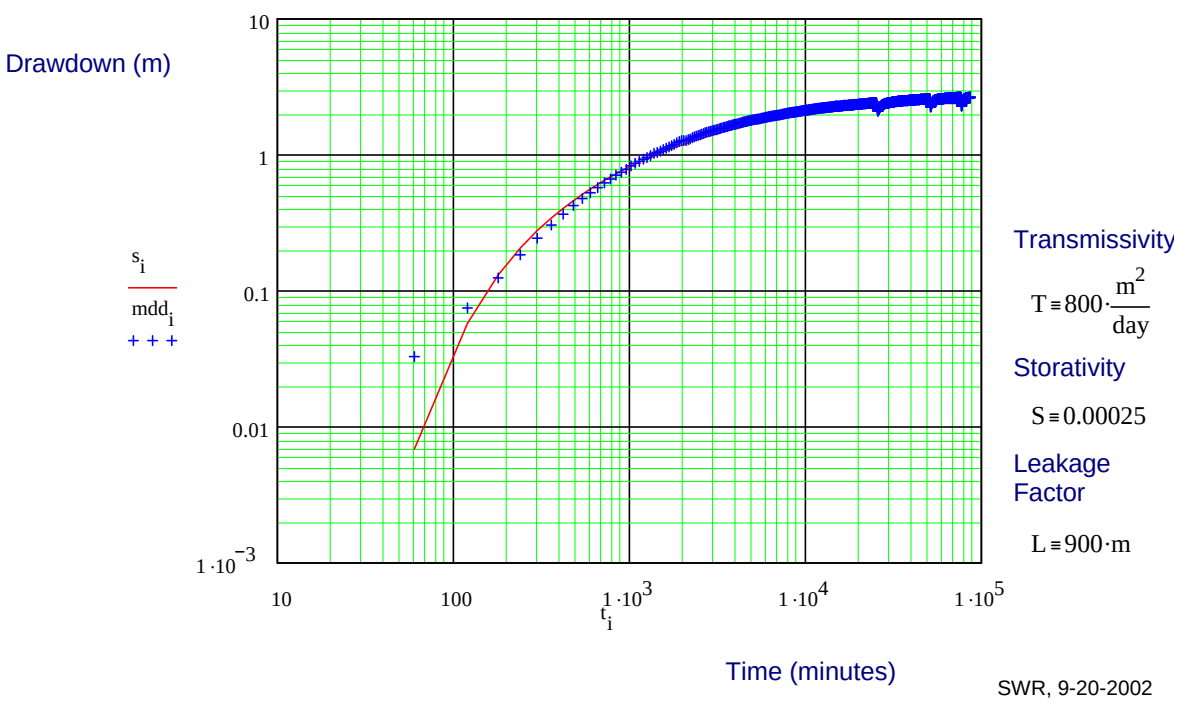
$mdd := A^{<1>} \cdot m$

Enter test parameters:

Well discharge (L^3/T): $Q := 6644.1 \cdot \frac{m^3}{day}$

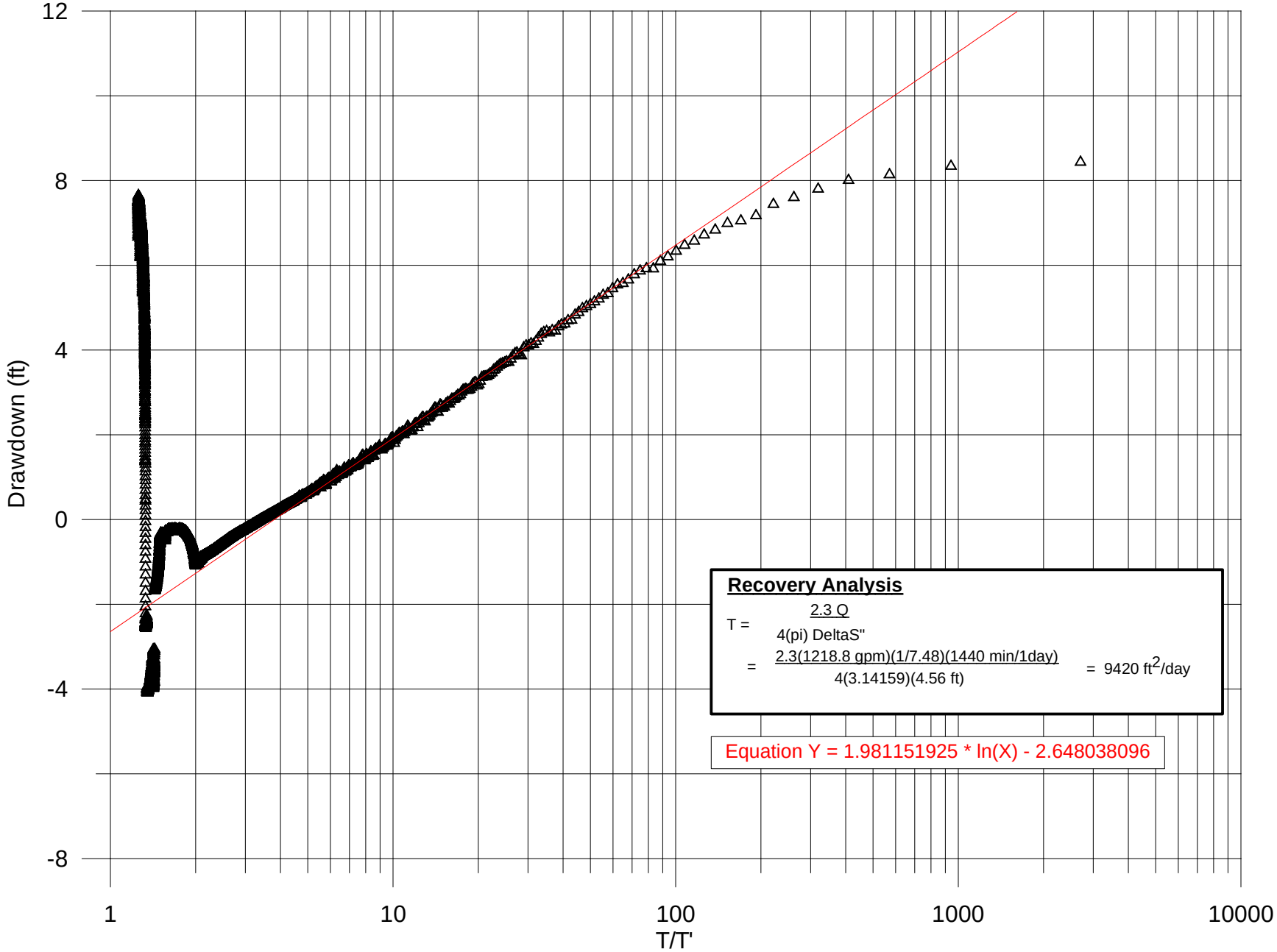
Radial distance from pumping to observation well (L): $r := 168 \cdot m$

Comparison of Observed and Theoretical Drawdowns (Hantush-Jacob Method)



SWR, 9-20-2002

Observed Recovery in Well 673418
Pumped Well: Coon Rapids Well No. 19 (110475)



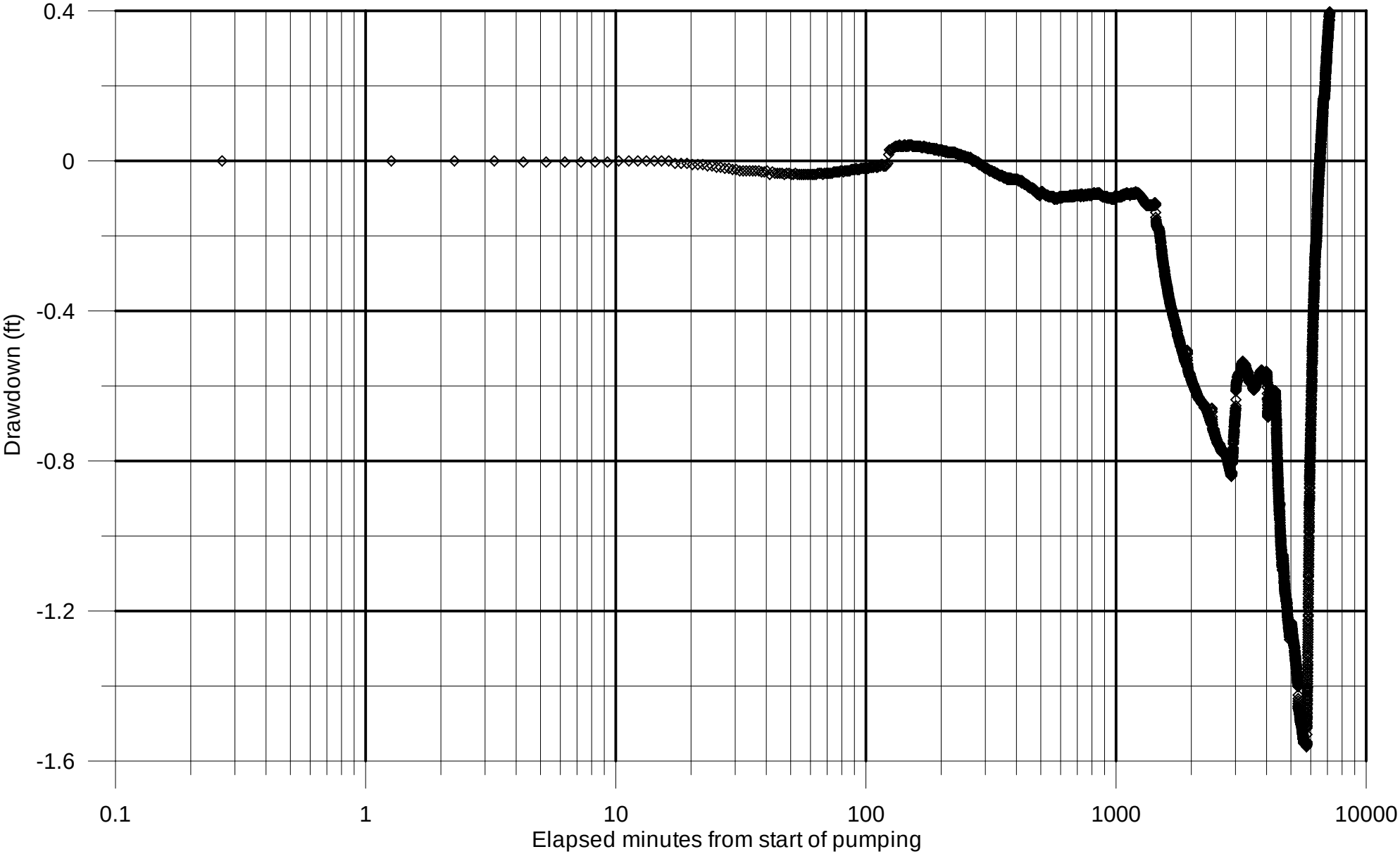
Recovery Analysis

$$T = \frac{2.3\,Q}{4(\pi)\,\text{DeltaS''}}$$

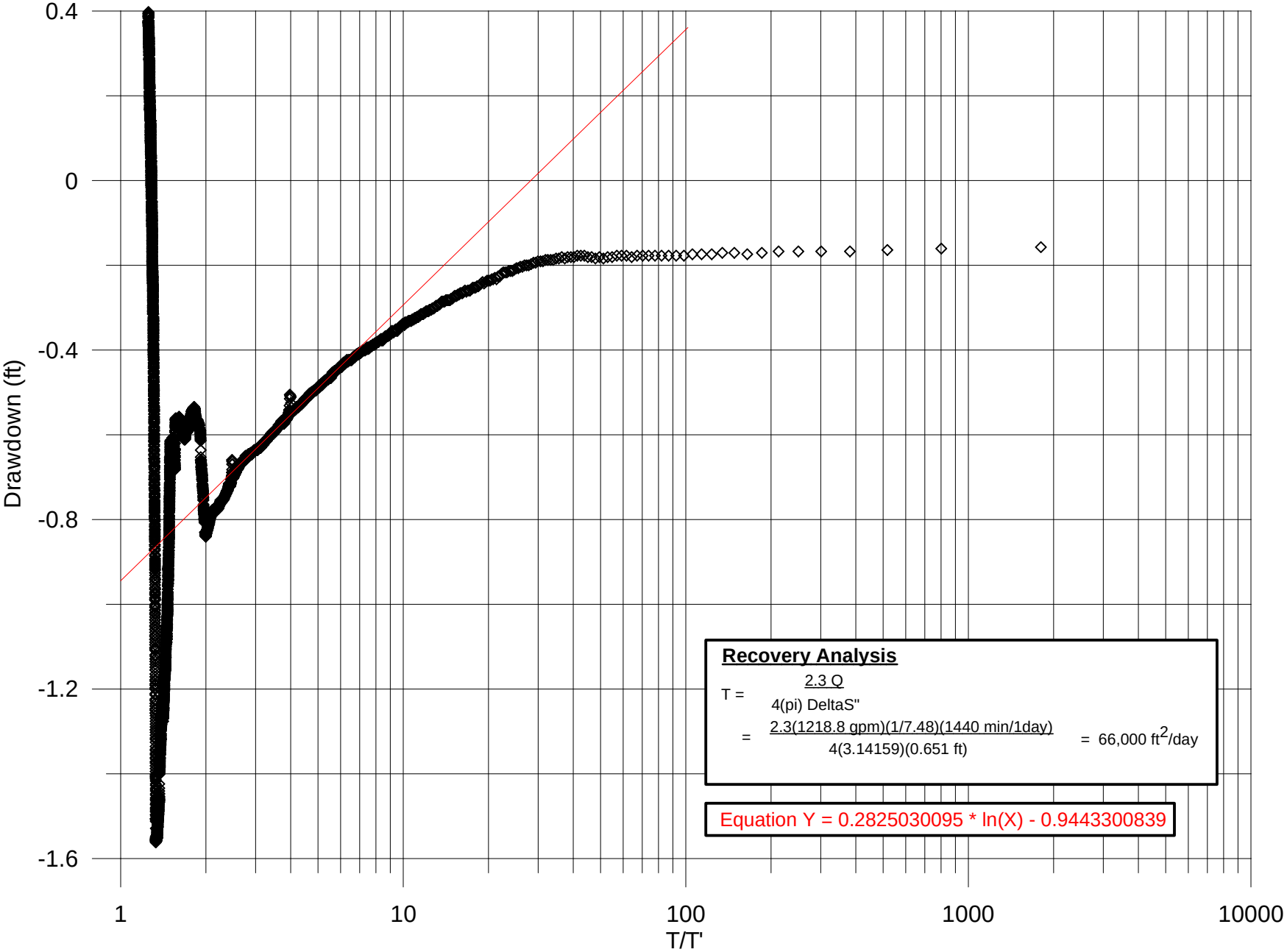
$$= \frac{2.3(1218.8\text{ gpm})(1/7.48)(1440\text{ min}/1\text{day})}{4(3.14159)(4.56\text{ ft})} = 9420\text{ ft}^2/\text{day}$$

Equation Y = 1.981151925 * ln(X) - 2.648038096

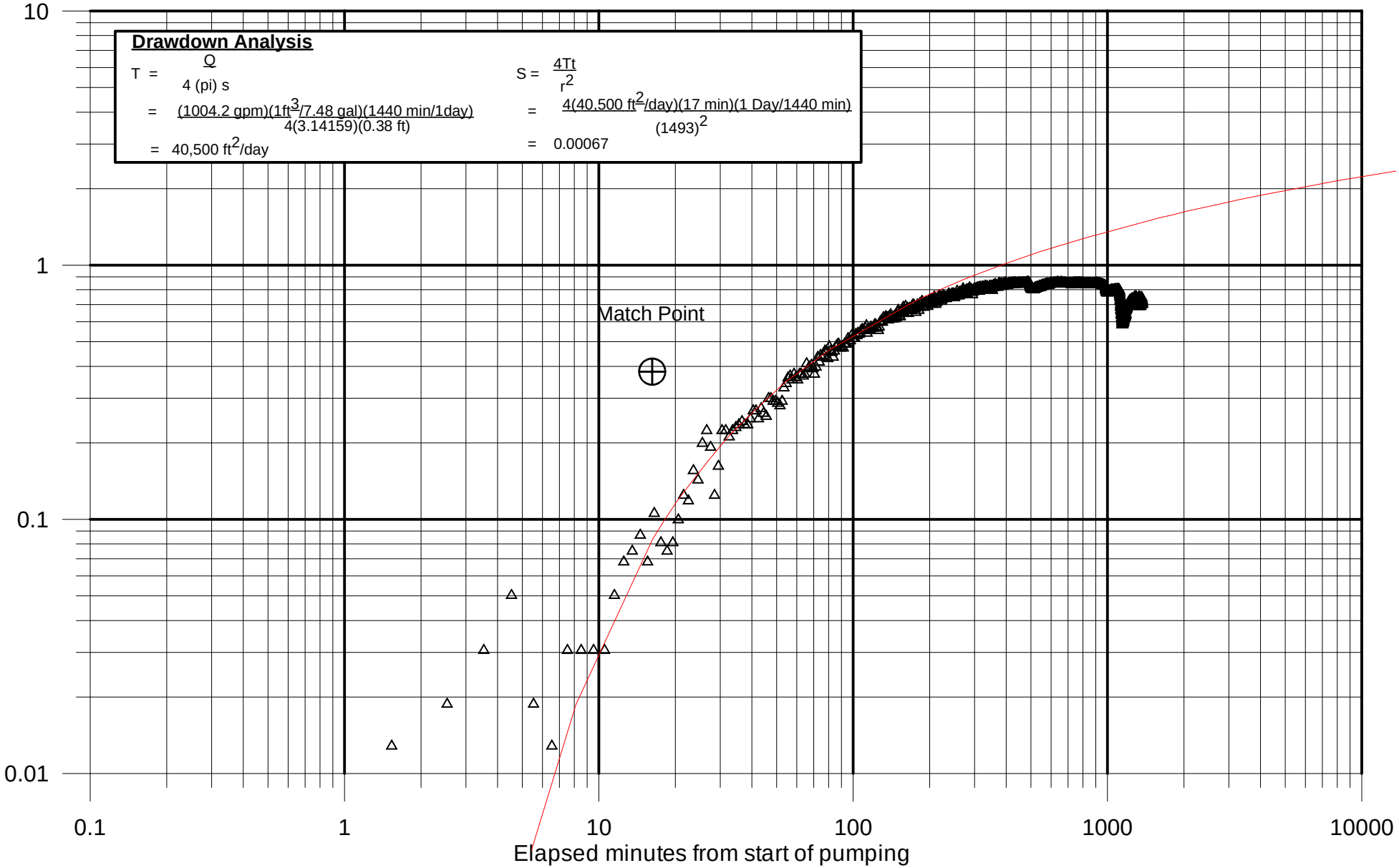
Observed Drawdown in well 673420
Pumped Well: Coon Rapids Well No. 19 (110475)



Observed Recovery in 673420
Pumped Well: Coon Rapids Well No. 19 (110475)



Observed Drawdown in Test Well 673418
Pumped Well: Coon Rapids No. 20 (420956)
Test Date: August 31 - September 1, 2002



UNSTEADY FLOW TO A WELL IN A SEMI-CONFINED AQUIFER WITH NO STORAGE IN OVERLYING AQUITARDS (HANTUSH-JACOB)

This document reads a set of time-drawdown data from disk, calculates a theoretical time-drawdown curve using user-specified parameters, and plots them both in a way that the user can interactively adjust the theoretical curve to obtain a match with the field data. Applied to Monitoring Well 673418 during pumping of Coon Rapids Well No. 20 (420956). Results presented below.

Read the field data and perform the data initialization:

Read data from disk: $A := \mathrm{READPRN}(\text{"673418\_cr20dd.txt"})$

Data initializations: $nrows := \mathrm{rows}(A)$

$nrows = 1.441 \cdot 10^3$

$i := 0, 1 .. nrows - 1$

$t := A^{<0>} \cdot min$

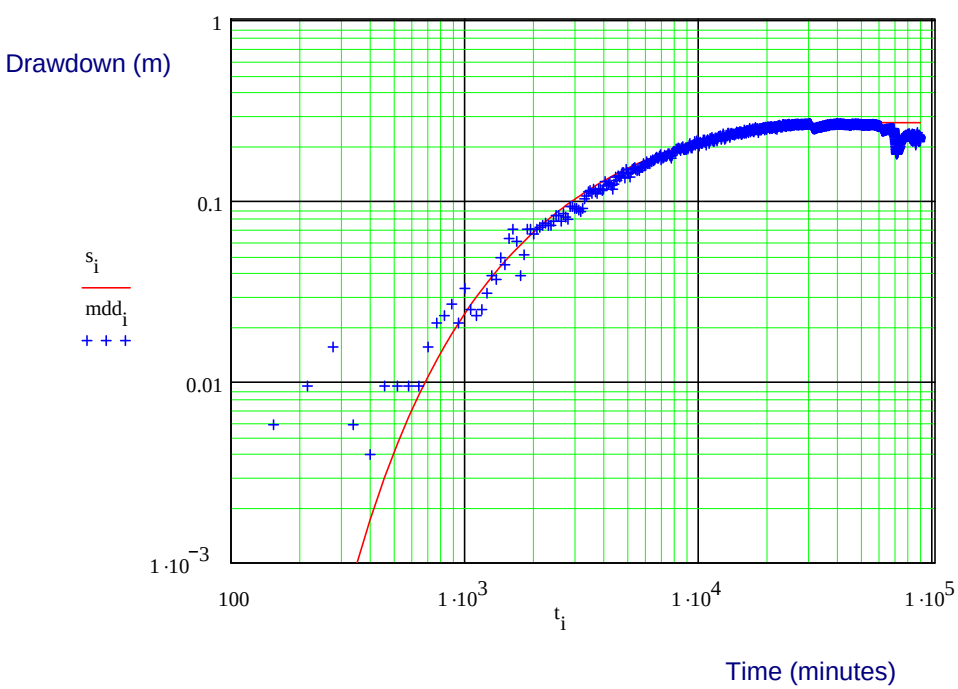
$mdd := A^{<1>} \cdot m$

Enter test parameters:

Well discharge (L^3/T): $Q := 5474.1 \cdot \frac{m^3}{day}$

Radial distance from pumping to observation well (L): $r := 455 \cdot m$

Comparison of Observed and Theoretical Drawdowns (Hantush-Jacob Method)



Transmissivity

$T \equiv 2500 \cdot \frac{m^2}{day}$

Storativity

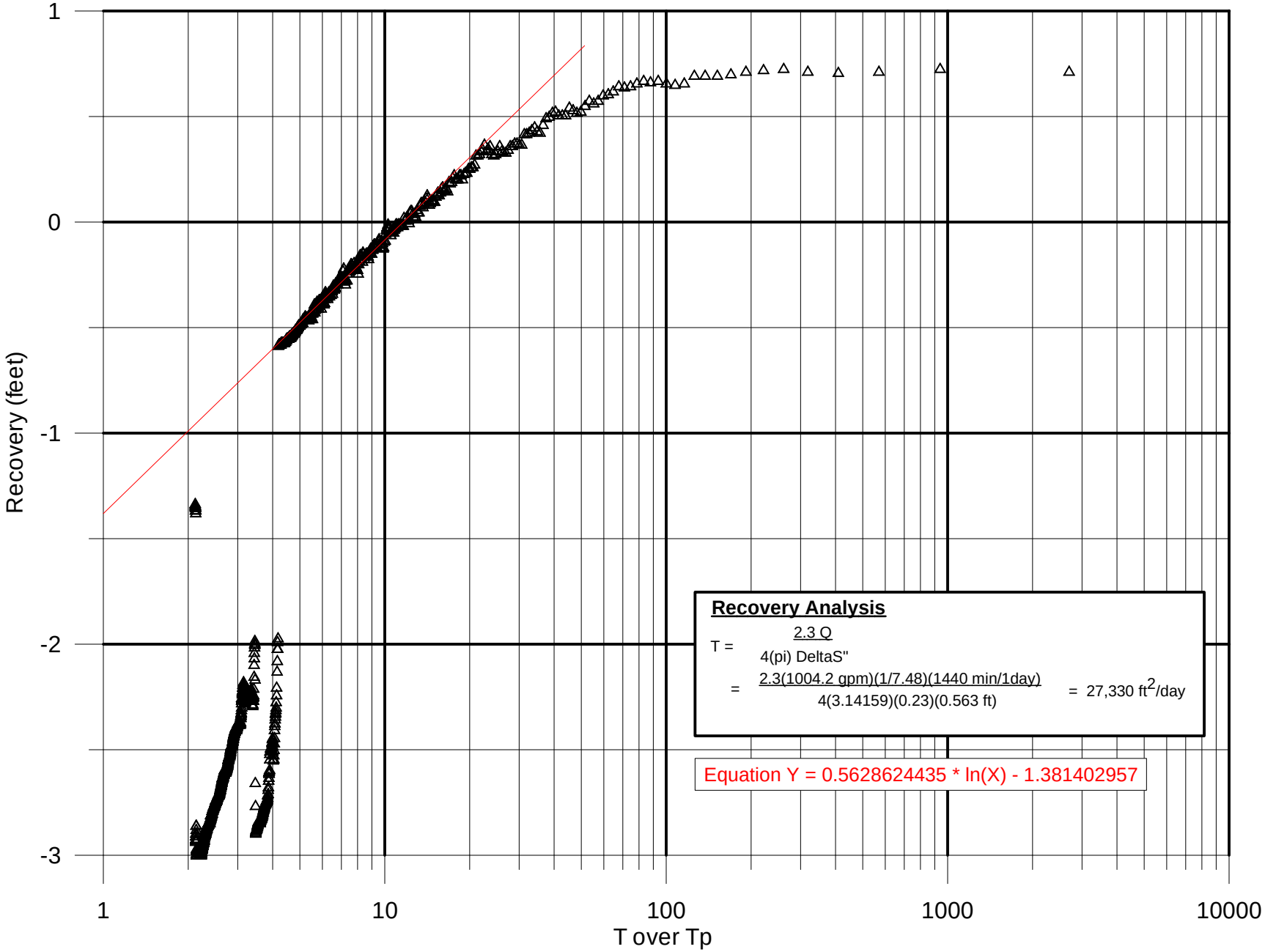
$S \equiv 0.0007$

Leakage Factor

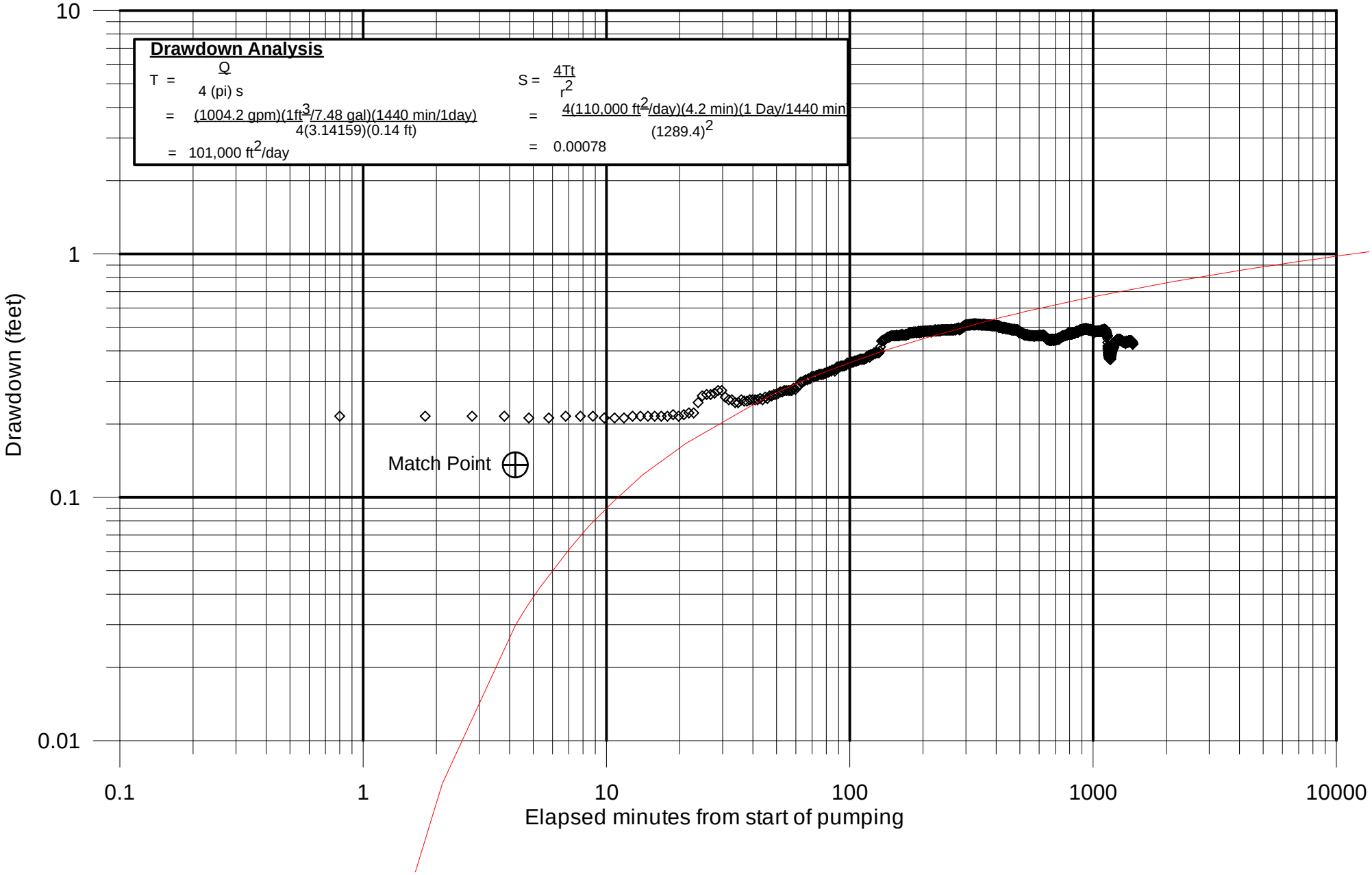
$L \equiv 750 \cdot m$

SWR, 9-26-2002

Observed Recovery in Test Well 673418
Pumped Well: Coon Rapids Well No. 20 (420956)
Test Date: August 31 - September 1, 2002



Observed Drawdown in Test Well 673420
Pumped Well: Coon Rapids No. 20 (420956)
Test Date: August 31 - September 1, 2002



UNSTEADY FLOW TO A WELL IN A SEMI-CONFINED AQUIFER WITH NO STORAGE IN OVERLYING AQUITARDS (HANTUSH-JACOB)

This document reads a set of time-drawdown data from disk, calculates a theoretical time-drawdown curve using user-specified parameters, and plots them both in a way that the user can interactively adjust the theoretical curve to obtain a match with the field data. Applied to Monitoring Well 673420 during pumping of Coon Rapids Well No. 20 (420956). Results presented below.

Read the field data and perform the data initialization:

Read data from disk: $A := \mathrm{READPRN}(\text{"673420\_dd\_cr20\_.prn"})$

Data initializations: $nrows := rows(A)$

$nrows = 2.371 \cdot 10^3$

$i := 0, 1 .. nrows - 1$

$t := A^{<0>} \cdot min$

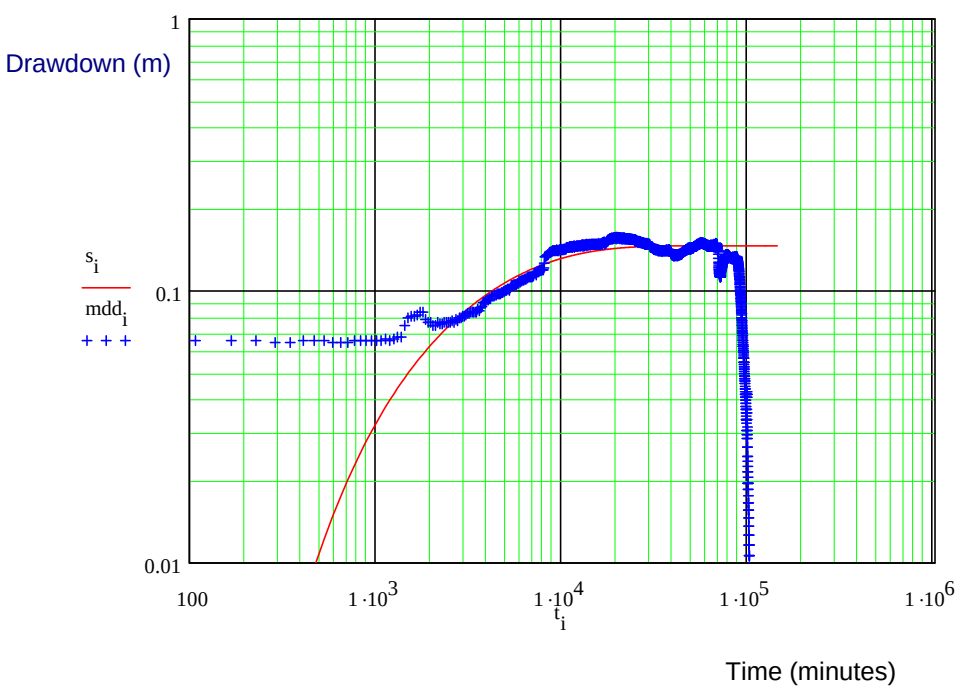
$mdd := A^{<1>} \cdot m$

Enter test parameters:

Well discharge (L^3/T): $Q := 5474 \cdot \frac{m^3}{day}$

Radial distance from pumping to observation well (L): $r := 393 \cdot m$

Comparison of Observed and Theoretical Drawdowns (Hantush-Jacob Method)



Transmissivity

$T \equiv 5100 \cdot \frac{m^2}{day}$

Storativity

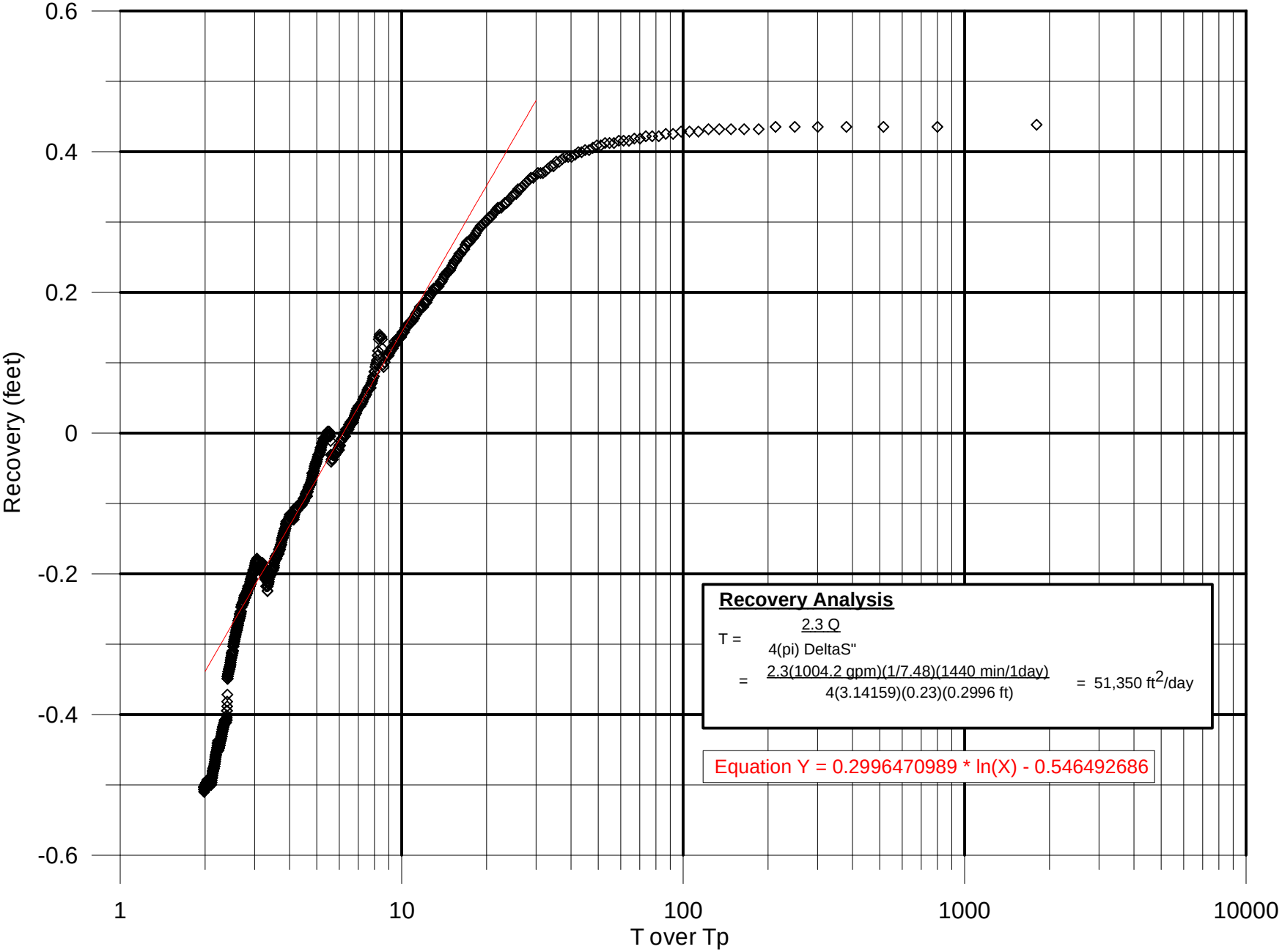
$S \equiv 0.001$

Leakage Factor

$L \equiv 725 \cdot m$

SWR, 9-26-2002

Observed Recovery in Test Well 673420
Pumped Well: Coon Rapids Well No. 20 (420956)
Test Date: August 31-September 1, 2002



Aquifer Test Report Appendix B

Field Data Sheets

Minnesota Department of Health
Special Services Unit
Drinking Water Protection Section
P.O. Box 64975
St. Paul, Minnesota 55164-0975

Test No.

Aquifer Test Information

Test Location	Well Owner	Test Conducted By
CR #19	COON RAPIDS	SCWR/HR GREEN/City CR
Date/Time Test Start	**Flow Rate (Units)**	**Pump Type**
8/29/02 11 am	VARIABLE	
Date/Time Recovery Start	**Flow Rate Measuring Device**	**Pump Intake Depth**
8/30/02 11 am	Flow meter	
Date/Time Test Finish	**Totalizer: End**	**Pumped Well Inner Casing Diameter**
9/3/02	203,718,000	
Notes	**Totalizer: Start**	**Confined/Unconfined**
	201963,000	CONF
	Total Pumped (Units)	**Quad Sheet Name/Number**
	1755,000 gals [1218.89 gpm]	

Unique Well Numbers	Location T, R, S, Quarters	Location N, E	Radial Distance	Open Depth	Transducer Setting	Measuring Point Location	Elevation, Datum
Pumped Well ~~VARIES~~ CR #19 110475		N E					
Observation Wells		N E					
OB Well # 673418		N (well 19) E 0208291	168m 551.2 ft	BTW	52.29 59.92		8-29-02 9:37 9-3-02 10:00
673420		N (well 19) E 0208291	566.8 m 1860 ft well 14		61.96 62.37		10:31 8-29 9-3-02
		N E	94 m				
		N E					

Sketch Map of Well Locations

0209032.txt

MINNESOTA MDH DEPARTMENT OF HEALTH
Environmental Health Division
Drinking Water Protection Section
Source Water Protection Unit
P.O. Box 64975
St. Paul, Minnesota 55164-0975

Determination of Aquifer Properties and Aquifer Test Plan (DAP-ATP) Form

Public Water Supply ID:	1020017	PWS Name:	Coon Rapids

Contact Information for Person Completing this Form

Name:	John Greer
Address:	Barr Engineering Company
	4700 West 77th Street, Suite 200
City, State, Zip:	Edina, MN 55435
Phone, Fax, e-mail:	(952) 832-2691

Aquifer Properties Determination Methods

☐ 1) An existing pumping test that meets the requirements of wellhead protection rule part 4720.5520 and that was previously conducted on a well connected to the public water supply system.

☐ 2) An existing pumping test that meets the requirements of wellhead protection rule part 4720.5520 and that was previously conducted on another well in a hydrogeologic setting determined by the department to be equivalent.

☐ 3) A proposed new test to be conducted on a new or existing well connected to the public water supply system and that meets the requirements for larger-sized water systems (wellhead protection rule part 4720.5520). A test plan must be approved before conducting the test.

☐ 4) A proposed new test to be conducted on a new or existing public well connected to the public water supply system and that meets the requirements for smaller-sized water systems (wellhead protection rule part 4720.5530). A test plan must be approved before conducting the test.

☐ 5) An existing pumping test that does not meet the requirements of wellhead protection rule part 4720.5520 and that was previously conducted on: 1) a public water supply well or 2) another well in a hydrogeologic setting determined by the department to be equivalent.

☑ 6) Existing specific capacity test(s) conducted on the public water supply well(s) or specific capacity tests conducted on other wells in a hydrogeologic setting determined by the department to be equivalent.

☐ 7) An existing published transmissivity value.

- Include all test data and analysis documentation with the estimated transmissivity, ft^2/day, when the aquifer properties determination method is; 1, 2, 5, 6, or 7, listed above.
- ▪▪ Attach detailed aquifer test plan for methods 3 or 4.

Submitted by: John Greer	Prof. License: 30347	Date: 7/31/2015

To request this document in another format, please call our Section Receptionist (651/201-4700) or Division TTY (651/201-5797).

Rationale for: 1) Aquifer Properties Determination or 2) Proposed New Test

Briefly describe the rationale for: 1) selected method to determine aquifer properties from existing data, **or** 2) a new aquifer test to be conducted on the pumped well referenced below. Include unique well numbers of all wells that were (or will be) monitored during data collection. How does the existing or proposed test deviate from the ideal. (e.g. rate, duration, no. of obwells, interfering wells, etc.) Attach documentation as necessary.

Aquifer Name:	Tunnel City Group - Wonewoc Sandstone	✓ Confined	☐ Unconfined	☐ Fractured Rock

Specific capacity data on the CWI logs for Coon Rapids Wells 24 (Unique Number 674478) and 25 (Unique Number 674479) were analyzed using the TGuess Method (Bradbury and Rothschild, 1985) to obtain a geometric mean transmissivity of 7,700 ft**2/day for the combined Tunnel City-Wonewoc aquifer (see attached).

The Tunnel City Group (CTCG) and Wonewoc Sandstone (CWOC) are represented as separate layers in the groundwater model, so this combined transmissivity must be apportioned between the two units. A search of the CWI within 5 km of Coon Rapids found 418 wells with sufficient data completed only in the CTCG and 42 wells with sufficient data completed only the CWOC. Average formation thicknesses of 149 feet for the CTCG and 57 feet for the CWOC were determined from the logs for the City of Coon Rapids wells that completely penetrate both units. The CTCG and CWOC data were analyzed using the TGuess method to obtain geometric mean T values of 1,300 ft**2/day for the CTCG and 530 ft**2/day for the CWOC. From these results, a ratio of 2.45:1 was used to apportion the combined Tunnel City-Wonewoc T of 7,700 ft**2/day to the CTCG and CWOC; the base case CTCG for the groundwater model was 5,470 ft**2/day and the base case CWOC T was 2,230 ft**2/day.

For the sensitivity analysis, the minimum T of 6,400 ft**2/day from Well 25 and the maximum T of 9,400 ft**2/day from Well 24 will be used as the lower and upper bounds, respectively, on Tunnel City-Wonewoc transmissivity. These values will be apportioned between layers using the 2.45:1 ratio as detailed above for the base model.

Proposed New Test Information Summary

Pumped Well Name (Unique Number):	674478, 674479	**Test Duration (Hours):**	varies
Location: X, Y (meters) UTM-Z15N or Lat-Lon (decimal degrees) datum: NAD83	473799, 5001596 (674478) 474351, 5001197 (674479)	**Pump Type:**	unknown
		Discharge Rate:	1560 gpm
Number of Observation Wells:	0	**Flow Rate Measuring Device Type:**	unknown

- A map showing the location of the pumping well and observation well(s) must be included.

List the unique number of each public water supply well to which this DAP-ATP Form applies

202926	202932	110460			
202929	202931	110461			
202972	202930	168720			
202951	202965	674478			
202937	168721	674479			
202943	161413				

Reviewed by: Amal Djerrari	**Approved:** ● Yes ○ No	**Approval Date:** 8/3/2015

Tunnel City - Wonewoc

Worksheet for Estimating Transmissivity and Hydraulic Conductivity from Specific Capacity Test Data

Explanation and notes attached.

Maximum iterations	100
Error tolerance (as drawdown)	0.001 feet

Field Data								*Estimated Parameters*			*Calculated Results*								*Diagnostics*					
		Depth to Water				Screened Interval													*Solution Integrity*			*Sensitivity of T:*		
Location	Well Diam.	Initial	Final	Test Duration	Mean Pumping Rate	Depth to Top	Depth to Bottom	Storage Coeff. (S)	Well loss Coeff. (C)	Aquifer Thickness (b)	Measured Drawdown (s_m)	Saturated Screen Length (L)	Well loss (s_w)	Partial Penetration Parameter (s_p)	Specific Capacity	**Transmissivity (T)**	**T (ft^2/day)**	**Conductivity (K)**	Calculated Drawdown	Error as Drawdown	Well Bore Storage Test	to S at ± 1 factor of 10	to s_w at 10% of s_m	to b at ± 25%
	inches	feet	feet	hours	gpm	feet	feet	-	sec^2/ft^5	feet	feet	feet	feet	-	gpm/ft	**sq ft/sec**		**ft/day**	feet			sq ft/sec	sq ft/sec	sq ft/sec
00674478 (Coon Rapids 24)	24	60.2	112	8	1560	240.5	388.0	0.001	0	236.0	51.80	147.5	0.0E+00	2.27	30.12	**1.1E-01**	**9.4E+03**	**39.7**	51.80	0.00%	pass	1.3E-02	1.3E-02	4.0E-02
00674479 (Coon Rapids 25)	24	51.4	121.4	48	1560	229.0	388.0	0.001	0	195.0	70.00	159.0	0.0E+00	0.74	22.29	**7.4E-02**	**6.4E+03**	**32.6**	70.00	0.00%	pass	9.6E-03	8.7E-03	1.9E-02

Geometric Mean **7.7E+03**

References:

Bradbury, K.B., and E.R. Rothschild, 1985. A computerized technique for estimating the hydraulic conductivity of aquifer from specific capacity data: Ground Water vol. 23, No. 2, pp. 240-246.

ASTM International, 2004. Standard Test Method for Determining Specific Capacity and Estimating Transmissivity at the Control Well, Standard D 5472-93, in Annual Book of ASTM Standards, Vol. 04.08 pp. 1279-1282.

Tunnel City Group

Worksheet for Estimating Transmissivity and Hydraulic Conductivity from Specific Capacity Test Data

Explanation and notes attached.

Maximum iterations	100
Error tolerance (as drawdown)	0.001 feet

	Field Data							*Estimated Parameters*			*Calculated Results*								*Diagnostics*					
		Depth to Water				Screened Interval													*Solution Integrity*			*Sensitivity of T:*		
Location	Well Diam.	Initial	Final	Test Duration	Mean Pumping Rate	Depth to Top	Depth to Bottom	Storage Coeff. (S)	Well loss Coeff. (C)	Aquifer Thickness (b)	Measured Drawdown (s_m)	Saturated Screen Length (L)	Well loss (s_w)	Partial Penetrameter Parameter (s_p)	Specific Capacity	**Transmissivity (T)**	**T (ft^2/day)**	**Conductivity (K)**	Calculated Drawdown	Error as Drawdown	Well Bore Storage Test	to S at ± 1 factor of 10	to s_w at 10% of s_m	to b at ± 25%
	inches	feet	feet	hours	gpm	feet	feet	-	sec^2/ft^5	feet	feet	feet	feet	-	gpm/ft	**sq ft/sec**		**ft/day**	feet			sq ft/sec	sq ft/sec	sq ft/sec
00104713	4	40	55	4	60	173.0	187.0	0.001	0	149.0	15.00	14.0	0.0E+00	42.84	4.00	**7.4E-02**	**6.4E+03**	**42.7**	15.00	0.00%	pass	1.6E-03	8.3E-03	3.7E-02
00104723	4	30	40	3	30	150.0	188.0	0.001	0	149.0	10.00	38.0	0.0E+00	14.78	3.00	**2.5E-02**	**2.1E+03**	**14.3**	10.00	0.00%	pass	1.3E-03	2.8E-03	1.1E-02
00104753	4	20	30	3	60	161.0	188.0	0.001	0	149.0	10.00	27.0	0.0E+00	21.84	6.00	**6.5E-02**	**5.7E+03**	**38.0**	10.00	0.00%	pass	2.5E-03	7.4E-03	3.1E-02
00104788	4	12	30	4	45	171.0	188.0	0.001	0	149.0	18.00	17.0	0.0E+00	35.30	2.50	**3.9E-02**	**3.4E+03**	**22.7**	18.00	0.00%	pass	1.0E-03	4.4E-03	1.9E-02
00104846	4	25	60	3	90	152.0	167.0	0.001	0	149.0	35.00	15.0	0.0E+00	40.00	2.57	**4.4E-02**	**3.8E+03**	**25.8**	35.00	0.00%	pass	1.1E-03	5.0E-03	2.2E-02
00104866	4	20	50	4	60	149.0	172.0	0.001	0	149.0	30.00	23.0	0.0E+00	25.91	2.00	**2.4E-02**	**2.1E+03**	**14.2**	30.00	0.00%	pass	8.3E-04	2.8E-03	1.2E-02
00104898	4	20	50	6	60	150.0	200.0	0.001	0	149.0	30.00	50.0	0.0E+00	10.31	2.00	**1.3E-02**	**1.2E+03**	**7.7**	30.00	0.00%	pass	8.4E-04	1.5E-03	6.1E-03
00104899	4	40	65	3	30	213.0	223.0	0.001	0	149.0	25.00	10.0	0.0E+00	59.65	1.20	**2.9E-02**	**2.5E+03**	**16.8**	25.00	0.00%	pass	4.9E-04	3.2E-03	1.5E-02
00105116	4	50	60	3	40	141.0	156.0	0.001	0	149.0	10.00	15.0	0.0E+00	40.00	4.00	**6.9E-02**	**6.0E+03**	**40.3**	10.00	0.00%	pass	1.6E-03	7.8E-03	3.5E-02
00105327	4	30	40	3	20	158.0	201.0	0.001	0	149.0	10.00	43.0	0.0E+00	12.65	2.00	**1.5E-02**	**1.3E+03**	**8.6**	10.00	0.00%	pass	8.4E-04	1.7E-03	6.9E-03
00105384	4	30	40	3	30	197.0	214.0	0.001	0	149.0	10.00	17.0	0.0E+00	35.30	3.00	**4.7E-02**	**4.1E+03**	**27.2**	10.00	0.01%	pass	1.2E-03	5.3E-03	2.3E-02
00107147	4	60	80	2	20	311.0	335.0	0.001	0	149.0	20.00	24.0	0.0E+00	24.77	1.00	**1.2E-02**	**1.0E+03**	**6.7**	20.00	0.00%	pass	4.1E-04	1.3E-03	5.7E-03
00111261	4	22	50	4	40	105.0	156.0	0.001	0	149.0	28.00	51.0	0.0E+00	10.02	1.43	**9.2E-03**	**7.9E+02**	**5.3**	28.00	0.00%	pass	6.0E-04	1.0E-03	4.3E-03
00111269	4	23	54	4	50	108.0	160.0	0.001	0	149.0	31.00	52.0	0.0E+00	9.74	1.61	**1.0E-02**	**8.8E+02**	**5.9**	31.00	0.00%	pass	6.8E-04	1.2E-03	4.8E-03
00114342	4	35	37	3	20	137.0	175.0	0.001	0	149.0	2.00	38.0	0.0E+00	14.78	10.00	**8.5E-02**	**7.3E+03**	**49.0**	2.00	0.01%	pass	4.2E-03	9.6E-03	3.8E-02
00114417	10	89	120	10	300	240.0	383.0	0.001	0	149.0	31.00	143.0	0.0E+00	0.15	9.68	**2.9E-02**	**2.5E+03**	**16.6**	31.00	0.00%	pass	4.2E-03	3.4E-03	7.2E-03
00121670	4	12	30	3	30	144.0	200.0	0.001	0	149.0	18.00	56.0	0.0E+00	8.71	1.67	**9.9E-03**	**8.5E+02**	**5.7**	18.00	0.00%	pass	7.0E-04	1.1E-03	4.6E-03
00122176	4	17	40	2	30	119.0	129.0	0.001	0	149.0	23.00	10.0	0.0E+00	59.65	1.30	**3.1E-02**	**2.7E+03**	**18.2**	23.00	0.00%	pass	5.4E-04	3.5E-03	1.7E-02
00122201	4	22	45	6	20	188.0	201.0	0.001	0	149.0	23.00	13.0	0.0E+00	46.09	0.87	**1.7E-02**	**1.5E+03**	**9.8**	23.00	0.00%	pass	3.6E-04	1.9E-03	8.7E-03
00122215	6	18	42	4	100	127.0	181.0	0.001	0	149.0	24.00	54.0	0.0E+00	8.50	4.17	**2.5E-02**	**2.1E+03**	**14.3**	24.00	0.00%	pass	1.8E-03	2.8E-03	1.1E-02
00122231	6	22	48	5	100	141.0	241.0	0.001	0	149.0	26.00	100.0	0.0E+00	2.27	3.85	**1.4E-02**	**1.2E+03**	**8.1**	26.00	0.00%	pass	1.7E-03	1.6E-03	5.6E-03
00122451	4	28	40	2	30	148.0	172.0	0.001	0	149.0	12.00	24.0	0.0E+00	24.77	2.50	**2.9E-02**	**2.5E+03**	**17.0**	12.00	0.00%	pass	1.0E-03	3.3E-03	1.4E-02
00122464	4	38	45	2	25	159.0	230.0	0.001	0	149.0	7.00	71.0	0.0E+00	5.78	3.57	**1.8E-02**	**1.5E+03**	**10.2**	7.00	0.01%	pass	1.5E-03	2.0E-03	8.1E-03
00122534	4	27	40	2	25	163.0	215.0	0.001	0	149.0	13.00	52.0	0.0E+00	9.74	1.92	**1.2E-02**	**1.0E+03**	**7.0**	13.00	0.00%	pass	8.1E-04	1.4E-03	5.7E-03
00122886	4	15	32	4	12	155.0	200.0	0.001	0	149.0	17.00	45.0	0.0E+00	11.92	0.71	**4.9E-03**	**4.3E+02**	**2.9**	17.00	0.00%	pass	3.0E-04	5.6E-04	2.3E-03
00124102	4	13	20	5	30	108.0	117.0	0.001	0	149.0	7.00	9.0	0.0E+00	66.14	4.29	**1.1E-01**	**9.9E+03**	**66.6**	7.00	0.00%	pass	1.8E-03	1.3E-02	6.1E-02
00124136	4	35	50	4	50	180.0	197.0	0.001	0	149.0	15.00	17.0	0.0E+00	35.30	3.33	**5.2E-02**	**4.5E+03**	**30.3**	15.00	0.00%	pass	1.4E-03	5.9E-03	2.6E-02
00124136	4	35	50	2	50	180.0	197.0	0.001	0	149.0	15.00	17.0	0.0E+00	35.30	3.33	**5.2E-02**	**4.5E+03**	**30.1**	15.00	0.00%	pass	1.4E-03	5.8E-03	2.6E-02
00124971	4	35	55	4	30	127.0	132.0	0.001	0	149.0	20.00	5.0	0.0E+00	117.56	1.50	**6.7E-02**	**5.8E+03**	**39.1**	20.00	0.00%	pass	6.1E-04	7.5E-03	3.8E-02
00124998	4	16	30	4	100	172.0	204.0	0.001	0	149.0	14.00	32.0	0.0E+00	18.09	7.14	**6.9E-02**	**6.0E+03**	**39.9**	14.00	0.00%	pass	3.0E-03	7.8E-03	3.1E-02
00126388	4	50	60	3	30	216.0	246.0	0.001	0	149.0	10.00	30.0	0.0E+00	19.45	3.00	**3.0E-02**	**2.6E+03**	**17.3**	10.00	0.00%	pass	1.2E-03	3.4E-03	1.4E-02
00126472	4	50	60	3	40	151.0	186.0	0.001	0	149.0	10.00	35.0	0.0E+00	16.31	4.00	**3.5E-02**	**3.1E+03**	**20.5**	10.00	0.00%	pass	1.7E-03	4.0E-03	1.6E-02
00126500	4	30	40	3	30	136.0	170.0	0.001	0	149.0	10.00	34.0	0.0E+00	16.87	3.00	**2.7E-02**	**2.3E+03**	**15.6**	10.00	0.00%	pass	1.2E-03	3.1E-03	1.3E-02
00126601	4	40	63	3	12	132.0	200.0	0.001	0	149.0	23.00	68.0	0.0E+00	6.28	0.52	**2.5E-03**	**2.2E+02**	**1.5**	23.00	0.00%	pass	2.2E-04	2.9E-04	1.2E-03
00126606	4	22	42	3	12	110.0	145.0	0.001	0	149.0	20.00	35.0	0.0E+00	16.31	0.60	**5.1E-03**	**4.4E+02**	**3.0**	20.00	0.00%	pass	2.5E-04	5.8E-04	2.4E-03
00126611	4	40	63	3	12	156.0	215.0	0.001	0	149.0	23.00	59.0	0.0E+00	8.02	0.52	**2.8E-03**	**2.5E+02**	**1.7**	23.00	0.00%	pass	2.2E-04	3.3E-04	1.4E-03
00126695	4	20	50	1	60	179.0	235.0	0.001	0	149.0	30.00	56.0	0.0E+00	8.71	2.00	**1.2E-02**	**9.9E+02**	**6.7**	30.00	0.00%	pass	8.4E-04	1.3E-03	5.6E-03
00126782	4	20	42	3	12	132.0	185.0	0.001	0	149.0	22.00	53.0	0.0E+00	9.47	0.55	**3.3E-03**	**2.8E+02**	**1.9**	22.00	0.00%	pass	2.3E-04	3.7E-04	1.6E-03
00126814	4	20	30	3	30	125.0	185.0	0.001	0	149.0	10.00	60.0	0.0E+00	7.80	3.00	**1.7E-02**	**1.5E+03**	**9.9**	10.00	0.01%	pass	1.3E-03	2.0E-03	7.9E-03
00127218	4	22	32	3	30	132.0	172.0	0.001	0	149.0	10.00	40.0	0.0E+00	13.87	3.00	**2.4E-02**	**2.0E+03**	**13.8**	10.00	0.00%	pass	1.3E-03	2.7E-03	1.1E-02
00127250	4	50	60	3	40	108.0	141.0	0.001	0	149.0	10.00	33.0	0.0E+00	17.46	4.00	**3.7E-02**	**3.2E+03**	**21.5**	10.00	0.00%	pass	1.7E-03	4.2E-03	1.7E-02
00128107	4	19	22	3	50	134.0	155.0	0.001	0	149.0	3.00	21.0	0.0E+00	28.47	16.67	**2.2E-01**	**1.9E+04**	**130.3**	3.00	0.01%	pass	6.9E-03	2.5E-02	1.1E-01
00128150	4	24	26	3	20	197.0	201.0	0.001	0	149.0	2.00	4.0	0.0E+00	146.35	10.00	**5.5E-01**	**4.8E+04**	**321.5**	2.00	0.00%	pass	4.1E-03	6.2E-02	3.2E-01
00131212	4	20	40	2	40	112.0	180.0	0.001	0	149.0	20.00	68.0	0.0E+00	6.28	2.00	**1.0E-02**	**8.6E+02**	**5.8**	20.00	0.00%	pass	8.5E-04	1.2E-03	4.7E-03
00131265	4	28	45	2	30	125.0	130.0	0.001	0	149.0	17.00	5.0	0.0E+00	117.56	1.76	**7.9E-02**	**6.8E+03**	**45.9**	17.00	0.00%	pass	7.2E-04	8.8E-03	4.5E-02
00131278	4	16	35	2	30	151.0	180.0	0.001	0	149.0	19.00	29.0	0.0E+00	20.20	1.58	**1.6E-02**	**1.4E+03**	**9.2**	19.00	0.00%	pass	6.6E-04	1.8E-03	7.6E-03
00132007	4	43	55	3	50	191.0	236.0	0.001	0	149.0	12.00	45.0	0.0E+00	11.92	4.17	**3.0E-02**	**2.6E+03**	**17.5**	12.00	0.00%	pass	1.7E-03	3.4E-03	1.4E-02
00132021	4	27	33	3	50	209.0	280.0	0.001	0	149.0	6.00	71.0	0.0E+00	5.78	8.33	**4.3E-02**	**3.7E+03**	**24.8**	6.00	0.00%	pass	3.5E-03	4.9E-03	1.9E-02
00135310	4	40	84	2	20	169.0	209.0	0.001	0	149.0	44.00	40.0	0.0E+00	13.87	0.45	**3.4E-03**	**2.9E+02**	**2.0**	44.00	0.00%	pass	1.9E-04	3.9E-04	1.7E-03
00135845	4	30	45	2	30	142.0	166.0	0.001	0	149.0	15.00	24.0	0.0E+00	24.77	2.00	**2.3E-02**	**2.0E+03**	**13.6**	15.00	0.00%	pass	8.3E-04	2.6E-03	1.1E-02
00136071	4	15	40	4	60	190.0	239.0	0.001	0	149.0	25.00	49.0	0.0E+00	10.61	2.40	**1.6E-02**	**1.4E+03**	**9.4**	25.00	0.00%	pass	1.0E-03	1.8E-03	7.4E-03
00136093	4	20	40	4	60	147.0	201.0	0.001	0	149.0	20.00	54.0	0.0E+00	9.21	3.00	**1.9E-02**	**1.6E+03**	**10.9**	20.00	0.00%	pass	1.3E-03	2.2E-03	8.6E-03
00137742	4	25	80	2	100	169.0	215.0	0.001	0	149.0	55.00	46.0	0.0E+00	11.57	1.82	**1.3E-02**	**1.1E+03**	**7.3**	55.00	0.00%	pass	7.6E-04	1.4E-03	5.9E-03
00137742	4	25	60	2	25	169.0	215.0	0.001	0	149.0	35.00	46.0	0.0E+00	11.57	0.71	**4.8E-03**	**4.2E+02**	**2.8**	35.00	0.00%	pass	3.0E-04	5.5E-04	2.3E-03
00139715	4	20	40	3	50	150.0	200.0	0.001	0	149.0	20.00	50.0	0.0E+00	10.31	2.50	**1.6E-02**	**1.4E+03**	**9.5**	20.00	0.00%	pass	1.0E-03	1.9E-03	7.6E-03
00139715	4	20	40	2	50	150.0	200.0	0.001	0	149.0	20.00	50.0	0.0E+00	10.31	2.50	**1.6E-02**	**1.4E+03**	**9.4**	20.00	0.00%	pass	1.0E-03	1.9E-03	7.6E-03
00140015	4	32	42	3	50	123.0	173.0	0.001	0	149.0	10.00	50.0	0.0E+00	10.31	5.00	**3.4E-02**	**2.9E+03**	**19.4**	10.00	0.00%	pass	2.1E-03	3.8E-03	1.5E-02
00140127	4	25	40	4	30	178.0	187.0	0.001	0	149.0	15.00	9.0	0.0E+00	66.14	2.00	**5.3E-02**	**4.6E+03**	**30.9**	15.00	0.00%	pass	8.2E-04	6.0E-03	2.9E-02
00140134	4	12	25	4	50	180.0	215.0	0.001	0	149.0	13.00	35.0	0.0E+00	16.31	3.85	**3.4E-02**	**3.0E+03**	**19.8**	13.00	0.00%	pass	1.6E-03	3.9E-03	1.6E-02
00140142	4	20	40	4	60	181.0	205.0	0.001	0	149.0	20.00	24.0	0.0E+00	24.77	3.00	**3.6E-02**	**3.1E+03**	**20.7**	20.00	0.00%	pass	1.2E-03	4.0E-03	1.7E-02
00140156	4	45	60	4	45	169.0	242.0	0.001	0	149.0	15.00	73.0	0.0E+00	5.47	3.00	**1.5E-02**	**1.3E+03**	**8.5**	15.00	0.00%	pass	1.3E-03	1.7E-03	6.6E-03
00143228	4	20	40	2	30	137.0	186.0	0.001	0	149.0	20.00	49.0	0.0E+00	10.61	1.50	**9.8E-03**	**8.4E+02**	**5.7**	20.00	0.00%	pass	6.3E-04	1.1E-03	4.6E-03
00144029	4	22	36	3	30	100.0	130.0	0.001	0	149.0	14.00	30.0	0.0E+00	19.45	2.14	**2.1E-02**	**1.8E+03**	**12.3**	14.00	0.00%	pass	8.9E-04	2.4E-03	1.0E-02
00144196	4	35	55	2	25	121.0	126.0	0.001	0	149.0	20.00	5.0	0.0E+00	117.56	1.25	**5.6E-02**	**4.8E+03**	**32.4**	20.00	0.00%	pass	5.1E-04	6.2E-03	3.2E-02
00145410	4	33	50	5	30	133.0	179.0	0.001	0	149.0	17.00	46.0	0.0E+00	11.57	1.76	**1.2E-02**	**1.1E+03**	**7.2**	17.00	0.00%	pass	7.4E-04	1.4E-03	5.7E-03

00147116	4	19	63	4	100	107.0	136.0	0.001	0	149.0	44.00	29.0	0.0E+00	20.20	2.27	**2.3E-02**	**2.0E+03**	**13.4**	44.00	0.00%	pass	9.4E-04	2.6E-03	1.1E-02
00147142	4	20	50	3	20	80.0	120.0	0.001	0	149.0	30.00	40.0	0.0E+00	13.87	0.67	**5.1E-03**	**4.4E+02**	**3.0**	30.00	0.00%	pass	2.8E-04	5.8E-04	2.4E-03
00147143	4	31	63	8	80	190.0	261.0	0.001	0	149.0	32.00	71.0	0.0E+00	5.78	2.50	**1.3E-02**	**1.1E+03**	**7.4**	32.00	0.00%	pass	1.1E-03	1.5E-03	5.6E-03
00147155	4	15	50	3	65	168.0	210.0	0.001	0	149.0	35.00	42.0	0.0E+00	13.04	1.86	**1.4E-02**	**1.2E+03**	**8.1**	35.00	0.00%	pass	7.8E-04	1.6E-03	6.5E-03
00149422	4	10	20	3	40	150.0	171.0	0.001	0	149.0	10.00	21.0	0.0E+00	28.47	4.00	**5.3E-02**	**4.6E+03**	**30.7**	10.00	0.00%	pass	1.7E-03	6.0E-03	2.6E-02
00155121	4	17	32	3	50	166.0	216.0	0.001	0	149.0	15.00	50.0	0.0E+00	10.31	3.33	**2.2E-02**	**1.9E+03**	**12.8**	15.00	0.00%	pass	1.4E-03	2.5E-03	1.0E-02
00155266	4	25	35	3	35	126.0	173.0	0.001	0	149.0	10.00	47.0	0.0E+00	11.24	3.50	**2.4E-02**	**2.1E+03**	**14.2**	10.00	0.00%	pass	1.5E-03	2.8E-03	1.1E-02
00155907	4	25	35	3	20	150.0	171.0	0.001	0	149.0	10.00	21.0	0.0E+00	28.47	2.00	**2.6E-02**	**2.3E+03**	**15.2**	10.00	0.00%	pass	8.3E-04	3.0E-03	1.3E-02
00156559	4	10	30	2	30	119.0	138.0	0.001	0	149.0	20.00	19.0	0.0E+00	31.54	1.50	**2.1E-02**	**1.8E+03**	**12.2**	20.00	0.00%	pass	6.2E-04	2.4E-03	1.0E-02
00156561	4	20	40	2	30	144.0	201.0	0.001	0	149.0	20.00	57.0	0.0E+00	8.48	1.50	**8.6E-03**	**7.4E+02**	**5.0**	20.00	0.00%	pass	6.3E-04	9.9E-04	4.1E-03
00156570	4	30	70	2	50	155.0	195.0	0.001	0	149.0	40.00	40.0	0.0E+00	13.87	1.25	**9.6E-03**	**8.3E+02**	**5.6**	40.00	0.00%	pass	5.2E-04	1.1E-03	4.6E-03
00158324	4	15	50	4	50	178.0	200.0	0.001	0	149.0	35.00	22.0	0.0E+00	27.13	1.43	**1.8E-02**	**1.6E+03**	**10.4**	35.00	0.00%	pass	5.9E-04	2.0E-03	8.7E-03
00158324	4	15	50	2	50	178.0	200.0	0.001	0	149.0	35.00	22.0	0.0E+00	27.13	1.43	**1.8E-02**	**1.5E+03**	**10.3**	35.00	0.00%	pass	5.9E-04	2.0E-03	8.7E-03
00158330	4	20	40	3	40	134.0	156.0	0.001	0	149.0	20.00	22.0	0.0E+00	27.13	2.00	**2.5E-02**	**2.2E+03**	**14.6**	20.00	0.00%	pass	8.3E-04	2.8E-03	1.2E-02
00158330	4	20	40	2	40	134.0	156.0	0.001	0	149.0	20.00	22.0	0.0E+00	27.13	2.00	**2.5E-02**	**2.2E+03**	**14.6**	20.00	0.00%	pass	8.3E-04	2.8E-03	1.2E-02
00158334	4	20	40	4	40	135.0	188.0	0.001	0	149.0	20.00	53.0	0.0E+00	9.47	2.00	**1.3E-02**	**1.1E+03**	**7.3**	20.00	0.00%	pass	8.4E-04	1.4E-03	5.8E-03
00158334	4	20	40	2	40	135.0	188.0	0.001	0	149.0	20.00	53.0	0.0E+00	9.47	2.00	**1.2E-02**	**1.1E+03**	**7.1**	20.00	0.00%	pass	8.4E-04	1.4E-03	5.8E-03
00159327	4	12	95	4	65	197.0	231.0	0.001	0	149.0	83.00	34.0	0.0E+00	16.87	0.78	**6.9E-03**	**6.0E+02**	**4.0**	83.00	0.00%	pass	3.3E-04	7.8E-04	3.3E-03
00159563	4	15	25	4	30	144.0	187.0	0.001	0	149.0	10.00	43.0	0.0E+00	12.65	3.00	**2.3E-02**	**1.9E+03**	**13.1**	10.00	0.00%	pass	1.3E-03	2.6E-03	1.0E-02
00159631	4	30	33	4	45	138.0	171.0	0.001	0	149.0	3.00	33.0	0.0E+00	17.46	15.00	**1.4E-01**	**1.2E+04**	**83.0**	3.00	0.01%	pass	6.2E-03	1.6E-02	6.4E-02
00161441	14	9.5	24	24	500	243.0	323.0	0.001	0	149.0	14.50	80.0	0.0E+00	3.43	34.48	**1.5E-01**	**1.3E+04**	**89.1**	14.50	0.00%	pass	1.5E-02	1.8E-02	5.5E-02
00161813	4	32	50	2	30	209.0	260.0	0.001	0	149.0	18.00	51.0	0.0E+00	10.02	1.67	**1.1E-02**	**9.1E+02**	**6.1**	18.00	0.00%	pass	7.0E-04	1.2E-03	5.0E-03
00165893	4	25	40	4.5	30	150.0	197.0	0.001	0	149.0	15.00	47.0	0.0E+00	11.24	2.00	**1.4E-02**	**1.2E+03**	**8.1**	15.00	0.00%	pass	8.4E-04	1.6E-03	6.4E-03
00166870	4	27	75	3	30	112.0	160.0	0.001	0	149.0	48.00	48.0	0.0E+00	10.92	0.63	**4.1E-03**	**3.5E+02**	**2.4**	48.00	0.00%	pass	2.6E-04	4.7E-04	2.0E-03
00166889	4	32	60	3	40	98.0	150.0	0.001	0	149.0	28.00	52.0	0.0E+00	9.74	1.43	**9.0E-03**	**7.7E+02**	**5.2**	28.00	0.00%	pass	6.0E-04	1.0E-03	4.2E-03
00169239	4	15	25	3.5	35	181.0	185.0	0.001	0	149.0	10.00	4.0	0.0E+00	146.35	3.50	**1.9E-01**	**1.7E+04**	**112.2**	10.00	0.00%	pass	1.4E-03	2.2E-02	1.1E-01
00169240	4	20	30	3.5	25	169.0	173.0	0.001	0	149.0	10.00	4.0	0.0E+00	146.35	2.50	**1.4E-01**	**1.2E+04**	**80.1**	10.00	0.00%	pass	1.0E-03	1.5E-02	8.0E-02
00170412	4	35	60	3	40	150.0	201.0	0.001	0	149.0	25.00	51.0	0.0E+00	10.02	1.60	**1.0E-02**	**8.8E+02**	**5.9**	25.00	0.00%	pass	6.7E-04	1.2E-03	4.8E-03
00170412	4	35	60	2	40	150.0	201.0	0.001	0	149.0	25.00	51.0	0.0E+00	10.02	1.60	**1.0E-02**	**8.7E+02**	**5.9**	25.00	0.00%	pass	6.7E-04	1.2E-03	4.8E-03
00170415	4	25	60	3	50	118.0	152.0	0.001	0	149.0	35.00	34.0	0.0E+00	16.87	1.43	**1.3E-02**	**1.1E+03**	**7.3**	35.00	0.00%	pass	6.0E-04	1.4E-03	6.0E-03
00170415	4	25	60	2	50	118.0	152.0	0.001	0	149.0	35.00	34.0	0.0E+00	16.87	1.43	**1.3E-02**	**1.1E+03**	**7.3**	35.00	0.00%	pass	6.0E-04	1.4E-03	6.0E-03
00170429	4	15	40	4	40	138.0	156.0	0.001	0	149.0	25.00	18.0	0.0E+00	33.32	1.60	**2.4E-02**	**2.1E+03**	**13.8**	25.00	0.00%	pass	6.6E-04	2.7E-03	1.2E-02
00170429	4	15	40	2	40	138.0	156.0	0.001	0	149.0	25.00	18.0	0.0E+00	33.32	1.60	**2.4E-02**	**2.0E+03**	**13.7**	25.00	0.00%	pass	6.6E-04	2.7E-03	1.2E-02
00170445	4	25	60	3	30	190.0	246.0	0.001	0	149.0	35.00	56.0	0.0E+00	8.71	0.86	**5.0E-03**	**4.3E+02**	**2.9**	35.00	0.00%	pass	3.6E-04	5.7E-04	2.4E-03
00170445	4	25	60	2	30	190.0	246.0	0.001	0	149.0	35.00	56.0	0.0E+00	8.71	0.86	**4.9E-03**	**4.2E+02**	**2.8**	35.00	0.00%	pass	3.6E-04	5.6E-04	2.4E-03
00174572	4	20	30	4	40	60.0	112.0	0.001	0	149.0	10.00	52.0	0.0E+00	9.74	4.00	**2.6E-02**	**2.2E+03**	**15.1**	10.00	0.00%	pass	1.7E-03	3.0E-03	1.2E-02
00174862	4	18	100	3	65	138.0	153.0	0.001	0	149.0	82.00	15.0	0.0E+00	40.00	0.79	**1.4E-02**	**1.2E+03**	**7.8**	82.00	0.00%	pass	3.3E-04	1.5E-03	6.9E-03
00175606	4	12	30	2	30	114.0	127.0	0.001	0	149.0	18.00	13.0	0.0E+00	46.09	1.67	**3.2E-02**	**2.8E+03**	**18.7**	18.00	0.00%	pass	6.9E-04	3.6E-03	1.7E-02
00175608	4	20	40	2	30	175.0	246.0	0.001	0	149.0	20.00	71.0	0.0E+00	5.78	1.50	**7.1E-03**	**6.2E+02**	**4.1**	20.00	0.00%	pass	6.4E-04	8.2E-04	3.4E-03
00178931	4	25	50	3	30	152.0	175.0	0.001	0	149.0	25.00	23.0	0.0E+00	25.91	1.20	**1.5E-02**	**1.3E+03**	**8.4**	25.00	0.00%	pass	5.0E-04	1.6E-03	7.0E-03
00179360	4	7	20	3	50	191.0	245.0	0.001	0	149.0	13.00	54.0	0.0E+00	9.21	3.85	**2.4E-02**	**2.1E+03**	**14.0**	13.00	0.00%	pass	1.6E-03	2.8E-03	1.1E-02
00183172	4	35	45	2	30	185.0	211.0	0.001	0	149.0	10.00	26.0	0.0E+00	22.75	3.00	**3.3E-02**	**2.9E+03**	**19.2**	10.00	0.00%	pass	1.2E-03	3.7E-03	1.6E-02
00183178	4	23	40	2	30	142.0	178.0	0.001	0	149.0	17.00	36.0	0.0E+00	15.77	1.76	**1.5E-02**	**1.3E+03**	**8.6**	17.00	0.00%	pass	7.4E-04	1.7E-03	7.0E-03
00183460	4	13	25	3	60	192.0	218.0	0.001	0	149.0	12.00	26.0	0.0E+00	22.75	5.00	**5.6E-02**	**4.8E+03**	**32.5**	12.00	0.00%	pass	2.1E-03	6.3E-03	2.6E-02
00183465	4	13	25	3	60	174.0	198.0	0.001	0	149.0	12.00	24.0	0.0E+00	24.77	5.00	**6.0E-02**	**5.2E+03**	**34.6**	12.00	0.00%	pass	2.1E-03	6.7E-03	2.8E-02
00184772	4	20	40	1	50	175.0	220.0	0.001	0	149.0	20.00	45.0	0.0E+00	11.92	2.50	**1.7E-02**	**1.5E+03**	**10.1**	20.00	0.00%	pass	1.0E-03	2.0E-03	8.3E-03
00190449	4	50	100	3	30	225.0	298.0	0.001	0	149.0	50.00	73.0	0.0E+00	5.47	0.60	**2.7E-03**	**2.4E+02**	**1.6**	50.00	0.00%	pass	2.5E-04	3.2E-04	1.3E-03
00193457	4	40	45	2	35	142.0	192.0	0.001	0	149.0	5.00	50.0	0.0E+00	10.31	7.00	**4.7E-02**	**4.0E+03**	**27.2**	5.00	0.00%	pass	2.9E-03	5.4E-03	2.1E-02
00193762	4	30	60	4	40	214.0	261.0	0.001	0	149.0	30.00	47.0	0.0E+00	11.24	1.33	**9.1E-03**	**7.9E+02**	**5.3**	30.00	0.00%	pass	5.6E-04	1.0E-03	4.3E-03
00193762	4	30	60	2	40	214.0	261.0	0.001	0	149.0	30.00	47.0	0.0E+00	11.24	1.33	**9.0E-03**	**7.8E+02**	**5.2**	30.00	0.00%	pass	5.6E-04	1.0E-03	4.3E-03
00193769	4	10	60	4	40	203.0	261.0	0.001	0	149.0	50.00	58.0	0.0E+00	8.25	0.80	**4.5E-03**	**3.9E+02**	**2.6**	50.00	0.00%	pass	3.4E-04	5.2E-04	2.2E-03
00193769	4	10	60	2	40	203.0	261.0	0.001	0	149.0	50.00	58.0	0.0E+00	8.25	0.80	**4.4E-03**	**3.8E+02**	**2.6**	50.00	0.00%	pass	3.4E-04	5.1E-04	2.2E-03
00194968	4	25	100	5	45	241.0	283.0	0.001	0	149.0	75.00	42.0	0.0E+00	13.04	0.60	**4.4E-03**	**3.8E+02**	**2.6**	75.00	0.00%	pass	2.5E-04	5.1E-04	2.1E-03
00197403	4	20	75	1	100	214.0	230.0	0.001	0	149.0	55.00	16.0	0.0E+00	37.51	1.82	**2.9E-02**	**2.5E+03**	**17.0**	55.00	0.00%	pass	7.5E-04	3.3E-03	1.5E-02
00197403	4	20	40	2	50	214.0	230.0	0.001	0	149.0	20.00	16.0	0.0E+00	37.51	2.50	**4.1E-02**	**3.5E+03**	**23.6**	20.00	0.00%	pass	1.0E-03	4.6E-03	2.1E-02
00197571	4	38	52	3	40	169.0	200.0	0.001	0	149.0	14.00	31.0	0.0E+00	18.75	2.86	**2.8E-02**	**2.4E+03**	**16.0**	14.00	0.00%	pass	1.2E-03	3.1E-03	1.3E-02
00199985	4	30	50	2	30	241.0	290.0	0.001	0	149.0	20.00	49.0	0.0E+00	10.61	1.50	**9.8E-03**	**8.4E+02**	**5.7**	20.00	0.00%	pass	6.3E-04	1.1E-03	4.6E-03
00199993	4	20	40	2	30	218.0	260.0	0.001	0	149.0	20.00	42.0	0.0E+00	13.04	1.50	**1.1E-02**	**9.6E+02**	**6.4**	20.00	0.00%	pass	6.3E-04	1.3E-03	5.3E-03
00199998	4	34	50	2	30	212.0	265.0	0.001	0	149.0	16.00	53.0	0.0E+00	9.47	1.88	**1.2E-02**	**1.0E+03**	**6.7**	16.00	0.00%	pass	7.9E-04	1.3E-03	5.4E-03
00248810	4	32	55	3	20	147.0	188.0	0.001	0	149.0	23.00	41.0	0.0E+00	13.45	0.87	**6.5E-03**	**5.7E+02**	**3.8**	23.00	0.00%	pass	3.6E-04	7.5E-04	3.1E-03
00251821	4	46	48	1	25	226.0	270.0	0.001	0	149.0	2.00	44.0	0.0E+00	12.28	12.50	**9.2E-02**	**8.0E+03**	**53.5**	2.00	0.00%	pass	5.2E-03	1.1E-02	4.2E-02
00257095	4	20	40	3	80	151.0	215.0	0.001	0	149.0	20.00	64.0	0.0E+00	7.00	4.00	**2.2E-02**	**1.9E+03**	**12.7**	20.00	0.00%	pass	1.7E-03	2.5E-03	9.9E-03
00270121	4	14	46	2	16	132.0	165.0	0.001	0	149.0	32.00	33.0	0.0E+00	17.46	0.50	**4.4E-03**	**3.8E+02**	**2.6**	32.00	0.00%	pass	2.1E-04	5.0E-04	2.1E-03
00404152	4	40	60	3	35	148.0	170.0	0.001	0	149.0	20.00	22.0	0.0E+00	27.13	1.75	**2.2E-02**	**1.9E+03**	**12.8**	20.00	0.00%	pass	7.2E-04	2.5E-03	1.1E-02
00404503	4	21	30	3	60	161.0	190.0	0.001	0	149.0	9.00	29.0	0.0E+00	20.20	6.67	**6.9E-02**	**6.0E+03**	**40.0**	9.00	0.01%	pass	2.8E-03	7.8E-03	3.2E-02
00404541	4	8	20	3	60	154.0	176.0	0.001	0	149.0	12.00	22.0	0.0E+00	27.13	5.00	**6.4E-02**	**5.5E+03**	**37.1**	12.00	0.00%	pass	2.1E-03	7.2E-03	3.1E-02
00404543	4	23	30	3	30	117.0	185.0	0.001	0	149.0	7.00	68.0	0.0E+00	6.28	4.29	**2.2E-02**	**1.9E+03**	**12.9**	7.00	0.01%	pass	1.8E-03	2.6E-03	1.0E-02
00404703	4	18	35	3	20	147.0	157.0	0.001	0	149.0	17.00	10.0	0.0E+00	59.65	1.18	**2.8E-02**	**2.5E+03**	**16.5**	17.00	0.00%	pass	4.8E-04	3.2E-03	1.5E-02
00404761	4	20	100	60	15	175.0	215.0	0.001	0	149.0	80.00	40.0	0.0E+00	13.87	0.19	**1.5E-03**	**1.3E+02**	**0.9**	80.00	0.00%	pass	7.8E-05	1.7E-04	6.8E-04
00405736	4	13	40	1	45	136.0	146.0	0.001	0	149.0	27.00	10.0	0.0E+00	59.65	1.67	**4.0E-02**	**3.5E+03**	**23.2**	27.00	0.00%	pass	6.9E-04	4.5E-03	2.2E-02
00405804	4	30	100	1	100	203.0	236.0	0.001	0	149.0	70.00	33.0	0.0E+00	17.46	1.43	**1.3E-02**	**1.1E+03**	**7.4**	70.00	0.00%	pass	6.0E-04	1.4E-03	6.1E-03
00405804	4	30	50	2	35	203.0	236.0	0.001	0	149.0	20.00	33.0	0.0E+00	17.46	1.75	**1.6E-02**	**1.4E+03**	**9.2**	20.00	0.00%	pass	7.3E-04	1.8E-03	7.5E-03
00405868	4	10	60	1	60	111.0	155.0	0.001	0	149.0	50.00	44.0	0.0E+00	12.28	1.20	**8.4E-03**	**7.2E+02**	**4.8**	50.00	0.00%	pass	5.0E-04	9.5E-04	4.1E-03
00405868	4	10	30	3	40	111.0	155.0	0.001	0	149.0	20.00	44.0	0.0E+00	12.28	2.00	**1.5E-02**	**1.3E+03**	**8.4**	20.00	0.00%	pass	8.4E-04	1.7E-03	6.8E-03
00406253	4	36	100	2	40	147.0	217.0	0.001	0	149.0	64.00	70.0	0.0E+00	5.94	0.63	**2.9E-03**	**2.5E+02**	**1.7**	64.00	0.00%	pass	2.7E-04	3.4E-04	1.4E-03
00406265	4	25	100	2	40	220.0	257.0	0.001	0	149.0	75.00	37.0	0.0E+00	15.26	0.53	**4.3E-03**	**3.7E+02**	**2.5**	75.00	0.00%	pass	2.2E-04	4.9E-04	2.1E-03
00406273	4	30	40	2	40	126.0	200.0	0.001	0	149.0	10.00	74.0	0.0E+00	5.32	4.00	**1.9E-02**	**1.6E+03**	**11.1**	10.00	0.01%	pass	1.7E-03	2.2E-03	8.7E-03
00406286	4	20	100	1	50	147.0	220.0	0.001	0	149.0	80.00	73.0	0.0E+00	5.47	0.63	**2.7E-03**	**2.3E+02**	**1.6**	80.00	0.00%	pass	2.7E-04	3.2E-04	1.4E-03

00406298	4	10	100	1	50	147.0	219.0	0.001	0	149.0	90.00	72.0	0.0E+00	5.63	0.56	**2.4E-03**	**2.1E+02**	**1.4**	90.00	0.00%	pass	2.4E-04	2.8E-04	1.2E-03
00406323	4	25	100	2	50	190.0	220.0	0.001	0	149.0	75.00	30.0	0.0E+00	19.45	0.67	**6.4E-03**	**5.5E+02**	**3.7**	75.00	0.00%	pass	2.8E-04	7.2E-04	3.1E-03
00406327	4	20	80	2.5	50	109.0	160.0	0.001	0	149.0	60.00	51.0	0.0E+00	10.02	0.83	**5.2E-03**	**4.5E+02**	**3.0**	60.00	0.00%	pass	3.5E-04	6.0E-04	2.5E-03
00406332	4	25	100	2	60	147.0	223.0	0.001	0	149.0	75.00	76.0	0.0E+00	5.04	0.80	**3.5E-03**	**3.0E+02**	**2.0**	75.00	0.00%	pass	3.4E-04	4.1E-04	1.7E-03
00406341	4	30	100	1	50	131.0	203.0	0.001	0	149.0	70.00	72.0	0.0E+00	5.63	0.71	**3.2E-03**	**2.7E+02**	**1.8**	70.00	0.00%	pass	3.0E-04	3.7E-04	1.6E-03
00406342	4	18	100	1	50	155.0	183.0	0.001	0	149.0	82.00	28.0	0.0E+00	20.99	0.61	**6.1E-03**	**5.3E+02**	**3.5**	82.00	0.00%	pass	2.5E-04	6.9E-04	3.0E-03
00406344	4	20	80	3	50	105.0	168.0	0.001	0	149.0	60.00	63.0	0.0E+00	7.19	0.83	**4.4E-03**	**3.8E+02**	**2.5**	60.00	0.00%	pass	3.5E-04	5.0E-04	2.1E-03
00406347	4	50	80	4	40	210.0	283.0	0.001	0	149.0	30.00	73.0	0.0E+00	5.47	1.33	**6.3E-03**	**5.5E+02**	**3.7**	30.00	0.00%	pass	5.7E-04	7.3E-04	2.9E-03
00408566	4	25	30	2	40	110.0	180.0	0.001	0	149.0	5.00	70.0	0.0E+00	5.94	8.00	**4.1E-02**	**3.5E+03**	**23.7**	5.00	0.00%	pass	3.4E-03	4.7E-03	1.8E-02
00408570	4	20	25	2	40	126.0	176.0	0.001	0	149.0	5.00	50.0	0.0E+00	10.31	8.00	**5.4E-02**	**4.6E+03**	**31.2**	5.00	0.00%	pass	3.4E-03	6.1E-03	2.4E-02
00408573	4	7	50	3	20	240.0	260.0	0.001	0	149.0	43.00	20.0	0.0E+00	29.94	0.47	**6.2E-03**	**5.4E+02**	**3.6**	43.00	0.00%	pass	1.9E-04	7.0E-04	3.1E-03
00408596	4	15	100	2	20	153.0	220.0	0.001	0	149.0	85.00	67.0	0.0E+00	6.45	0.24	**1.1E-03**	**9.5E+01**	**0.6**	85.00	0.00%	pass	1.0E-04	1.3E-04	5.6E-04
00408954	4	25	60	3	20	162.0	167.0	0.001	0	149.0	35.00	5.0	0.0E+00	117.56	0.57	**2.6E-02**	**2.2E+03**	**14.8**	35.00	0.00%	pass	2.3E-04	2.8E-03	1.5E-02
00408954	4	25	60	2	20	162.0	167.0	0.001	0	149.0	35.00	5.0	0.0E+00	117.56	0.57	**2.5E-02**	**2.2E+03**	**14.8**	35.00	0.00%	pass	2.3E-04	2.8E-03	1.5E-02
00409450	4	30	75	1	100	217.0	250.0	0.001	0	149.0	45.00	33.0	0.0E+00	17.46	2.22	**2.0E-02**	**1.7E+03**	**11.5**	45.00	0.00%	pass	9.3E-04	2.3E-03	9.5E-03
00409450	4	30	45	1	15	217.0	250.0	0.001	0	149.0	15.00	33.0	0.0E+00	17.46	1.00	**8.8E-03**	**7.6E+02**	**5.1**	15.00	0.00%	pass	4.2E-04	1.0E-03	4.3E-03
00409517	4	13	26	3	20	126.0	175.0	0.001	0	149.0	13.00	49.0	0.0E+00	10.61	1.54	**1.0E-02**	**8.8E+02**	**5.9**	13.00	0.00%	pass	6.5E-04	1.2E-03	4.8E-03
00410627	4	14	25	4	50	185.0	232.0	0.001	0	149.0	11.00	47.0	0.0E+00	11.24	4.55	**3.2E-02**	**2.8E+03**	**18.7**	11.00	0.00%	pass	1.9E-03	3.7E-03	1.5E-02
00410646	4	23	30	4	35	137.0	168.0	0.001	0	149.0	7.00	31.0	0.0E+00	18.75	5.00	**4.9E-02**	**4.2E+03**	**28.5**	7.00	0.00%	pass	2.1E-03	5.6E-03	2.3E-02
00410958	4	22	26	2	40	130.0	160.0	0.001	0	149.0	4.00	30.0	0.0E+00	19.45	10.00	**1.0E-01**	**8.7E+03**	**58.4**	4.00	0.01%	pass	4.2E-03	1.1E-02	4.6E-02
00411515	4	20	40	3	30	125.0	130.0	0.001	0	149.0	20.00	5.0	0.0E+00	117.56	1.50	**6.7E-02**	**5.8E+03**	**39.0**	20.00	0.00%	pass	6.1E-04	7.5E-03	3.8E-02
00415857	4	17	25	3	60	123.0	165.0	0.001	0	149.0	8.00	42.0	0.0E+00	13.04	7.50	**5.8E-02**	**5.0E+03**	**33.8**	8.00	0.00%	pass	3.1E-03	6.6E-03	2.6E-02
00415885	4	22	28	3	80	138.0	180.0	0.001	0	149.0	6.00	42.0	0.0E+00	13.04	13.33	**1.0E-01**	**9.1E+03**	**60.9**	6.00	0.00%	pass	5.6E-03	1.2E-02	4.7E-02
00415951	4	20	35	3	40	178.0	255.0	0.001	0	149.0	15.00	77.0	0.0E+00	4.90	2.67	**1.2E-02**	**1.1E+03**	**7.1**	15.00	0.00%	pass	1.1E-03	1.4E-03	5.6E-03
00415960	4	15	29	3	60	110.0	160.0	0.001	0	149.0	14.00	50.0	0.0E+00	10.31	4.29	**2.9E-02**	**2.5E+03**	**16.6**	14.00	0.00%	pass	1.8E-03	3.3E-03	1.3E-02
00415968	4	20	41	3	50	126.0	160.0	0.001	0	149.0	21.00	34.0	0.0E+00	16.87	2.38	**2.1E-02**	**1.8E+03**	**12.4**	21.00	0.00%	pass	9.9E-04	2.4E-03	9.9E-03
00416097	4	10	23	5	45	172.0	223.0	0.001	0	149.0	13.00	51.0	0.0E+00	10.02	3.46	**2.3E-02**	**2.0E+03**	**13.3**	13.00	0.00%	pass	1.5E-03	2.6E-03	1.0E-02
00416167	4	35	55	3	60	130.0	180.0	0.001	0	149.0	20.00	50.0	0.0E+00	10.31	3.00	**2.0E-02**	**1.7E+03**	**11.5**	20.00	0.00%	pass	1.3E-03	2.3E-03	9.1E-03
00416420	4	35	60	3	30	143.0	245.0	0.001	0	149.0	25.00	102.0	0.0E+00	2.31	1.20	**4.2E-03**	**3.6E+02**	**2.4**	25.00	0.00%	pass	5.2E-04	4.9E-04	1.8E-03
00416448	4	9	25	2	30	145.0	155.0	0.001	0	149.0	16.00	10.0	0.0E+00	59.65	1.88	**4.5E-02**	**3.9E+03**	**26.3**	16.00	0.00%	pass	7.7E-04	5.1E-03	2.4E-02
00417466	4	25	100	2	55	168.0	239.0	0.001	0	149.0	75.00	71.0	0.0E+00	5.78	0.73	**3.4E-03**	**2.9E+02**	**2.0**	75.00	0.00%	pass	3.1E-04	3.9E-04	1.7E-03
00417474	4	20	100	1	50	168.0	243.0	0.001	0	149.0	80.00	75.0	0.0E+00	5.18	0.63	**2.7E-03**	**2.3E+02**	**1.5**	80.00	0.00%	pass	2.7E-04	3.1E-04	1.4E-03
00417483	4	20	80	2	60	242.0	283.0	0.001	0	149.0	60.00	41.0	0.0E+00	13.45	1.00	**7.5E-03**	**6.5E+02**	**4.3**	60.00	0.00%	pass	4.2E-04	8.5E-04	3.6E-03
00417497	4	20	100	4	60	115.0	203.0	0.001	0	149.0	80.00	88.0	0.0E+00	3.58	0.75	**3.0E-03**	**2.6E+02**	**1.7**	80.00	0.00%	pass	3.2E-04	3.4E-04	1.4E-03
00418362	4	25	100	3	40	175.0	203.0	0.001	0	149.0	75.00	28.0	0.0E+00	20.99	0.53	**5.4E-03**	**4.7E+02**	**3.1**	75.00	0.00%	pass	2.2E-04	6.1E-04	2.6E-03
00418365	4	25	100	3	35	129.0	134.0	0.001	0	149.0	75.00	5.0	0.0E+00	117.56	0.47	**2.1E-02**	**1.8E+03**	**12.1**	75.00	0.00%	pass	1.9E-04	2.3E-03	1.2E-02
00418391	4	25	100	4	55	189.0	283.0	0.001	0	149.0	75.00	94.0	0.0E+00	2.99	0.73	**2.7E-03**	**2.4E+02**	**1.6**	75.00	0.00%	pass	3.1E-04	3.2E-04	1.2E-03
00418393	4	32	100	2.5	40	189.0	243.0	0.001	0	149.0	68.00	54.0	0.0E+00	9.21	0.59	**3.5E-03**	**3.0E+02**	**2.0**	68.00	0.00%	pass	2.5E-04	4.0E-04	1.7E-03
00418432	4	10	25	4	40	154.0	216.0	0.001	0	149.0	15.00	62.0	0.0E+00	7.39	2.67	**1.5E-02**	**1.3E+03**	**8.6**	15.00	0.01%	pass	1.1E-03	1.7E-03	6.8E-03
00418451	4	25	100	6	75	210.0	263.0	0.001	0	149.0	75.00	53.0	0.0E+00	9.47	1.00	**6.2E-03**	**5.4E+02**	**3.6**	75.00	0.00%	pass	4.2E-04	7.1E-04	2.9E-03
00419515	4	9	20	3	45	143.0	168.0	0.001	0	149.0	11.00	25.0	0.0E+00	23.72	4.09	**4.7E-02**	**4.1E+03**	**27.3**	11.00	0.00%	pass	1.7E-03	5.3E-03	2.2E-02
00419531	4	15	25	3	60	245.0	288.0	0.001	0	149.0	10.00	43.0	0.0E+00	12.65	6.00	**4.6E-02**	**3.9E+03**	**26.4**	10.00	0.00%	pass	2.5E-03	5.2E-03	2.1E-02
00419532	4	28	45	3	40	152.0	185.0	0.001	0	149.0	17.00	33.0	0.0E+00	17.46	2.35	**2.2E-02**	**1.9E+03**	**12.5**	17.00	0.00%	pass	9.8E-04	2.4E-03	1.0E-02
00421010	4	10	147	2	75	147.0	157.0	0.001	0	149.0	137.00	10.0	0.0E+00	59.65	0.55	**1.3E-02**	**1.1E+03**	**7.6**	137.00	0.00%	pass	2.3E-04	1.5E-03	7.1E-03
00425078	4	23	40	3.5	30	157.0	161.0	0.001	0	149.0	17.00	4.0	0.0E+00	146.35	1.76	**9.7E-02**	**8.4E+03**	**56.4**	17.00	0.00%	pass	7.2E-04	1.1E-02	5.6E-02
00425090	4	17	30	4	30	148.0	153.0	0.001	0	149.0	13.00	5.0	0.0E+00	117.56	2.31	**1.0E-01**	**9.0E+03**	**60.2**	13.00	0.00%	pass	9.5E-04	1.2E-02	5.9E-02
00425350	4	30	50	3	40	176.0	245.0	0.001	0	149.0	20.00	69.0	0.0E+00	6.11	2.00	**1.0E-02**	**8.6E+02**	**5.8**	20.00	0.00%	pass	8.5E-04	1.2E-03	4.6E-03
00425350	4	30	50	2	40	176.0	245.0	0.001	0	149.0	20.00	69.0	0.0E+00	6.11	2.00	**9.8E-03**	**8.5E+02**	**5.7**	20.00	0.00%	pass	8.5E-04	1.1E-03	4.6E-03
00425716	4	8	100	3	100	105.0	141.0	0.001	0	149.0	92.00	36.0	0.0E+00	15.77	1.09	**9.1E-03**	**7.9E+02**	**5.3**	92.00	0.00%	pass	4.5E-04	1.0E-03	4.3E-03
00425719	4	30	100	6	80	175.0	223.0	0.001	0	149.0	70.00	48.0	0.0E+00	10.92	1.14	**7.8E-03**	**6.7E+02**	**4.5**	70.00	0.00%	pass	4.8E-04	8.9E-04	3.6E-03
00425730	4	25	100	3	60	168.0	223.0	0.001	0	149.0	75.00	55.0	0.0E+00	8.96	0.80	**4.7E-03**	**4.1E+02**	**2.7**	75.00	0.00%	pass	3.4E-04	5.4E-04	2.3E-03
00425748	4	20	56	1	30	69.0	75.0	0.001	0	149.0	36.00	6.0	0.0E+00	98.34	0.83	**3.1E-02**	**2.7E+03**	**18.2**	36.00	0.00%	pass	3.4E-04	3.5E-03	1.8E-02
00425749	4	22	84	2	60	123.0	143.0	0.001	0	149.0	62.00	20.0	0.0E+00	29.94	0.97	**1.3E-02**	**1.1E+03**	**7.5**	62.00	0.00%	pass	4.0E-04	1.5E-03	6.5E-03
00425789	4	33	100	4	50	116.0	123.0	0.001	0	149.0	67.00	7.0	0.0E+00	84.57	0.75	**2.5E-02**	**2.1E+03**	**14.3**	67.00	0.00%	pass	3.1E-04	2.8E-03	1.4E-02
00425830	4	30	50	2	30	226.0	276.0	0.001	0	149.0	20.00	50.0	0.0E+00	10.31	1.50	**9.6E-03**	**8.3E+02**	**5.6**	20.00	0.00%	pass	6.3E-04	1.1E-03	4.6E-03
00425845	4	20	40	2	30	214.0	260.0	0.001	0	149.0	20.00	46.0	0.0E+00	11.57	1.50	**1.0E-02**	**8.9E+02**	**6.0**	20.00	0.00%	pass	6.3E-04	1.2E-03	4.9E-03
00425849	4	53	75	2	50	230.0	300.0	0.001	0	149.0	22.00	70.0	0.0E+00	5.94	2.27	**1.1E-02**	**9.6E+02**	**6.4**	22.00	0.00%	pass	9.6E-04	1.3E-03	5.2E-03
00426475	4	25	45	3	25	170.0	201.0	0.001	0	149.0	20.00	31.0	0.0E+00	18.75	1.25	**1.2E-02**	**1.0E+03**	**6.9**	20.00	0.00%	pass	5.2E-04	1.3E-03	5.6E-03
00428503	4	15	50	3	45	167.0	200.0	0.001	0	149.0	35.00	33.0	0.0E+00	17.46	1.29	**1.2E-02**	**1.0E+03**	**6.7**	35.00	0.00%	pass	5.4E-04	1.3E-03	5.5E-03
00429075	4	30	50	3	30	165.0	200.0	0.001	0	149.0	20.00	35.0	0.0E+00	16.31	1.50	**1.3E-02**	**1.1E+03**	**7.5**	20.00	0.00%	pass	6.3E-04	1.5E-03	6.1E-03
00430212	4	20	84	1.75	75	101.0	123.0	0.001	0	149.0	64.00	22.0	0.0E+00	27.13	1.17	**1.5E-02**	**1.3E+03**	**8.4**	64.00	0.00%	pass	4.9E-04	1.6E-03	7.2E-03
00430262	4	14	40	32	50	109.0	163.0	0.001	0	149.0	26.00	54.0	0.0E+00	9.21	1.92	**1.3E-02**	**1.1E+03**	**7.3**	26.00	0.00%	pass	8.1E-04	1.4E-03	5.5E-03
00430268	4	12	100	5	50	154.0	192.0	0.001	0	149.0	88.00	38.0	0.0E+00	14.78	0.57	**4.6E-03**	**3.9E+02**	**2.6**	88.00	0.00%	pass	2.4E-04	5.2E-04	2.2E-03
00430281	4	31	120	5	50	175.0	228.0	0.001	0	149.0	89.00	53.0	0.0E+00	9.47	0.56	**3.4E-03**	**3.0E+02**	**2.0**	89.00	0.00%	pass	2.4E-04	3.9E-04	1.6E-03
00430332	4	51	100	1	30	147.0	159.0	0.001	0	149.0	49.00	12.0	0.0E+00	49.88	0.61	**1.2E-02**	**1.1E+03**	**7.2**	49.00	0.00%	pass	2.5E-04	1.4E-03	6.6E-03
00430510	4	20	150	2	20	179.0	215.0	0.001	0	149.0	130.00	36.0	0.0E+00	15.77	0.15	**1.2E-03**	**1.1E+02**	**0.7**	130.00	0.00%	pass	6.4E-05	1.4E-04	6.1E-04
00431418	4	25	35	4	30	178.0	215.0	0.001	0	149.0	10.00	37.0	0.0E+00	15.26	3.00	**2.5E-02**	**2.2E+03**	**14.7**	10.00	0.00%	pass	1.3E-03	2.9E-03	1.2E-02
00431425	4	30	40	4	30	162.0	187.0	0.001	0	149.0	10.00	25.0	0.0E+00	23.72	3.00	**3.5E-02**	**3.0E+03**	**20.0**	10.00	0.00%	pass	1.2E-03	3.9E-03	1.6E-02
00431428	4	25	35	3	30	127.0	144.0	0.001	0	149.0	10.00	17.0	0.0E+00	35.30	3.00	**4.7E-02**	**4.1E+03**	**27.2**	10.00	0.01%	pass	1.2E-03	5.3E-03	2.3E-02
00431624	4	20	50	3	30	137.0	246.0	0.001	0	149.0	30.00	109.0	0.0E+00	1.81	1.00	**3.3E-03**	**2.8E+02**	**1.9**	30.00	0.00%	pass	4.3E-04	3.9E-04	1.4E-03
00431667	4	14	44	3	90	152.0	185.0	0.001	0	149.0	30.00	33.0	0.0E+00	17.46	3.00	**2.8E-02**	**2.4E+03**	**16.0**	30.00	0.00%	pass	1.2E-03	3.1E-03	1.3E-02
00431690	4	15	40	3	80	141.0	180.0	0.001	0	149.0	25.00	39.0	0.0E+00	14.31	3.20	**2.6E-02**	**2.2E+03**	**15.0**	25.00	0.00%	pass	1.3E-03	2.9E-03	1.2E-02
00432991	6	31	36	2	85	220.0	260.0	0.001	0	149.0	5.00	40.0	0.0E+00	12.76	17.00	**1.3E-01**	**1.1E+04**	**74.9**	5.00	0.01%	pass	7.1E-03	1.5E-02	5.7E-02
00434618	4	5	100	3	85	122.0	168.0	0.001	0	149.0	95.00	46.0	0.0E+00	11.57	0.89	**6.1E-03**	**5.3E+02**	**3.6**	95.00	0.00%	pass	3.7E-04	7.0E-04	2.9E-03
00434621	4	15	100	4	50	133.0	203.0	0.001	0	149.0	85.00	70.0	0.0E+00	5.94	0.59	**2.8E-03**	**2.4E+02**	**1.6**	85.00	0.00%	pass	2.5E-04	3.2E-04	1.4E-03
00434631	4	11	30	2	30	148.0	216.0	0.001	0	149.0	19.00	68.0	0.0E+00	6.28	1.58	**7.8E-03**	**6.7E+02**	**4.5**	19.00	0.00%	pass	6.7E-04	9.0E-04	3.7E-03
00434670	4	15	50	3	40	110.0	150.0	0.001	0	149.0	35.00	40.0	0.0E+00	13.87	1.14	**8.8E-03**	**7.6E+02**	**5.1**	35.00	0.00%	pass	4.8E-04	1.0E-03	4.2E-03
00434670	4	15	50	2	40	110.0	150.0	0.001	0	149.0	35.00	40.0	0.0E+00	13.87	1.14	**8.8E-03**	**7.6E+02**	**5.1**	35.00	0.00%	pass	4.8E-04	1.0E-03	4.2E-03

00435725	4	16	35	3	30	203.0	238.0	0.001	0	149.0	19.00	35.0	0.0E+00	16.31	1.58	**1.4E-02**	**1.2E+03**	**7.9**	19.00	0.00%	pass	6.6E-04	1.6E-03	6.4E-03
00435808	4	16	25	3.5	40	217.0	230.0	0.001	0	149.0	9.00	13.0	0.0E+00	46.09	4.44	**8.7E-02**	**7.5E+03**	**50.5**	9.00	0.00%	pass	1.8E-03	9.8E-03	4.4E-02
00437679	4	24	29	3	30	225.0	260.0	0.001	0	149.0	5.00	35.0	0.0E+00	16.31	6.00	**5.3E-02**	**4.6E+03**	**31.0**	5.00	0.00%	pass	2.5E-03	6.1E-03	2.4E-02
00439015	4	28	120	1	60	168.0	203.0	0.001	0	149.0	92.00	35.0	0.0E+00	16.31	0.65	**5.4E-03**	**4.7E+02**	**3.1**	92.00	0.00%	pass	2.7E-04	6.2E-04	2.7E-03
00439015	4	28	100	3	50	168.0	203.0	0.001	0	149.0	72.00	35.0	0.0E+00	16.31	0.69	**5.9E-03**	**5.1E+02**	**3.4**	72.00	0.00%	pass	2.9E-04	6.7E-04	2.8E-03
00439885	4	26	60	3	80	167.0	197.0	0.001	0	149.0	34.00	30.0	0.0E+00	19.45	2.35	**2.3E-02**	**2.0E+03**	**13.5**	34.00	0.00%	pass	9.8E-04	2.6E-03	1.1E-02
00439933	4	40	50	3	50	143.0	175.0	0.001	0	149.0	10.00	32.0	0.0E+00	18.09	5.00	**4.8E-02**	**4.1E+03**	**27.6**	10.00	0.00%	pass	2.1E-03	5.4E-03	2.2E-02
00439961	4	22	32	3	70	143.0	170.0	0.001	0	149.0	10.00	27.0	0.0E+00	21.84	7.00	**7.7E-02**	**6.6E+03**	**44.4**	10.00	0.01%	pass	2.9E-03	8.7E-03	3.6E-02
00439965	4	30	40	3	40	154.0	215.0	0.001	0	149.0	10.00	61.0	0.0E+00	7.59	4.00	**2.3E-02**	**2.0E+03**	**13.2**	10.00	0.00%	pass	1.7E-03	2.6E-03	1.0E-02
00440811	4	30	50	2	30	149.0	154.0	0.001	0	149.0	20.00	5.0	0.0E+00	117.56	1.50	**6.7E-02**	**5.8E+03**	**39.0**	20.00	0.00%	pass	6.1E-04	7.5E-03	3.8E-02
00440839	4	25	45	2	40	228.0	245.0	0.001	0	149.0	20.00	17.0	0.0E+00	35.30	2.00	**3.1E-02**	**2.7E+03**	**18.0**	20.00	0.00%	pass	8.3E-04	3.5E-03	1.6E-02
00446002	4	30	40	3	40	197.0	265.0	0.001	0	149.0	10.00	68.0	0.0E+00	6.28	4.00	**2.1E-02**	**1.8E+03**	**12.0**	10.00	0.01%	pass	1.7E-03	2.4E-03	9.4E-03
00448052	4	12	25	3	60	166.0	190.0	0.001	0	149.0	13.00	24.0	0.0E+00	24.77	4.62	**5.5E-02**	**4.8E+03**	**31.9**	13.00	0.00%	pass	1.9E-03	6.2E-03	2.6E-02
00448069	4	35	43	3	60	135.0	166.0	0.001	0	149.0	8.00	31.0	0.0E+00	18.75	7.50	**7.4E-02**	**6.4E+03**	**42.8**	8.00	0.01%	pass	3.1E-03	8.4E-03	3.4E-02
00448237	4	20	150	2	40	261.0	306.0	0.001	0	149.0	130.00	45.0	0.0E+00	11.92	0.31	**2.1E-03**	**1.8E+02**	**1.2**	130.00	0.00%	pass	1.3E-04	2.4E-04	1.0E-03
00448838	4	56	63	3	30	200.0	260.0	0.001	0	149.0	7.00	60.0	0.0E+00	7.80	4.29	**2.5E-02**	**2.1E+03**	**14.3**	7.00	0.00%	pass	1.8E-03	2.8E-03	1.1E-02
00448864	4	16	25	3	35	110.0	180.0	0.001	0	149.0	9.00	70.0	0.0E+00	5.94	3.89	**2.0E-02**	**1.7E+03**	**11.4**	9.00	0.01%	pass	1.6E-03	2.3E-03	8.9E-03
00449100	4	30	50	3	80	124.0	170.0	0.001	0	149.0	20.00	46.0	0.0E+00	11.57	4.00	**2.8E-02**	**2.5E+03**	**16.5**	20.00	0.00%	pass	1.7E-03	3.3E-03	1.3E-02
00453431	4	17	25	3	75	142.0	184.0	0.001	0	149.0	8.00	42.0	0.0E+00	13.04	9.38	**7.3E-02**	**6.3E+03**	**42.5**	8.00	0.00%	pass	3.9E-03	8.3E-03	3.3E-02
00453436	4	35	45	3	60	131.0	144.0	0.001	0	149.0	10.00	13.0	0.0E+00	46.09	6.00	**1.2E-01**	**1.0E+04**	**68.2**	10.00	0.00%	pass	2.5E-03	1.3E-02	6.0E-02
00456501	4	18	40	3	30	223.0	255.0	0.001	0	149.0	22.00	32.0	0.0E+00	18.09	1.36	**1.3E-02**	**1.1E+03**	**7.3**	22.00	0.00%	pass	5.7E-04	1.4E-03	6.0E-03
00456968	4	15	63	1	100	131.0	159.0	0.001	0	149.0	48.00	28.0	0.0E+00	20.99	2.08	**2.1E-02**	**1.8E+03**	**12.3**	48.00	0.00%	pass	8.7E-04	2.4E-03	1.0E-02
00457058	4	30	120	4	50	147.0	206.0	0.001	0	149.0	90.00	59.0	0.0E+00	8.02	0.56	**3.1E-03**	**2.6E+02**	**1.8**	90.00	0.00%	pass	2.3E-04	3.5E-04	1.5E-03
00457058	4	30	100	3.5	45	147.0	206.0	0.001	0	149.0	70.00	59.0	0.0E+00	8.02	0.64	**3.6E-03**	**3.1E+02**	**2.1**	70.00	0.00%	pass	2.7E-04	4.1E-04	1.7E-03
00457910	4	45	75	4	50	151.0	190.0	0.001	0	149.0	30.00	39.0	0.0E+00	14.31	1.67	**1.3E-02**	**1.2E+03**	**7.7**	30.00	0.00%	pass	7.0E-04	1.5E-03	6.2E-03
00457910	4	45	75	2	50	151.0	190.0	0.001	0	149.0	30.00	39.0	0.0E+00	14.31	1.67	**1.3E-02**	**1.1E+03**	**7.6**	30.00	0.00%	pass	7.0E-04	1.5E-03	6.2E-03
00458906	4	20	140	3	50	158.0	203.0	0.001	0	149.0	120.00	45.0	0.0E+00	11.92	0.42	**2.8E-03**	**2.5E+02**	**1.7**	120.00	0.00%	pass	1.7E-04	3.3E-04	1.4E-03
00458906	4	20	80	1	40	158.0	203.0	0.001	0	149.0	60.00	45.0	0.0E+00	11.92	0.67	**4.5E-03**	**3.9E+02**	**2.6**	60.00	0.00%	pass	2.8E-04	5.1E-04	2.2E-03
00460905	4	30	55	2	30	198.0	245.0	0.001	0	149.0	25.00	47.0	0.0E+00	11.24	1.20	**8.1E-03**	**7.0E+02**	**4.7**	25.00	0.00%	pass	5.0E-04	9.2E-04	3.8E-03
00460917	4	12	35	2	30	197.0	245.0	0.001	0	149.0	23.00	48.0	0.0E+00	10.92	1.30	**8.6E-03**	**7.4E+02**	**5.0**	23.00	0.00%	pass	5.5E-04	9.9E-04	4.1E-03
00461866	4	25	45	3	25	200.0	245.0	0.001	0	149.0	20.00	45.0	0.0E+00	11.92	1.25	**8.8E-03**	**7.6E+02**	**5.1**	20.00	0.00%	pass	5.2E-04	1.0E-03	4.1E-03
00462852	4	35	55	3	30	99.0	140.0	0.001	0	149.0	20.00	41.0	0.0E+00	13.45	1.50	**1.1E-02**	**9.9E+02**	**6.6**	20.00	0.00%	pass	6.3E-04	1.3E-03	5.4E-03
00463713	4	22	40	3	35	198.0	201.0	0.001	0	149.0	18.00	3.0	0.0E+00	194.25	1.94	**1.4E-01**	**1.2E+04**	**81.4**	18.00	0.00%	pass	8.0E-04	1.6E-02	8.3E-02
00464187	4	25	42	3	30	203.0	261.0	0.001	0	149.0	17.00	58.0	0.0E+00	8.25	1.76	**1.0E-02**	**8.8E+02**	**5.9**	17.00	0.00%	pass	7.4E-04	1.2E-03	4.8E-03
00467605	4	30	40	3	40	195.0	260.0	0.001	0	149.0	10.00	65.0	0.0E+00	6.81	4.00	**2.2E-02**	**1.9E+03**	**12.5**	10.00	0.01%	pass	1.7E-03	2.5E-03	9.8E-03
00470381	4	18	28	3	50	180.0	214.0	0.001	0	149.0	10.00	34.0	0.0E+00	16.87	5.00	**4.5E-02**	**3.9E+03**	**26.3**	10.00	0.00%	pass	2.1E-03	5.2E-03	2.1E-02
00471042	4	20	60	1	40	158.0	201.0	0.001	0	149.0	40.00	43.0	0.0E+00	12.65	1.00	**7.1E-03**	**6.1E+02**	**4.1**	40.00	0.00%	pass	4.2E-04	8.1E-04	3.4E-03
00472736	4	22	30	3	49	145.0	173.0	0.001	0	149.0	8.00	28.0	0.0E+00	20.99	6.13	**6.5E-02**	**5.6E+03**	**37.7**	8.00	0.01%	pass	2.5E-03	7.3E-03	3.0E-02
00472741	4	14	23	3	49	145.0	172.0	0.001	0	149.0	9.00	27.0	0.0E+00	21.84	5.44	**5.9E-02**	**5.1E+03**	**34.4**	9.00	0.00%	pass	2.3E-03	6.7E-03	2.8E-02
00473106	4	15	27	2	18	195.0	205.0	0.001	0	149.0	12.00	10.0	0.0E+00	59.65	1.50	**3.6E-02**	**3.1E+03**	**21.0**	12.00	0.01%	pass	6.2E-04	4.1E-03	1.9E-02
00473144	4	32	38	2	20	135.0	145.0	0.001	0	149.0	6.00	10.0	0.0E+00	59.65	3.33	**8.1E-02**	**7.0E+03**	**46.9**	6.00	0.00%	pass	1.4E-03	9.1E-03	4.3E-02
00474088	4	20	30	3	60	79.0	140.0	0.001	0	149.0	10.00	61.0	0.0E+00	7.59	6.00	**3.4E-02**	**3.0E+03**	**20.0**	10.00	0.00%	pass	2.5E-03	4.0E-03	1.5E-02
00475371	4	15	47	3	20	160.0	172.0	0.001	0	149.0	32.00	12.0	0.0E+00	49.88	0.63	**1.3E-02**	**1.1E+03**	**7.5**	32.00	0.00%	pass	2.6E-04	1.4E-03	6.8E-03
00475396	4	20	80	3	60	211.0	240.0	0.001	0	149.0	60.00	29.0	0.0E+00	20.20	1.00	**1.0E-02**	**8.6E+02**	**5.8**	60.00	0.00%	pass	4.2E-04	1.1E-03	4.8E-03
00477331	4	10	20	3	30	123.0	133.0	0.001	0	149.0	10.00	10.0	0.0E+00	59.65	3.00	**7.3E-02**	**6.3E+03**	**42.3**	10.00	0.00%	pass	1.2E-03	8.2E-03	3.9E-02
00478543	3	18	36	2	30	250.0	280.0	0.001	0	149.0	18.00	30.0	0.0E+00	20.59	1.67	**1.7E-02**	**1.5E+03**	**9.9**	18.00	0.00%	pass	6.9E-04	1.9E-03	8.2E-03
00478544	3	6	18	2	30	250.0	270.0	0.001	0	149.0	12.00	20.0	0.0E+00	31.79	2.50	**3.6E-02**	**3.1E+03**	**20.8**	12.00	0.00%	pass	1.0E-03	4.0E-03	1.8E-02
00479448	4	30	130	4	50	155.0	160.0	0.001	0	149.0	100.00	5.0	0.0E+00	117.56	0.50	**2.2E-02**	**1.9E+03**	**13.0**	100.00	0.00%	pass	2.0E-04	2.5E-03	1.3E-02
00479933	4	29	40	2	30	187.0	247.0	0.001	0	149.0	11.00	60.0	0.0E+00	7.80	2.73	**1.5E-02**	**1.3E+03**	**8.9**	11.00	0.01%	pass	1.1E-03	1.8E-03	7.1E-03
00479938	4	55	80	4	35	275.0	336.0	0.001	0	149.0	25.00	61.0	0.0E+00	7.59	1.40	**7.7E-03**	**6.7E+02**	**4.5**	25.00	0.00%	pass	5.9E-04	8.9E-04	3.6E-03
00487507	4	14	50	3	80	240.0	255.0	0.001	0	149.0	36.00	15.0	0.0E+00	40.00	2.22	**3.8E-02**	**3.3E+03**	**22.2**	36.00	0.00%	pass	9.2E-04	4.3E-03	1.9E-02
00487802	4	20	140	1	70	168.0	220.0	0.001	0	149.0	120.00	52.0	0.0E+00	9.74	0.58	**3.4E-03**	**3.0E+02**	**2.0**	120.00	0.00%	pass	2.5E-04	4.0E-04	1.7E-03
00487802	4	20	80	1	40	168.0	220.0	0.001	0	149.0	60.00	52.0	0.0E+00	9.74	0.67	**4.0E-03**	**3.4E+02**	**2.3**	60.00	0.00%	pass	2.8E-04	4.5E-04	2.0E-03
00489003	4	22	30	3.5	35	208.0	276.0	0.001	0	149.0	8.00	68.0	0.0E+00	6.28	4.38	**2.3E-02**	**2.0E+03**	**13.3**	8.00	0.01%	pass	1.8E-03	2.6E-03	1.0E-02
00489043	4	10	25	3	35	184.0	247.0	0.001	0	149.0	15.00	63.0	0.0E+00	7.19	2.33	**1.3E-02**	**1.1E+03**	**7.3**	15.00	0.00%	pass	9.9E-04	1.5E-03	5.9E-03
00490089	4	30	55	3	40	216.0	275.0	0.001	0	149.0	25.00	59.0	0.0E+00	8.02	1.60	**9.1E-03**	**7.8E+02**	**5.3**	25.00	0.00%	pass	6.7E-04	1.0E-03	4.3E-03
00494232	4	12	20	3	49	142.0	177.0	0.001	0	149.0	8.00	35.0	0.0E+00	16.31	6.13	**5.5E-02**	**4.7E+03**	**31.7**	8.00	0.00%	pass	2.6E-03	6.2E-03	2.5E-02
00494236	4	20	30	3	49	151.0	182.0	0.001	0	149.0	10.00	31.0	0.0E+00	18.75	4.90	**4.8E-02**	**4.1E+03**	**27.7**	10.00	0.00%	pass	2.0E-03	5.4E-03	2.2E-02
00496370	4	20	40	2	30	133.0	158.0	0.001	0	149.0	20.00	25.0	0.0E+00	23.72	1.50	**1.7E-02**	**1.5E+03**	**9.8**	20.00	0.00%	pass	6.2E-04	1.9E-03	8.2E-03
00498147	4	15	25	3	30	201.0	211.0	0.001	0	149.0	10.00	10.0	0.0E+00	59.65	3.00	**7.3E-02**	**6.3E+03**	**42.3**	10.00	0.00%	pass	1.2E-03	8.2E-03	3.9E-02
00498218	4	12	50	3	60	137.0	168.0	0.001	0	149.0	38.00	31.0	0.0E+00	18.75	1.58	**1.5E-02**	**1.3E+03**	**8.7**	38.00	0.00%	pass	6.6E-04	1.7E-03	7.1E-03
00500462	4	35	80	3	30	220.0	260.0	0.001	0	149.0	45.00	40.0	0.0E+00	13.87	0.67	**5.1E-03**	**4.4E+02**	**3.0**	45.00	0.00%	pass	2.8E-04	5.8E-04	2.4E-03
00500561	4	43	53	3	50	117.0	155.0	0.001	0	149.0	10.00	38.0	0.0E+00	14.78	5.00	**4.2E-02**	**3.6E+03**	**24.1**	10.00	0.00%	pass	2.1E-03	4.7E-03	1.9E-02
00500568	4	7	17	3	30	182.0	187.0	0.001	0	149.0	10.00	5.0	0.0E+00	117.56	3.00	**1.3E-01**	**1.2E+04**	**78.3**	10.00	0.00%	pass	1.2E-03	1.5E-02	7.7E-02
00500594	4	15	25	3	60	204.0	240.0	0.001	0	149.0	10.00	36.0	0.0E+00	15.77	6.00	**5.2E-02**	**4.5E+03**	**30.3**	10.00	0.00%	pass	2.5E-03	5.9E-03	2.4E-02
00500679	4	50	70	3	40	224.0	264.0	0.001	0	149.0	20.00	40.0	0.0E+00	13.87	2.00	**1.6E-02**	**1.4E+03**	**9.1**	20.00	0.00%	pass	8.4E-04	1.8E-03	7.3E-03
00503661	4	15	100	3	60	147.0	181.0	0.001	0	149.0	85.00	34.0	0.0E+00	16.87	0.71	**6.2E-03**	**5.3E+02**	**3.6**	85.00	0.00%	pass	2.9E-04	7.0E-04	2.9E-03
00503673	4	70	140	2.25	35	256.0	301.0	0.001	0	149.0	70.00	45.0	0.0E+00	11.92	0.50	**3.4E-03**	**2.9E+02**	**2.0**	70.00	0.00%	pass	2.1E-04	3.9E-04	1.7E-03
00503723	6	24	98	3	100	113.0	177.0	0.001	0	149.0	74.00	64.0	0.0E+00	6.46	1.35	**6.6E-03**	**5.7E+02**	**3.8**	74.00	0.00%	pass	5.7E-04	7.7E-04	3.1E-03
00505353	4	40	145	2	45	275.0	281.0	0.001	0	149.0	105.00	6.0	0.0E+00	98.34	0.43	**1.6E-02**	**1.4E+03**	**9.4**	105.00	0.00%	pass	1.8E-04	1.8E-03	9.2E-03
00506377	4	25	40	3	50	170.0	240.0	0.001	0	149.0	15.00	70.0	0.0E+00	5.94	3.33	**1.7E-02**	**1.4E+03**	**9.7**	15.00	0.00%	pass	1.4E-03	1.9E-03	7.6E-03
00506521	4	52	92	3	60	193.0	228.0	0.001	0	149.0	40.00	35.0	0.0E+00	16.31	1.50	**1.3E-02**	**1.1E+03**	**7.5**	40.00	0.00%	pass	6.3E-04	1.5E-03	6.1E-03
00506527	4	10	20	3	30	148.0	153.0	0.001	0	149.0	10.00	5.0	0.0E+00	117.56	3.00	**1.3E-01**	**1.2E+04**	**78.3**	10.00	0.00%	pass	1.2E-03	1.5E-02	7.7E-02
00506541	4	20	30	3	50	123.0	170.0	0.001	0	149.0	10.00	47.0	0.0E+00	11.24	5.00	**3.5E-02**	**3.0E+03**	**20.4**	10.00	0.00%	pass	2.1E-03	4.0E-03	1.6E-02
00511963	4	10	25	3	45	162.0	214.0	0.001	0	149.0	15.00	52.0	0.0E+00	9.74	3.00	**1.9E-02**	**1.7E+03**	**11.1**	15.00	0.00%	pass	1.3E-03	2.2E-03	8.8E-03
00511972	4	25	40	4	45	148.0	172.0	0.001	0	149.0	15.00	24.0	0.0E+00	24.77	3.00	**3.6E-02**	**3.1E+03**	**20.7**	15.00	0.00%	pass	1.2E-03	4.0E-03	1.7E-02
00512762	4	15	40	3	50	172.0	226.0	0.001	0	149.0	25.00	54.0	0.0E+00	9.21	2.00	**1.2E-02**	**1.1E+03**	**7.1**	25.00	0.00%	pass	8.4E-04	1.4E-03	5.7E-03
00514721	4	20	35	2	20	140.0	150.0	0.001	0	149.0	15.00	10.0	0.0E+00	59.65	1.33	**3.2E-02**	**2.8E+03**	**18.7**	15.00	0.01%	pass	5.5E-04	3.6E-03	1.7E-02

00518967	4	22	32	3	49	102.0	139.0	0.001	0	149.0	10.00	37.0	0.0E+00	15.26	4.90	**4.2E-02**	**3.6E+03**	**24.1**	10.00	0.00%	pass	2.0E-03	4.7E-03	1.9E-02
00521348	4	50	293	1	100	278.0	293.0	0.001	0	149.0	243.00	15.0	0.0E+00	40.00	0.41	**6.9E-03**	**6.0E+02**	**4.0**	243.00	0.00%	pass	1.7E-04	7.7E-04	3.6E-03
00521868	4	20	80	3	40	189.0	215.0	0.001	0	149.0	60.00	26.0	0.0E+00	22.75	0.67	**7.2E-03**	**6.2E+02**	**4.2**	60.00	0.00%	pass	2.8E-04	8.2E-04	3.5E-03
00523638	4	27	39	2	20	140.0	150.0	0.001	0	149.0	12.00	10.0	0.0E+00	59.65	1.67	**4.0E-02**	**3.5E+03**	**23.4**	12.00	0.00%	pass	6.9E-04	4.5E-03	2.2E-02
00523961	4	26	41	3	50	112.0	202.0	0.001	0	149.0	15.00	90.0	0.0E+00	3.38	3.33	**1.4E-02**	**1.2E+03**	**7.9**	15.00	0.00%	pass	1.4E-03	1.6E-03	5.9E-03
00523970	4	15	35	3	40	147.0	187.0	0.001	0	149.0	20.00	40.0	0.0E+00	13.87	2.00	**1.6E-02**	**1.4E+03**	**9.1**	20.00	0.00%	pass	8.4E-04	1.8E-03	7.3E-03
00524214	4	30	80	3	30	244.0	254.0	0.001	0	149.0	50.00	10.0	0.0E+00	59.65	0.60	**1.4E-02**	**1.2E+03**	**8.4**	50.00	0.00%	pass	2.5E-04	1.6E-03	7.7E-03
00524565	4	20	22	1	40	128.0	138.0	0.001	0	149.0	2.00	10.0	0.0E+00	59.65	20.00	**4.9E-01**	**4.2E+04**	**283.9**	2.00	0.01%	pass	8.2E-03	5.5E-02	2.6E-01
00524571	4	20	22	1	12	97.0	140.0	0.001	0	149.0	2.00	43.0	0.0E+00	12.65	6.00	**4.4E-02**	**3.8E+03**	**25.7**	2.00	0.05%	pass	2.5E-03	5.1E-03	2.1E-02
00525523	4	23	33	3	49	141.0	184.0	0.001	0	149.0	10.00	43.0	0.0E+00	12.65	4.90	**3.7E-02**	**3.2E+03**	**21.5**	10.00	0.00%	pass	2.0E-03	4.2E-03	1.7E-02
00525533	4	40	50	3	49	91.0	152.0	0.001	0	149.0	10.00	61.0	0.0E+00	7.59	4.90	**2.8E-02**	**2.4E+03**	**16.2**	10.00	0.00%	pass	2.1E-03	3.2E-03	1.3E-02
00527970	4	45	80	3	30	113.0	155.0	0.001	0	149.0	35.00	42.0	0.0E+00	13.04	0.86	**6.3E-03**	**5.5E+02**	**3.7**	35.00	0.00%	pass	3.6E-04	7.2E-04	3.0E-03
00531399	4	15	60	3	30	194.0	266.0	0.001	0	149.0	45.00	72.0	0.0E+00	5.63	0.67	**3.1E-03**	**2.7E+02**	**1.8**	45.00	0.00%	pass	2.8E-04	3.6E-04	1.5E-03
00531833	4	18	40	2	25	263.0	281.0	0.001	0	149.0	22.00	18.0	0.0E+00	33.32	1.14	**1.7E-02**	**1.4E+03**	**9.7**	22.00	0.00%	pass	4.7E-04	1.9E-03	8.4E-03
00533014	4	10	15	4	50	156.0	201.0	0.001	0	149.0	5.00	45.0	0.0E+00	11.92	10.00	**7.5E-02**	**6.5E+03**	**43.3**	5.00	0.02%	pass	4.2E-03	8.5E-03	3.3E-02
00533492	4	21	41	3	40	197.0	231.0	0.001	0	149.0	20.00	34.0	0.0E+00	16.87	2.00	**1.8E-02**	**1.5E+03**	**10.3**	20.00	0.00%	pass	8.3E-04	2.0E-03	8.4E-03
00533519	4	30	50	3	30	165.0	225.0	0.001	0	149.0	20.00	60.0	0.0E+00	7.80	1.50	**8.4E-03**	**7.2E+02**	**4.8**	20.00	0.00%	pass	6.3E-04	9.6E-04	3.9E-03
00536770	4	20	30	2	18	194.0	198.0	0.001	0	149.0	10.00	4.0	0.0E+00	146.35	1.80	**9.9E-02**	**8.6E+03**	**57.5**	10.00	0.00%	pass	7.3E-04	1.1E-02	5.8E-02
00538061	4	20	40	3	40	208.0	250.0	0.001	0	149.0	20.00	42.0	0.0E+00	13.04	2.00	**1.5E-02**	**1.3E+03**	**8.7**	20.00	0.00%	pass	8.4E-04	1.7E-03	7.0E-03
00538080	4	20	40	3	40	103.0	150.0	0.001	0	149.0	20.00	47.0	0.0E+00	11.24	2.00	**1.4E-02**	**1.2E+03**	**8.0**	20.00	0.00%	pass	8.4E-04	1.6E-03	6.4E-03
00538127	4	35	55	3	40	154.0	225.0	0.001	0	149.0	20.00	71.0	0.0E+00	5.78	2.00	**9.8E-03**	**8.4E+02**	**5.7**	20.00	0.00%	pass	8.5E-04	1.1E-03	4.5E-03
00540065	4	12	20	3	40	112.0	142.0	0.001	0	149.0	8.00	30.0	0.0E+00	19.45	5.00	**5.0E-02**	**4.3E+03**	**29.0**	8.00	0.00%	pass	2.1E-03	5.7E-03	2.3E-02
00540437	4	15	40	3	50	144.0	185.0	0.001	0	149.0	25.00	41.0	0.0E+00	13.45	2.00	**1.5E-02**	**1.3E+03**	**8.9**	25.00	0.00%	pass	8.4E-04	1.7E-03	7.2E-03
00541761	4	30	55	3	30	141.0	171.0	0.001	0	149.0	25.00	30.0	0.0E+00	19.45	1.20	**1.2E-02**	**1.0E+03**	**6.8**	25.00	0.00%	pass	5.0E-04	1.3E-03	5.6E-03
00546162	4	25	90	6	80	105.0	175.0	0.001	0	149.0	65.00	70.0	0.0E+00	5.94	1.23	**6.1E-03**	**5.3E+02**	**3.6**	65.00	0.00%	pass	5.2E-04	7.1E-04	2.8E-03
00547598	4	12	25	3	35	196.0	245.0	0.001	0	149.0	13.00	49.0	0.0E+00	10.61	2.69	**1.8E-02**	**1.6E+03**	**10.5**	13.00	0.00%	pass	1.1E-03	2.1E-03	8.3E-03
00547605	4	10	60	3	40	193.0	246.0	0.001	0	149.0	50.00	53.0	0.0E+00	9.47	0.80	**4.9E-03**	**4.2E+02**	**2.8**	50.00	0.00%	pass	3.4E-04	5.6E-04	2.3E-03
00551256	4	15	60	3	45	126.0	146.0	0.001	0	149.0	45.00	20.0	0.0E+00	29.94	1.00	**1.4E-02**	**1.2E+03**	**7.8**	45.00	0.00%	pass	4.1E-04	1.5E-03	6.7E-03
00554759	4	40	70	4	30	166.0	200.0	0.001	0	149.0	30.00	34.0	0.0E+00	16.87	1.00	**8.8E-03**	**7.6E+02**	**5.1**	30.00	0.00%	pass	4.2E-04	1.0E-03	4.2E-03
00554780	4	12	30	3	50	187.0	240.0	0.001	0	149.0	18.00	53.0	0.0E+00	9.47	2.78	**1.7E-02**	**1.5E+03**	**10.1**	18.00	0.00%	pass	1.2E-03	2.0E-03	8.1E-03
00556695	4	12	45	3	30	169.0	212.0	0.001	0	149.0	33.00	43.0	0.0E+00	12.65	0.91	**6.6E-03**	**5.7E+02**	**3.8**	33.00	0.00%	pass	3.8E-04	7.5E-04	3.1E-03
00556715	4	20	60	3	40	182.0	232.0	0.001	0	149.0	40.00	50.0	0.0E+00	10.31	1.00	**6.4E-03**	**5.5E+02**	**3.7**	40.00	0.00%	pass	4.2E-04	7.3E-04	3.0E-03
00557440	4	10	30	2	20	163.0	180.0	0.001	0	149.0	20.00	17.0	0.0E+00	35.30	1.00	**1.5E-02**	**1.3E+03**	**8.9**	20.00	0.00%	pass	4.1E-04	1.7E-03	7.8E-03
00559043	4	30	60	5	50	244.0	305.0	0.001	0	149.0	30.00	61.0	0.0E+00	7.59	1.67	**9.3E-03**	**8.1E+02**	**5.4**	30.00	0.00%	pass	7.0E-04	1.1E-03	4.3E-03
00559384	4	25	55	30	40	154.0	225.0	0.001	0	149.0	30.00	71.0	0.0E+00	5.78	1.33	**7.0E-03**	**6.0E+02**	**4.0**	30.00	0.00%	pass	5.6E-04	8.0E-04	3.0E-03
00559391	4	20	40	3	40	168.0	205.0	0.001	0	149.0	20.00	37.0	0.0E+00	15.26	2.00	**1.7E-02**	**1.4E+03**	**9.7**	20.00	0.00%	pass	8.3E-04	1.9E-03	7.8E-03
00559397	4	35	55	3	40	225.0	262.0	0.001	0	149.0	20.00	37.0	0.0E+00	15.26	2.00	**1.7E-02**	**1.4E+03**	**9.7**	20.00	0.00%	pass	8.3E-04	1.9E-03	7.8E-03
00559406	4	10	20	3	40	90.0	150.0	0.001	0	149.0	10.00	60.0	0.0E+00	7.80	4.00	**2.3E-02**	**2.0E+03**	**13.3**	10.00	0.00%	pass	1.7E-03	2.6E-03	1.0E-02
00559410	4	48	68	3	40	167.0	220.0	0.001	0	149.0	20.00	53.0	0.0E+00	9.47	2.00	**1.2E-02**	**1.1E+03**	**7.2**	20.00	0.00%	pass	8.4E-04	1.4E-03	5.8E-03
00559424	4	22	42	3	40	210.0	250.0	0.001	0	149.0	20.00	40.0	0.0E+00	13.87	2.00	**1.6E-02**	**1.4E+03**	**9.1**	20.00	0.00%	pass	8.4E-04	1.8E-03	7.3E-03
00559446	4	20	30	2	10	170.0	200.0	0.001	0	149.0	10.00	30.0	0.0E+00	19.45	1.00	**9.7E-03**	**8.3E+02**	**5.6**	10.00	0.00%	pass	4.2E-04	1.1E-03	4.6E-03
00559498	4	22	50	2	50	210.0	276.0	0.001	0	149.0	28.00	66.0	0.0E+00	6.63	1.79	**9.1E-03**	**7.9E+02**	**5.3**	28.00	0.00%	pass	7.6E-04	1.0E-03	4.3E-03
00562970	4	28	48	3	40	207.0	250.0	0.001	0	149.0	20.00	43.0	0.0E+00	12.65	2.00	**1.5E-02**	**1.3E+03**	**8.6**	20.00	0.00%	pass	8.4E-04	1.7E-03	6.9E-03
00563498	4	20	40	3	30	186.0	196.0	0.001	0	149.0	20.00	10.0	0.0E+00	59.65	1.50	**3.6E-02**	**3.1E+03**	**21.1**	20.00	0.00%	pass	6.2E-04	4.1E-03	1.9E-02
00564172	4	30	42	3	25	265.0	292.0	0.001	0	149.0	12.00	27.0	0.0E+00	21.84	2.08	**2.2E-02**	**1.9E+03**	**13.0**	12.00	0.00%	pass	8.6E-04	2.5E-03	1.1E-02
00566171	4	10	25	3	50	191.0	240.0	0.001	0	149.0	15.00	49.0	0.0E+00	10.61	3.33	**2.2E-02**	**1.9E+03**	**13.0**	15.00	0.00%	pass	1.4E-03	2.6E-03	1.0E-02
00572022	4	15	40	3	50	180.0	220.0	0.001	0	149.0	25.00	40.0	0.0E+00	13.87	2.00	**1.6E-02**	**1.4E+03**	**9.1**	25.00	0.00%	pass	8.4E-04	1.8E-03	7.3E-03
00576749	4	30	50	3	30	196.0	231.0	0.001	0	149.0	20.00	35.0	0.0E+00	16.31	1.50	**1.3E-02**	**1.1E+03**	**7.5**	20.00	0.00%	pass	6.3E-04	1.5E-03	6.1E-03
00577032	4	60	100	1	30	136.0	200.0	0.001	0	149.0	40.00	64.0	0.0E+00	7.00	0.75	**3.7E-03**	**3.2E+02**	**2.2**	40.00	0.00%	pass	3.2E-04	4.3E-04	1.9E-03
00580587	4	20	60	6	25	155.0	185.0	0.001	0	149.0	40.00	30.0	0.0E+00	19.45	0.63	**6.1E-03**	**5.3E+02**	**3.5**	40.00	0.00%	pass	2.6E-04	6.9E-04	2.9E-03
00580648	4	26	150	2.5	40	190.0	215.0	0.001	0	149.0	124.00	25.0	0.0E+00	23.72	0.32	**3.6E-03**	**3.1E+02**	**2.1**	124.00	0.00%	pass	1.3E-04	4.0E-04	1.8E-03
00582672	4	35	80	2	30	272.0	316.0	0.001	0	149.0	45.00	44.0	0.0E+00	12.28	0.67	**4.7E-03**	**4.0E+02**	**2.7**	45.00	0.00%	pass	2.8E-04	5.3E-04	2.3E-03
00582855	4	40	50	3	60	150.0	198.0	0.001	0	149.0	10.00	48.0	0.0E+00	10.92	6.00	**4.2E-02**	**3.6E+03**	**24.2**	10.00	0.00%	pass	2.5E-03	4.8E-03	1.9E-02
00584416	4	25	60	10	30	230.0	287.0	0.001	0	149.0	35.00	57.0	0.0E+00	8.48	0.86	**5.1E-03**	**4.4E+02**	**2.9**	35.00	0.00%	pass	3.6E-04	5.8E-04	2.3E-03
00584430	4	6	40	4	50	148.0	215.0	0.001	0	149.0	34.00	67.0	0.0E+00	6.45	1.47	**7.5E-03**	**6.5E+02**	**4.4**	34.00	0.00%	pass	6.2E-04	8.7E-04	3.5E-03
00588556	4	25	50	4	40	200.0	260.0	0.001	0	149.0	25.00	60.0	0.0E+00	7.80	1.60	**9.0E-03**	**7.8E+02**	**5.2**	25.00	0.00%	pass	6.7E-04	1.0E-03	4.2E-03
00588563	4	12	40	5	50	159.0	220.0	0.001	0	149.0	28.00	61.0	0.0E+00	7.59	1.79	**1.0E-02**	**8.7E+02**	**5.8**	28.00	0.00%	pass	7.5E-04	1.2E-03	4.6E-03
00588572	4	30	50	3	30	239.0	291.0	0.001	0	149.0	20.00	52.0	0.0E+00	9.74	1.50	**9.4E-03**	**8.1E+02**	**5.5**	20.00	0.00%	pass	6.3E-04	1.1E-03	4.4E-03
00592879	4	20	60	4	50	204.0	260.0	0.001	0	149.0	40.00	56.0	0.0E+00	8.71	1.25	**7.4E-03**	**6.4E+02**	**4.3**	40.00	0.00%	pass	5.3E-04	8.5E-04	3.5E-03
00595671	4	35	60	5	50	180.0	240.0	0.001	0	149.0	25.00	60.0	0.0E+00	7.80	2.00	**1.1E-02**	**9.9E+02**	**6.6**	25.00	0.00%	pass	8.4E-04	1.3E-03	5.2E-03
00595673	4	30	50	5	50	212.0	260.0	0.001	0	149.0	20.00	48.0	0.0E+00	10.92	2.50	**1.7E-02**	**1.5E+03**	**10.0**	20.00	0.00%	pass	1.0E-03	2.0E-03	7.9E-03
00596673	4	23	120	2	50	133.0	150.0	0.001	0	149.0	97.00	17.0	0.0E+00	35.30	0.52	**7.9E-03**	**6.8E+02**	**4.6**	97.00	0.00%	pass	2.1E-04	8.8E-04	4.0E-03
00599174	4	30	50	5	50	239.0	280.0	0.001	0	149.0	20.00	41.0	0.0E+00	13.45	2.50	**2.0E-02**	**1.7E+03**	**11.3**	20.00	0.00%	pass	1.0E-03	2.2E-03	8.9E-03
00602052	4	25	60	4	50	191.0	290.0	0.001	0	149.0	35.00	99.0	0.0E+00	2.55	1.43	**5.3E-03**	**4.5E+02**	**3.0**	35.00	0.00%	pass	6.1E-04	6.1E-04	2.3E-03
00602087	4	25	60	3	30	233.0	283.0	0.001	0	149.0	35.00	50.0	0.0E+00	10.31	0.86	**5.5E-03**	**4.7E+02**	**3.2**	35.00	0.00%	pass	3.6E-04	6.3E-04	2.6E-03
00606054	4	20	40	5	50	139.0	180.0	0.001	0	149.0	20.00	41.0	0.0E+00	13.45	2.50	**2.0E-02**	**1.7E+03**	**11.3**	20.00	0.00%	pass	1.0E-03	2.2E-03	8.9E-03
00606064	4	25	50	6	50	155.0	200.0	0.001	0	149.0	25.00	45.0	0.0E+00	11.92	2.00	**1.4E-02**	**1.3E+03**	**8.4**	25.00	0.00%	pass	8.4E-04	1.7E-03	6.6E-03
00609853	4	25	60	8	50	220.0	300.0	0.001	0	149.0	35.00	80.0	0.0E+00	4.51	1.43	**6.5E-03**	**5.6E+02**	**3.8**	35.00	0.00%	pass	6.1E-04	7.5E-04	2.9E-03
00613573	4	35	80	10	50	212.0	275.0	0.001	0	149.0	45.00	63.0	0.0E+00	7.19	1.11	**6.1E-03**	**5.3E+02**	**3.6**	45.00	0.00%	pass	4.7E-04	7.0E-04	2.8E-03
00621007	4	15	60	2	100	114.0	155.0	0.001	0	149.0	45.00	41.0	0.0E+00	13.45	2.22	**1.7E-02**	**1.5E+03**	**9.8**	45.00	0.00%	pass	9.3E-04	1.9E-03	7.9E-03
00624973	4	30	210	4	40	239.0	250.0	0.001	0	149.0	180.00	11.0	0.0E+00	54.33	0.22	**4.9E-03**	**4.2E+02**	**2.8**	180.00	0.00%	pass	9.1E-05	5.5E-04	2.6E-03
00627861	4	25	50	8	40	153.0	220.0	0.001	0	149.0	25.00	67.0	0.0E+00	6.45	1.60	**8.4E-03**	**7.3E+02**	**4.9**	25.00	0.00%	pass	6.8E-04	9.7E-04	3.8E-03
00631742	4	20	60	2	150	155.0	200.0	0.001	0	149.0	40.00	45.0	0.0E+00	11.92	3.75	**2.7E-02**	**2.3E+03**	**15.6**	40.00	0.00%	pass	1.6E-03	3.1E-03	1.2E-02
00632756	4	20	60	3	50	142.0	192.0	0.001	0	149.0	40.00	50.0	0.0E+00	10.31	1.25	**8.1E-03**	**7.0E+02**	**4.7**	40.00	0.00%	pass	5.2E-04	9.2E-04	3.8E-03
00636919	4	20	60	3	30	169.0	216.0	0.001	0	149.0	40.00	47.0	0.0E+00	11.24	0.75	**5.0E-03**	**4.3E+02**	**2.9**	40.00	0.00%	pass	3.1E-04	5.7E-04	2.4E-03
00636924	4	30	60	5	50	180.0	220.0	0.001	0	149.0	30.00	40.0	0.0E+00	13.87	1.67	**1.3E-02**	**1.1E+03**	**7.6**	30.00	0.00%	pass	7.0E-04	1.5E-03	6.1E-03
00638287	4	25	50	6	50	139.0	180.0	0.001	0	149.0	25.00	41.0	0.0E+00	13.45	2.00	**1.6E-02**	**1.3E+03**	**9.1**	25.00	0.00%	pass	8.4E-04	1.8E-03	7.1E-03
00641208	4	30	240	1	50	215.0	240.0	0.001	0	149.0	210.00	25.0	0.0E+00	23.72	0.24	**2.6E-03**	**2.2E+02**	**1.5**	210.00	0.00%	pass	9.9E-05	2.9E-04	1.3E-03

00641250	4	38	140	1	80	205.0	240.0	0.001	0	149.0	102.00	35.0	0.0E+00	16.31	0.78	**6.5E-03**	**5.7E+02**	**3.8**	102.00	0.00%	pass	3.3E-04	7.4E-04	3.2E-03
00642607	4	40	70	1	20	210.0	232.0	0.001	0	149.0	30.00	22.0	0.0E+00	27.13	0.67	**8.1E-03**	**7.0E+02**	**4.7**	30.00	0.00%	pass	2.8E-04	9.2E-04	4.1E-03
00642640	4	40	60	1	20	210.0	235.0	0.001	0	149.0	20.00	25.0	0.0E+00	23.72	1.00	**1.1E-02**	**9.6E+02**	**6.4**	20.00	0.00%	pass	4.1E-04	1.3E-03	5.5E-03
00643796	4	18	60	2	30	215.0	272.0	0.001	0	149.0	42.00	57.0	0.0E+00	8.48	0.71	**4.0E-03**	**3.5E+02**	**2.3**	42.00	0.00%	pass	3.0E-04	4.6E-04	2.0E-03
00644640	4	30	60	5	50	160.0	260.0	0.001	0	149.0	30.00	100.0	0.0E+00	2.47	1.67	**6.2E-03**	**5.4E+02**	**3.6**	30.00	0.00%	pass	7.1E-04	7.2E-04	2.6E-03
00645655	4	21	30	3	60	179.0	211.0	0.001	0	149.0	9.00	32.0	0.0E+00	18.09	6.67	**6.4E-02**	**5.5E+03**	**37.0**	9.00	0.00%	pass	2.8E-03	7.2E-03	2.9E-02
00645658	4	24	32	3	60	172.0	210.0	0.001	0	149.0	8.00	38.0	0.0E+00	14.78	7.50	**6.3E-02**	**5.4E+03**	**36.5**	8.00	0.00%	pass	3.1E-03	7.2E-03	2.9E-02
00648511	4	19	60	3	30	152.0	202.0	0.001	0	149.0	41.00	50.0	0.0E+00	10.31	0.73	**4.6E-03**	**4.0E+02**	**2.7**	41.00	0.00%	pass	3.1E-04	5.3E-04	2.2E-03
00648828	4	45	255	1	70	234.0	255.0	0.001	0	149.0	210.00	21.0	0.0E+00	28.47	0.33	**4.2E-03**	**3.6E+02**	**2.4**	210.00	0.00%	pass	1.4E-04	4.7E-04	2.1E-03
00649217	4	10	30	4	30	93.0	110.0	0.001	0	149.0	20.00	17.0	0.0E+00	35.30	1.50	**2.3E-02**	**2.0E+03**	**13.5**	20.00	0.00%	pass	6.2E-04	2.6E-03	1.2E-02
00650703	4	37	80	1	30	154.0	200.0	0.001	0	149.0	43.00	46.0	0.0E+00	11.57	0.70	**4.6E-03**	**4.0E+02**	**2.7**	43.00	0.00%	pass	2.9E-04	5.3E-04	2.3E-03
00659787	4	35	55	1	20	210.0	231.0	0.001	0	149.0	20.00	21.0	0.0E+00	28.47	1.00	**1.3E-02**	**1.1E+03**	**7.4**	20.00	0.00%	pass	4.1E-04	1.4E-03	6.4E-03
00661125	4	20	50	8	40	191.0	340.0	0.001	0	149.0	30.00	149.0	0.0E+00	0.00	1.33	**3.8E-03**	**3.3E+02**	**2.2**	30.00	0.00%	pass	5.8E-04	4.5E-04	1.2E-03
00669166	4	22	60	2	30	137.0	198.0	0.001	0	149.0	38.00	61.0	0.0E+00	7.59	0.79	**4.2E-03**	**3.6E+02**	**2.4**	38.00	0.00%	pass	3.3E-04	4.8E-04	2.0E-03
00670224	4	15	50	8	50	160.0	190.0	0.001	0	149.0	35.00	30.0	0.0E+00	19.45	1.43	**1.4E-02**	**1.2E+03**	**8.3**	35.00	0.00%	pass	5.9E-04	1.6E-03	6.6E-03
00681481	4	45	80	1	20	136.0	156.0	0.001	0	149.0	35.00	20.0	0.0E+00	29.94	0.57	**7.5E-03**	**6.5E+02**	**4.4**	35.00	0.00%	pass	2.4E-04	8.5E-04	3.8E-03
00693255	4	30	120	1	60	209.0	240.0	0.001	0	149.0	90.00	31.0	0.0E+00	18.75	0.67	**6.1E-03**	**5.3E+02**	**3.6**	90.00	0.00%	pass	2.8E-04	7.0E-04	3.0E-03
00693865	4	25	50	8	50	218.0	240.0	0.001	0	149.0	25.00	22.0	0.0E+00	27.13	2.00	**2.6E-02**	**2.2E+03**	**14.8**	25.00	0.00%	pass	8.3E-04	2.9E-03	1.2E-02
00706703	4	20	60	2	25	211.0	246.0	0.001	0	149.0	40.00	35.0	0.0E+00	16.31	0.63	**5.3E-03**	**4.6E+02**	**3.1**	40.00	0.00%	pass	2.6E-04	6.0E-04	2.5E-03
00707655	4	15	50	8	70	240.0	300.0	0.001	0	149.0	35.00	60.0	0.0E+00	7.80	2.00	**1.2E-02**	**1.0E+03**	**6.7**	35.00	0.00%	pass	8.4E-04	1.3E-03	5.2E-03
00707857	4	29	50	8	70	169.0	300.0	0.001	0	149.0	21.00	131.0	0.0E+00	0.64	3.33	**1.1E-02**	**9.4E+02**	**6.3**	21.00	0.00%	pass	1.4E-03	1.3E-03	3.5E-03
00707875	4	25	50	8	60	217.0	260.0	0.001	0	149.0	25.00	43.0	0.0E+00	12.65	2.40	**1.8E-02**	**1.6E+03**	**10.6**	25.00	0.00%	pass	1.0E-03	2.1E-03	8.2E-03
00707896	4	20	50	8	60	175.0	296.0	0.001	0	149.0	30.00	121.0	0.0E+00	1.11	2.00	**6.7E-03**	**5.8E+02**	**3.9**	30.00	0.00%	pass	8.6E-04	7.8E-04	2.4E-03
00707897	4	26	60	8	60	183.0	320.0	0.001	0	149.0	34.00	137.0	0.0E+00	0.40	1.76	**5.4E-03**	**4.6E+02**	**3.1**	34.00	0.00%	pass	7.7E-04	6.3E-04	1.7E-03
00716797	4	25	260	1	30	232.0	260.0	0.001	0	149.0	235.00	28.0	0.0E+00	20.99	0.13	**1.2E-03**	**1.1E+02**	**0.7**	235.00	0.00%	pass	5.3E-05	1.4E-04	6.3E-04
00716799	4	22	220	1	100	216.0	220.0	0.001	0	149.0	198.00	4.0	0.0E+00	146.35	0.51	**2.8E-02**	**2.4E+03**	**16.0**	198.00	0.00%	pass	2.1E-04	3.1E-03	1.6E-02
00735706	4	18	165	1	60	168.0	186.0	0.001	0	149.0	147.00	18.0	0.0E+00	33.32	0.41	**5.9E-03**	**5.1E+02**	**3.4**	147.00	0.00%	pass	1.7E-04	6.6E-04	3.0E-03
00735706	4	18	75	2	40	168.0	186.0	0.001	0	149.0	57.00	18.0	0.0E+00	33.32	0.70	**1.0E-02**	**8.8E+02**	**5.9**	57.00	0.00%	pass	2.9E-04	1.2E-03	5.2E-03
00739556	4	15	50	8	80	163.0	188.0	0.001	0	149.0	35.00	25.0	0.0E+00	23.72	2.29	**2.6E-02**	**2.3E+03**	**15.4**	35.00	0.00%	pass	9.5E-04	3.0E-03	1.2E-02
00742803	4	70	240	1	30	263.0	300.0	0.001	0	149.0	170.00	37.0	0.0E+00	15.26	0.18	**1.4E-03**	**1.2E+02**	**0.8**	170.00	0.00%	pass	7.4E-05	1.5E-04	6.9E-04
00748035	4	27	80	2	100	167.0	196.0	0.001	0	149.0	53.00	29.0	0.0E+00	20.20	1.89	**1.9E-02**	**1.6E+03**	**11.0**	53.00	0.00%	pass	7.8E-04	2.1E-03	9.0E-03
00756072	4	15	35	45	55	160.0	190.0	0.001	0	149.0	20.00	30.0	0.0E+00	19.45	2.75	**2.9E-02**	**2.5E+03**	**16.6**	20.00	0.00%	pass	1.1E-03	3.2E-03	1.3E-02
00761478	4	30	90	2	75	173.0	220.0	0.001	0	149.0	60.00	47.0	0.0E+00	11.24	1.25	**8.4E-03**	**7.3E+02**	**4.9**	60.00	0.00%	pass	5.2E-04	9.6E-04	4.0E-03
00765325	4	20	60	3	30	80.0	175.0	0.001	0	149.0	40.00	95.0	0.0E+00	2.90	0.75	**2.7E-03**	**2.4E+02**	**1.6**	40.00	0.00%	pass	3.2E-04	3.2E-04	1.3E-03
00776889	4	24	220	1.5	25	219.0	245.0	0.001	0	149.0	196.00	26.0	0.0E+00	22.75	0.13	**1.3E-03**	**1.1E+02**	**0.8**	196.00	0.00%	pass	5.3E-05	1.5E-04	6.7E-04
00778026	4	24	100	6	50	199.0	245.0	0.001	0	149.0	76.00	46.0	0.0E+00	11.57	0.66	**4.6E-03**	**3.9E+02**	**2.6**	76.00	0.00%	pass	2.8E-04	5.2E-04	2.1E-03
00778031	6	20	27.75	2.5	100	161.0	260.0	0.001	0	149.0	7.75	99.0	0.0E+00	2.35	12.90	**4.9E-02**	**4.2E+03**	**28.2**	7.75	0.01%	pass	5.5E-03	5.7E-03	1.9E-02
00778073	4	22	44	1	20	126.0	171.0	0.001	0	149.0	22.00	45.0	0.0E+00	11.92	0.91	**6.2E-03**	**5.3E+02**	**3.6**	22.00	0.00%	pass	3.8E-04	7.0E-04	3.0E-03
00779162	4	13	50	5	70	194.0	235.0	0.001	0	149.0	37.00	41.0	0.0E+00	13.45	1.89	**1.5E-02**	**1.3E+03**	**8.5**	37.00	0.00%	pass	7.9E-04	1.7E-03	6.8E-03
00779305	4	25	50	3	75	168.0	218.0	0.001	0	149.0	25.00	50.0	0.0E+00	10.31	3.00	**2.0E-02**	**1.7E+03**	**11.5**	25.00	0.00%	pass	1.3E-03	2.3E-03	9.1E-03
00784102	8	34	250	3	400	168.0	250.0	0.001	0	149.0	216.00	82.0	0.0E+00	3.69	1.85	**7.1E-03**	**6.1E+02**	**4.1**	216.00	0.00%	pass	7.9E-04	8.3E-04	3.2E-03
																Max	**4.8E+04**	**3.2E+02**						
																Min	**9.5E+01**	**6.4E-01**						
																Geomean	**1.3E+03**	**8.9E+00**						

References:

Bradbury, K.B., and E.R. Rothschild, 1985. A computerized technique for estimating the hydraulic conductivity of aquifer from specific capacity data: Ground Water vol. 23, No. 2, pp. 240-246.

ASTM International, 2004. Standard Test Method for Determining Specific Capacity and Estimating Transmissivity at the Control Well, Standard D 5472-93, in Annual Book of ASTM Standards, Vol. 04.08 pp. 1279-1282.

Wonewoc

Worksheet for Estimating Transmissivity and Hydraulic Conductivity from Specific Capacity Test Data

Explanation and notes attached.

Maximum iterations	100
Error tolerance (as drawdown)	0.001 feet

	Field Data							*Estimated Parameters*			*Calculated Results*								*Diagnostics*					
		Depth to Water				Screened Interval													*Solution Integrity*			*Sensitivity of T:*		
Location	Well Diam.	Initial	Final	Test Duration	Mean Pumping Rate	Depth to Top	Depth to Bottom	Storage Coeff. (S)	Well loss Coeff. (C)	Aquifer Thickness (b)	Measured Drawdown (s_m)	Saturated Screen Length (L)	Well loss (s_w)	Partial Penetration Parameter (s_p)	Specific Capacity	**Transmissivity (T)**	**T (ft^2/day)**	**Conductivity (K)**	Calculated Drawdown	Error as Drawdown	Well Bore Storage Test	to S at ± 1 factor of 10	to s_w at 10% of s_m	to b at ± 25%
	inches	feet	feet	hours	gpm	feet	feet	-	sec^2/ft^5	feet	feet	feet	feet	-	gpm/ft	**sq ft/sec**		**ft/day**	feet			sq ft/sec	sq ft/sec	sq ft/sec
00104703	3	24	40	4	25	216.0	229.0	0.001	0	57.0	16.00	13.0	0.0E+00	14.60	1.56	**1.3E-02**	**1.1E+03**	**19.4**	16.00	0.00%	pass	6.5E-04	1.5E-03	5.7E-03
00122194	4	15	35	3	30	220.0	260.0	0.001	0	57.0	20.00	40.0	0.0E+00	1.71	1.50	**5.0E-03**	**4.3E+02**	**7.5**	20.00	0.00%	pass	6.5E-04	5.9E-04	1.8E-03
00140176	4	20	35	4	60	245.0	288.0	0.001	0	57.0	15.00	43.0	0.0E+00	1.28	4.00	**1.4E-02**	**1.2E+03**	**20.6**	15.00	0.00%	pass	1.7E-03	1.6E-03	4.4E-03
00145432	4	13	30	5	25	172.0	214.0	0.001	0	57.0	17.00	42.0	0.0E+00	1.42	1.47	**4.9E-03**	**4.2E+02**	**7.4**	17.00	0.00%	pass	6.3E-04	5.7E-04	1.7E-03
00147153	4	21	25	3	60	202.0	231.0	0.001	0	57.0	4.00	29.0	0.0E+00	4.14	15.00	**7.0E-02**	**6.0E+03**	**105.6**	4.00	0.00%	pass	6.4E-03	8.1E-03	2.7E-02
00154527	4	40	55	4	35	181.0	186.0	0.001	0	57.0	15.00	5.0	0.0E+00	35.86	2.33	**3.7E-02**	**3.2E+03**	**56.0**	15.00	0.00%	pass	9.6E-04	4.2E-03	1.9E-02
00155262	4	20	30	3	25	207.0	213.0	0.001	0	57.0	10.00	6.0	0.0E+00	30.09	2.50	**3.4E-02**	**3.0E+03**	**52.0**	10.00	0.00%	pass	1.0E-03	3.9E-03	1.7E-02
00169693	4	10	30	2	30	275.0	311.0	0.001	0	57.0	20.00	36.0	0.0E+00	2.42	1.50	**5.3E-03**	**4.5E+02**	**8.0**	20.00	0.00%	pass	6.5E-04	6.2E-04	2.1E-03
00178923	4	25	60	3	30	223.0	275.0	0.001	0	57.0	35.00	52.0	0.0E+00	0.35	0.86	**2.3E-03**	**2.0E+02**	**3.5**	35.00	0.00%	pass	3.7E-04	2.8E-04	6.9E-04
00179376	4	15	35	3	55	278.0	306.0	0.001	0	57.0	20.00	28.0	0.0E+00	4.45	2.75	**1.2E-02**	**1.1E+03**	**18.5**	20.00	0.00%	pass	1.2E-03	1.4E-03	5.1E-03
00190419	4	20	40	3	20	202.0	243.0	0.001	0	57.0	20.00	41.0	0.0E+00	1.56	1.00	**3.2E-03**	**2.8E+02**	**4.8**	20.00	0.00%	pass	4.3E-04	3.8E-04	1.2E-03
00197581	4	7	28	3	60	212.0	270.0	0.001	0	57.0	21.00	58.0	0.0E+00	-0.06	2.86	**7.9E-03**	**6.8E+02**	**12.0**	21.00	0.00%	pass	1.2E-03	9.4E-04	1.9E-03
00199906	4	26	50	2	30	201.0	220.0	0.001	0	57.0	24.00	19.0	0.0E+00	8.48	1.25	**7.1E-03**	**6.2E+02**	**10.8**	24.00	0.00%	pass	5.3E-04	8.2E-04	3.2E-03
00406314	4	10	100	1	50	210.0	280.0	0.001	0	57.0	90.00	70.0	0.0E+00	-0.62	0.56	**1.1E-03**	**9.8E+01**	**1.7**	90.00	0.00%	pass	2.5E-04	1.4E-04	4.1E-04
00406320	4	20	100	2	60	273.0	340.0	0.001	0	57.0	80.00	67.0	0.0E+00	-0.50	0.75	**1.7E-03**	**1.5E+02**	**2.6**	80.00	0.00%	pass	3.3E-04	2.1E-04	5.0E-04
00408981	4	15	45	2	35	195.0	231.0	0.001	0	57.0	30.00	36.0	0.0E+00	2.42	1.17	**4.0E-03**	**3.5E+02**	**6.1**	30.00	0.00%	pass	5.0E-04	4.7E-04	1.7E-03
00408981	4	15	45	3	35	195.0	231.0	0.001	0	57.0	30.00	36.0	0.0E+00	2.42	1.17	**4.1E-03**	**3.6E+02**	**6.3**	30.00	0.00%	pass	5.0E-04	4.8E-04	1.7E-03
00409516	4	15	245	3	12	217.0	245.0	0.001	0	57.0	230.00	28.0	0.0E+00	4.45	0.05	**1.9E-04**	**1.7E+01**	**0.3**	230.00	0.00%	pass	2.2E-05	2.3E-05	9.7E-05
00411507	4	20	40	3	30	256.0	335.0	0.001	0	57.0	20.00	79.0	0.0E+00	-0.99	1.50	**3.4E-03**	**3.0E+02**	**5.2**	20.00	0.00%	pass	6.6E-04	4.2E-04	1.6E-03
00429151	4	8	18	3	25	220.0	225.0	0.001	0	57.0	10.00	5.0	0.0E+00	35.86	2.50	**3.9E-02**	**3.4E+03**	**59.8**	10.00	0.00%	pass	1.0E-03	4.4E-03	2.0E-02
00435830	4	7	15	4	30	213.0	255.0	0.001	0	57.0	8.00	42.0	0.0E+00	1.42	3.75	**1.3E-02**	**1.1E+03**	**19.5**	8.00	0.00%	pass	1.6E-03	1.5E-03	4.3E-03
00435832	4	10	20	4	30	168.0	216.0	0.001	0	57.0	10.00	48.0	0.0E+00	0.71	3.00	**9.4E-03**	**8.1E+02**	**14.2**	10.00	0.00%	pass	1.3E-03	1.1E-03	2.8E-03
00437222	4	12	75	1	100	195.0	236.0	0.001	0	57.0	63.00	41.0	0.0E+00	1.56	1.59	**4.9E-03**	**4.2E+02**	**7.4**	63.00	0.00%	pass	6.9E-04	5.8E-04	1.9E-03
00437222	4	12	30	1	25	195.0	236.0	0.001	0	57.0	18.00	41.0	0.0E+00	1.56	1.39	**4.2E-03**	**3.6E+02**	**6.4**	18.00	0.00%	pass	6.0E-04	5.0E-04	1.7E-03
00437700	4	13	30	3	25	205.0	240.0	0.001	0	57.0	17.00	35.0	0.0E+00	2.62	1.47	**5.4E-03**	**4.6E+02**	**8.1**	17.00	0.00%	pass	6.3E-04	6.3E-04	2.2E-03
00450304	4	16	40	5	30	232.0	286.0	0.001	0	57.0	24.00	54.0	0.0E+00	0.20	1.25	**3.5E-03**	**3.0E+02**	**5.3**	24.00	0.00%	pass	5.5E-04	4.2E-04	9.4E-04
00450309	4	15	30	4	35	232.0	286.0	0.001	0	57.0	15.00	54.0	0.0E+00	0.20	2.33	**6.7E-03**	**5.8E+02**	**10.2**	15.00	0.00%	pass	1.0E-03	8.0E-04	1.7E-03
00450310	4	19	45	4	25	238.0	298.0	0.001	0	57.0	26.00	60.0	0.0E+00	-0.17	0.96	**2.5E-03**	**2.1E+02**	**3.8**	26.00	0.00%	pass	4.2E-04	3.0E-04	6.3E-04
00450325	4	25	45	5	30	232.0	291.0	0.001	0	57.0	20.00	59.0	0.0E+00	-0.12	1.50	**4.1E-03**	**3.5E+02**	**6.2**	20.00	0.00%	pass	6.6E-04	4.9E-04	1.0E-03
00477365	4	36	70	2	35	306.0	350.0	0.001	0	57.0	34.00	44.0	0.0E+00	1.15	1.03	**3.0E-03**	**2.6E+02**	**4.6**	34.00	0.00%	pass	4.5E-04	3.6E-04	1.1E-03
00494285	4	15	25	3	30	162.0	167.0	0.001	0	57.0	10.00	5.0	0.0E+00	35.86	3.00	**4.7E-02**	**4.1E+03**	**72.0**	10.00	0.01%	pass	1.2E-03	5.3E-03	2.4E-02
00506378	4	25	40	3	40	228.0	258.0	0.001	0	57.0	15.00	30.0	0.0E+00	3.85	2.67	**1.1E-02**	**9.7E+02**	**17.1**	15.00	0.00%	pass	1.1E-03	1.3E-03	4.6E-03
00509243	4	10	160	1	70	163.0	174.0	0.001	0	57.0	150.00	11.0	0.0E+00	16.37	0.47	**3.9E-03**	**3.3E+02**	**5.9**	150.00	0.00%	pass	1.9E-04	4.4E-04	1.8E-03
00509243	4	10	100	2	50	163.0	174.0	0.001	0	57.0	90.00	11.0	0.0E+00	16.37	0.56	**4.7E-03**	**4.0E+02**	**7.1**	90.00	0.00%	pass	2.3E-04	5.3E-04	2.2E-03
00510535	4	20	45	2	40	203.0	245.0	0.001	0	57.0	25.00	42.0	0.0E+00	1.42	1.60	**5.0E-03**	**4.3E+02**	**7.6**	25.00	0.00%	pass	6.9E-04	5.9E-04	1.8E-03
00510535	4	20	45	3	40	203.0	245.0	0.001	0	57.0	25.00	42.0	0.0E+00	1.42	1.60	**5.2E-03**	**4.4E+02**	**7.8**	25.00	0.00%	pass	6.9E-04	6.1E-04	1.8E-03
00511955	4	18	30	3.5	50	212.0	261.0	0.001	0	57.0	12.00	49.0	0.0E+00	0.61	4.17	**1.3E-02**	**1.1E+03**	**19.7**	12.00	0.00%	pass	1.8E-03	1.5E-03	3.7E-03
00562952	4	20	200	3	25	227.0	238.0	0.001	0	57.0	180.00	11.0	0.0E+00	16.37	0.14	**1.1E-03**	**9.9E+01**	**1.7**	180.00	0.00%	pass	5.8E-05	1.3E-04	5.5E-04
00587137	4	25	65	2	75	220.0	245.0	0.001	0	57.0	40.00	25.0	0.0E+00	5.52	1.88	**8.8E-03**	**7.6E+02**	**13.3**	40.00	0.00%	pass	8.0E-04	1.0E-03	3.8E-03
00599191	4	30	50	3	40	224.0	240.0	0.001	0	57.0	20.00	16.0	0.0E+00	10.65	2.00	**1.3E-02**	**1.2E+03**	**20.2**	20.00	0.00%	pass	8.4E-04	1.5E-03	5.8E-03
00624533	4	20	50	6	70	300.0	320.0	0.001	0	57.0	30.00	20.0	0.0E+00	7.89	2.33	**1.4E-02**	**1.2E+03**	**20.5**	30.00	0.00%	pass	9.8E-04	1.6E-03	5.7E-03
00705752	4	18	100	2	55	200.0	240.0	0.001	0	57.0	82.00	40.0	0.0E+00	1.71	0.67	**2.1E-03**	**1.8E+02**	**3.1**	82.00	0.00%	pass	2.9E-04	2.5E-04	8.3E-04

Max	**6.0E+03**	**1.1E+02**
Min	**1.7E+01**	**2.9E-01**
Geomean	**5.3E+02**	**9.3E+00**

References:

Bradbury, K.B., and E.R. Rothschild, 1985. A computerized technique for estimating the hydraulic conductivity of aquifer from specific capacity data: Ground Water vol. 23, No. 2, pp. 240-246.

ASTM International, 2004. Standard Test Method for Determining Specific Capacity and Estimating Transmissivity at the Control Well, Standard D 5472-93, in Annual Book of ASTM Standards, Vol. 04.08 pp. 1279-1282.

MINNESOTA MDH DEPARTMENT OF HEALTH
Environmental Health Division
Drinking Water Protection Section
Source Water Protection Unit
P.O. Box 64975
St. Paul, Minnesota 55164-0975

Determination of Aquifer Properties and Aquifer Test Plan (DAP-ATP) Form

Public Water Supply ID:	1020017	PWS Name:	Coon Rapids

Contact Information for Person Completing this Form

Name:	John Greer
Address:	Barr Engineering Company
	4700 West 77th Street, Suite 200
City, State, Zip:	Edina, MN 55435
Phone, Fax, e-mail:	(952) 832-2691

Aquifer Properties Determination Methods

☐ 1) An existing pumping test that meets the requirements of wellhead protection rule part 4720.5520 and that was previously conducted on a well connected to the public water supply system.

☐ 2) An existing pumping test that meets the requirements of wellhead protection rule part 4720.5520 and that was previously conducted on another well in a hydrogeologic setting determined by the department to be equivalent.

☐ 3) A proposed new test to be conducted on a new or existing well connected to the public water supply system and that meets the requirements for larger-sized water systems (wellhead protection rule part 4720.5520). A test plan must be approved before conducting the test.

☐ 4) A proposed new test to be conducted on a new or existing public well connected to the public water supply system and that meets the requirements for smaller-sized water systems (wellhead protection rule part 4720.5530). A test plan must be approved before conducting the test.

☐ 5) An existing pumping test that does not meet the requirements of wellhead protection rule part 4720.5520 and that was previously conducted on: 1) a public water supply well or 2) another well in a hydrogeologic setting determined by the department to be equivalent.

☑ 6) Existing specific capacity test(s) conducted on the public water supply well(s) or specific capacity tests conducted on other wells in a hydrogeologic setting determined by the department to be equivalent.

☐ 7) An existing published transmissivity value.

- Include all test data and analysis documentation with the estimated transmissivity, ft^2/day, when the aquifer properties determination method is; 1, 2, 5, 6, or 7, listed above.
- ▪ Attach detailed aquifer test plan for methods 3 or 4.

Submitted by: John Greer	Prof. License: 30347	Date: 7/31/2015

To request this document in another format, please call our Section Receptionist (651/201-4700) or Division TTY (651/201-5797).

Rationale for: 1) Aquifer Properties Determination or 2) Proposed New Test

Briefly describe the rationale for: 1) selected method to determine aquifer properties from existing data, **or** 2) a new aquifer test to be conducted on the pumped well referenced below. Include unique well numbers of all wells that were (or will be) monitored during data collection. How does the existing or proposed test deviate from the ideal. (e.g. rate, duration, no. of obwells, interfering wells, etc.) Attach documentation as necessary.

Aquifer Name:	Mt. Simon Sandstone	✓ Confined	☐ Unconfined	☐ Fractured Rock

Specific capacity data on the CWI log for Coon Rapids Well 18 (Unique Number 110469) was analyzed using the TGuess Method (Bradbury and Rothschild, 1985) to obtain a transmissivity of 4,700 ft**2/day (see attached).

Four production tests were conducted on Andover Well 3 (Unique Number 431683) in 1987. See the attached plots (provided by MDH) for test data and analysis. Below is a summary of the results from the four tests:

Date	Flow Rate (gpm)	T(ft**2/day)
10/12/1987	600	1,880
10/13/1987	600	1,600
10/14/1987	800	2,200
10/16/1987	1000	2,130

The geometric mean transmissivity of all five tests is 2,310 ft**2/day, which will be used in the base case model. The max and min of the four tests, 1,600 ft**2/day and 4,700 ft**2/day, respectively, will be used as the sensitivity analysis ranges.

Proposed New Test Information Summary

Pumped Well Name (Unique Number):	110469, 431683	**Test Duration (Hours):**	varies
Location: X, Y (meters) UTM-Z15N or Lat-Lon (decimal degrees) datum: NAD83	476962, 5004924 (110469) 476994, 5007465 (431683)	**Pump Type:**	unknown
		Discharge Rate:	600, 800, 1000, 1400 gpm
Number of Observation Wells:	0	**Flow Rate Measuring Device Type:**	unknown

- A map showing the location of the pumping well and observation well(s) must be included.

List the unique number of each public water supply well to which this DAP-ATP Form applies

202929	202965	110469			
202972	168721				
202951	161413				
202943	110460				
202932	110461				
202930	168720				

Reviewed by: Amal Djerrari	**Approved:** ● Yes ○ No	**Approval Date:** 8/3/2015

Mt. Simon

Worksheet for Estimating Transmissivity and Hydraulic Conductivity from Specific Capacity Test Data

Explanation and notes attached.

Maximum iterations	100
Error tolerance (as drawdown)	0.001 feet

Field Data								*Estimated Parameters*			*Calculated Results*								*Diagnostics*					
		Depth to Water				Screened Interval													*Solution Integrity*			*Sensitivity of T:*		
Location	Well Diam.	Initial	Final	Test Duration	Mean Pumping Rate	Depth to Top	Depth to Bottom	Storage Coeff. (S)	Well loss Coeff. (C)	Aquifer Thickness (b)	Measured Drawdown (s_m)	Saturated Screen Length (L)	Well loss (s_w)	Partial Penetration Parameter (s_p)	Specific Capacity	**Transmissivity (T)**	**T (ft^2/day)**	**Conductivity (K)**	Calculated Drawdown	Error as Drawdown	Well Bore Storage Test	to S at ± 1 factor of 10	to s_w at 10% of s_m	to b at ± 25%
	inches	feet	feet	hours	gpm	feet	feet	-	sec^2/ft^5	feet	feet	feet	feet	-	gpm/ft	**sq ft/sec**		**ft/day**	feet			sq ft/sec	sq ft/sec	sq ft/sec
00110469 (Coon Rapids 18)	24	140	248	36	1400	575.0	637.0	0.001	0	128.0	108.00	62.0	0.0E+00	3.53	12.96	**5.4E-02**	**4.7E+03**	**36.7**	108.00	0.00%	pass	5.5E-03	6.3E-03	1.9E-02

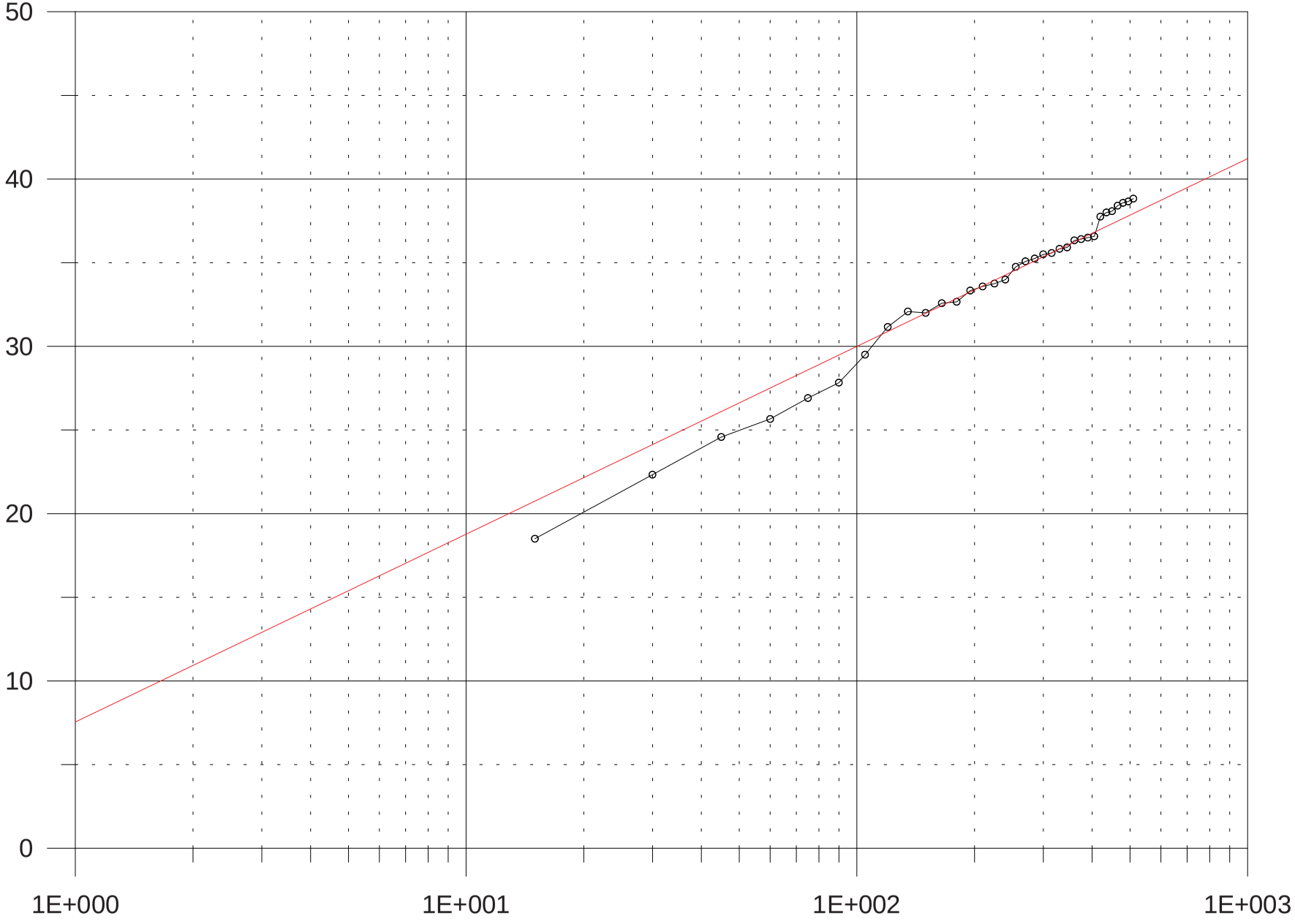
References:

Bradbury, K.B., and E.R. Rothschild, 1985. A computerized technique for estimating the hydraulic conductivity of aquifer from specific capacity data: Ground Water vol. 23, No. 2, pp. 240-246.

ASTM International, 2004. Standard Test Method for Determining Specific Capacity and Estimating Transmissivity at the Control Well, Standard D 5472-93, in Annual Book of ASTM Standards, Vol. 04.08 pp. 1279-1282.

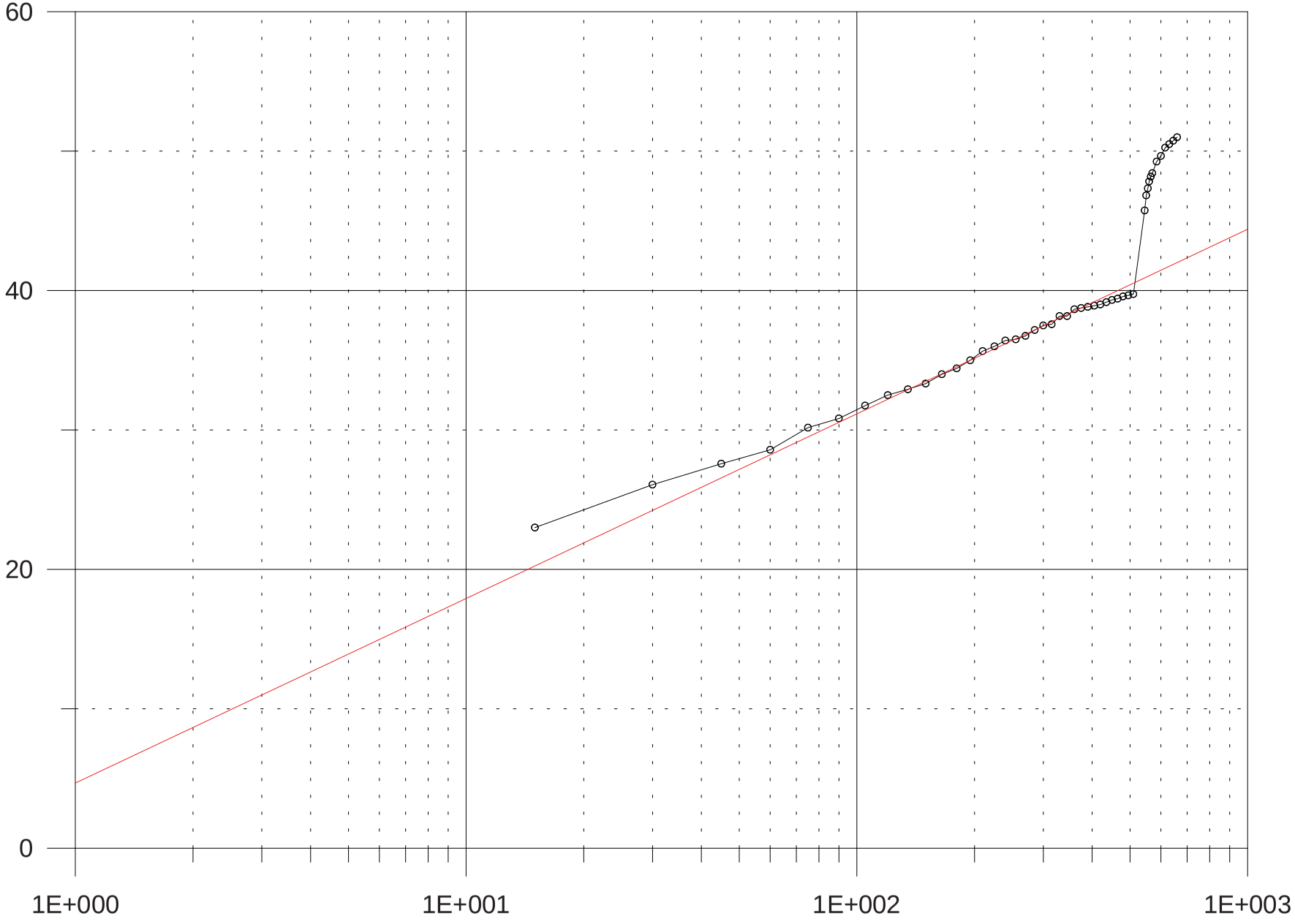
Test of Andover Well #3 (431683)
10/12/1987
Production Test

T = 35.3 600 / 11.24 = 1880 ft2/day



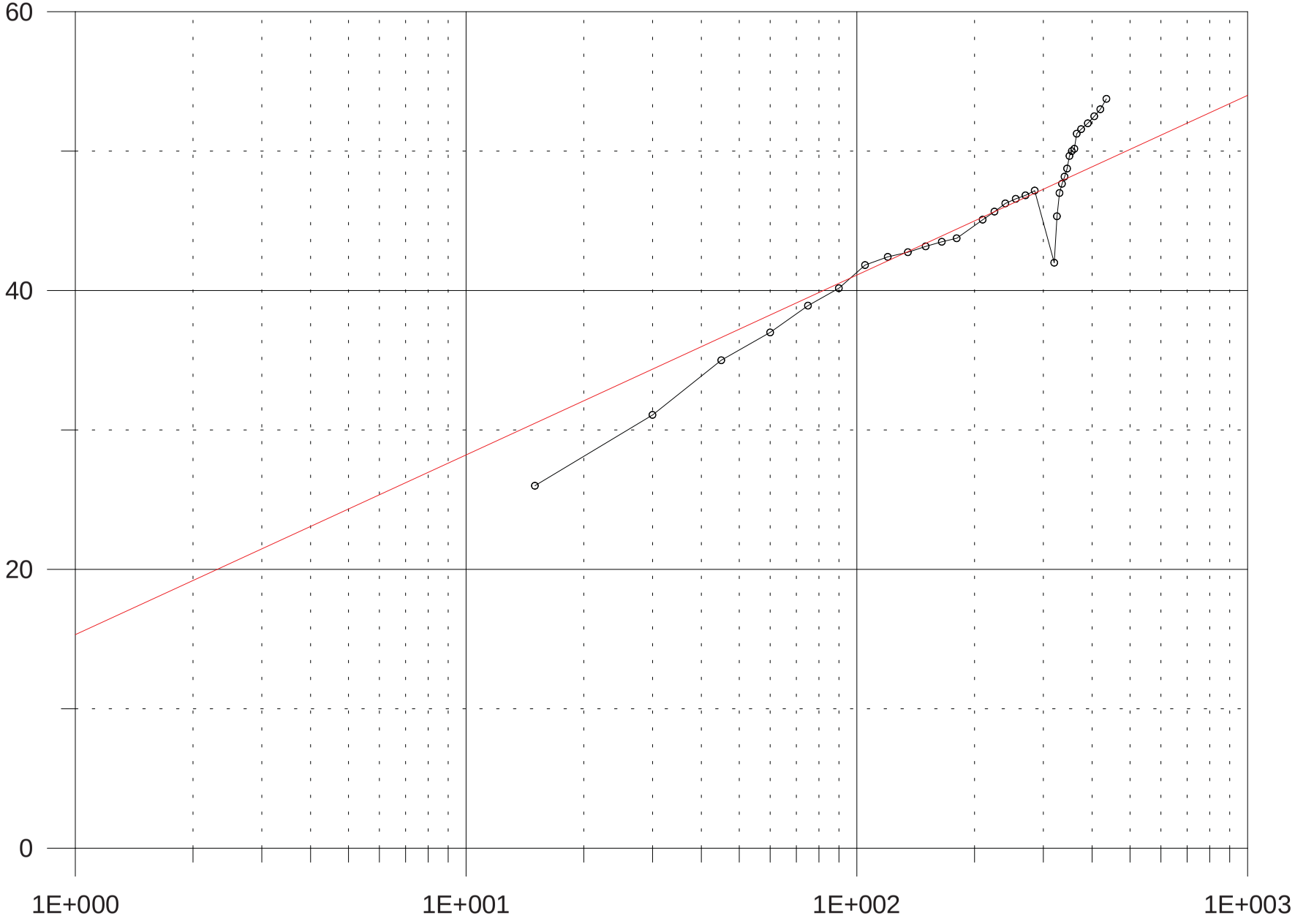
Test of Andover Well #3 (431683)
10/13/1987
Production Test

T = 35.3 600 / 13.24 = 1600 ft2/day



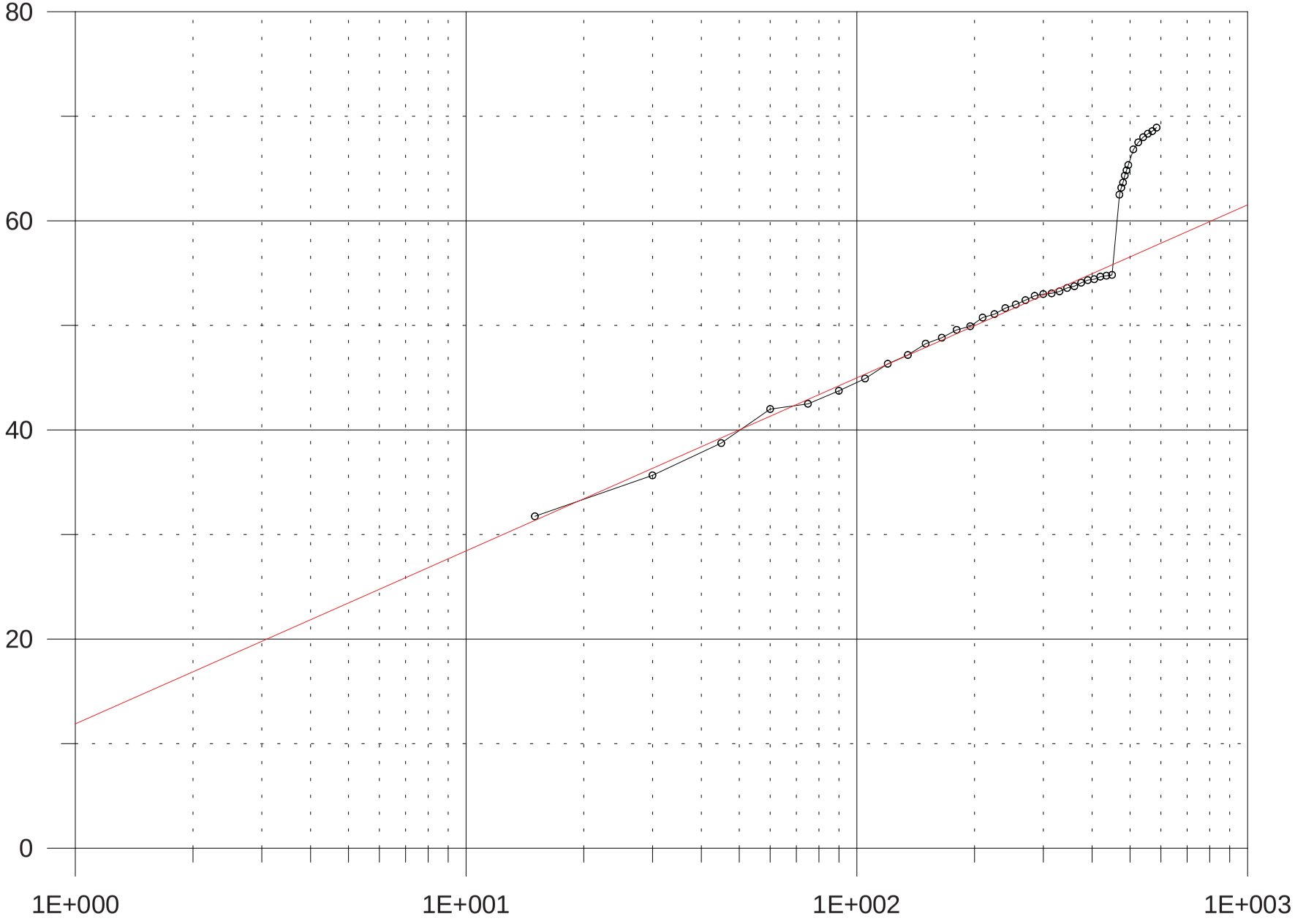
Test of Andover Well #3 (431683)
10/14/1987
Production Test

T = 35.3 800/ 12.89 = 2200ft2/day



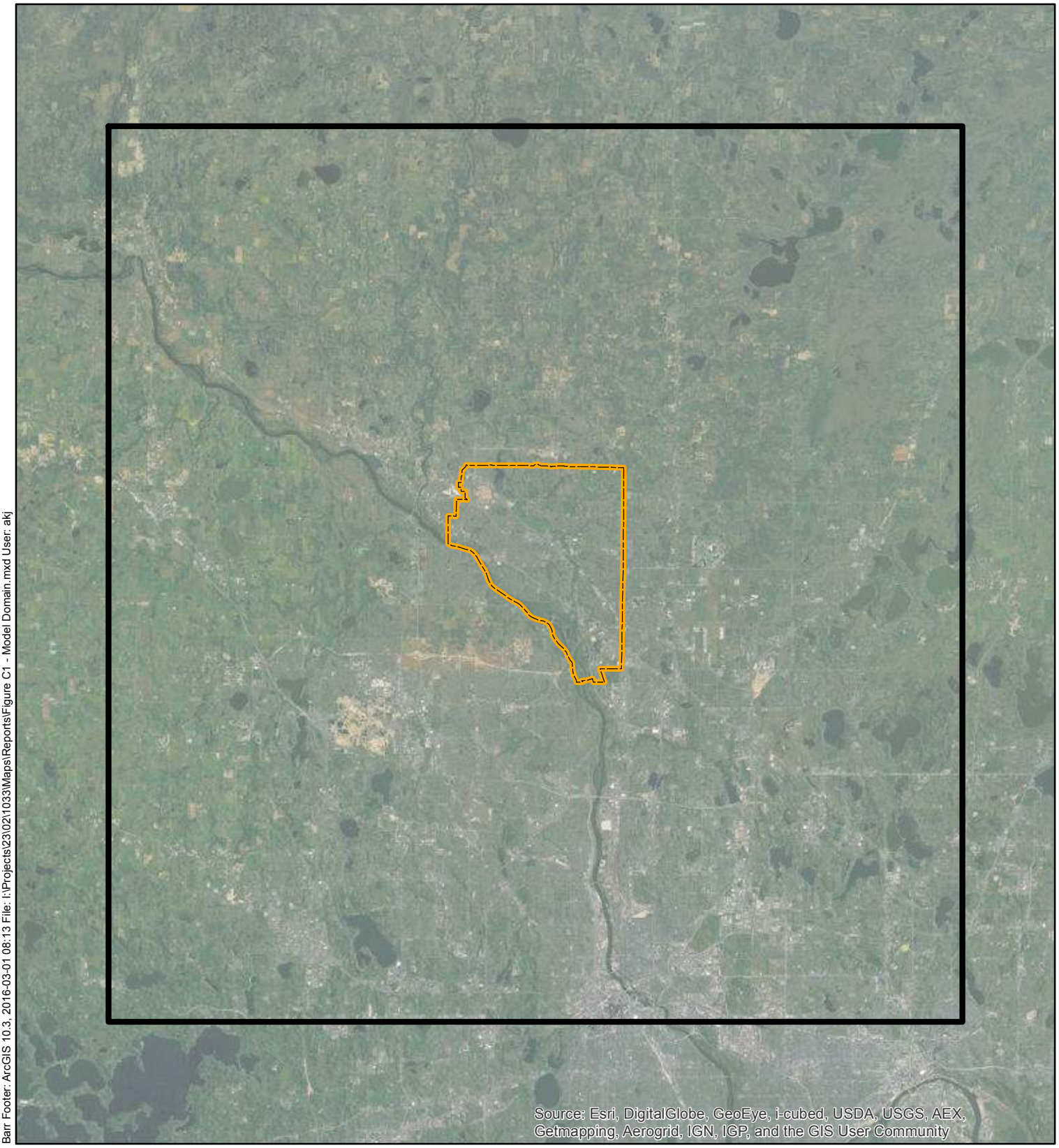
Test of Andover Well #3 (431683)
10/16/1987
Production Test

T = 35.3 1000/ 15.56 = 2130 ft2/day



Appendix C

Groundwater Model Details



Barr Footer: ArcGIS 10.3, 2016-03-01 08:13 File: I:\Projects\23\02\1033\Maps\Reports\Figure C1 - Model Domain.mxd User: akj

Model Boundary

Coon Rapids City Limits

N

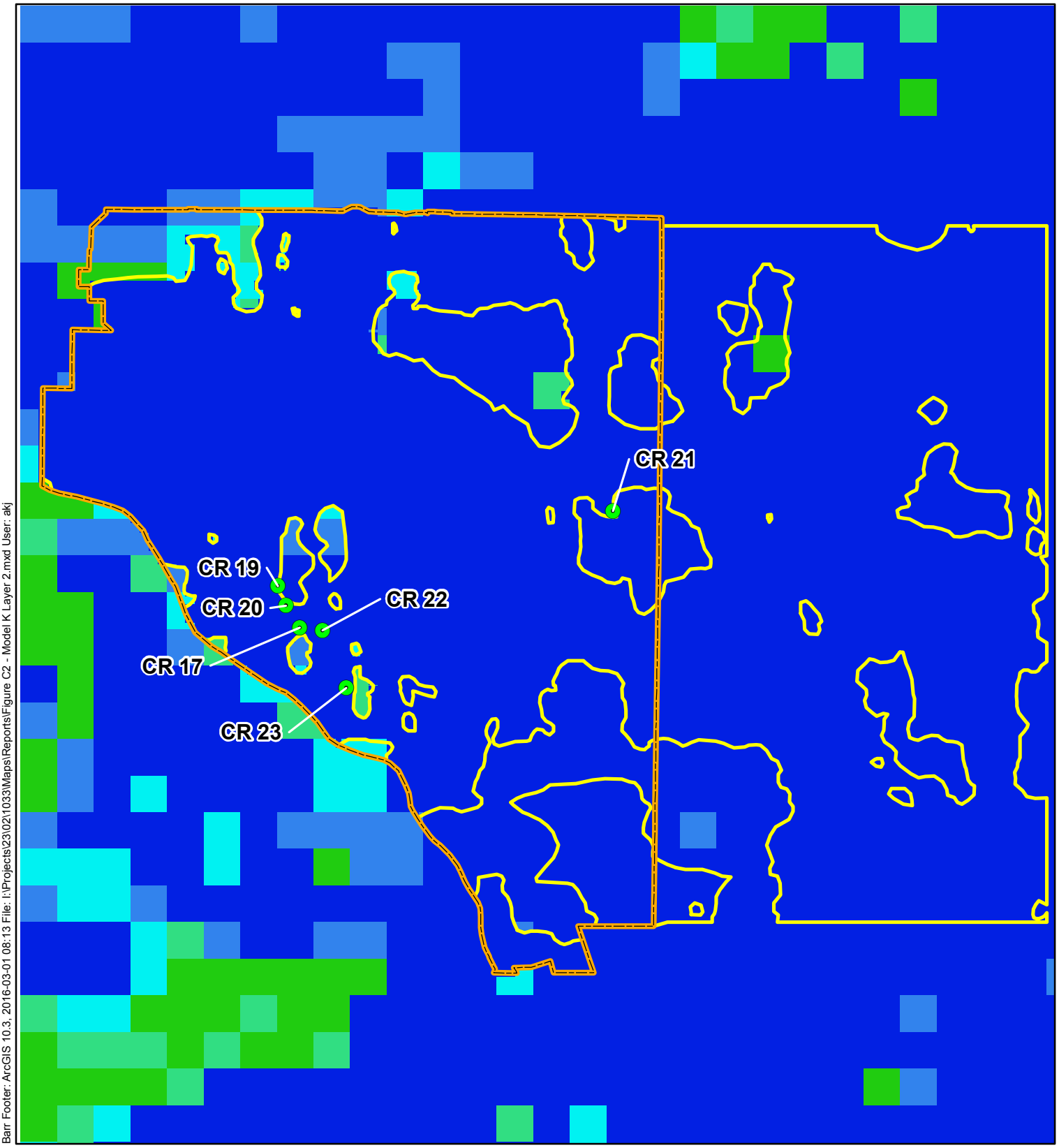
Miles

4 0 4

BARR

Figure C1

MODEL DOMAIN
Coon Rapids WHPP Amendment
City of Coon Rapids, MN



Barr Footer: ArcGIS 10.3, 2016-03-01 08:13 File: I:\Projects\23\02\1033\Maps\Reports\Figure C2 - Model K Layer 2.mxd User: akj

Coon Rapids Municipal Well open to Quaternary

Coon Rapids City Limits

Till Unit Ce Extent in K Modification Area

Layer 2 Kz (m/day)

- 0.0001 - 0.0549
- 0.0550 - 0.2536
- 0.2537 - 1.0045
- 1.0046 - 3.3159
- 3.3160 - 7.6300

N

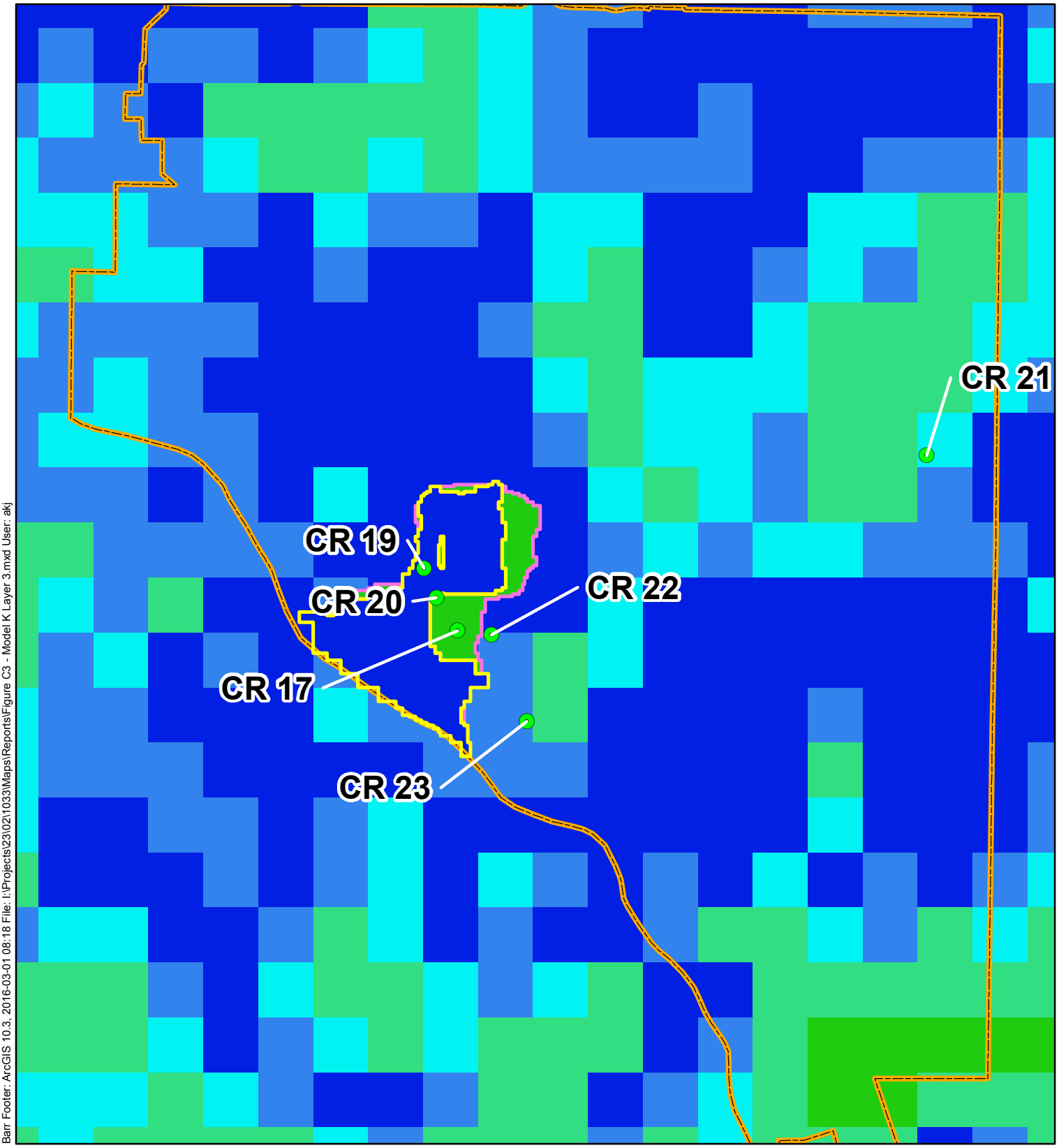
Feet

6,000 0 6,000

BARR

Figure C2

HYDRAULIC CONDUCTIVITY
LAYER 2
Coon Rapids WHPP Amendment
City of Coon Rapids, MN



Barr Footer: ArcGIS 10.3, 2016-03-01 08:18 File: I:\Projects\23\02\1033\Maps\Reports\Figure C3 - Model K Layer 3.mxd User: akj

Coon Rapids Municipal Well open to Quaternary

Coon Rapids City Limits

Layer 3 Kx (m/day)

- 0.62 - 3.91
- 3.92 - 9.03
- 9.04 - 16.54
- 16.55 - 39.67
- 39.68 - 71.05

Till Unit Xt Extent

Sand Unit Sr Extent

N

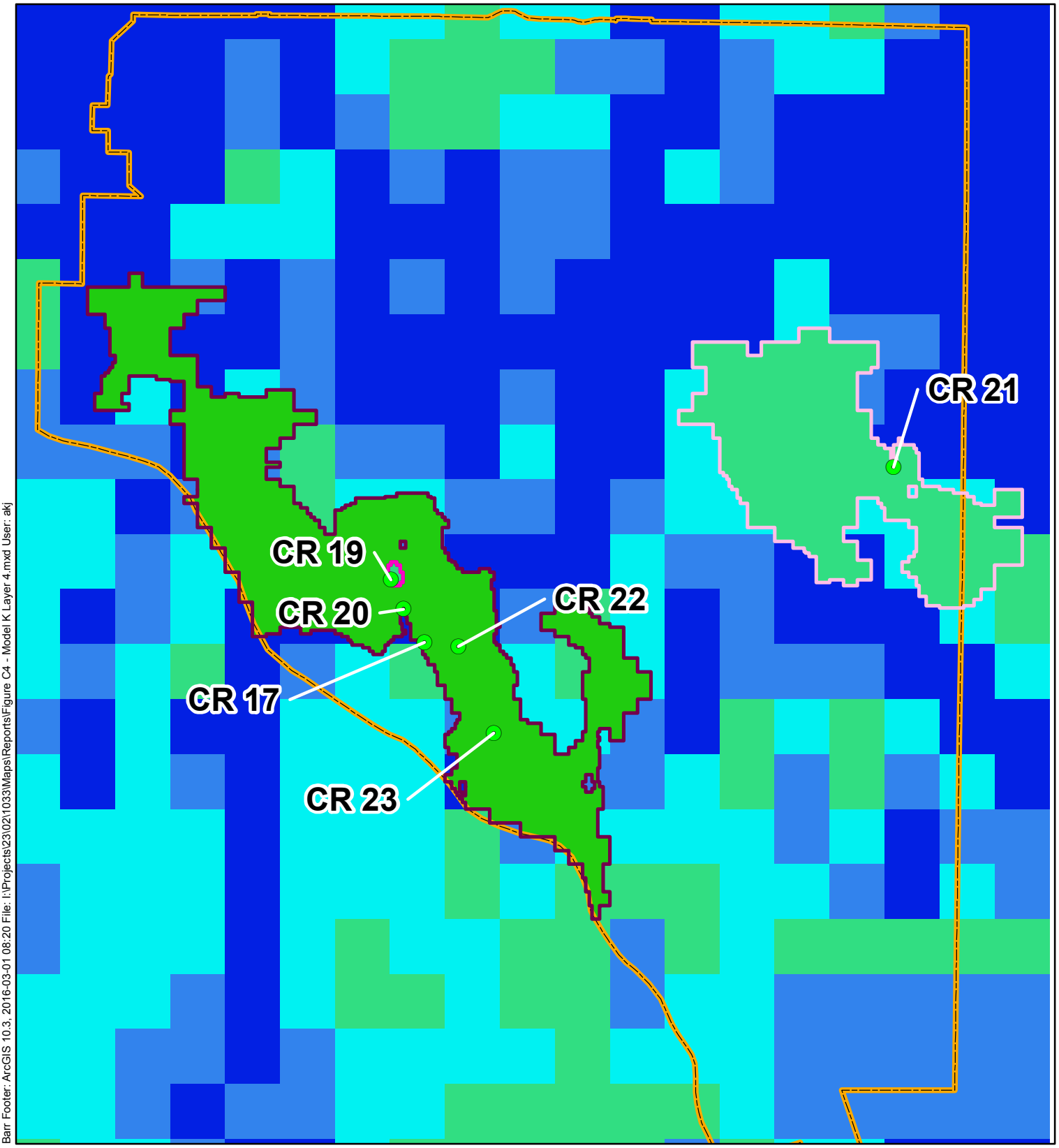
Feet

4,000 0 4,000

BARR

Figure C3

HYDRAULIC CONDUCTIVITY
LAYER 3
Coon Rapids WHPP Amendment
City of Coon Rapids, MN



Barr Footer: ArcGIS 10.3, 2016-03-01 08:20 File: I:\Projects\23\02\1033\Maps\Reports\Figure C4 - Model K Layer 4.mxd User: akj

Coon Rapids Municipal Well open to Quaternary

Coon Rapids City Limits

Layer 4 Kx (m/day)

- 0.57 - 8.63
- 8.64 - 18.38
- 18.39 - 32.30
- 32.31 - 104.43
- 104.44 - 314.42

Sand Units Sp/Sx Extent (Wells 17, 20, 22, 23)

Sand Units Sx/Sr Extent (Well 21)

Sand Unit Sr Extent (Well 19)

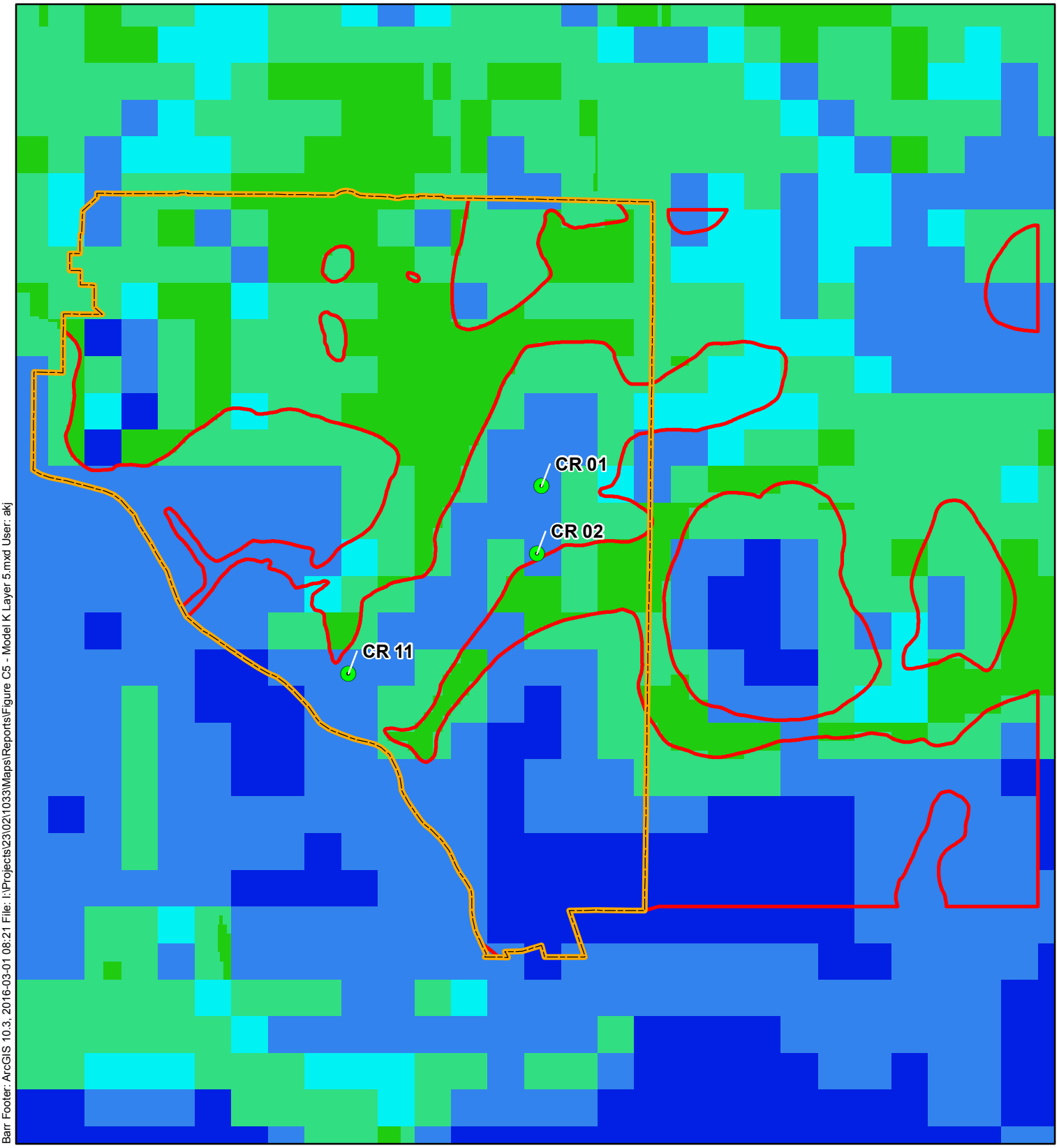
Feet

4,000 0 4,000

BARR

Figure C4

HYDRAULIC CONDUCTIVITY
LAYER 4
Coon Rapids WHPP Amendment
City of Coon Rapids, MN



Barr Footer: ArcGIS 10.3, 2016-03-01 08:21 File: I:\Projects\23\02\1033\Maps\Reports\Figure C5 - Model K Layer 5.mxd User: akj

Coon Rapids Municipal Well Open to St. Lawrence Formation

Coon Rapids City Limits

St. Lawrence K Modification Area

Layer 5 Kx (m/day)

- 0.26 - 1.00
- 1.01 - 4.01
- 4.02 - 11.58
- 11.59 - 28.98
- 28.99 - 50.00

N

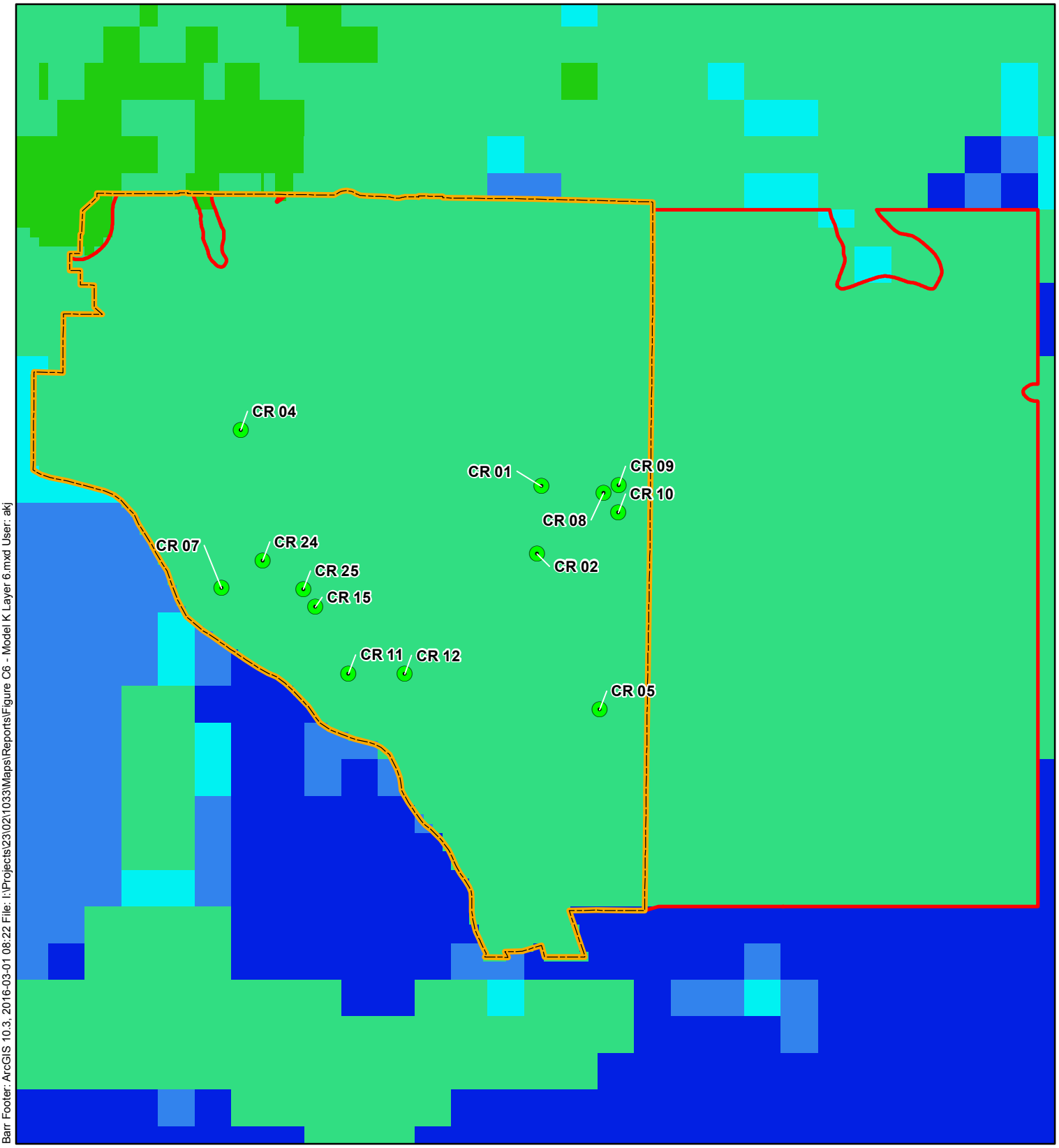
Feet

6,000 0 6,000

BARR

Figure C5

HYDRAULIC CONDUCTIVITY
LAYER 5
Coon Rapids WHPP Amendment
City of Coon Rapids, MN



Barr Footer: ArcGIS 10.3, 2016-03-01 08:22 File: I:\Projects\23\02\1033\Maps\Reports\Figure C6 - Model K Layer 6.mxd User: akj

Coon Rapids Municipal Well Open to Tunnel City Group

Coon Rapids City Limits

Tunnel City K Modification Area

Layer 6 Kx (m/day)

- 0.33 - 0.41
- 0.42 - 0.48
- 0.49 - 1.32
- 1.33 - 15.00
- 15.01 - 50.00

N

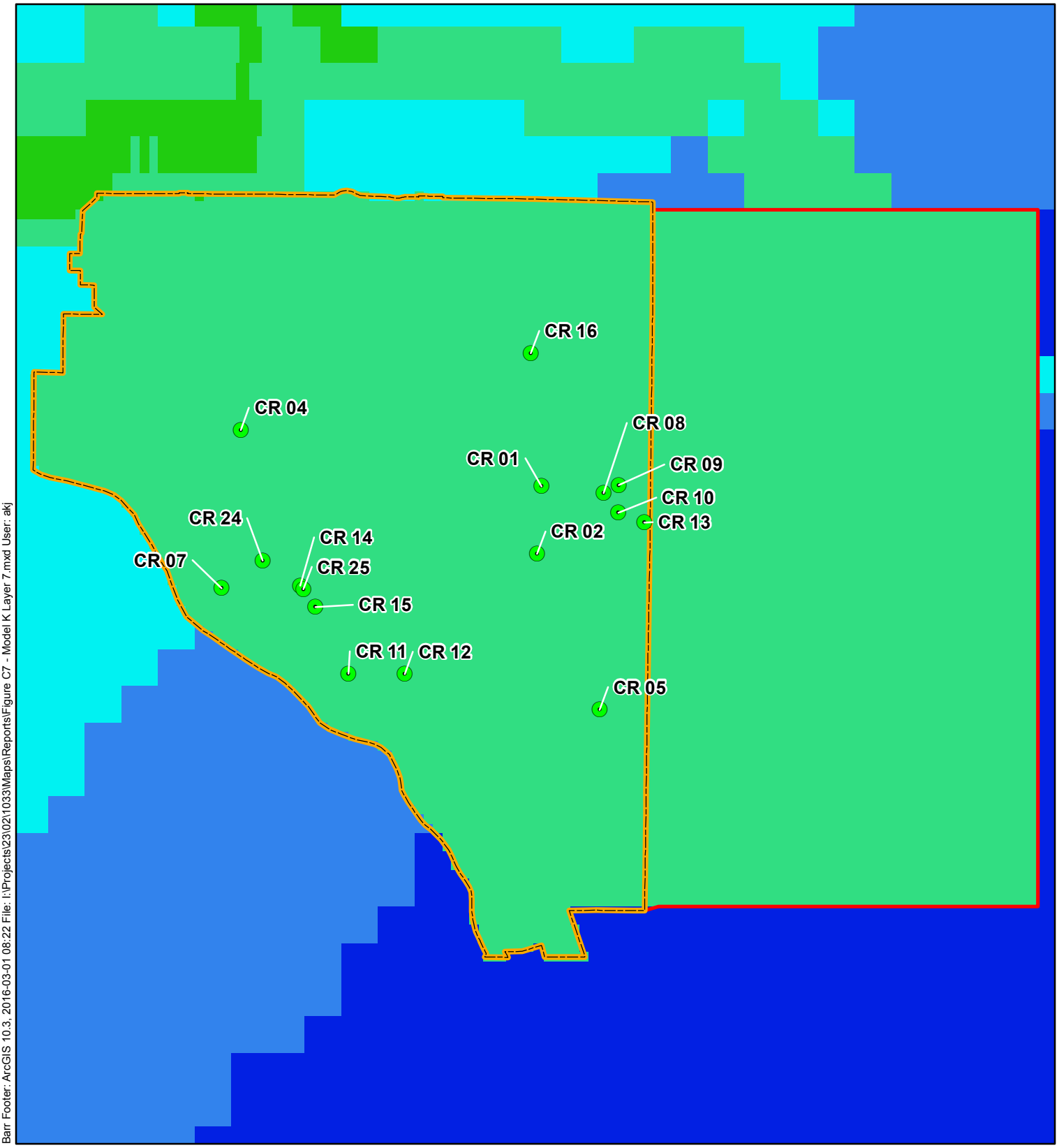
Feet

6,000 0 6,000

BARR

Figure C6

HYDRAULIC CONDUCTIVITY
LAYER 6
Coon Rapids WHPP Amendment
City of Coon Rapids, MN



Barr Footer: ArcGIS 10.3, 2016-03-01 08:22 File: I:\Projects\23\02\1033\Maps\Reports\Figure C7 - Model K Layer 7.mxd User: akj

Coon Rapids Municipal Well Open to Wonewoc Sandstone

Coon Rapids City Limits

K Modification Area

Layer 7 Kx (m/day)

- 0.36 - 0.57
- 0.58 - 0.69
- 0.70 - 1.17
- 1.18 - 12.00
- 12.01 - 50.00

N

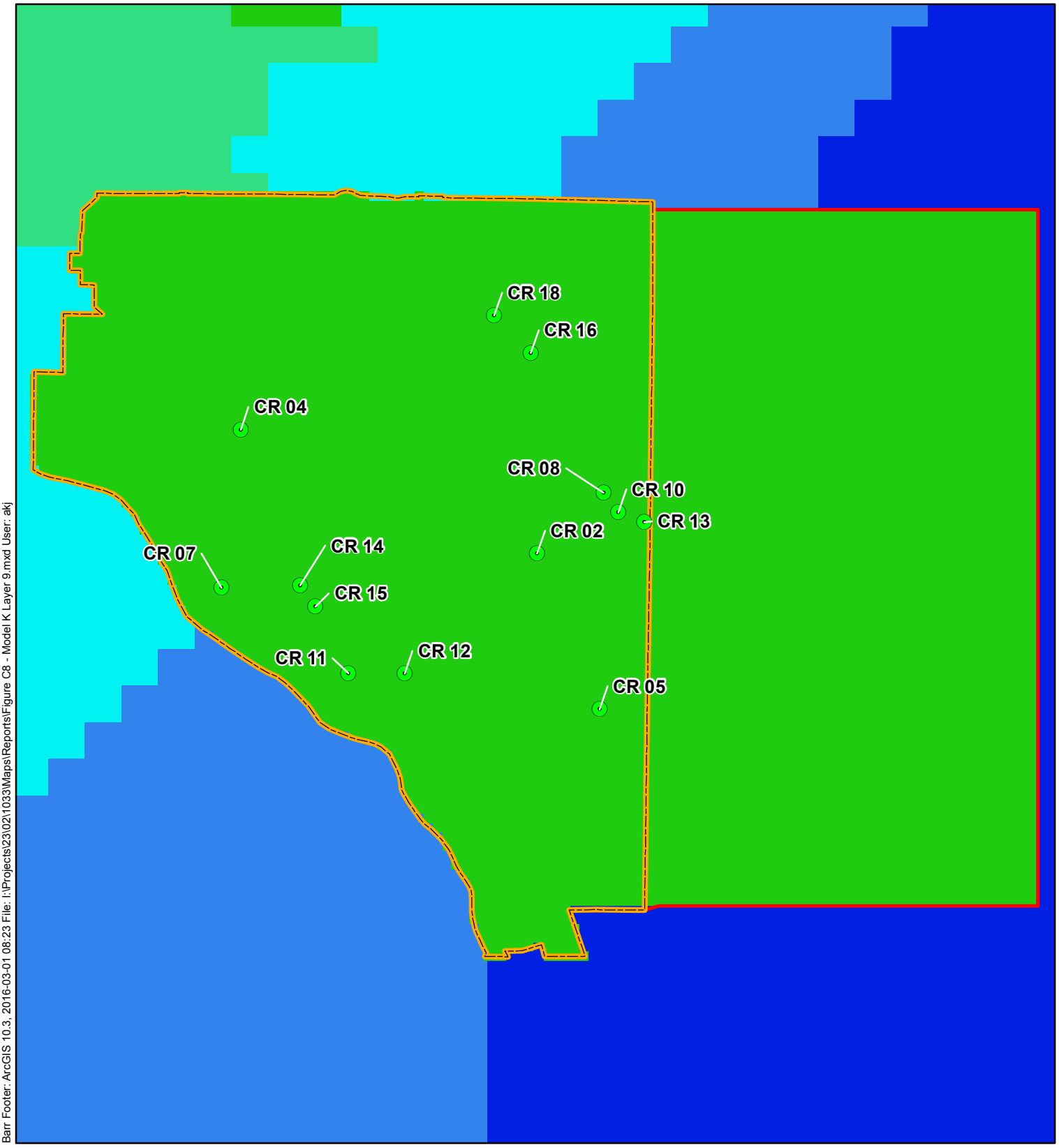
Feet

6,000 0 6,000

BARR

Figure C7

HYDRAULIC CONDUCTIVITY
LAYER 7
Coon Rapids WHPP Amendment
City of Coon Rapids, MN



Barr Footer: ArcGIS 10.3, 2016-03-01 08:23 File: I:\Projects\23\02\1033\Maps\Reports\Figure C8 - Model K Layer 9.mxd User: akj

Coon Rapids Municipal Well Open to Mt. Simon

Coon Rapids City Limits

K Modification Area

Layer 9 Kx (m/day)

- 0.87 - 1.05
- 1.06 - 1.17
- 1.18 - 1.33
- 1.34 - 2.42
- 2.43 - 8.20

N

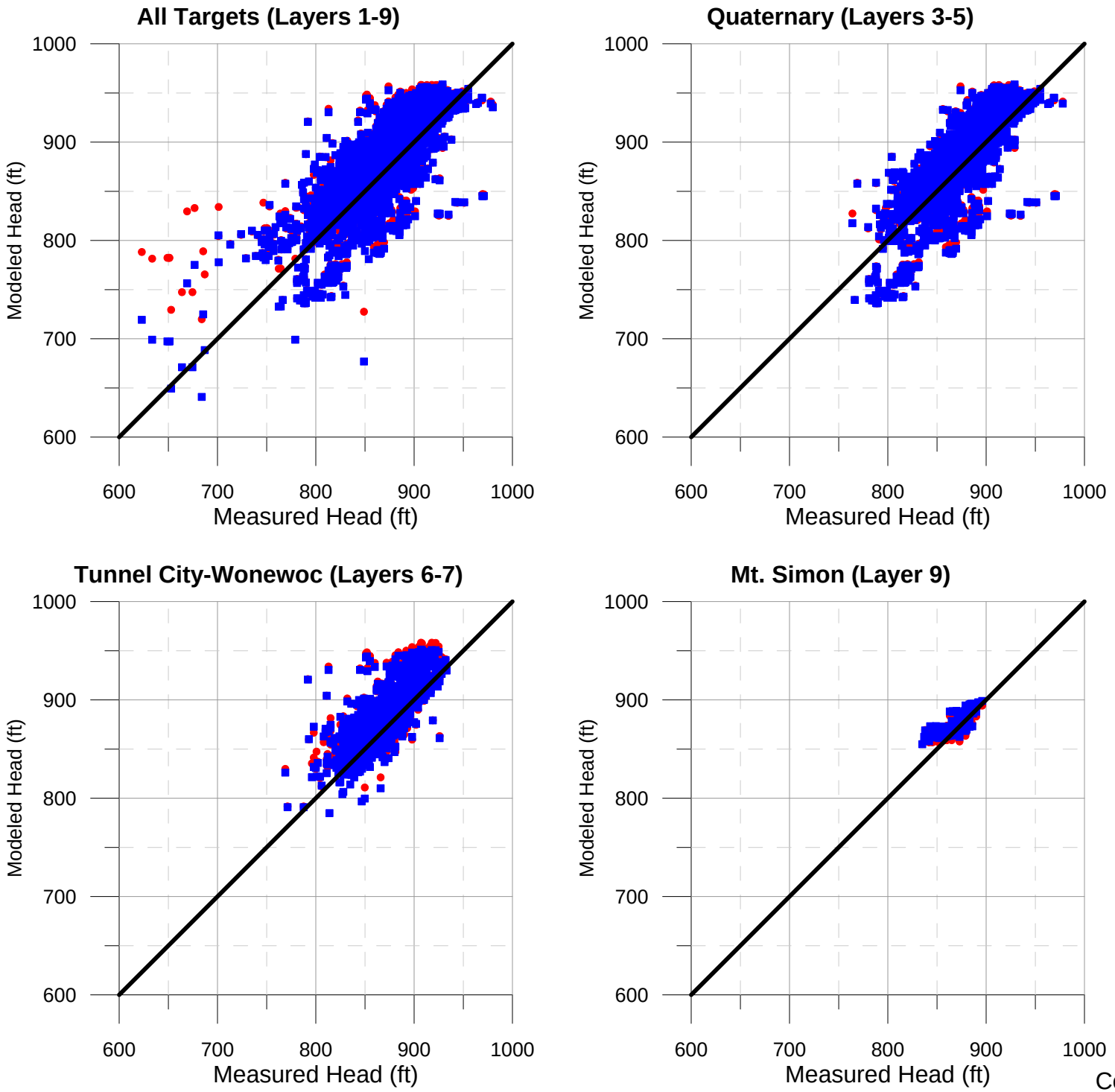
Feet

6,000 0 6,000

BARR

Figure C8

HYDRAULIC CONDUCTIVITY
LAYER 9
Coon Rapids WHPP Amendment
City of Coon Rapids, MN



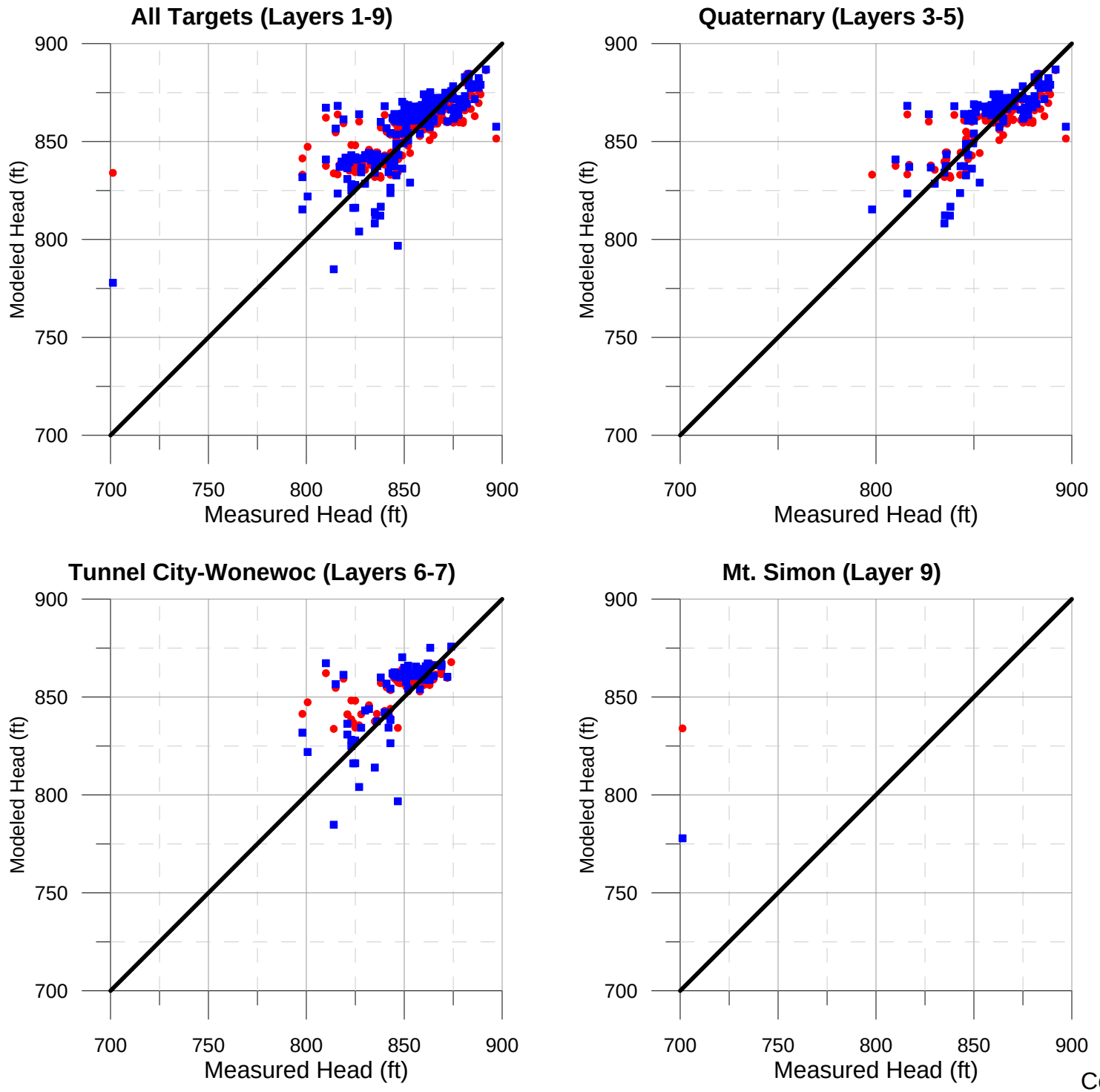
Only Metro Model 3 targets within the TMR model boundary shown.

WHPP model has updated K field but uses identical pumping rates to the base Metro Model 3.

Figure C9

MODEL CALIBRATION
ALL MODEL TARGETS
Coon Rapids WHPP Amendment
City of Coon Rapids, MN

V:\23\02\1033\MM3\TMR\Calibration\Calibration_Comparison.grf



Only Metro Model 3 targets within Coon Rapids city limits shown.

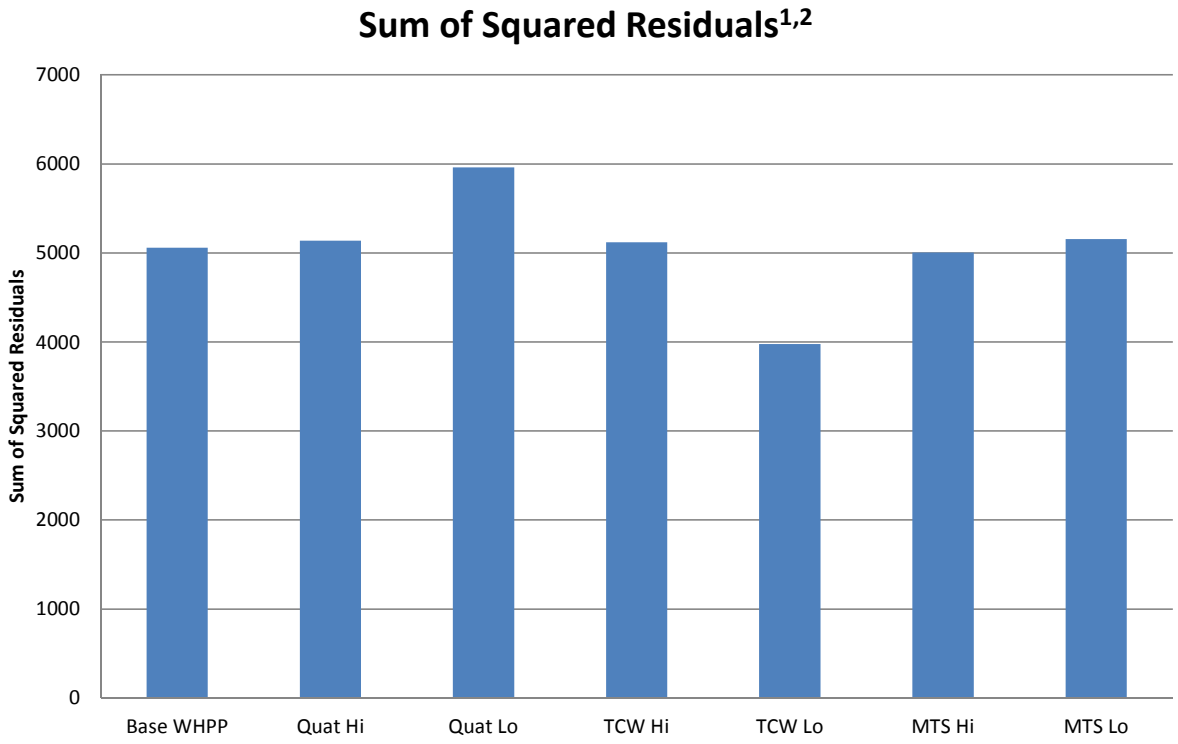
WHPP model has updated K field but uses identical pumping rates to the base Metro Model 3.

V:\23\02\1033\MM3\TMR\Calibration\Calibration_Comparison_CRonly.grf

Figure C10

MODEL CALIBRATION
COON RAPIDS ONLY
Coon Rapids WHPP Amendment
City of Coon Rapids, MN

Figure C11
Sensitivity Analysis Results
Coon Rapids WHPP Amendment



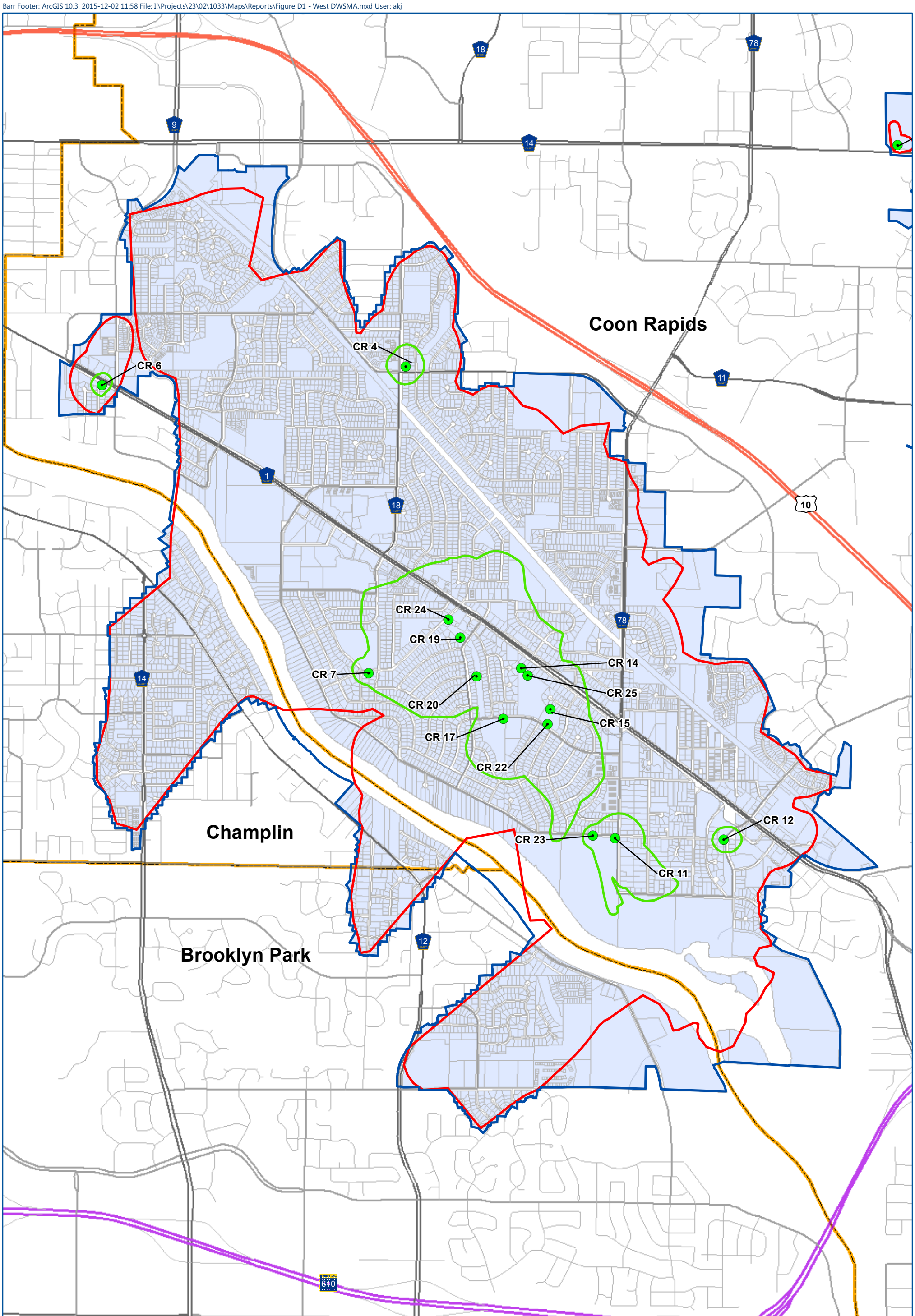
[1] Residuals calculated for the 220 Metro Model 3 calibration targets within Coon Rapids city limits only

[2] Residual = measured head - modeled head

Appendix D

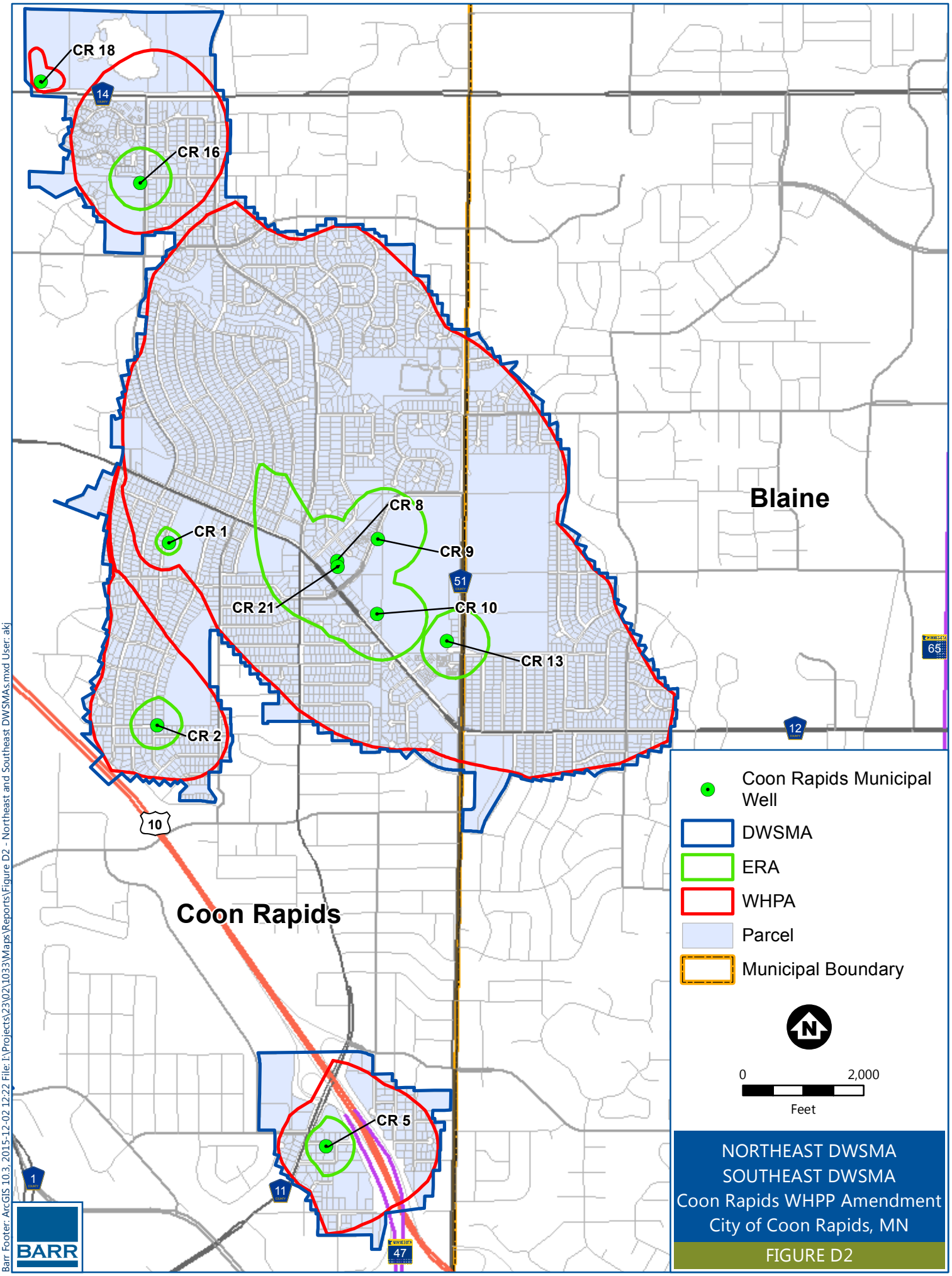
1:24,000 DWSMA Maps

Barr Footer: ArcGIS 10.3, 2015-12-02 11:58 File: I:\Projects\23\02\1033\Maps\Reports\Figure D1 - West DWSMA.mxd User: akj



WEST DWSMA
Coon Rapids WHPP Amendment
City of Coon Rapids, MN

FIGURE D1


CR 18
CR 16
CR 8
CR 9
CR 1
CR 21
CR 10
CR 13
CR 2
CR 5
Blaine
Coon Rapids
14
51
65
12
10
1
11
47
Coon Rapids Municipal Well
DWSMA
ERA
WHPA
Parcel
Municipal Boundary
N
0
2,000
Feet
NORTHEAST DWSMA
SOUTHEAST DWSMA
Coon Rapids WHPP Amendment
City of Coon Rapids, MN
FIGURE D2
BARR
Barr Footer: ArcGIS 10.3, 2015-12-02 12:22 File: I:\Projects\23\02\1033\Maps\Reports\Figure D2 - Northeast and Southeast DWSMAs.mxd User: akj

Appendix E

MDH Well Vulnerability Assessments

Adam K. Janzen

From: Djerrari, Amal (MDH) <amal.djerrari@state.mn.us>
Sent: Friday, October 23, 2015 15:18
To: Adam K. Janzen
Cc: John Greer; Djerrari, Amal (MDH)
Subject: RE: Coon Rapids Tritium

Hi Adam
I just received the tritium results for Coon Rapids
Amal

Well Id	Collection Date	Analyte	Result	PWS Id
202931	7/9/2015	TRITIUM	2.902362371	1020017
110460	7/9/2015	TRITIUM	1.763706017	1020017
474384	7/9/2015	TRITIUM	8.563001794	1020017
202929	7/9/2015	TRITIUM	2.581490857	1020017
202951	7/9/2015	TRITIUM	<.8	1020017
202937	7/9/2015	TRITIUM	6.833970803	1020017
110469	7/9/2015	TRITIUM	<.8	1020017

Amal M. Djerrari, Ph.D., P.E
Hydrologist

Minnesota Department of Health
Source Water Protection Unit
625 Robert Street North
St. Paul, MN 55164

ph: (651) 201-4577
Cell: (651) 245-1918
Fax: (651) 201-4701
e-mail: amal.djerrari@state.mn.us

MINNESOTA DEPARTMENT OF HEALTH
SECTION OF DRINKING WATER PROTECTION
SWP Vulnerability Rating

625 Robert St. N. St. Paul MN 55155
P.O. Box 64975 St. Paul MN 55164 - 0975

PWSID: 1020017
SYSTEM NAME: Coon Rapids
WELL NAME: Well #1

TIER: 2
WHP RANK:
UNIQUE WELL #: 00202926

COUNTY: Anoka | TOWNSHIP NUMBER: 31 | RANGE: 24 W | SECTION: 13 | QUARTERS: BCCA

CRITERIA		DESCRIPTION	POINTS
Aquifer Name(s)	:	Multiple Aquifer	
DNR Geologic Sensitivity Rating	:	Low	20
L Score	:	3	
Geologic Data From	:	Well Record	
Year Constructed	:	1957	
Construction Method	:	Cable Tool/Bored	0
Casing Depth	:	220	5
Well Depth	:	462	
Casing grouted into borehole?		Unknown	0
Cement grout between casings?		Not applicable	0
All casings extend to land surface?		Yes	0
Gravel - packed casings?		No	0
Wood or masonry casing?		No	0
Holes or cracks in casing?		Unknown	0
Isolation distance violations?			0
Pumping Rate	:	600	10
Pathogen Detected?			0
Surface Water Characteristics?			0
Maximum nitrate detected	:	<.05 12/16/1997	0
Maximum tritium detected	:	Unknown	0
Non-THMS VOCs detected?			0
Pesticides detected?			0
Carbon 14 age	:	Unknown	0
Wellhead Protection Score	:		35
Wellhead Protection Vulnerability Rating	:		NOT VULNERABLE

Vulnerability Overridden :

COMMENTS

ST. LAWRENCE - EAU CLAIRE

MINNESOTA DEPARTMENT OF HEALTH
SECTION OF DRINKING WATER PROTECTION
SWP Vulnerability Rating

625 Robert St. N. St. Paul MN 55155
P.O. Box 64975 St. Paul MN 55164 - 0975

PWSID: 1020017
SYSTEM NAME: Coon Rapids
WELL NAME: Well #2

TIER: 2
WHP RANK:
UNIQUE WELL #: 00202929

COUNTY: Anoka | TOWNSHIP NUMBER: 31 | RANGE: 24 W | SECTION: 13 | QUARTERS: CCCC

CRITERIA		DESCRIPTION	POINTS
Aquifer Name(s)	:	Multiple Aquifer	
DNR Geologic Sensitivity Rating	:	Low	20
L Score	:	1	
Geologic Data From	:	Well Record	
Year Constructed	:	1957	
Construction Method	:	Cable Tool/Bored	0
Casing Depth	:	226	5
Well Depth	:	685	
Casing grouted into borehole?		Unknown	0
Cement grout between casings?		Not applicable	0
All casings extend to land surface?		Yes	0
Gravel - packed casings?		No	0
Wood or masonry casing?		No	0
Holes or cracks in casing?		Unknown	0
Isolation distance violations?			0
Pumping Rate	:	600	10
Pathogen Detected?			0
Surface Water Characteristics?			0
Maximum nitrate detected	:	.18 07/13/2004	0
Maximum tritium detected	:	Unknown	0
Non-THMS VOCs detected?			0
Pesticides detected?			0
Carbon 14 age	:	Unknown	0
Wellhead Protection Score	:		35
Wellhead Protection Vulnerability Rating	:		NOT VULNERABLE

Vulnerability Overridden :

COMMENTS
ST. LAWRENCE - SOLOR CHURCH

MINNESOTA DEPARTMENT OF HEALTH
SECTION OF DRINKING WATER PROTECTION
SWP Vulnerability Rating

625 Robert St. N. St. Paul MN 55155
P.O. Box 64975 St. Paul MN 55164 - 0975

PWSID: 1020017
SYSTEM NAME: Coon Rapids
WELL NAME: Well #4

TIER: 2
WHP RANK:
UNIQUE WELL #: 00202972

COUNTY: Anoka | TOWNSHIP NUMBER: 31 | RANGE: 24 W | SECTION: 9 | QUARTERS: DCCC

CRITERIA		DESCRIPTION	POINTS
Aquifer Name(s)	:	Franconia-Mt. Simon	
DNR Geologic Sensitivity Rating	:	Low	20
L Score	:	1	
Geologic Data From	:	Well Record	
Year Constructed	:	1960	
Construction Method	:	Cable Tool/Bored	0
Casing Depth	:	233	5
Well Depth	:	605	
Casing grouted into borehole?		Yes	0
Cement grout between casings?		Yes	0
All casings extend to land surface?		Yes	0
Gravel - packed casings?		No	0
Wood or masonry casing?		No	0
Holes or cracks in casing?		Unknown	0
Isolation distance violations?			0
Pumping Rate	:	600	10
Pathogen Detected?			0
Surface Water Characteristics?			0
Maximum nitrate detected	:	.46 07/08/2013	0
Maximum tritium detected	:	Unknown	0
Non-THMS VOCs detected?			0
Pesticides detected?			0
Carbon 14 age	:	Unknown	0
Wellhead Protection Score	:		35
Wellhead Protection Vulnerability Rating	:		NOT VULNERABLE
Vulnerability Overridden	:		

COMMENTS

NITRATE DATA FROM PWSD 1989, 8/75 SAMPLE Low rating is based on the thickness of the St. Lawrence that is grouted off. Log was not descriptive enough to assess the glacial deposits.

MINNESOTA DEPARTMENT OF HEALTH
SECTION OF DRINKING WATER PROTECTION
SWP Vulnerability Rating

625 Robert St. N. St. Paul MN 55155
P.O. Box 64975 St. Paul MN 55164 - 0975

PWSID: 1020017
SYSTEM NAME: Coon Rapids
WELL NAME: Well #5

TIER: 2
WHP RANK:
UNIQUE WELL #: 00202951

COUNTY: Anoka | TOWNSHIP NUMBER: 31 | RANGE: 24 W | SECTION: 25 | QUARTERS: ACBB

CRITERIA		DESCRIPTION	POINTS
Aquifer Name(s)	:	Franconia-Mt. Simon	
DNR Geologic Sensitivity Rating	:	Low	15
L Score	:	4	
Geologic Data From	:	Well Record	
Year Constructed	:	1961	
Construction Method	:	Cable Tool/Bored	0
Casing Depth	:	242	5
Well Depth	:	695	
Casing grouted into borehole?		Unknown	0
Cement grout between casings?		Unknown	5
All casings extend to land surface?		Yes	0
Gravel - packed casings?		No	0
Wood or masonry casing?		No	0
Holes or cracks in casing?		Unknown	0
Isolation distance violations?			0
Pumping Rate	:	900	10
Pathogen Detected?			0
Surface Water Characteristics?			0
Maximum nitrate detected	:	<.4	0
Maximum tritium detected	:	Unknown	0
Non-THMS VOCs detected?			0
Pesticides detected?			0
Carbon 14 age	:	Unknown	0
Wellhead Protection Score	:		35
Wellhead Protection Vulnerability Rating	:		NOT VULNERABLE

Vulnerability Overridden :

COMMENTS
Low score is based on the thickness of the St. Lawrence that is sealed off.

MINNESOTA DEPARTMENT OF HEALTH
SECTION OF DRINKING WATER PROTECTION
SWP Vulnerability Rating

625 Robert St. N. St. Paul MN 55155
P.O. Box 64975 St. Paul MN 55164 - 0975

PWSID: 1020017 | TIER: 2
SYSTEM NAME: Coon Rapids | WHP RANK:
WELL NAME: Well #6 | UNIQUE WELL #: 00202937

COUNTY: Anoka | TOWNSHIP NUMBER: 31 | RANGE: 24 W | SECTION: 17 | QUARTERS: BBAA

CRITERIA		DESCRIPTION	POINTS
Aquifer Name(s)	:	Tunnel City Group	
DNR Geologic Sensitivity Rating	:	Low	20
L Score	:	2	
Geologic Data From	:	Well Record	
Year Constructed	:	1960	
Construction Method	:	Cable Tool/Bored	0
Casing Depth	:	118	10
Well Depth	:	158	
Casing grouted into borehole?		Unknown	0
Cement grout between casings?		Not applicable	0
All casings extend to land surface?		Yes	0
Gravel - packed casings?		No	0
Wood or masonry casing?		No	0
Holes or cracks in casing?		Unknown	0
Isolation distance violations?			0
Pumping Rate	:	1050	20
Pathogen Detected?			0
Surface Water Characteristics?			0
Maximum nitrate detected	:	<1	0
Maximum tritium detected	:	14.9 11/08/1999	VULNERABLE
Non-THMS VOCs detected?			0
Pesticides detected?			0
Carbon 14 age	:	Unknown	0
Wellhead Protection Score	:		50
Wellhead Protection Vulnerability Rating	:		VULNERABLE

Vulnerability Overridden :

COMMENTS
NITRATE DATA FROM PWSD 1989, 8/75 SAMPLE

MINNESOTA DEPARTMENT OF HEALTH
SECTION OF DRINKING WATER PROTECTION
SWP Vulnerability Rating

625 Robert St. N. St. Paul MN 55155
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PWSID: 1020017
SYSTEM NAME: Coon Rapids
WELL NAME: Well #7

TIER: 2
WHP RANK:
UNIQUE WELL #: 00202943

COUNTY: Anoka | TOWNSHIP NUMBER: 31 | RANGE: 24 W | SECTION: 21 | QUARTERS: BDAC

CRITERIA		DESCRIPTION	POINTS
Aquifer Name(s)	:	Franconia-Mt. Simon	
DNR Geologic Sensitivity Rating	:	Low	20
L Score	:	3	
Geologic Data From	:	Well Record	
Year Constructed	:	1964	
Construction Method	:	Cable Tool/Bored	0
Casing Depth	:	189	10
Well Depth	:	632	
Casing grouted into borehole?		Unknown	0
Cement grout between casings?		Unknown	5
All casings extend to land surface?		Yes	0
Gravel - packed casings?		No	0
Wood or masonry casing?		No	0
Holes or cracks in casing?		Unknown	0
Isolation distance violations?			0
Pumping Rate	:	1050	20
Pathogen Detected?			0
Surface Water Characteristics?			0
Maximum nitrate detected	:	<.4	0
Maximum tritium detected	:	1.1 11/08/1999	VULNERABLE
Non-THMS VOCs detected?			0
Pesticides detected?			0
Carbon 14 age	:	Unknown	0
Wellhead Protection Score	:		55
Wellhead Protection Vulnerability Rating	:		VULNERABLE

Vulnerability Overridden :

COMMENTS

MINNESOTA DEPARTMENT OF HEALTH
SECTION OF DRINKING WATER PROTECTION
SWP Vulnerability Rating

625 Robert St. N. St. Paul MN 55155
P.O. Box 64975 St. Paul MN 55164 - 0975

PWSID: 1020017
SYSTEM NAME: Coon Rapids
WELL NAME: Well #8

TIER: 2
WHP RANK:
UNIQUE WELL #: 00202932

COUNTY: Anoka | TOWNSHIP NUMBER: 31 | RANGE: 24 W | SECTION: 13 | QUARTERS: ACCD

CRITERIA		DESCRIPTION	POINTS
Aquifer Name(s)	:	Franconia-Mt. Simon	
DNR Geologic Sensitivity Rating	:	Low	20
L Score	:	1	
Geologic Data From	:	Data Inferred From Nearby Wells	
Year Constructed	:	1965	
Construction Method	:	Cable Tool/Bored	0
Casing Depth	:	283	5
Well Depth	:	700	
Casing grouted into borehole?		Yes	0
Cement grout between casings?		Yes	0
All casings extend to land surface?		Yes	0
Gravel - packed casings?		No	0
Wood or masonry casing?		No	0
Holes or cracks in casing?		Unknown	0
Isolation distance violations?			0
Pumping Rate	:	1000	10
Pathogen Detected?			0
Surface Water Characteristics?			0
Maximum nitrate detected	:	<1	0
Maximum tritium detected	:	Unknown	0
Non-THMS VOCs detected?			0
Pesticides detected?			0
Carbon 14 age	:	Unknown	0
Wellhead Protection Score	:		35
Wellhead Protection Vulnerability Rating	:		NOT VULNERABLE

Vulnerability Overridden :

COMMENTS

NITRATE DATA FFROM PWSD 1989, 8/75 SAMPLE. Low rating is taken from the log of well #2 (202929).

MINNESOTA DEPARTMENT OF HEALTH
SECTION OF DRINKING WATER PROTECTION
SWP Vulnerability Rating

625 Robert St. N. St. Paul MN 55155
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PWSID: 1020017 | TIER: 2
SYSTEM NAME: Coon Rapids | WHP RANK:
WELL NAME: Well #9 | UNIQUE WELL #: 00202931

COUNTY: Anoka | TOWNSHIP NUMBER: 31 | RANGE: 24 W | SECTION: 13 | QUARTERS: ACCD

CRITERIA		DESCRIPTION	POINTS
Aquifer Name(s)	:	Franconia-Eau Claire	
DNR Geologic Sensitivity Rating	:	Very low	10
L Score	:	10	
Geologic Data From	:	Data Inferred From Nearby Wells	
Year Constructed	:	1969	
Construction Method	:	Cable Tool/Bored	0
Casing Depth	:	294	5
Well Depth	:	500	
Casing grouted into borehole?		Yes	0
Cement grout between casings?		Yes	0
All casings extend to land surface?		Yes	0
Gravel - packed casings?		No	0
Wood or masonry casing?		No	0
Holes or cracks in casing?		Unknown	0
Isolation distance violations?			0
Pumping Rate	:	1000	10
Pathogen Detected?			NOT VULNERABLE
Surface Water Characteristics?			NOT VULNERABLE
Maximum nitrate detected	:	<.4	NOT VULNERABLE
Maximum tritium detected	:	<.8 04/21/1997	NOT VULNERABLE
Non-THMS VOCs detected?			0
Pesticides detected?			0
Carbon 14 age	:	Unknown	0
Wellhead Protection Score	:		25
Wellhead Protection Vulnerability Rating	:		NOT VULNERABLE

Vulnerability Overridden :

COMMENTS
Very low rating is based on the log for well #2 (202931).

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MINNESOTA DEPARTMENT OF HEALTH
SECTION OF DRINKING WATER PROTECTION
SWP Vulnerability Rating

PWSID: 1020017
SYSTEM NAME: Coon Rapids
WELL NAME: Well #10

TIER: 2
WHP RANK:
UNIQUE WELL #: 00202930

COUNTY: Anoka | TOWNSHIP NUMBER: 31 | RANGE: 24 W | SECTION: 13 | QUARTERS: DABC

CRITERIA		DESCRIPTION	POINTS
Aquifer Name(s)	:	Franconia-Mt. Simon	
DNR Geologic Sensitivity Rating	:	Very low	10
L Score	:	10	
Geologic Data From	:	Data Inferred From Nearby Wells	
Year Constructed	:	1970	
Construction Method	:	Cable Tool/Bored	0
Casing Depth	:	272	5
Well Depth	:	684	
Casing grouted into borehole?		Unknown	0
Cement grout between casings?		Yes	0
All casings extend to land surface?		Yes	0
Gravel - packed casings?		No	0
Wood or masonry casing?		No	0
Holes or cracks in casing?		Unknown	0
Isolation distance violations?			0
Pumping Rate	:	1000	10
Pathogen Detected?			0
Surface Water Characteristics?			0
Maximum nitrate detected	:	<1	0
Maximum tritium detected	:	Unknown	0
Non-THMS VOCs detected?			0
Pesticides detected?			0
Carbon 14 age	:	Unknown	0
Wellhead Protection Score	:		25
Wellhead Protection Vulnerability Rating	:		NOT VULNERABLE

Vulnerability Overridden :

COMMENTS

NITRATE DATA FROM PWSD 1989, 8/75 SAMPLE NITRATE DATA FROM PWSD 1989, 7/80 SAMPLE NITRATE DATA FROM PWSD 1989, 6/84 SAMPLE NITRATE DATA FROM PWWSD 1989, 7/79 SAMPLE Very low rating is based on well #13 and the presence of the St. Lawrence confining layer.

625 Robert St. N. St. Paul MN 55155
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MINNESOTA DEPARTMENT OF HEALTH
SECTION OF DRINKING WATER PROTECTION
SWP Vulnerability Rating

PWSID: 1020017
SYSTEM NAME: Coon Rapids
WELL NAME: Well #11

TIER: 2
WHP RANK:
UNIQUE WELL #: 00202965

COUNTY: Anoka | TOWNSHIP NUMBER: 31 | RANGE: 24 W | SECTION: 27 | QUARTERS: BAAA

CRITERIA		DESCRIPTION	POINTS
Aquifer Name(s)	:	Tunnel City-Wonewoc	
DNR Geologic Sensitivity Rating	:	Very low	0
L Score	:	4	
Geologic Data From	:	Well Record	
Year Constructed	:	1972	
Construction Method	:	Rotary/Drilled	0
Casing Depth	:	189	10
Well Depth	:	421	
Casing grouted into borehole?		Yes	0
Cement grout between casings?		Not applicable	0
All casings extend to land surface?		Yes	0
Gravel - packed casings?		No	0
Wood or masonry casing?		No	0
Holes or cracks in casing?		Unknown	0
Isolation distance violations?			0
Pumping Rate	:	1100	20
Pathogen Detected?			0
Surface Water Characteristics?			0
Maximum nitrate detected	:	<.4	0
Maximum tritium detected	:	2.7 06/08/2010	VULNERABLE
Non-THMS VOCs detected?			0
Pesticides detected?			0
Carbon 14 age	:	Unknown	0
Wellhead Protection Score	:		30
Wellhead Protection Vulnerability Rating	:		VULNERABLE
Vulnerability Overridden	:		

COMMENTS
NITRATE DATA FROEM PWSD 1989, 10/85 SAMPLE. Previous tritium result 7.2 on 11/08/1999.

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MINNESOTA DEPARTMENT OF HEALTH
SECTION OF DRINKING WATER PROTECTION
SWP Vulnerability Rating

PWSID: 1020017
SYSTEM NAME: Coon Rapids
WELL NAME: Well #12

TIER: 2
WHP RANK:
UNIQUE WELL #: 00168721

COUNTY: Anoka | TOWNSHIP NUMBER: 31 | RANGE: 24 W | SECTION: 27 | QUARTERS: AAAA

CRITERIA		DESCRIPTION	POINTS
Aquifer Name(s)	:	Franconia-Mt. Simon	
DNR Geologic Sensitivity Rating	:	Very low	10
L Score	:	9	
Geologic Data From	:	Well Record	
Year Constructed	:	1975	
Construction Method	:	Cable Tool/Bored	0
Casing Depth	:	208	5
Well Depth	:	604	
Casing grouted into borehole?		Yes	0
Cement grout between casings?		Yes	0
All casings extend to land surface?		Yes	0
Gravel - packed casings?		No	0
Wood or masonry casing?		No	0
Holes or cracks in casing?		Unknown	0
Isolation distance violations?			0
Pumping Rate	:	850	10
Pathogen Detected?			0
Surface Water Characteristics?			0
Maximum nitrate detected	:	<.4	0
Maximum tritium detected	:	Unknown	0
Non-THMS VOCs detected?			0
Pesticides detected?			0
Carbon 14 age	:	Unknown	0
Wellhead Protection Score	:		25
Wellhead Protection Vulnerability Rating	:		NOT VULNERABLE

Vulnerability Overridden :

COMMENTS

625 Robert St. N. St. Paul MN 55155
P.O. Box 64975 St. Paul MN 55164 - 0975

MINNESOTA DEPARTMENT OF HEALTH
SECTION OF DRINKING WATER PROTECTION
SWP Vulnerability Rating

PWSID: 1020017
SYSTEM NAME: Coon Rapids
WELL NAME: Well #13

TIER: 2
WHP RANK:
UNIQUE WELL #: 00168720

COUNTY: Anoka | TOWNSHIP NUMBER: 31 | RANGE: 24 W | SECTION: 13 | QUARTERS: DADD

CRITERIA		DESCRIPTION	POINTS
Aquifer Name(s)	:	Franconia-Mt. Simon	
DNR Geologic Sensitivity Rating	:	Very low	10
L Score	:	10	
Geologic Data From	:	Well Record	
Year Constructed	:	1977	
Construction Method	:	Cable Tool/Bored	0
Casing Depth	:	395	5
Well Depth	:	693	
Casing grouted into borehole?		Yes	0
Cement grout between casings?		Yes	0
All casings extend to land surface?		Yes	0
Gravel - packed casings?		No	0
Wood or masonry casing?		No	0
Holes or cracks in casing?		Unknown	0
Isolation distance violations?			0
Pumping Rate	:	1000	10
Pathogen Detected?			0
Surface Water Characteristics?			0
Maximum nitrate detected	:	<.4	0
Maximum tritium detected	:	Unknown	0
Non-THMS VOCs detected?			0
Pesticides detected?			0
Carbon 14 age	:	Unknown	0
Wellhead Protection Score	:		25
Wellhead Protection Vulnerability Rating	:		NOT VULNERABLE

Vulnerability Overridden :

COMMENTS

MINNESOTA DEPARTMENT OF HEALTH
SECTION OF DRINKING WATER PROTECTION
SWP Vulnerability Rating

625 Robert St. N. St. Paul MN 55155
P.O. Box 64975 St. Paul MN 55164 - 0975

PWSID: 1020017
SYSTEM NAME: Coon Rapids
WELL NAME: Well #14

TIER: 2
WHP RANK:
UNIQUE WELL #: 00110460

COUNTY: Anoka | TOWNSHIP NUMBER: 31 | RANGE: 24 W | SECTION: 22 | QUARTERS: BCBB

CRITERIA		DESCRIPTION	POINTS
Aquifer Name(s)	:	Franconia-Mt. Simon	
DNR Geologic Sensitivity Rating	:	Medium	25
L Score	:	0	
Geologic Data From	:	Well Record	
Year Constructed	:	1977	
Construction Method	:	Cable Tool/Bored	0
Casing Depth	:	328	5
Well Depth	:	613	
Casing grouted into borehole?		Yes	0
Cement grout between casings?		Yes	0
All casings extend to land surface?		Yes	0
Gravel - packed casings?		No	0
Wood or masonry casing?		No	0
Holes or cracks in casing?		Unknown	0
Isolation distance violations?			0
Pumping Rate	:	1000	10
Pathogen Detected?			NOT VULNERABLE
Surface Water Characteristics?			NOT VULNERABLE
Maximum nitrate detected	:	<.4	NOT VULNERABLE
Maximum tritium detected	:	<.8 11/08/1999	NOT VULNERABLE
Non-THMS VOCs detected?			0
Pesticides detected?			0
Carbon 14 age	:	Unknown	0
Wellhead Protection Score	:		40
Wellhead Protection Vulnerability Rating	:		NOT VULNERABLE

Vulnerability Overridden :

COMMENTS

MINNESOTA DEPARTMENT OF HEALTH
SECTION OF DRINKING WATER PROTECTION
SWP Vulnerability Rating

625 Robert St. N. St. Paul MN 55155
P.O. Box 64975 St. Paul MN 55164 - 0975

PWSID: 1020017
SYSTEM NAME: Coon Rapids
WELL NAME: Well #15

TIER: 2
WHP RANK:
UNIQUE WELL #: 00110461

COUNTY: Anoka | TOWNSHIP NUMBER: 31 | RANGE: 24 W | SECTION: 22 | QUARTERS: BCDD

CRITERIA		DESCRIPTION	POINTS
Aquifer Name(s)	:	Franconia-Mt. Simon	
DNR Geologic Sensitivity Rating	:	Low	20
L Score	:	1	
Geologic Data From	:	Well Record	
Year Constructed	:	1976	
Construction Method	:	Cable Tool/Bored	0
Casing Depth	:	225	5
Well Depth	:	615	
Casing grouted into borehole?		Yes	0
Cement grout between casings?		Yes	0
All casings extend to land surface?		Yes	0
Gravel - packed casings?		No	0
Wood or masonry casing?		No	0
Holes or cracks in casing?		Unknown	0
Isolation distance violations?			0
Pumping Rate	:	1300	20
Pathogen Detected?			0
Surface Water Characteristics?			0
Maximum nitrate detected	:	<.4	0
Maximum tritium detected	:	1 11/08/1999	VULNERABLE
Non-THMS VOCs detected?			0
Pesticides detected?			0
Carbon 14 age	:	Unknown	0
Wellhead Protection Score	:		45
Wellhead Protection Vulnerability Rating	:		VULNERABLE

Vulnerability Overridden :

COMMENTS

MINNESOTA DEPARTMENT OF HEALTH
SECTION OF DRINKING WATER PROTECTION
SWP Vulnerability Rating

625 Robert St. N. St. Paul MN 55155
P.O. Box 64975 St. Paul MN 55164 - 0975

PWSID: 1020017
SYSTEM NAME: Coon Rapids
WELL NAME: Well #16

TIER: 2
WHP RANK:
UNIQUE WELL #: 00161413

COUNTY: Anoka | TOWNSHIP NUMBER: 31 | RANGE: 24 W | SECTION: 11 | QUARTERS: ADAA

CRITERIA		DESCRIPTION	POINTS
Aquifer Name(s)	:	Wonewoc-Mt.Simon	
DNR Geologic Sensitivity Rating	:	Very low	15
L Score	:	5	
Geologic Data From	:	Well Record	
Year Constructed	:	1981	
Construction Method	:	Cable Tool/Bored	0
Casing Depth	:	395	5
Well Depth	:	653	
Casing grouted into borehole?		Yes	0
Cement grout between casings?		Yes	0
All casings extend to land surface?		Yes	0
Gravel - packed casings?		No	0
Wood or masonry casing?		No	0
Holes or cracks in casing?		Unknown	0
Isolation distance violations?			0
Pumping Rate	:	1050	20
Pathogen Detected?			0
Surface Water Characteristics?			0
Maximum nitrate detected	:	<.05 08/02/1994	0
Maximum tritium detected	:	Unknown	0
Non-THMS VOCs detected?			0
Pesticides detected?			0
Carbon 14 age	:	Unknown	0
Wellhead Protection Score	:		40
Wellhead Protection Vulnerability Rating	:		NOT VULNERABLE

Vulnerability Overridden :

COMMENTS
L=5 Based on 58 feet of St. Lawrence Formation

625 Robert St. N. St. Paul MN 55155
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MINNESOTA DEPARTMENT OF HEALTH
SECTION OF DRINKING WATER PROTECTION
SWP Vulnerability Rating

PWSID: 1020017
SYSTEM NAME: Coon Rapids
WELL NAME: Well #17

TIER: 2
WHP RANK:
UNIQUE WELL #: 00150357

COUNTY: Anoka | TOWNSHIP NUMBER: 31 | RANGE: 24 W | SECTION: 21 | QUARTERS: DAAA

CRITERIA		DESCRIPTION	POINTS
Aquifer Name(s)	:	Quaternary Buried Artesian	
DNR Geologic Sensitivity Rating	:	Medium	25
L Score	:	0	
Geologic Data From	:	Well Record	
Year Constructed	:	1981	
Construction Method	:	Cable Tool/Bored	0
Casing Depth	:	81	10
Well Depth	:	121	
Casing grouted into borehole?		No	0
Cement grout between casings?		Not applicable	0
All casings extend to land surface?		Yes	0
Gravel - packed casings?		No	0
Wood or masonry casing?		No	0
Holes or cracks in casing?		Unknown	0
Isolation distance violations?			0
Pumping Rate	:	1000	10
Pathogen Detected?			0
Surface Water Characteristics?			0
Maximum nitrate detected	:	<.4	0
Maximum tritium detected	:	2 06/08/2010	VULNERABLE
Non-THMS VOCs detected?			0
Pesticides detected?			0
Carbon 14 age	:	Unknown	0
Wellhead Protection Score	:		45
Wellhead Protection Vulnerability Rating	:		VULNERABLE
Vulnerability Overridden	:		

COMMENTS

MINNESOTA DEPARTMENT OF HEALTH
SECTION OF DRINKING WATER PROTECTION
SWP Vulnerability Rating

625 Robert St. N. St. Paul MN 55155
P.O. Box 64975 St. Paul MN 55164 - 0975

PWSID: 1020017
SYSTEM NAME: Coon Rapids
WELL NAME: Well #18

TIER: 2
WHP RANK:
UNIQUE WELL #: 00110469

COUNTY: Anoka | TOWNSHIP NUMBER: 31 | RANGE: 24 W | SECTION: 2 | QUARTERS: DCDC

CRITERIA		DESCRIPTION	POINTS
Aquifer Name(s)	:	Mt. Simon	
DNR Geologic Sensitivity Rating	:	Very low	0
L Score	:	18	
Geologic Data From	:	Well Record	
Year Constructed	:	1986	
Construction Method	:	Cable Tool/Bored	0
Casing Depth	:	575	0
Well Depth	:	637	
Casing grouted into borehole?		Yes	0
Cement grout between casings?		Unknown	5
All casings extend to land surface?		Yes	0
Gravel - packed casings?		No	0
Wood or masonry casing?		No	0
Holes or cracks in casing?		Unknown	0
Isolation distance violations?			0
Pumping Rate	:	1000	10
Pathogen Detected?			NOT VULNERABLE
Surface Water Characteristics?			NOT VULNERABLE
Maximum nitrate detected	:	<.4	NOT VULNERABLE
Maximum tritium detected	:	<.8 04/21/1997	NOT VULNERABLE
Non-THMS VOCs detected?			0
Pesticides detected?			0
Carbon 14 age	:	A	-20
Wellhead Protection Score	:		-5
Wellhead Protection Vulnerability Rating	:		NOT VULNERABLE

Vulnerability Overridden :

COMMENTS

MINNESOTA DEPARTMENT OF HEALTH
SECTION OF DRINKING WATER PROTECTION
SWP Vulnerability Rating

625 Robert St. N. St. Paul MN 55155
P.O. Box 64975 St. Paul MN 55164 - 0975

PWSID: 1020017
SYSTEM NAME: Coon Rapids
WELL NAME: Well #19

TIER: 2
WHP RANK:
UNIQUE WELL #: 00110475

COUNTY: Anoka | TOWNSHIP NUMBER: 31 | RANGE: 24 W | SECTION: 16 | QUARTERS:

CRITERIA		DESCRIPTION	POINTS
Aquifer Name(s)	:	Quaternary Buried Artesian	
DNR Geologic Sensitivity Rating	:	Low	20
L Score	:	3	
Geologic Data From	:	Well Record	
Year Constructed	:	1987	
Construction Method	:	Cable Tool/Bored	0
Casing Depth	:	115	10
Well Depth	:	135	
Casing grouted into borehole?		Yes	0
Cement grout between casings?		Unknown	5
All casings extend to land surface?		Yes	0
Gravel - packed casings?		No	0
Wood or masonry casing?		No	0
Holes or cracks in casing?		Unknown	0
Isolation distance violations?			0
Pumping Rate	:	1150	20
Pathogen Detected?			0
Surface Water Characteristics?			0
Maximum nitrate detected	:	.53 07/08/2014	0
Maximum tritium detected	:	36.7 07/16/1991	VULNERABLE
Non-THMS VOCs detected?			0
Pesticides detected?			0
Carbon 14 age	:	M	0
Wellhead Protection Score	:		55
Wellhead Protection Vulnerability Rating	:		VULNERABLE

Vulnerability Overridden :

COMMENTS

625 Robert St. N. St. Paul MN 55155
P.O. Box 64975 St. Paul MN 55164 - 0975

MINNESOTA DEPARTMENT OF HEALTH
SECTION OF DRINKING WATER PROTECTION
SWP Vulnerability Rating

PWSID: 1020017
SYSTEM NAME: Coon Rapids
WELL NAME: Well #20

TIER: 2
WHP RANK:
UNIQUE WELL #: 00420956

COUNTY: Anoka | TOWNSHIP NUMBER: 31 | RANGE: 24 W | SECTION: 21 | QUARTERS: ADBD

CRITERIA		DESCRIPTION	POINTS
Aquifer Name(s)	:	Quaternary Buried Artesian	
DNR Geologic Sensitivity Rating	:	Low	20
L Score	:	1	
Geologic Data From	:	Well Record	
Year Constructed	:	1988	
Construction Method	:	Cable Tool/Bored	0
Casing Depth	:	95	10
Well Depth	:	135	
Casing grouted into borehole?		Yes	0
Cement grout between casings?		Yes	0
All casings extend to land surface?		Yes	0
Gravel - packed casings?		No	0
Wood or masonry casing?		No	0
Holes or cracks in casing?		Unknown	0
Isolation distance violations?			0
Pumping Rate	:	1100	20
Pathogen Detected?			0
Surface Water Characteristics?			0
Maximum nitrate detected	:	.35 07/08/2014	0
Maximum tritium detected	:	6.9 06/08/2010	VULNERABLE
Non-THMS VOCs detected?			0
Pesticides detected?			0
Carbon 14 age	:	Unknown	0
Wellhead Protection Score	:		50
Wellhead Protection Vulnerability Rating	:		VULNERABLE
Vulnerability Overridden	:		Jim Walsh

COMMENTS

MINNESOTA DEPARTMENT OF HEALTH
SECTION OF DRINKING WATER PROTECTION
SWP Vulnerability Rating

625 Robert St. N. St. Paul MN 55155
P.O. Box 64975 St. Paul MN 55164 - 0975

PWSID: 1020017
SYSTEM NAME: Coon Rapids
WELL NAME: Well #21

TIER: 2
WHP RANK:
UNIQUE WELL #: 00474384

COUNTY: Anoka | TOWNSHIP NUMBER: 31 | RANGE: 24 W | SECTION: 13 | QUARTERS: ACCD

CRITERIA		DESCRIPTION	POINTS
Aquifer Name(s)	:	Quaternary Buried Artesian	
DNR Geologic Sensitivity Rating	:	Low	20
L Score	:	1	
Geologic Data From	:	Well Record	
Year Constructed	:	1990	
Construction Method	:	Cable Tool/Bored	0
Casing Depth	:	170	10
Well Depth	:	203	
Casing grouted into borehole?		Unknown	0
Cement grout between casings?		Yes	0
All casings extend to land surface?		Yes	0
Gravel - packed casings?		No	0
Wood or masonry casing?		No	0
Holes or cracks in casing?		Unknown	0
Isolation distance violations?			0
Pumping Rate	:	900	10
Pathogen Detected?			0
Surface Water Characteristics?			0
Maximum nitrate detected	:	<.05 07/07/2014	0
Maximum tritium detected	:	11.5 04/21/1997	VULNERABLE
Non-THMS VOCs detected?			0
Pesticides detected?			0
Carbon 14 age	:	Unknown	0
Wellhead Protection Score	:		40
Wellhead Protection Vulnerability Rating	:		VULNERABLE

Vulnerability Overridden :

COMMENTS

625 Robert St. N. St. Paul MN 55155
P.O. Box 64975 St. Paul MN 55164 - 0975

MINNESOTA DEPARTMENT OF HEALTH
SECTION OF DRINKING WATER PROTECTION
SWP Vulnerability Rating

PWSID: 1020017
SYSTEM NAME: Coon Rapids
WELL NAME: Well #22

TIER: 2
WHP RANK:
UNIQUE WELL #: 00474385

COUNTY: Anoka | TOWNSHIP NUMBER: 31 | RANGE: 24 W | SECTION: 22 | QUARTERS: CBAA

CRITERIA		DESCRIPTION	POINTS
Aquifer Name(s)	:	Quaternary Buried Artesian	
DNR Geologic Sensitivity Rating	:	Medium	25
L Score	:	0	
Geologic Data From	:	Well Record	
Year Constructed	:	1990	
Construction Method	:	Cable Tool/Bored	0
Casing Depth	:	80	10
Well Depth	:	105	
Casing grouted into borehole?		Yes	0
Cement grout between casings?		Not applicable	0
All casings extend to land surface?		Yes	0
Gravel - packed casings?		No	0
Wood or masonry casing?		No	0
Holes or cracks in casing?		Unknown	0
Isolation distance violations?			0
Pumping Rate	:	250	5
Pathogen Detected?			0
Surface Water Characteristics?			0
Maximum nitrate detected	:	.07 09/23/2014	0
Maximum tritium detected	:	Unknown	0
Non-THMS VOCs detected?			0
Pesticides detected?			0
Carbon 14 age	:	Unknown	0
Wellhead Protection Score	:		40
Wellhead Protection Vulnerability Rating	:		VULNERABLE
Vulnerability Overridden	:		Jim Walsh

COMMENTS
Vulnerable because of tritium in Well 20.

625 Robert St. N. St. Paul MN 55155
P.O. Box 64975 St. Paul MN 55164 - 0975

MINNESOTA DEPARTMENT OF HEALTH
SECTION OF DRINKING WATER PROTECTION
SWP Vulnerability Rating

PWSID: 1020017
SYSTEM NAME: Coon Rapids
WELL NAME: Well #23

TIER: 2
WHP RANK:
UNIQUE WELL #: 00463020

COUNTY: Anoka | TOWNSHIP NUMBER: 31 | RANGE: 24 W | SECTION: 27 | QUARTERS: BAA

CRITERIA		DESCRIPTION	POINTS
Aquifer Name(s)	:	Quaternary Buried Artesian	
DNR Geologic Sensitivity Rating	:	Medium	25
L Score	:	0	
Geologic Data From	:	Well Record	
Year Constructed	:	1991	
Construction Method	:	Cable Tool/Bored	0
Casing Depth	:	93	10
Well Depth	:	128	
Casing grouted into borehole?		Yes	0
Cement grout between casings?		Unknown	5
All casings extend to land surface?		Yes	0
Gravel - packed casings?		No	0
Wood or masonry casing?		No	0
Holes or cracks in casing?		Unknown	0
Isolation distance violations?			0
Pumping Rate	:	250	5
Pathogen Detected?			0
Surface Water Characteristics?			0
Maximum nitrate detected	:	<.05 09/23/2014	0
Maximum tritium detected	:	7.7 06/08/2010	VULNERABLE
Non-THMS VOCs detected?			0
Pesticides detected?			0
Carbon 14 age	:	Unknown	0
Wellhead Protection Score	:		45
Wellhead Protection Vulnerability Rating	:		VULNERABLE
Vulnerability Overridden	:		

COMMENTS
Previous tritium result 21.6 TU on 04/21/1997.

625 Robert St. N. St. Paul MN 55155
P.O. Box 64975 St. Paul MN 55164 - 0975

MINNESOTA DEPARTMENT OF HEALTH
SECTION OF DRINKING WATER PROTECTION
SWP Vulnerability Rating

PWSID: 1020017
SYSTEM NAME: Coon Rapids
WELL NAME: Well #24

TIER: 2
WHP RANK:
UNIQUE WELL #: 00674478

COUNTY: Anoka | TOWNSHIP NUMBER: | RANGE: | SECTION: | QUARTERS:

CRITERIA		DESCRIPTION	POINTS
Aquifer Name(s)	:	Tunnel City-Wonewoc	
DNR Geologic Sensitivity Rating	:	Medium	25
L Score	:	0	
Geologic Data From	:	Well Record	
Year Constructed	:	2003	
Construction Method	:	Cable Tool/Bored	0
Casing Depth	:	241	5
Well Depth	:	388	
Casing grouted into borehole?		Yes	0
Cement grout between casings?		Yes	0
All casings extend to land surface?		Yes	0
Gravel - packed casings?		No	0
Wood or masonry casing?		No	0
Holes or cracks in casing?		Unknown	0
Isolation distance violations?			0
Pumping Rate	:	1150	20
Pathogen Detected?			0
Surface Water Characteristics?			0
Maximum nitrate detected	:	<.05 07/08/2014	0
Maximum tritium detected	:	7.7 07/15/2010	VULNERABLE
Non-THMS VOCs detected?			0
Pesticides detected?			0
Carbon 14 age	:	Unknown	0
Wellhead Protection Score	:		50
Wellhead Protection Vulnerability Rating	:		VULNERABLE

Vulnerability Overridden :

COMMENTS

625 Robert St. N. St. Paul MN 55155
P.O. Box 64975 St. Paul MN 55164 - 0975

MINNESOTA DEPARTMENT OF HEALTH
SECTION OF DRINKING WATER PROTECTION
SWP Vulnerability Rating

PWSID: 1020017
SYSTEM NAME: Coon Rapids
WELL NAME: Well #25

TIER: 2
WHP RANK:
UNIQUE WELL #: 00674479

COUNTY: Anoka | TOWNSHIP NUMBER: | RANGE: | SECTION: | QUARTERS:

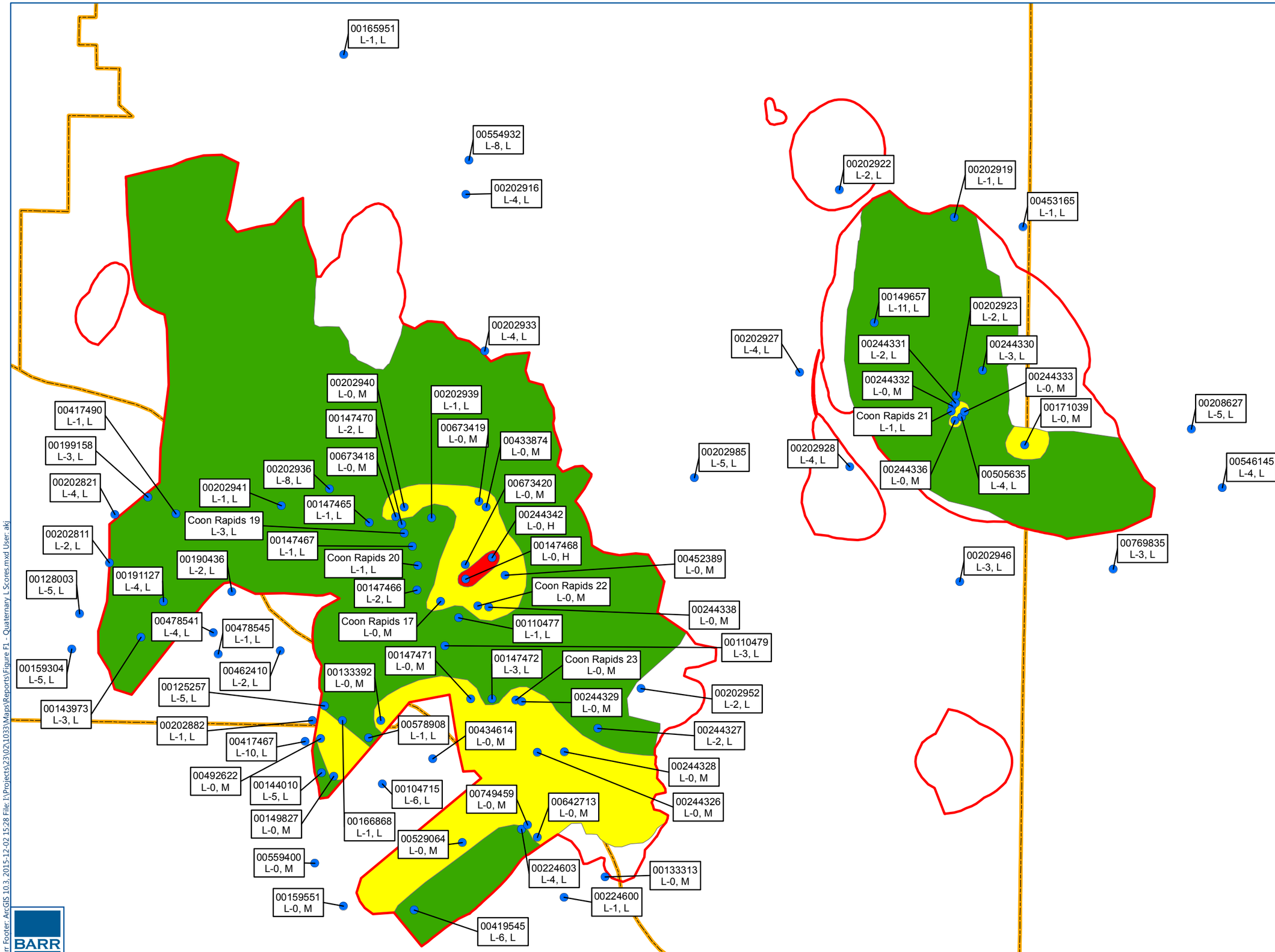
CRITERIA		DESCRIPTION	POINTS
Aquifer Name(s)	:	Tunnel City-Wonewoc	
DNR Geologic Sensitivity Rating	:	Low	20
L Score	:	3	
Geologic Data From	:	Well Record	
Year Constructed	:	2003	
Construction Method	:	Cable Tool/Bored	0
Casing Depth	:	229	5
Well Depth	:	388	
Casing grouted into borehole?		Yes	0
Cement grout between casings?		Yes	0
All casings extend to land surface?		Yes	0
Gravel - packed casings?		No	0
Wood or masonry casing?		No	0
Holes or cracks in casing?		Unknown	0
Isolation distance violations?			0
Pumping Rate	:	1125	20
Pathogen Detected?			0
Surface Water Characteristics?			0
Maximum nitrate detected	:	<.05 07/08/2014	0
Maximum tritium detected	:	Unknown	0
Non-THMS VOCs detected?			0
Pesticides detected?			0
Carbon 14 age	:	Unknown	0
Wellhead Protection Score	:		45
Wellhead Protection Vulnerability Rating	:		VULNERABLE

Vulnerability Overridden :

COMMENTS
L=3 Based on 30 feet of St. Lawrence Formation

Appendix F

L-Score and Vulnerability Maps



Quaternary L Score Well

WHPA

Municipal Boundary

Geologic Sensitivity

Very High

High

Moderate

Low

Unique Number/Well Name
L score, Geol. Sens.

Geologic sensitivity shown only for areas where the capture zone from the Quaternary aquifer is the uppermost capture zone in the WHPA.

Note: Only Quaternary wells deeper than 80' used in the L score calculations. The shallowest Coon Rapids Well (20) is screened from 80-105' below ground surface.

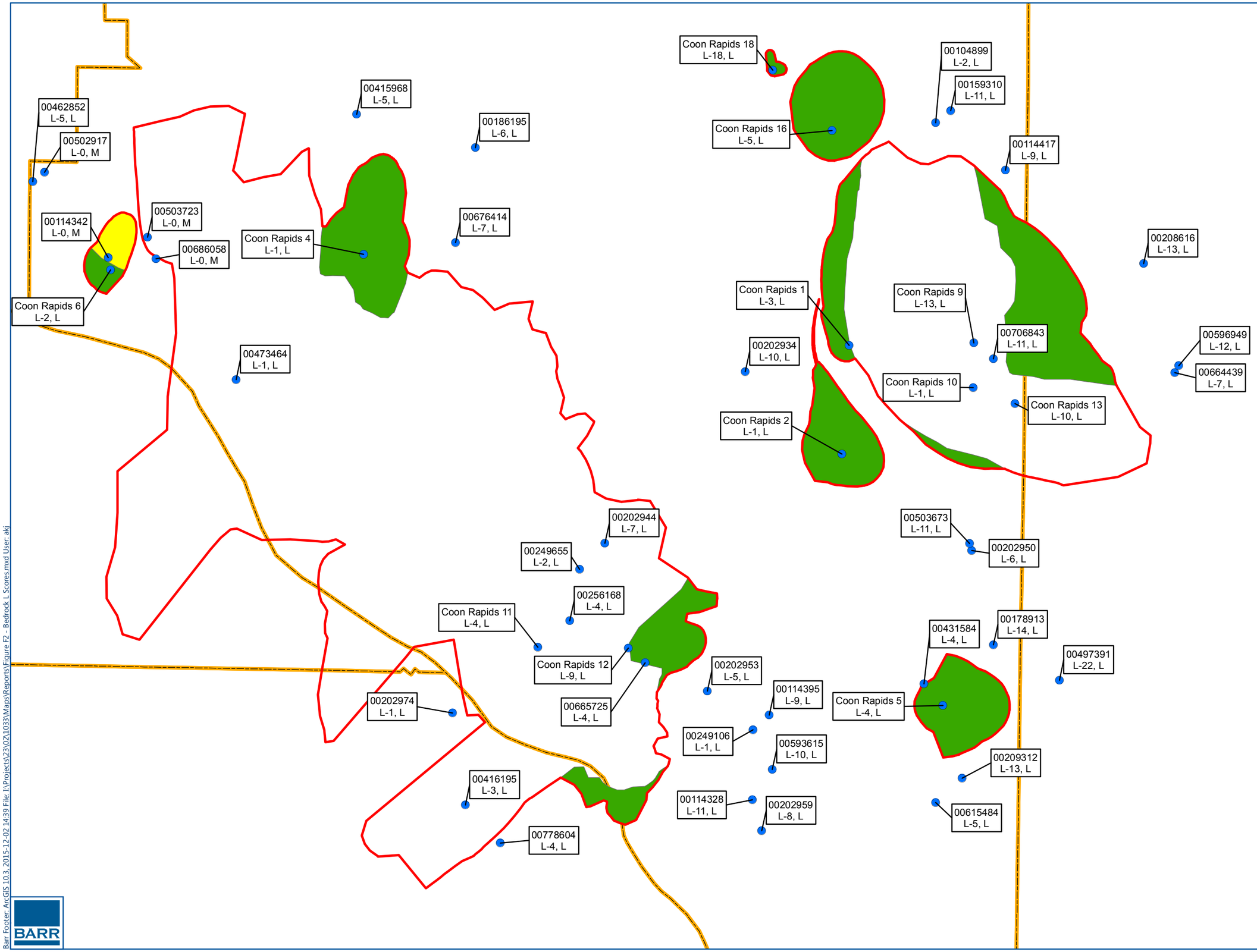
0 2,500
Feet

QUATERNARY L SCORES
AND GEOLOGIC SENSITIVITY
Coon Rapids WHPP Amendment
City of Coon Rapids, MN

FIGURE F1

BARR

Barr Footer: ArcGIS 10.3, 2015-12-02 15:28 File: I:\Projects\23\02\1033\Maps\Reports\Figure F1 - Quaternary L Scores.mxd User: akj



Bedrock L Score Well

WHPA

Municipal Boundary

Geologic Sensitivity

Very High

High

Moderate

Low

Unique Number/Well Name
L score, Geol. Sens.

Geologic sensitivity shown only for areas where the capture zone from a bedrock aquifer is the uppermost capture zone in the WHPA.

All L scores computed using only strata above the Tunnel City Group-Wonewoc Sandstone aquifer except at Coon Rapids 18, where all strata above the Mt. Simon aquifer were used.

0 2,500
Feet

BEDROCK L SCORES
AND GEOLOGIC SENSITIVITY
Coon Rapids WHPP Amendment
City of Coon Rapids, MN

FIGURE F2

BARR

Barr Footer: ArcGIS 10.3, 2015-12-02 14:39 File: I:\Projects\23\02\1033\Maps\Reports\Figure F2 - Bedrock L Scores.mxd User: akj

Appendix G

Groundwater Model Files and GIS Shapefiles

Appendix C

Data Elements Assessment

Appendix C

Data Elements Assessment

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Attachment C-4 Maps for Other Jurisdictions

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C1.0 Data Elements Assessment

The data elements and their assessments required to be included in the Wellhead and Source Water Protection Plan amendment (WHPP) for the City of Coon Rapids (Public Water Supply 1020017) are discussed in this appendix. Data elements related to the physical environment, land use, water quantity, and water quality required for this WHPP for the City of Coon Rapids were specified in the October 14, 2016 Scoping 2 Decision Notice from the Minnesota Department of Health (MDH, 2016).

Three Drinking Water Supply Management Areas (DWSMAs) have been delineated for Coon Rapids that encompass the Wellhead Protection Areas (WHPAs) for the Coon Rapids water supply wells (Barr, 2016). The West DWSMA encompasses the WHPAs for Wells 4, 6, 7, 11, 12, 14, 15, 17, 19, 20, 22, 23, 24, and 15; the Northeast DWSMA encompasses the WHPAs for Wells 1, 2, 8, 9, 10, 13, 16, 18, and 21; and the Southeast DWSMA encompasses the Well 5 WHPA. The Southeast DWSMA is contained entirely within the Coon Rapids city limits while the Northeast DWSMA extends east into Blaine and the West DWSMA extends southwest into Champlin and Brooklyn Park in Hennepin County. Locations of the Coon Rapids DWSMAs are shown on Figure C-1.

C1.1 Physical Data Elements

Physical data elements required to be considered for this Plan amendment are identified in the Scoping 2 Decision Notice (MDH, 2016). Per the Scoping 2 Decision Notice, precipitation, geology and hydrogeology, soils, and water resources data elements were required to be considered during development of the Plan.

C1.1.1 Precipitation

Management of the Coon Rapids DWSMAs must consider and reflect available precipitation information.

As shown in Attachment C-1, there were/are a number of precipitation gaging stations in Anoka County that reported measurements to the State Climatology Office during the period 2012-2016. In addition, there were/are a number of precipitation gaging stations in Hennepin County that reported measurements to the State Climatology Office during the period 2012-2016. Locations of these precipitation gaging stations are identified by township, range, and section in the Minnesota Climatology Working Group tables in Attachment C-1. These tables also show the monthly and annual precipitation measured at these stations in Anoka and Hennepin Counties for the period 2012 through 2016.

Annual precipitation in east-central Minnesota from the late 1830s to 2000 is shown in the following graph:

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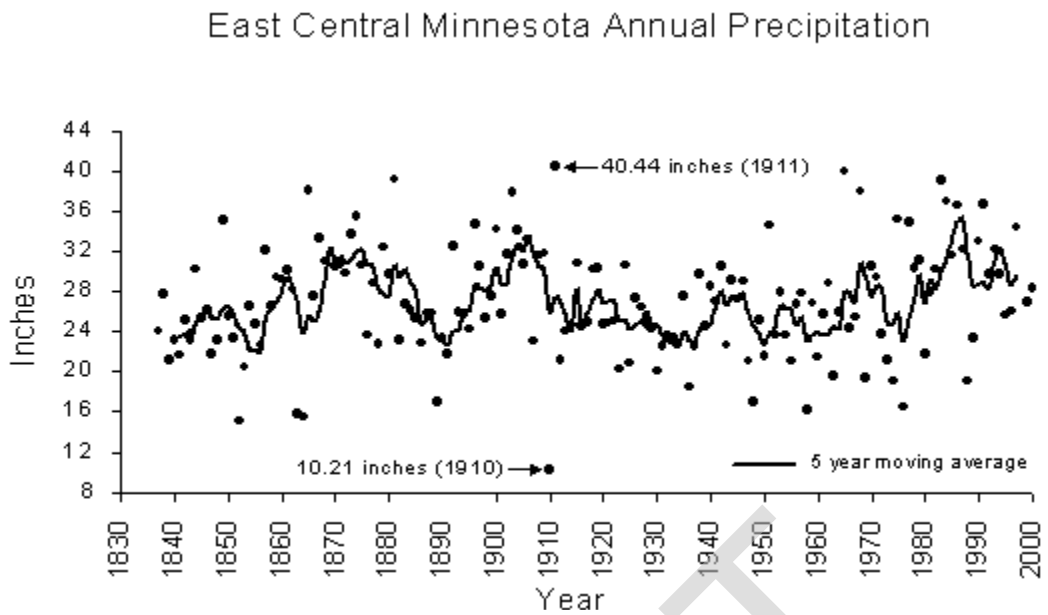

Source: Minnesota Dept. of Natural Resources website

The amount of precipitation affects recharge to the groundwater system and the potential for contaminant loading to the groundwater system. This is particularly important in areas of high aquifer vulnerability where the aquifer is not protected from infiltration of precipitation by significant confining units between the ground surface and the top of the source water aquifer. Recharge to the groundwater system affects the size of the WHPA. Recharge was included in the groundwater flow model used to identify the porous media flow portion of the WHPAs (e.g., Barr, 2016; Metropolitan Council, 2012 and 2014). In addition, the amount of precipitation also affects the amount of surface runoff. As noted in Barr (2016), the one of the Coon Rapids DWSMAs includes an area where aquifer vulnerability is classified as High but it was determined that it was not necessary to include surface water contribution areas in the delineations. (Surface water contribution areas are areas of higher topography from which surface runoff drains onto areas within the WHPA where aquifer vulnerability is classified as High.)

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C1.1.2 Geology and Hydrogeology

Existing information on the geology and hydrogeology in the vicinity of Coon Rapids was used to define the extent of the source water aquifers used by the City, delineate the WHPAs, and to assess the vulnerability of the public water supply wells and the aquifers in the DWSMAs.

The regional conceptual hydrogeologic model is described in detail by Metropolitan Council (2009; 2014) and hydrogeologic conditions in the vicinity of Coon Rapids are discussed by Barr (2016). Information pertinent to the Coon Rapids area is summarized below.

The Quaternary-aged unconsolidated sediments that overlie the bedrock in Coon Rapids were deposited by multiple glacial advances during the Pleistocene Epoch (Meyer et al., 2013) and vary in thickness from approximately 90 to nearly 300 feet. The upper 30-50 feet of the Quaternary sediments are typically comprised of sand and gravel. The deeper sediments are comprised of discontinuous sequences of fine-grained sediments (i.e., clays and silts) interbedded with sands and gravels.

As shown on Figure C-2, the Coon Rapids DWSMAs are underlain by a complex buried bedrock valley network. The uppermost bedrock unit beneath the DWSMAs varies by location and ranges from the Jordan Sandstone to the Tunnel City Group. The reader is referred to Mossler (2012) for additional information on the details of the bedrock in the Coon Rapids area.

The regional groundwater flow system in the vicinity of Coon Rapids includes the following aquifers: Quaternary glacial drift deposits, Tunnel City Group and Wonewoc Sandstone (considered a single aquifer known as the Tunnel City-Wonewoc aquifer), and Mt. Simon Sandstone. The St. Lawrence Formation, which overlies the Tunnel City Group, is considered to be a regional aquitard but it can support domestic wells. The Eau Claire Formation aquitard hydraulically separates the Wonewoc Sandstone from the Mt. Simon Sandstone.

As shown in Table C-1, the Coon Rapids municipal water supply wells are completed in various aquifers including Quaternary sand and gravel, the Tunnel City-Wonewoc aquifer, and the Mt. Simon aquifer. These aquifers are also referred to in this Plan amendment as the source water aquifers.

The important bedrock hydrostratigraphic units relative to the Coon Rapids DWSMAs are described in more detail by Barr (2016).

Information regarding the geology and hydrogeology of the area was used to assess the vulnerability to contamination of the source water aquifers within the DWSMAs. The information is consistent with the classification of the susceptibility to contamination of the source water aquifers within the DWSMAs varying from Low to High depending upon location.

C1.1.3 Soils

Management of the Coon Rapids DWSMAs must consider and reflect available soil information.

Review of available information from the U.S. Department of Agriculture – Natural Resources Conservation Service SSURGO database (USDA-NRCS, 2012) indicates that there are a variety of surficial soil types within the DWSMAs and that these soils have a range of infiltration characteristics. Surficial soil types within the DWSMAs are shown on Figure C-3 and surficial soil permeability is shown on Figure C-4. While available data from the Minnesota Board of Water and Soil Resources (BWSR) indicates there are small areas of high soil erosion risk within the West and Northeast DWSMAs, the City is not aware of any eroding lands causing sedimentation problems within the DWSMAs.

Based on the aquifer vulnerability assessment results, issues related to surficial soil characteristics or the surficial soil types may potentially have an effect on the management strategies developed for the DWSMAs. Surficial geologic materials in the City of Coon Rapids include clay, silt, sand, gravel, and porous soils. As indicated on Figure C-4, most of the surficial soils in the DWSMAs have a high or moderate infiltration rate. The City is well aware that land development and land use activity may have an impact on the source water aquifers, particularly in areas of high aquifer vulnerability within the DWSMAs, due to infiltration through the permeable soil types.

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C1.1.4 Water Resources

Management of the Coon Rapids DWSMAs must consider and reflect available water resources information.

Surface water resources must be evaluated to determine if they could potentially apply to this Plan.

The Mississippi River watershed is the only major watershed that overlaps the Coon Rapids DWSMAs. The City of Coon Rapids lies within the boundaries of the area administered by the Coon Creek Watershed District (CCWD). The West DWSMA extends into the area administered by the West Mississippi Watershed Management Organization (WMWMO). Flow directions in and boundaries of the watersheds in the area do not indicate any reasons for concern.

Surface water bodies within or that cross the DWSMAs include lakes, ponds, river/streams, stormwater basins, and wetlands. There are water bodies in the DWSMAs that meet the definition of public waters in Minnesota Statutes Section 103G.005, subdivision 15. In addition, there are water bodies in the DWSMAs that have shoreland classifications pursuant to Minnesota Statutes Sections 103F.201 to 103F.221 and consistent with Minnesota Rules part 6120.3300. Title 11 of the Coon Rapids City Code regulates land development, including in environmentally sensitive areas. No streams cross the portion of the West DWSMA in which the source water aquifer vulnerability has been classified as High. A small portion of the Northeast DWSMA near McKay Creek Lake is in FEMA-designated Flood Zone A. There are areas in the West and Northeast DWSMAs that are in FEMA-designated Flood Zone AE. Floodplains in Coon Rapids are addressed in Title 11, Chapter 11-1100 of the Coon Rapids City Code. Coon Rapids does not currently have an appropriation permit to withdraw water from any surface water feature within the DWSMAs. Water quality management for the surface water bodies in Coon Rapids is addressed in the City's Storm Water Pollution Prevention Plan.

There are wetlands within the DWSMAs. Approximately one-half of these wetlands within the DWSMAs are small in size (i.e., <1 acre) and are not definable by the Minnesota Statute for Public Waters Wetlands (i.e., Section 103G.221 to 103G.2373). Locations of wetlands in Coon Rapids are identified in the City's Wetland Management Plan (WSB, 2004).

Per the October 14, 2016 Scoping 2 Decision Notice from the MDH, submission of data elements related to water resources are not required for this WHPP amendment.

Geologic conditions in and around the City's DWSMAs result in the aquifer vulnerability being classified as High in approximately 0.4% of the area within the West DWSMA. No areas in which aquifer vulnerability is classified as High are present in the Northeast DWSMA or Southeast DWSMA. Based on the aquifer vulnerability assessment results, it considered to be possible that issues related to surface water resources could have some effect on the water quality in the source water aquifers and should be considered in the development of the management strategies for the DWSMAs, particularly in areas where aquifer vulnerability is classified as High. The quality of the source water is dependent on the quality of its recharge. Recharge sources/mechanisms are noted above. Existing surface water management programs in the DWSMAs address water quality and, therefore, reduce the potential negative effects that surface

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infiltrating waters may have on the source water aquifer. The City believes that existing surface water management programs are adequate to address surface water quality in the DWSMAs and to ensure that aquifer recharge and water availability do not become an issue for the City.

C1.2 Land Use Data Elements

The Scoping 2 Decision Notice required land use data elements to be considered during development of this Plan amendment. Land use and public utility services are within the DWSMAs are discussed in this section. In Part 1 of this Plan amendment, property parcel boundaries were used in the delineation of the DWSMAs (Barr, 2016).

C1.2.1 Current Land Use

Figure C-5 shows the current (year 2010, with minor modifications based on newer information) land use map within the DWSMAs. Numerous land uses are found within the DWSMAs. Land uses in the DWSMAs that cover 1% or more of the area in the DWSMAs include residential of various types, park/recreational/preserve, open water, institutional, retail and other commercial, undeveloped land, and major highways. As shown on Figure C-5, residential land use, which includes Single Family (detached and attached), Multifamily, and Manufactured Housing Parks, is the most common land use occupying approximately 61% of the area in the DWSMAs. Figure C-6 shows the current Coon Rapids zoning within the DWSMAs. Zoning maps for Blaine, Brooklyn Park, and Champlin are presented in Attachment C-4.

C.1.2.1.1 Potential Contaminant Source Inventory

A potential contaminant source inventory (PCSI) was conducted within the DWSMAs. As shown on Figure C-1, the aquifer vulnerability in the DWSMAs includes the following classifications: Low, Moderate, and High. In the West DWSMA, approximately 94.5% of the area has an aquifer vulnerability classification of Moderate. The aquifer vulnerability is classified as Low in approximately 5% of the West DWSMA and High in approximately 0.5% of the West DWSMA. In the Northeast DWSMA, approximately 99% of the area has an aquifer vulnerability classification of Moderate. The aquifer vulnerability is classified as Low in approximately 1% of the Northeast DWSMA. The aquifer vulnerability within the entire Southeast DWSMA around Coon Rapids Well 5 is classified as Low.

Per the October 14, 2016 Scoping 2 Decision Notice and MDH policy, in the areas where aquifer vulnerability is classified as High the types of potential contaminant point sources inventoried include chemical storage sites, potential Class V well locations (per the U.S. EPA, Class V wells include cesspools, large-scale septic systems serving more than 20 people, or potential automotive maintenance waste disposal wells/pits), hazardous waste generators, individual sewage treatment systems (ISTS; a.k.a., septic systems), storage tank sites (registered storage tanks and leaking underground storage tank sites), pipeline facilities, and wells. In areas where the aquifer vulnerability is classified as Moderate the types of potential contaminant point sources inventoried include above-ground and underground storage tanks, leaking underground storage tank (LUST) locations, potential Class V well locations, pipeline facilities, chemical storage locations, spills/potential contamination sites, and wells. In areas where the aquifer vulnerability is classified as Low the types of potential contaminant point sources inventoried include potential Class V well locations and wells.

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Information on potential contaminant source locations was obtained from the following sources: Anoka County, Minnesota Department of Agriculture (MDA), Minnesota Department of Health (MDH), Minnesota Department of Natural Resources (MDNR), Minnesota Department of Public Safety (MnDPS), Minnesota Geological Survey (MGS), Minnesota Office of Pipeline Safety (MnOPS), Minnesota Pollution Control Agency (MPCA), Metropolitan Council, Minnesota Geospatial Information Office (MGIO), National Pipeline Mapping System, and U.S. Environmental Protection Agency (USEPA) databases. These data sources are summarized in Table C-2. Information from the various sources was compared to identify overlaps/duplications. In keeping with the Wellhead Protection Rules and MDH policy, all identified potential contaminant source locations within the old Coon Rapids DWSMA limits have been verified. Furthermore, all potential contaminant source locations identified in the areas between the boundaries of the old and new Coon Rapids DWSMAs were verified during preparation of this Plan amendment. As part of location verification locations identified during the PCSI that mapped incorrectly were corrected to the extent possible based on available data. For future updates of this Plan, the City will access available data sources and maintain as accurate and up to date a potential contaminant source database as possible in its wellhead protection file.

A potential contaminant source inventory for in the Inner Wellhead Management Zone (IWMZ) around each of the municipal supply wells was completed in June, 2016. Copies of the IWMZ inventory reports are presented in Attachment C-2.

Properties identified as potential sources of contamination during the PCSI include properties with wells, potential Class V well locations, storage tanks, LUST sites, and chemical storage. Information on these properties is presented in Tables C-3 through C-6 as follows:

- Wells – Table C-3
- Potential Class V wells – Table C-4
- Storage tanks and LUST sites – Table C-5
- Chemical Storage Sites – Table C-6

The potential contaminant source properties identified during the inventory include various commercial, institutional, government, and storage tank sites as well as residences. All of the LUST sites identified within the DWSMAs have been closed by the MPCA. Locations of potential contaminant sources are shown on Figures C-7 through C-10 as follows:

- Well locations – Figure C-7
- Potential Class V well locations – Figure C-8
- Storage tank and LUST site locations – Figure C-9
- Chemical storage site locations – Figure C-10

These potential contaminant sources have been considered in the development of the management strategies for the DWSMAs.

Potential contaminant source locations were verified, to the extent possible, during preparation of this Plan amendment (Tables C-3 through C-6). Verification procedures used included matching mapped locations with addresses on MDH Well Records or State/County-issued permits or in County/State/Federal databases, published business addresses, property parcel addresses, local knowledge of City staff, or information from City files (note that not all verification procedures were used for each type of potential

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contaminant source). The data tables indicate the status of verification for each potential contaminant source location. New information developed on contaminant sources in the future will be verified as they are discovered as part of the WHPP implementation.

C.1.2.1.1.1 Wells

Wells located within the DWSMAs, in particular wells completed in or below the source water aquifers from which the City's wells pump have the potential for being a pathway via which contamination could more rapidly reach a source water aquifer and the Coon Rapids municipal wells; especially if the wells were not properly installed or have not been adequately maintained. Data obtained from the Minnesota County Well Index (CWI) and the MDNR Permit and Reporting System (MPARS) during the PCSI indicate that there are 207 wells (this number includes 193 active wells, two inactive wells, and 12 wells whose status is unknown) within the Coon Rapids DWSMAs (Figure C-7). Twenty-five of the wells are the Coon Rapids municipal water supply wells. Table C-3 lists the wells that were identified in the DWSMAs and indicates the aquifer in which each well is completed (if known), the date the well was completed (if known), and the status of the well (if known).

During the search for wells in the DWSMAs, 921 sealed wells were identified. Per direction from the MDH, the sealed well locations are not included in the PCSI. However, since an improperly sealed well could act as a pathway for contaminants to migrate from the surface into the groundwater system the City believes it is important to maintain a record of sealed well locations. Therefore, sealed well locations in the DWSMAs are shown in Attachment C-3.

As indicated in Table C-3, uses for the 193 known active wells in the DWSMAs include domestic (109), non-Coon Rapids public water supply (7), irrigation (11), and commercial (5) along with other uses. Twenty-eight of the active wells in the DWSMAs (not counting the Coon Rapids municipal supply wells) extend into or through the Tunnel City-Wonewoc aquifer (18 of Coon Rapids' wells pump from this aquifer). In addition, 58 active non-City wells are open to unconsolidated sand and gravel above the bedrock. As indicated in Table C-3, seven Coon Rapids wells pump from an unconsolidated, confined sand and gravel aquifer above the bedrock. Wells located within the DWSMAs, particularly those wells completed in or below the source water aquifers, have the potential to provide a pathway for contamination to reach the source water aquifer(s) and the Coon Rapids municipal water supply wells.

Available information from the MPARS database indicates that there are 37 high capacity wells within a zone that includes the Coon Rapids DWSMAs and extends one mile beyond the DWSMA boundaries (this number does not include the 24 Coon Rapids municipal supply wells). High capacity wells are defined as wells that pump more than 1,000,000 gallons per year or more than 10,000 gallons per day. Owners of these wells are required to obtain a groundwater appropriation permit from the MDNR. High capacity wells outside of the DWSMAs were identified because changes in operation of these wells could, potentially, affect the DWSMA boundaries. Of these 37 non-Coon Rapids wells, nine are used for municipal water supply, 19 are used for some type of irrigation, six are used for industrial processing, two are used for water level maintenance, and one is identified as a construction dewatering well (Table C-7). As shown in Table C-7, 28 of the non-Coon Rapids high capacity wells extend into or through the Tunnel City Group.

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C.1.2.1.1.2 Potential Class V Well Locations

An inventory of locations where Class V wells may be present, or may have been present, within the DWSMAs was done as part of the PCSI. A typical land use associated with the presence of Class V wells is automobile service stations and repair shops. As defined by the U.S. Environmental Protection Agency, cesspools and large-scale septic systems that serve more than 20 people also are included in the Class V well classification. During the PCSI, it was determined that there are 23 separate property parcels where Class V wells may be present, or may have been present, based on the type of business that is or had operated there or the use of the property (see Table C-4 and Figure C-8). Twenty of these properties are in the West DWSMA and the other three are in the Northeast DWSMA (Figure C-8). For all 23 properties, the assessment of potential for presence of a Class V well is due to the properties' association with automobile repair. MDH did not require that the City determine if Class V wells are actually present on any of these properties. Results of the location verification are summarized in Table C-4.

C.1.2.1.1.3 Storage Tanks

The PCSI identified 54 properties within the portions of the DWSMAs in which aquifer vulnerability is classified as Moderate on which storage tanks are or have been located (see Table C-5 and Figure C-9). These properties include a total of 186 current or former storage tanks. Ninety-eight of the tanks have been removed (Table C-5). Products stored in the remaining storage tanks vary from site to site and include various fuels, oils, hydraulic fluid, and unspecified substances. As indicated in Table C-5, releases from the tanks were reported at 33 of the properties. Available information indicates that the MPCA has closed all of the sites for which releases were reported.

C.1.2.1.1.4 Chemical Storage Sites

The PCSI identified 23 properties within the portions of the DWSMAs where aquifer vulnerability is classified as Moderate on which chemical storage occurs (Table C-6 and Figure C-10). Five of these properties are City wells (Wells 6, 7, 12, 16, and 18) and two of the properties are the City's water treatment plants. Water treatment chemicals are stored at the properties.

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C1.2.2 Historical Land Use

The area around Coon Rapids was organized as Anoka Township in 1857. Initially, the Township included Coon Creek (what is now the City of Coon Rapids) as well as what is now the City of Anoka. Agriculture was the main economic activity in the area at the time. The first railway service to Coon Creek began in 1863 (Gilund, 1985). Brick manufacturing began in Coon Creek around 1880. The Village of Coon Rapids was incorporated in 1952. The Village of Coon Rapids became the City of Coon Rapids in 1959.

In 1960 the population of Coon Rapids was 14,931. By 1980 the population of Coon Rapids had grown to 35,826 and to 52,978 by 1990. Population growth in Coon Rapids slowed after 1990. The 2010 census counted 61,476 people in Coon Rapids. The Metropolitan Council estimated the 2015 population of Coon Rapids to be 62,527. Additional information on the history of Coon Rapids can be found on the City's webpage http://www.ci.coon-rapids.mn.us/415/City-History and the Anoka County Historical Society webpage https://anokacountyhistory.org/history-of-anoka-county/history-of-coon-rapids/ .

Historical land use shown on Figure C-11 is based on pre-1984 land use data from the Metropolitan Council. As indicated on Figure C-11, the vast majority of the pre-1984 land use in the areas that fall within the limits of the DWSMAs was residential. Metadata associated with ArcView shapefiles of pre-1984 land use maps available from the Metropolitan Council indicate that the maps are not considered reliable for determining land use of individual properties. Based on available information, historical land uses that might significantly affect the management strategies for the DWSMAs that are not currently present within the DWSMAs were not identified.

While it is possible that buried features such as wells that were not properly sealed or unused underground storage tanks not listed in any available database could be present within the DWSMAs, available information does not suggest the presence of such features. Thus, there is no basis for a concerted search for such buried features within the DWSMAs. If any such, currently unknown, features are to be located in the future it would most likely occur only if they are encountered during development or redevelopment of a property.

C1.3 Public Utilities

Management of the DWSMAs in the City of Coon Rapids must consider and reflect available public utility services information.

Coon Rapids Wells 1 through 16, 24, and 25 have open-borehole completions. The bedrock aquifers in which these wells are open are shown in Table C-1. Coon Rapids Well 17 and Wells 19 through 23 are screened in the unconsolidated, confined Quaternary sand and gravel that overlies the bedrock. Well construction information for the Coon Rapids municipal wells is summarized in Table C-1. Copies of the MDH Well Records for these wells are presented in Appendix A.

C1.3.1 Pipelines

As shown on Figure C-12, natural gas pipelines cross the northwestern portion of the Northeast DWSMA. One natural gas pipelines is adjacent to the southern boundary of the Southeast DWSMA. There are no petroleum pipelines that cross the Coon Rapids DWSMAs. The City will rely on State/Federal oversight and the management programs of the pipeline owners for proper operation and maintenance of the pipelines and response to releases from the pipelines. The City will inform the pipeline owners of the proximity of their pipelines to the City's DWSMAs. To the extent possible, the City will support any response activities by these other entities in the event of a release from any of the pipelines within or near the DWSMAs.

C.1.3.2 Sewers

C.1.3.2.1 Sanitary Sewers

The trunk sanitary sewer system in Coon Rapids is shown on Figure C-13.

An improperly designed or maintained sanitary sewer system may increase the chance for the release of untreated sewage into environmentally sensitive areas such as protected wetlands, lakes, or rivers or allow infiltration of contaminants that could potentially reach the uppermost source water aquifer. The City of

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Coon Rapids has an ongoing maintenance program to insure the integrity and proper operation of their sanitary sewer system. Additional measures in this Plan to address the sanitary sewer system is considered to be unnecessary.

C.1.3.2.2 Storm Sewers

Storm water management in Coon Rapids is described in the City's Comprehensive Storm Water Management Plan and Storm Water Pollution Prevention Plan. The City's storm sewer system is shown on Figure C-14. Title 13of the City Code addresses stormwater management in Coon Rapids.

In addition to the City's storm water management system, portions of the Anoka County ditch system cross the West and Northeast DWSMAs. A map showing the County ditch system is presented in Attachment C-4.

A municipal storm sewer and surface water drainage system plays a significant role in the management of storm water and can be an important part of management strategies developed for a wellhead protection plan. An improperly designed or maintained storm sewer and surface water drainage system may increase the chance for the spread of a contaminant into environmentally sensitive areas such as protected wetlands, lakes, or rivers or allow infiltration of contaminants that could potentially reach the uppermost source water aquifer. A surface water management program is in place in Coon Rapids. The City will rely on their existing surface water management program to address issues related to surface water. Therefore additional measures to address surface water in this Plan are considered to be unnecessary.

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C1.4 Water Quantity Data Elements

Groundwater and surface water quantity are discussed in this section as required by the October 14, 2016 Scoping 2 Decision Notice from the MDH.

C1.4.1 Surface Water Quantity

As discussed above, surface water features within the DWSMAs include lakes, ponds, storm water basins, and wetlands. Surface water management is discussed in the City's Storm Water Pollution Prevention Plan. There are no active appropriations permits to withdraw water directly from any surface water feature within the DWSMAs. In addition, the City is not aware of any current water-use conflicts that impact surface water quantity in the vicinity of the DWSMAs. Therefore, measures in this Plan to address surface water quantity issues are considered to be unnecessary.

C1.4.2 Groundwater Quantity

The Coon Rapids municipal water supply system currently includes 24 wells. As shown in Table C-1, Wells 1 through 7, 12, 16, 18, 22 and 23 are used only seasonally. Under MDNR Appropriation Permit No. 1980-6139, the City of Coon Rapids currently has a permitted annual groundwater appropriation of 3.2 billion gallons per year (BGY). The permitted instantaneous total pumping rate for the Coon Rapids system is 26,575 gallons per minute (gpm) or approximately 38.3 million gallons per day (MGD).

The projected water use (i.e., pumpage) used to delineate the Coon Rapids WHPAs and DWSMAs was 3,758,131,000 gallons per year (Barr, 2016).

The City of Coon Rapids was incorporated in 1959. In 1960 the population of Coon Rapids was 14,931. By 1980 the population of Coon Rapids had grown to 35,826 and to 52,978 by 1990. Population growth in Coon Rapids slowed after 1990. The 2010 census counted 61,476 people in Coon Rapids. The Metropolitan Council estimated the 2015 population of Coon Rapids to be 62,527. The Metropolitan Council projects Coon Rapids' population to reach 64,800 in 2020 and 68,400 in 2030 (Metropolitan Council, 2015).

Water demand for the period 2004 through 2013 is presented in the City's Comprehensive Water System Plan (Bolton & Menk, 2014). Total annual volume pumped by the Coon Rapids municipal wells during the period 2010 through 2014 is presented in Part 1 of this Plan amendment (Barr, 2016). Between 2005 and 2015 Coon Rapids's water demand varied from year to year. During this period the population served increased by only 0.5%. The total annual water demand in 2015 was approximately 18% lower than the total demand in 2005. During the period 2005 through 2015, the total per capita/day water demand met by the City's water supply system ranged from approximately 104 gallons per capita/day (gpc/d) to approximately 144 gpc/d.

The City's Comprehensive Water System Plan (Bolton & Menk, 2014) projects the daily average water demand in 2029 using two different methodologies. The 2029 average day demand projections range from approximately 8.3 MGD to 9.05 MGD (approximately 5,800 gpm to 6,300 gpm). The Water System Plan also projects the 2029 maximum day water demand using the two methodologies. The 2029 maximum day demand projections range from approximately 23.75 MGD to 25.80 MGD (approximately 16,500 gpm to 17,900 gpm). Current daily water demand (based on the period 2010-2015) averages approximately 7.3 MGD. Maximum day demand (the largest daily water use in a given year) ranged from 14.0 MGD to 20.8 MGD in the period 2010-2015.

As discussed above, in addition to the City of Coon Rapids municipal wells the PCSI identified 37 high capacity water wells within one mile of the DWSMAs that are listed in the MDNR's MPARS database as having annual appropriations of more than 1 million gallons. Information on these wells is presented in Table C-7. The City is currently unaware of any adverse groundwater conflicts or interferences related to the existing Coon Rapids municipal wells.

Construction of other high capacity wells in or near the DWSMAs may influence groundwater flow in the source water aquifers and the groundwater quantity available to the municipal system. Such wells could potentially affect the boundaries of the DWSMAs, which would require the City to update the Wellhead Protection Plan. In addition, such wells could potentially reduce the static levels in the source water aquifers. Issues regarding changes in appropriations resulting from additions or deletions to the current list of water appropriations in or near the DWSMAs will be addressed in the management portion of this Plan.

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Persistent drought conditions may also prove to be a threat to the quantity of groundwater available to the municipal system. The City's water conservation program includes a tiered water rate structure and odd-even day sprinkling restrictions. The sprinkling restrictions are in place for the period June 1 through August 31. Under Title 13 Section 13-219 of the City Code the Emergency Board (which consists of the Mayor, City Manager, and Director of Public Services) can declare a Water Emergency and put in place measures over and above the City's odd-even day sprinkling restrictions to curtail water usage during periods of critical shortages. Allowable restrictions on water use during a Water Emergency are specified in Title 13 Section 13-220 of the City Code.

Coon Rapids' current water supply meets the demand of its consumers. The City is confident that the municipal water supply system will continue to have the capability of meeting future demand.

C1.5 Water Quality Data Elements

Surface water and groundwater quality are discussed in this section as required by the October 14, 2016 Scoping 2 Decision Notice from the MDH, submission of data related to water quality in this WHPP amendment is not required.

C1.5. Surface Water Quality

The Mississippi River and Coon Creek cross the West DWSMA and Sand Creek crosses the Northeast DWSMA. The MPCA has identified these streams as impaired waters. Surface water management is addressed in the City's Storm Water Pollution Prevention Plan.

C1.5.2 Groundwater Quality

The MDH has an ongoing program to monitor the quality of municipal water supplies. City of Coon Rapids municipal wells are sampled annually for selected metals, other inorganic compounds, organic compounds (including perfluorochemicals), and bacteria as part of this program. To date, reported concentrations of all monitoring parameters meet the regulatory levels specified by the U.S. EPA as part of the Safe Drinking Water Act or by the State of Minnesota. These results are presented in the City's annual Consumer Confidence Report. The City does not routinely collect samples from their water supplies wells beyond the annual sampling by the MDH. A copy of the City's 2016 Consumer Confidence Report is presented in Appendix D. The 2016 Consumer Confidence Report, along with reports from previous years, can also be found on the City's website at http://www.ci.coon-rapids.mn.us/Archive.aspx?AMID=40.

The City treats water pumped from its primary water supply wells in two water treatment plants to remove iron and manganese from the water before it is put in to the distribution system. In addition to iron and manganese removal, water from the treatment plants is chlorinated and fluoridated before being put into the distribution system. Water from the seasonal wells is chlorinated and fluoridated at the wellheads before it enters the distribution system. Two of the seasonal wells (Wells 16 and 18) are subject to annual withdrawal limits due to an agreement with the MDH to address radium concentrations in the water pumped from these wells.

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The MDH has prepared a study for Anoka County which evaluates the relative susceptibility of the water table aquifer to contamination from nitrate (MDH, 2012). There are a few small areas of high susceptibility identified by the MDH within the Coon Rapids DWSMAs. The uppermost source water aquifer within the Coon Rapids DWSMAs is generally separated from the water table aquifer by hydrogeologic confining units. The vulnerability classification of the uppermost source water aquifer within the Coon Rapids DWSMAs ranges from Low to Moderate, except for a small area near Wells 15 and 25 in which the vulnerability is High. Very low concentrations of nitrate (i.e., <1 mg/L) have been reported in samples from five of the Coon Rapids water supply wells (Barr, 2016). Typically, the most significant source of nitrate in groundwater is agricultural practices. As shown on Figure C-05, agricultural land use is not present in the Coon Rapids DWSMAs. Thus, it is unlikely that any significant concentrations of nitrate will be introduced into the water table aquifer in the DWSMAs in the future and nitrate likely will not adversely impact the uppermost source water aquifer in the DWSMAs.

It's important to consider groundwater quality when determining management strategies for the land uses within the DWSMAs. Since the City currently enjoys good water quality, the City has developed management strategies in this WHPP amendment aimed at maintaining the groundwater quality in the source water aquifers.

C1.6 Assessment of Data Elements

C1.6.1 Use of the Municipal Wells

Coon Rapids currently has 24 municipal water supply wells in the municipal water supply and distribution system for Public Water Supply 1020017. Locations of the wells are shown on Figure C-1 and construction details for the Coon Rapids municipal wells are summarized in Table C-1. Copies of the MDH well records for these wells are presented in Appendix A.

In the 2010 census Coon Rapids had a population of 61,476. The Metropolitan Council projects Coon Rapids' population to reach 64,800 in 2020 and 68,400 in 2030 (Metropolitan Council, 2015).

As discussed above, the City's projected daily average water demand in 2029 ranges from approximately 8.3 MGD to 9.05 MGD (approximately 5,800 gpm to 6,300 gpm) while the projected 2029 maximum day water demand ranges from approximately 23.75 MGD to 25.80 MGD (approximately 16,500 gpm to 17,900 gpm). Current daily water demand (based on the period 2010-2015) averages approximately 7.3 MGD. Coon Rapids' permitted annual appropriation volume is 3.2 BGY. The permitted instantaneous total pumping rate for the Coon Rapids system is 26,575 gpm.

Coon Rapids currently has five water storage facilities consisting of three elevated towers and two ground reservoirs. These facilities have a combined storage capacity of 14.5 million gallons. The Comprehensive Water System Plan (Bolton & Menk, 2014) recommends a new 1.5 million gallon elevated tower be constructed.

The City's Comprehensive Water System Plan (Bolton & Menk, 2014) does not indicate that any additional water supply wells will be needed to provide for projected future water demand.

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C1.6.2 Wellhead Protection Area Criteria

Delineation of the WHPAs for the Coon Rapids wells involved the evaluation of porous-media flow. Information/criteria used to perform the groundwater flow modeling for the Coon Rapids WHPA/DWSMA delineations are discussed in the WHPA delineation report (Amendment to Part 1 of this WHPP prepared by Barr, 2016) and summarized below.

C1.6.2.1 Time of Travel

A 10-year groundwater time of travel was used for the WHPA delineation for each of the Coon Rapids municipal wells. A map in the Part 1 amendment report shows the 10-year groundwater time of travel WHPAs for the Coon Rapids wells.

C1.6.2.2 Aquifer Transmissivity

A combination of pumping tests conducted at Coon Rapids Wells 19 and 20 (Quaternary), specific capacity data at Well 21 (Quaternary), specific capacity data at Coon Rapids Wells 24 and 25 (Tunnel City and Wonewoc), specific capacity data at Coon Rapids Well 18 (Mt. Simon), and pumping tests at Andover Well 3 (Mt. Simon) were used to estimate the transmissivities of the source water aquifers. A summary of the test results is included in Appendix B of the Part 1 WHPP Amendment report. Results from the tests were incorporated into the groundwater flow model as discussed in the WHPP Part 1 Amendment report (Barr, 2016).

C1.6.2.3 Daily Volume of Water Pumped

Daily volume of water pumped from each of Coon Rapids' municipal wells used in the groundwater flow model was determined by using the highest recorded or projected pumping annual volume for each well. Determination of the daily volume of water pumped for each well used in the groundwater flow models is discussed in detail in Barr (2016).

C1.6.2.4 Flow Boundaries

The Mississippi River, along the southwest boundary of Coon Rapids, is a groundwater flow boundary, though not necessarily for all of the aquifers in the area. Additional details on the groundwater flow boundaries used for groundwater flow modeling are presented in Metropolitan Council (2009; 2014). Major rivers and lakes within the model domain are simulated using the MODFLOW River Package.

C1.6.2.5 Groundwater Flow Field

The groundwater flow field used for delineation of the WHPAs was determined by the groundwater flow model. The groundwater flow direction in the confined Quaternary and Tunnel City-Wonewoc aquifers is generally westerly to southerly in the vicinity of Coon Rapids. No published groundwater contours are known for these aquifers in Anoka County, but the modeled contours appear to be reasonable since they indicate groundwater flow towards the Mississippi River.

As expected due to the presence of the Eau Claire Formation aquitard, flow in the Mt. Simon Sandstone aquifer is less influenced by the rivers and more dependent on high capacity pumping. As a result, flow in the Mt. Simon in the vicinity of Coon Rapids is primarily directed towards the south and southwest. This is

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consistent with the large cone of depression centered on southeastern Hennepin County shown on the Mt. Simon groundwater contour map included in the Hennepin County Geologic Atlas (Kanivetsky, 1989).

C1.6.3 Quantity and Quality of Water Supplying the Public Water Supply Wells

As discussed above, the Coon Rapids municipal wells are open to three different aquifers. Construction details for the Coon Rapids municipal wells are summarized in Table C-1.

Based on the available information, there are no known groundwater quantity issues that will have any significant impact on the management of the DWSMAs associated with the Coon Rapids wells. While it is possible that high capacity wells completed in the source water aquifers in the vicinity of Coon Rapids or within the DWSMAs could affect the quantity of groundwater available, there are currently no known significant conflicts or interferences related to the municipal wells in the DWSMAs.

The City currently is not planning to install any additional water supply wells to meet future demand. New high capacity wells constructed by others in the vicinity of the DWSMAs within the 10-year life time of this Plan could, potentially, affect the DWSMA boundaries. If directed to do so by the MDH, the City will incorporate such new wells into the groundwater model and assess if projected pumping from the new wells would affect the boundaries of the DWSMAs. Any required Plan amendments would be prepared with the help of the Wellhead Protection Consultant.

C1.6.4 Land and Groundwater Uses in the DWSMAs

Aquifer vulnerability within the DWSMAs ranges from Low to High. In the West DWSMA, approximately 94.5% of the area has an aquifer vulnerability classification of Moderate. The aquifer vulnerability is classified as Low in approximately 5% of the West DWSMA and High in approximately 0.5% of the West DWSMA. In the Northeast DWSMA, approximately 99% of the area has an aquifer vulnerability classification of Moderate. The aquifer vulnerability is classified as Low in approximately 1% of the Northeast DWSMA. The aquifer vulnerability within the entire Southeast DWSMA around Coon Rapids Well 5 is classified as Low.

Land uses within the DWSMAs could affect source water protection efforts or the management of the DWSMAs. In particular, unmaintained, damaged, poorly-constructed, unused, or incorrectly abandoned wells could provide a direct route for contaminants to enter one or more of the source water aquifers.

As discussed by Barr (2016), the DWSMAs were delineated to encompass the zones in which groundwater travel time to the Coon Rapids municipal wells is ten years or less. The DWSMAs encompass the WHPAs and are defined by geographically identifiable features. The Southeast DWSMA is contained entirely within the Coon Rapids city limits, while the Northeast DWSMA extends east into Blaine and the West DWSMA extends southwest into Champlin and Brooklyn Park.

Potential contaminant sources within the DWSMAs identified through the PCSI include wells, properties where Class V wells potentially may be, or may have been, located, storage tank sites, and chemical storage locations. These potential contaminant sources will be considered when developing the management strategies for the Coon Rapids DWSMAs.

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C2.0 References

Barr Engineering Company (Barr), 2016. City of Coon Rapids Wellhead Protection Plan Amendment – Part 1: Delineation of the Wellhead Protection Area (WHPA), Drinking Water Supply Management Area (DWSMA) and Assessments of Well and DWSMA Vulnerability, prepared for the City of Coon Rapids, March 2016.

Bolton & Menk, 2014. Comprehensive Water System Plan, prepared for City of Coon Rapids, project no. N21.107935, October 2014.

Gilund, L.R., 1985. Coon Rapids: A Fine City by a Dam Site – History of Coon Rapids, Minnesota 1849-1984.

Kanivetsky, R., 1989. Bedrock Hydrogeology. Plate 6 of 9, *in* Geologic Atlas of Hennepin County, Minnesota: N.H. Balaban (ed.). Minnesota Geological Survey County Atlas Series, Atlas C-4. University of Minnesota, St. Paul.

Metropolitan Council, 2009. Twin Cities Metropolitan Area Regional Groundwater Flow Model Version 2.00: Technical Report in Support of the Metropolitan Area Master Water Supply Plan

Metropolitan Council, 2012. Using the soil water balance model (SWB) to estimate recharge for the Twin Cities Metropolitan Area Groundwater Model Version 3. Prepared by Barr Engineering. Metropolitan Council: Saint Paul, MN.

Metropolitan Council, 2014. Twin Cities Metropolitan Area Regional Groundwater Flow Model, Version 3.0. Prepared by Barr Engineering. Metropolitan Council: Saint Paul, MN.

Metropolitan Council, 2015. Coon Rapids Water Supply Profile in Appendix 1 of Master Water Supply Plan, September 23, 2015.

Meyer, G.N., Tipping, R.G., and R.S. Lively, 2013. Sand Distribution Model. Plate 5 of 6, *in* Geologic Atlas of Anoka County, Minnesota: D.R. Setterholm (ed.). Minnesota Geological Survey County Atlas Series, Atlas C-27. University of Minnesota, St. Paul.

Minnesota Department of Health (MDH), 2016. Scoping 2 Decision Notice and Meeting Summary – City of Coon Rapids – PWSID 1020017, Letter from John Freitag of the MDH to Kory Jorgensen of the City of Coon Rapids, October 14, 2016.

Mossler, J.H., 2012. Bedrock Geology. Plate 2 of 6, *in* Geologic Atlas of Anoka County, Minnesota: D.R. Setterholm (ed.). Minnesota Geological Survey County Atlas Series, Atlas C-27. University of Minnesota, St. Paul.

Minnesota Department of Health (MDH), 2012. Nitrate-Nitrogen Probability Ranking Map for the Water Table Aquifer – Anoka County, Minnesota, Environmental Health Division – Source Water Protection Unit, October 2012.

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United States Dept. of Agriculture - Natural Resources Conservation Service (USDA-NRCS), 2012. Gridded Soil Survey Geographic (gSSURGO) Database for Minnesota. Available online at: http://datagateway.nrcs.usda.gov

WSB and Associates (WSB), 2004. Wetland Management Plan, prepared for the City of Coon Rapids.

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Tables

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Table C-1

Coon Rapids Municipal Well Construction Summary
Coon Rapids WHPP Amendment

Local Well ID	Unique Number	Use/ Status[1]	Casing Diameter (in.)	Casing Depth (ft.)	Well Depth (ft.)	Year Constructed	Aquifer	Well Vulnerability
1	202926	S	12	220	462	1957	CTCW	Not Vulnerable
2	202929	S	12	226	788	1957	CTCG-CMTS	Not Vulnerable
4	202972	S	20 x 16	233	605	1960	CTCG-CMTS	Not Vulnerable
5	202951	S	24 x 16	242	695	1961	CTCG-CMTS	Not Vulnerable
6	202937	S	20	118	158	1960	CTCG	Vulnerable
7	202943	S	24 x 16	189	632	1964	CTCG-CMTS	Vulnerable
8	202932	P	24 x 16	283	700	1965	CTCG-CMTS	Not Vulnerable
9	202931	P	24 x 16	294	500	1969	CTCW	Not Vulnerable
10	202930	P	30 x 24 x 16	272	684	1970	CTCG-CMTS	Not Vulnerable
11	202965	P	24	157	627	1972	CTCG-CMTS	Vulnerable
12	168721	S	24 x 16	208	604	1975	CTCG-CMTS	Not Vulnerable
13	168720	P	24 x 16	395	693	1977	CTCG-CMTS	Not Vulnerable
14	110460	P	30 x 20	328	613	1977	CTCG-CMTS	Not Vulnerable
15	110461	P	30 x 20	225	615	1976	CTCG-CMTS	Vulnerable
16	161413	S	30 x 24 x 18	395	653	1981	CWON-CMTS	Not Vulnerable
17	150357	P	30	81	121	1981	QBAA	Vulnerable
18	110469	S	36 x 30 x 24	575	637	1986	CMTS	Not Vulnerable
19	110475	P	30 x 20	115	135	1987	QBAA	Vulnerable
20	420956	P	30 x 20	95	135	1988	QBAA	Vulnerable
21	474384	P	24 x 18	170	203	1990	QBAA	Vulnerable
22	474385	S	24	80	105	1990	QBAA	Vulnerable
23	463020	S	30 x 24	93	128	1991	QBAA	Vulnerable
24	674478	P	36 x 30 x 24	241	388	2003	CTCW	Vulnerable
25	674479	P	36 x 24	229	388	2003	CTCW	Vulnerable

[1] P = Primary; S = Seasonal
CMTS = Mt. Simon Sandstone
CTCG = Tunnel City Groupl
CTCW = Tunnel City Group and Wonewoc Sandstone
CWON = Wonewoc Sandstone
QBAA = Quaternary Buried Artesian Aquifer

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Table C-2

Potential Contaminant Source Inventory Data Sources
Coon Rapids WHPP Amendment

Potential Contaminant Source Type	Data Source(s)
Chemical Storage Sites	MnDPS, MDA
Hazardous Waste Generator Locations	MPCA WIMN & Agency Interests databases; Anoka County
LUST Site Locations	MPCA WIMN & Agency Interests databases
Potential Class V Well Locations	MPCA WIMN database; USEPA
Storage Tanks	MPCA WIMN & Agency Interests databases
Wells	MN CWI database; MDNR MPARS database; MDH Sealed Wells database
Other Data Type	**Data Source(s)**
Current Land Use	Met Council 2010 Generalized Land Use
Historical Land Use	Met Council pre-1984 Land Use
Planned Land Use	Met Council 2030 Generalized Interpreted Land Use
Bedrock Geology	MGS 2013 Bedrock Geology of the Twin Cities Ten-County Metropolitan Area
Flood Zones	FEMA Digital Flood Insurance Rate Map Database (2015 – Effective)
Pipelines	MGIO & MnOPS 1996, USDOT NPMS public map view
Soil Cover	U.S. Dept. of Agriculture, Natural Resources Conservation Service SSURGO Soils Database
Soil Permeability	U.S. Dept. of Agriculture, Natural Resources Conservation Service SSURGO Soils Database
Zoning	City of Coon Rapids Zoning Map

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Acronyms

CWI – County Well Index
FEMA – Federal Emergency Management Administration
MnDPS – Minnesota Department of Public Safety
Met Council – Metropolitan Council
MDA – Minnesota Department of Agriculture
MDH – Minnesota Department of Health
MDNR – Minnesota Department of Natural Resources
MPARS – Minnesota Permitting and Reporting System
MGIO – Minnesota Geospatial Information Office
MGS – Minnesota Geological Survey
MnOPS – Minnesota Office of Pipeline Safety
MPCA – Minnesota Pollution Control Agency
NPMS – National Pipeline Mapping System
WIMN – What's In My Neighborhood
USDOT – United States Department of Transportation
USEPA – United States Environmental Protection Agency

Table C-3

PCSI Results - Well Locations in the DWSMAs
City of Coon Rapids Part 2 WHPP Amendment

PCSI ID	PID No.	Unique No.	Status	Use	Well Owner	Well Location	City	Total Depth (Feet)	Date Completed	Aquifer	PCS Code	Location Verified
1	003-133124230045	202926	Active	Community Supply (municipal - Coon Rapids)	Coon Rapids 1	11349 Norway St Nw	Coon Rapids	462	09/00/1957	MTPL	WEL	Yes
2	003-133124330022	202929	Active	Community Supply (municipal - Coon Rapids)	Coon Rapids 2	10911 Magnolia St	Coon Rapids	788	06/00/1957	MTPL	WEL	Yes
4	003-093124430001	202972	Active	Community Supply (municipal - Coon Rapids)	Coon Rapids 4	2731 Northdale Bl	Coon Rapids	605	08/19/1960	CTCM	WEL	Yes
5	003-253124130041	202951	Active	Community Supply (municipal - Coon Rapids)	Coon Rapids 5	99th La Nw	Coon Rapids	695	09/00/1961	CTCM	WEL	Yes
6	003-173124220016	202937	Active	Community Supply (municipal - Coon Rapids)	Coon Rapids 6	11611 Yucca St Nw	Coon Rapids	158	11/00/1960	CTCG	WEL	Yes
7	003-263124220041	202943	Active	Community Supply (municipal - Coon Rapids)	Coon Rapids 7	10617 Direct River Dr	Coon Rapids	632	04/00/1964	CTCM	WEL	Yes
8	003-133124130109	202932	Active	Community Supply (municipal - Coon Rapids)	Coon Rapids 8	269 Northdale Bl	Coon Rapids	700	05/07/1965	CTCM	WEL	Yes
9	003-133124130108	202931	Active	Community Supply (municipal - Coon Rapids)	Coon Rapids 9	11399 Dogwood St Nw	Coon Rapids	500	04/07/1969	CTCE	WEL	Yes
10	003-133124420001	202930	Active	Community Supply (municipal - Coon Rapids)	Coon Rapids 10	203 Northdale Bl	Coon Rapids	684	05/05/1970	CTCM	WEL	Yes
11	003-273124210001	202965	Active	Community Supply (municipal - Coon Rapids)	Coon Rapids 11	Not Available	Coon Rapids	627	05/11/1972	CTCW	WEL	Yes
12	003-273124110043	168721	Active	Community Supply (municipal - Coon Rapids)	Coon Rapids 12	Not Available	Coon Rapids	604	05/14/1975	CTCM	WEL	Yes
13	003-133124140007	168720	Active	Community Supply (municipal - Coon Rapids)	Coon Rapids 13	11100 University Av	Coon Rapids	693	03/25/1977	CTCM	WEL	Yes
14	003-223124230002	110460	Active	Community Supply (municipal - Coon Rapids)	Coon Rapids 14	2344 Coon Rapids Bl	Coon Rapids	613	03/22/1977	CTCM	WEL	Yes
15	003-223124230001	110461	Active	Community Supply (municipal - Coon Rapids)	Coon Rapids 15	2231 105th Av	Coon Rapids	615	09/13/1976	CTCM	WEL	Yes
16	003-113124140001	161413	Active	Community Supply (municipal - Coon Rapids)	Coon Rapids 16	12280 Olive St	Coon Rapids	653	04/10/1981	CWMS	WEL	Yes
17	003-213124410046	150357	Active	Community Supply (municipal - Coon Rapids)	Coon Rapids 17	2400 105th Av Nw	Coon Rapids	121	12/18/1981	QBAA	WEL	Yes
18	003-023124430001	110469	Active	Community Supply (municipal - Coon Rapids)	Coon Rapids 18	Not Available	Coon Rapids	637	05/00/1986	CMTS	WEL	Yes
19	003-213124110036	110475	Active	Community Supply (municipal - Coon Rapids)	Coon Rapids 19	Not Available	Coon Rapids	143	10/14/1987	QBAA	WEL	Yes
20	003-213124140086	420956	Active	Community Supply (municipal - Coon Rapids)	Coon Rapids 20	Xavis St Nw	Coon Rapids	135	04/26/1988	QBAA	WEL	Yes
21	003-133124130109	474384	Active	Community Supply (municipal - Coon Rapids)	Coon Rapids 21	269 Northdale Bl	Coon Rapids	207	01/26/1990	QBAA	WEL	Yes
22	003-223124230001	474385	Active	Community Supply (municipal - Coon Rapids)	Coon Rapids 22	2220 105th Av Nw	Coon Rapids	108	03/15/1990	QBAA	WEL	Yes
23	003-273124210001	463020	Active	Community Supply (municipal - Coon Rapids)	Coon Rapids 23	2100 Coon Rapids Bl Nw	Coon Rapids	151	12/16/1991	QBAA	WEL	Yes
24	003-213124110023	674478	Active	Community Supply (municipal - Coon Rapids)	Coon Rapids 24	10845 Direct River Dr	Coon Rapids	388	12/19/2003	CTCW	WEL	Yes
25	003-223124230002	674479	Active	Community Supply (municipal - Coon Rapids)	Coon Rapids 25	2324 Coon Rapids Bl Nw	Coon Rapids	388	12/19/2003	CTCW	WEL	Yes
26	053-3412021340014	133395	Active	Domestic	Dooley, Ed	10925 Mississippi St	Champlin	124	06/21/1977	CJDN	WEL	Yes
27	003-233124330036	202952	Active	Domestic	Shephard, Paul	1520 Coon Rapids Bl Nw	Coon Rapids	126	09/23/1970	QBAA	WEL	Approximate
28	003-223124420064	202945	Active	Commercial	North Central Gas	Not Available	Coon Rapids	258	01/11/1961	CTCG	WEL	Uncertain
29	053-2812021330028	417490	Active	Domestic	Not Available	11701 Adair Av	Champlin	110	09/06/1985	CJDN	WEL	Yes
30	003-253124110046	1000000006	Unknown	Not Available	Not Available	Not Available	Coon Rapids	0	Not Available	Not Available	WEL	Uncertain
31	053-3212021140123	404218	Active	Domestic	Karst	11327 Douglas Dr	Champlin	185	02/16/1985	CJSL	WEL	Yes
32	053-2912021440009	202818	Active	Domestic	Not Available	11709 Edgewood Av Ne	Champlin	102	12/03/1973	QBAA	WEL	Yes
33	053-2812021330041	143530	Active	Domestic	Halm, Jerry	11801 Porter Dr	Champlin	98	04/20/1977	CJDN	WEL	Approximate
34	053-3312021440014	202889	Active	Domestic	Sjolander, Fred	11020 West River Rd	Champlin	174	10/08/1971	CJTC	WEL	Yes
35	053-3312021230088	191144	Active	Domestic	Not Available	11333 Colorado Av	Champlin	122	10/21/1982	CJDN	WEL	Yes
36	053-3312021320070	202858	Active	Domestic	Not Available	6009 113th Av	Champlin	66	09/04/1973	QBAA	WEL	Yes
37	053-0311921130041	197589	Active	Domestic	Joyce, Irene	3609 Sunset Rd	Brooklyn Park	152	08/21/1984	CJSL	WEL	Yes
38	003-263124220004	665725	Active	Heat Pump	Drake Apartments	10011 Egret Bl	Coon Rapids	230	10/30/2001	CTCG	WEL	Yes
39	053-3212021110042	202886	Active	Domestic	Bouley, Eugene	11641 Douglas Dr	Champlin	101	10/24/1967	CJDN	WEL	Yes
40	053-0411921140001	122263	Active	Domestic	Darmer, Larry	10637 Noble Av N	Brooklyn Park	143	08/10/1983	CJSL	WEL	Approximate
41	053-0311921130034	165650	Active	Domestic	Aun, John	3616 Sunset Rd	Brooklyn Park	131	06/11/1980	CJDN	WEL	Yes
42	053-2812021340032	228438	Active	Community Supply (municipal)	Champlin 2	Not Available	Champlin	620	04/15/1974	CTCM	WEL	Uncertain
43	003-213124230005	202942	Active	Domestic	Lumley, Howard	10630 Mississippi Bl	Coon Rapids	245	03/23/1965	CSLT	WEL	Yes
44	053-3312021230043	197329	Active	Domestic	Not Available	5917 114th La	Champlin	112	06/24/1983	CJDN	WEL	Yes
45	003-133124410008	171039	Active	Domestic	Dahler, William	11140 University Av Ne	Coon Rapids	98	07/30/1980	QBAA	WEL	Yes
46	053-3312021320063	202859	Active	Domestic	Not Available	6016 113th Av	Champlin	67	11/01/1973	QBAA	WEL	Yes
47	003-173124220083	202938	Active	Public Supply/non-community	Summerhill School	3856 Coon Rapids Bl	Coon Rapids	284	00/00/1970	CTCG	WEL	Yes
48	003-153124430016	248460	Active	Public Supply/non-comm.-non-transient	Church Of The Epiphany A	Not Available	Coon Rapids	0	Not Available	Not Available	WEL	Uncertain
49	053-3412021330052	111253	Active	Commercial	Armstrong, Ralph	4608 109th Av N	Champlin	190	01/20/1977	CSLT	WEL	Approximate
50	053-3412021340008	154163	Active	Domestic	Carlson, D.H.	10952 Mississippi Dr	Champlin	139	09/18/1978	CJSL	WEL	Yes
51	053-0311921340008	431406	Active	Domestic	Not Available	10325 France Av N	Brooklyn Park	110	02/04/1987	CJDN	WEL	Approximate
52	053-0311921220058	452565	Active	Domestic	Nerison, Dennis	10700 Noble Av	Brooklyn Park	95	11/23/1988	CJDN	WEL	Yes
53	053-3312021230065	191128	Active	Domestic	Not Available	6200 114th Av N	Champlin	111	10/21/1982	CJDN	WEL	Yes
54	053-3212021110064	155085	Active	Domestic	Not Available	6304 115.5th Av N	Champlin	176	06/26/1978	CJSL	WEL	Yes
55	053-3312021440063	125257	Active	Domestic	Adams, Paul	10909 Noble Av Nw	Champlin	102	08/18/1976	QBAA	WEL	Yes
56	003-133124210031	202924	Active	Domestic	Not Available	11630 Larch St Nw	Coon Rapids	78	06/10/1958	QBAA	WEL	Yes
58	053-3412021340005	433824	Active	Domestic	Asplund, David	10932 Mississippi Dr N	Champlin	119	10/11/1987	CJSL	WEL	Yes
59	053-0211921330001	420970	Active	Community Supply (municipal)	Brooklyn Park 15	Not Available	Brooklyn Park	622	05/08/1989	CMSH	WEL	Uncertain
60	053-0211921330001	224603	Active	Test Well	Brooklyn Park Tw-5	Not Available	Brooklyn Park	120	05/30/1973	Not Available	WEL	Uncertain
61	003-153124430016	545373	Active	Irrigation Well	Epiphany Church	11001 Hanson Bl	Coon Rapids	273	04/13/1994	CTCG	WEL	Yes
62	003-133124420086	144024	Active	Irrigation Well	Foley Dental Office	11237 Foley Bl Nw	Coon Rapids	40	09/23/1976	QWTA	WEL	Yes
63	053-3412021330016	166854	Active	Domestic	Toskas, Dennis	10965 Mississippi Dr	Champlin	75	09/27/1979	CJDN	WEL	Yes
64	053-3312021440052	166868	Active	Domestic	Wallin, John	11005 West River Rd	Champlin	103	10/25/1979	CJDN	WEL	Yes
65	003-163124340062	202936	Active	Domestic	Szyplinsti	10930 Crooked Lake Bl Nw	Coon Rapids	155	09/17/1960	CJDN	WEL	Approximate
66	053-0311921340006	511954	Active	Public Supply/non-comm.-transient	Pine Grove Bible Church	4000 101St Av	Brooklyn Park	135	11/09/1989	CJSL	WEL	Yes
67	003-253124110004	169013	Active	Domestic	Lundberg, Bruce	9975 Butternut St Nw	Coon Rapids	120	12/19/1979	QBAA	WEL	Approximate
68	003-153124230092	486000	Active	Other	Mccalib, Mark	11343 Verdin St Nw	Coon Rapids	25	06/14/1992	QWTA	WEL	Yes
69	053-2812021330014	174863	Active	Domestic	Not Available	11823 Porter Dr	Champlin	118	04/15/1980	CJDN	WEL	Yes
70	053-0311921220038	202888	Active	Commercial	Skelly Oil	River Rd W	Champlin	268	04/28/1966	CTCG	WEL	Uncertain

Table C-3

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City of Coon Rapids Part 2 WHPP Amendment

PCSI ID	PID No.	Unique No.	Status	Use	Well Owner	Well Location	City	Total Depth (Feet)	Date Completed	Aquifer	PCS Code	Location Verified
71	053-3412021340015	430260	Active	Domestic	Elson, Richard	10935 Mississippi Dr	Champlin	80	04/21/1987	CJDN	WEL	Yes
72	003-223124230001	244339	Active	Observation Well	Coon Rapids Obth-25	Not Available	Coon Rapids	103	03/23/1989	Not Available	WEL	Uncertain
73	003-223124140010	202944	Active	Domestic	Broms Investment Co.	10527 Ibis St Nw	Coon Rapids	255	03/15/1972	CTCG	WEL	Yes
74	053-0311921210028	122784	Active	Domestic	Anderson, Ray	10930 West River Rd	Champlin	52	10/20/1976	QBAA	WEL	Approximate
75	003-223124230002	147468	Active	Observation Well	Coon Rapids Obth-7	Not Available	Coon Rapids	127	08/21/1988	QBAA	WEL	Uncertain
76	053-3312021240077	171026	Active	Domestic	Cody, Ron	11454 Welcome La N	Champlin	191	05/16/1981	CJTC	WEL	Yes
77	053-2812021330002	202883	Active	Commercial	Not Available	11843 West River Rd	Champlin	260	06/13/1972	CSLT	WEL	Yes
78	003-123124230117	202922	Active	Domestic	Boden, Richard	12221 Olive St Nw	Coon Rapids	122	05/08/1970	QBAA	WEL	Yes
79	003-153124220001	202933	Active	Public Supply/non-community	Coon Rapids Jr. High Sch	Not Available	Coon Rapids	158	11/05/1957	QBAA	WEL	Uncertain
80	053-0311921420007	409424	Active	Domestic	Robertson, Chuck	10510 France Av N	Brooklyn Park	65	06/05/1985	QBAA	WEL	Yes
81	053-0311921130033	421111	Active	Domestic	Frentress, Edna	3608 Sunset Rd	Brooklyn Park	55	06/05/1986	QBAA	WEL	Yes
82	053-3412021340007	149773	Active	Domestic	Houle, Roberta	10944 Mississippi Dr	Champlin	81	12/16/1977	QBAA	WEL	Yes
83	003-153124240032	604124	Active	Domestic	Ocel, Robert J.	11401 Partridge St Nw	Coon Rapids	21	10/27/1997	QWTA	WEL	Yes
84	003-083124330080	165952	Active	Domestic	Not Available	3835 Coon Rapids Bl Nw	Coon Rapids	111	07/17/1979	QBAA	WEL	Approximate
85	003-133124130108	505635	Unknown	Test Well	City Of Coon Rapids Tw	11400 Dogwood St Nw	Coon Rapids	210	06/20/1989	Not Available	WEL	Approximate
86	003-223124230002	244325	Active	Observation Well	Coon Rapids Obth-11	Not Available	Coon Rapids	195	Not Available	Not Available	WEL	Uncertain
87	053-3312021230013	159338	Active	Domestic	Thompsen, Gary	5924 114th Av N	Champlin	132	06/08/1979	CJDN	WEL	Yes
88	053-3312021320002	143973	Active	Domestic	Christiansen, Marvin	11216 Douglas Dr	Champlin	93	10/15/1977	QBAA	WEL	Yes
89	003-213124140025	147466	Active	Observation Well	Coon Rapids Obth-9	Not Available	Coon Rapids	131	08/25/1987	QBAA	WEL	Uncertain
90	053-3312021320067	202860	Active	Domestic	Not Available	6109 113th Av	Champlin	66	09/20/1970	QBAA	WEL	Yes
91	053-3212021110043	160034	Active	Domestic	Collison, Larry	11631 Douglas Dr N	Champlin	200	04/27/1979	CJSL	WEL	Yes
92	053-3212021110061	202814	Active	Domestic	Rivera, Grorge	6305 116th Av	Champlin	90	10/10/1972	CJDN	WEL	Yes
93	003-213124110049	147470	Active	Observation Well	Coon Rapids Obth-5	Not Available	Coon Rapids	140	08/15/1987	MTPL	WEL	Uncertain
94	053-0411921140001	171086	Active	Domestic	Koehn, Daryl	10645 Noble Av N	Brooklyn Park	167	08/05/1981	CJSL	WEL	Approximate
95	003-133124130109	244332	Active	Observation Well	Coon Rapids Obth-18A	Not Available	Coon Rapids	200	03/01/1989	QBAA	WEL	Uncertain
96	053-0311921130019	186154	Active	Domestic	Skooglund, Paul	3707 Sunset Rd	Brooklyn Park	165	08/12/1982	CJTC	WEL	Yes
97	053-2812021330031	114308	Active	Domestic	Popp, Gerald	11830 West River Rd	Champlin	255	04/02/1975	CSLT	WEL	Yes
98	053-2812021330006	114346	Active	Domestic	O'Konek, Arthur	11820 Douglas Rd	Champlin	214	07/01/1976	CSTL	WEL	Yes
99	053-3212021110069	202811	Active	Domestic	Sybrandt, H.	6500 115.5th St	Champlin	95	07/05/1971	QBAA	WEL	Yes
100	053-0311921430028	416195	Active	Domestic	Strand, Randall & Charlotte	10301 Abbott Av N	Brooklyn Park	200	12/16/1986	CSLT	WEL	Approximate
101	003-123124220093	143434	Active	Domestic	Not Available	688 Main St	Coon Rapids	156	07/12/1977	QBAA	WEL	Yes
102	053-0311921220005	556919	Active	Domestic	Everson, Gehart	10840 Noble Av N	Brooklyn Park	62	12/21/1994	QBUA	WEL	Yes
103	053-0211921320004	749459	Active	Domestic	Kroenig, Paul	10433 River Rd W	Brooklyn Park	104	05/03/2007	QBAA	WEL	Yes
104	053-0311921220059	202979	Active	Domestic	Not Available	10800 Kyle Av	Brooklyn Park	86	01/24/1968	CJDN	WEL	Yes
105	053-2912021440008	202820	Active	Domestic	Not Available	11717 Edgewood Av	Champlin	102	12/04/1973	QBAA	WEL	Yes
106	003-173124220079	114342	Active	Domestic	Geroux, Lee	3849 Coon Rapids Bl Nw	Coon Rapids	175	12/15/1975	CTCG	WEL	Approximate
107	003-273124110060	202963	Active	Domestic	Flynn, Tom	9933 Ibis St Nw	Coon Rapids	143	07/21/1971	CJDN	WEL	Yes
108	053-0311921230011	111265	Active	Domestic	Bernard, William	10650 Noble Av N	Brooklyn Park	197	06/13/1977	CSLT	WEL	Yes
109	003-273124110063	202964	Active	Domestic	Weaver, Darrel	1669 99th Av Nw	Coon Rapids	165	04/06/1972	CJSL	WEL	Approximate
110	053-3312021210079	156206	Active	Domestic	Ray, Roger	11601 River Rd W	Champlin	108	02/06/1979	CJDN	WEL	Yes
111	053-3312021230085	173122	Active	Domestic	Not Available	6217 Thousand Pines Entre	Champlin	108	10/31/1980	CJDN	WEL	Yes
112	053-2912021440112	255976	Inactive	Domestic	Not Available	11703 Douglas Dr	Champlin	172	Not Available	CSTL	WEL	Approximate
113	053-0311921130038	133205	Active	Domestic	Renstrum, Don Sr.	3701 Sunset Rd	Brooklyn Park	134	06/06/1977	CJSL	WEL	Yes
114	003-213124110039	147467	Active	Observation Well	Coon Rapids Obth-8	Not Available	Coon Rapids	140	08/24/1988	QBAA	WEL	Uncertain
115	053-3412021340013	133392	Active	Domestic	Dooley, Ed	10901 Indiana Av N	Champlin	87	03/14/1977	QBAA	WEL	Yes
116	053-0311921230011	149827	Active	Domestic	Bernard, William	10650 Noble Av N	Brooklyn Park	105	07/07/1978	QBAA	WEL	Yes
117	053-3412021330023	149850	Active	Domestic	Leef, Steven	10974 West River Rd	Champlin	140	08/10/1978	CJSL	WEL	Yes
118	053-3312021320043	202863	Active	Domestic	Not Available	6217 111.5th Av N	Champlin	61	07/10/1973	QBAA	WEL	Yes
119	053-3312021230062	191127	Active	Domestic	Not Available	6100 114th Av Ne	Champlin	107	10/18/1982	QBAA	WEL	Yes
120	053-0311921220018	179045	Active	Domestic	Aurzado, Lamonte	10809 Kyle N	Brooklyn Park	94	06/11/1981	CJDN	WEL	Yes
121	003-083124340224	686058	Active	Irrigation Well	Pheasant Ridge Thownhome	11701 Tulip St Nw	Coon Rapids	166	09/18/2002	CTCG	WEL	Yes
122	053-0311921420096	183897	Active	Domestic	Sagerstrom, Ray	10401 France Av N	Brooklyn Park	99	07/01/1982	CJDN	WEL	Approximate
123	003-083124340075	497511	Active	Irrigation Well	Burkholder, Dayton	3790 117th La	Coon Rapids	28	08/24/1991	QWTA	WEL	Yes
124	053-0211921340005	133313	Active	Domestic	Coon Rapids Dam	103rd	Brooklyn Park	113	09/22/1977	QBAA	WEL	Uncertain
125	003-213124220031	202941	Active	Domestic	Jacobsen, Roger	10916 Flora St Nw	Coon Rapids	100	05/07/1973	QBAA	WEL	Yes
126	053-2912021440013	191135	Active	Domestic	Hanson, Dale R.	11716 Edgewood Av N	Champlin	166	11/17/1982	QBAA	WEL	Yes
127	053-3312021320057	202861	Active	Domestic	Not Available	6216 113th Av	Champlin	95	12/04/1973	CJDN	WEL	Yes
128	003-133124130004	202923	Active	Domestic	Schultz, Charles	11401 Flintwood St Nw	Coon Rapids	90	05/18/1966	QBAA	WEL	Yes
129	053-2912021440007	202821	Active	Domestic	Not Available	11725 Edgewood Av	Champlin	101	01/30/1974	QBAA	WEL	Yes
130	003-213124110049	147469	Active	Observation Well	Coon Rapids Obth-6	Not Available	Coon Rapids	150	08/20/1987	QBAA	WEL	Uncertain
131	053-0311921220018	578908	Active	Domestic	City Of Brooklyn Park	10832 Kyle Av N	Brooklyn Park	83	08/13/1997	QBAA	WEL	Approximate
132	053-0311921130020	506508	Active	Domestic	Walters, Larry	3713 Sunset Rd	Brooklyn Park	162	07/17/1989	CJTC	WEL	Yes
133	003-083124340156	503723	Active	Irrigation Well	Reisling Park North Iii	3729 118th La Nw	Coon Rapids	177	08/03/1989	CTCG	WEL	Yes
134	053-3312021230051	191153	Active	Domestic	Henneman, Chuck	6008 114th Av N	Champlin	107	12/22/1982	CJDN	WEL	Yes
135	053-0311921230011	144010	Active	Domestic	Resech, Dave	10655 Noble Av N	Brooklyn Park	102	06/30/1976	QBAA	WEL	Yes
136	053-3412021340008	439820	Active	Domestic	Sherer, Douglas	10952 Mississippi Dr	Champlin	78	01/15/1988	QBAA	WEL	Yes
137	053-3312021320044	202862	Active	Domestic	Not Available	6209 111.5th Av	Champlin	58	06/12/1973	QBAA	WEL	Yes

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PCSI ID	PID No.	Unique No.	Status	Use	Well Owner	Well Location	City	Total Depth (Feet)	Date Completed	Aquifer	PCS Code	Location Verified
138	053-0311921140010	449190	Active	Domestic	Edwards, Greg Sr.	10501 West River Rd	Brooklyn Park	138	12/14/1988	CJSL	WEL	Yes
139	053-3212021110031	202817	Active	Domestic	Not Available	11631 Edgewood Av	Champlin	102	03/20/1972	QBAA	WEL	Yes
140	053-0311921220028	471027	Active	Domestic	Goldsmith, Sue	10724 Noble Av N	Brooklyn Park	65	11/16/1990	QBAA	WEL	Yes
141	053-0311921220004	417485	Active	Domestic	Sullivan	10856 Noble Av N	Brooklyn Park	203	08/26/1985	CTCG	WEL	Yes
142	053-3312021220095	149755	Active	Domestic	Van Dalen, N.H.	6106 117th Av N	Champlin	174	03/30/1978	CJSL	WEL	Approximate
143	053-2812021330005	124994	Active	Domestic	Stone, William	11810 Douglas Dr	Champlin	230	05/25/1977	CSLT	WEL	Yes
144	003-223124430055	256168	Active	Domestic	Ms. Elva	10203 Linnet St Nw	Coon Rapids	254	Not Available	CTCG	WEL	Yes
145	053-3212021110066	202810	Active	Domestic	Not Available	6400 115.5th Av	Champlin	105	02/22/1972	QBAA	WEL	Yes
146	003-163124320008	202935	Active	Irrigation Well	Elisff, Ben	3114 Coon Rapids Bl Nw	Coon Rapids	65	05/03/1964	QWTA	WEL	Approximate
147	003-213124110002	202939	Active	Domestic	Leverenz, Tom	2437 Coon Rapids Bl	Coon Rapids	81	07/06/1972	QBAA	WEL	Yes
148	053-0311921130040	190433	Active	Domestic	Johnson, Raymond	3689 Sunset Rd	Brooklyn Park	140	11/16/1982	CJSL	WEL	Yes
149	053-0411921110008	492622	Active	Domestic	Richardson, Julie	10845 Noble Av N	Brooklyn Park	127	06/27/1991	QBAA	WEL	Yes
150	053-2912021440028	183865	Active	Domestic	Michels, Doug	11819 Douglas Dr	Champlin	76	04/13/1982	QBAA	WEL	Yes
151	003-123124430027	462360	Active	Irrigation Well	Hildre, G.W.	308 118th Av Nw	Coon Rapids	16	05/01/1990	QWTA	WEL	Yes
152	003-223124240055	452389	Active	Irrigation Well	Haven'S Sporting Goods	2141 Coon Rapids Bl Nw	Coon Rapids	96	03/28/1989	QBAA	WEL	Yes
153	053-0211921320002	642713	Active	Domestic	Elsness, Mike	10417 West River Rd	Brooklyn Park	100	05/24/2000	QBAA	WEL	Yes
154	053-0311921220002	466007	Active	Domestic	Follis, Gail	4513 109th Av N	Brooklyn Park	103	05/21/1990	CJDN	WEL	Yes
155	053-2812021330003	199158	Active	Domestic	Sheforgen, Rick	11839 West River Road	Champlin	110	07/27/1983	CJDN	WEL	Yes
156	053-3412021330019	124130	Active	Domestic	Not Available	10972 Mississippi Dr	Champlin	106	10/29/1975	CJDN	WEL	Yes
157	053-3312021220033	159308	Active	Domestic	Thomsen, Gary	11500 Zane Ci N	Champlin	132	06/08/1979	CJDN	WEL	Yes
158	053-0411921110009	184765	Active	Domestic	Anderson, John	10833 Noble Av N	Brooklyn Park	141	05/10/1982	CJSL	WEL	Yes
159	053-3212021110065	149426	Active	Domestic	Not Available	6308 115.5th Av	Champlin	186	11/28/1977	CJSL	WEL	Yes
160	003-133124330042	202928	Active	Domestic	Not Available	11141 Magnolia St Nw	Coon Rapids	155	01/02/1957	QBAA	WEL	Approximate
161	053-3312021440001	452608	Active	Unknown	City Of Champlin	10980 West River Rd	Champlin	59	01/24/1989	QBAA	WEL	Yes
162	053-0311921340007	419545	Active	Commercial	Kirkpatrick	3900 101St Av	Brooklyn Park	100	08/19/1986	QBAA	WEL	Yes
163	053-3412021340010	434641	Active	Domestic	Not Available	10951 Mississippi Dr	Champlin	80	07/27/1987	CJDN	WEL	Yes
164	003-173124440042	655594	Active	Elevator	Tsm Develpoment	11030 Mississippi Bl	Coon Rapids	35	12/13/2000	Not Available	WEL	Yes
165	003-133124420001	706843	Active	Irrigation Well	Northdale Middle School	11301 Dogwood St Nw	Coon Rapids	470	05/18/2005	CTCW	WEL	Yes
166	003-173124120001	676524	Active	Elevator	U Haul	3401 Coon Rapids Bl Nw	Coon Rapids	19	07/01/2002	Not Available	WEL	Approximate
167	053-0311921440016	778604	Active	Irrigation Well	Nature View Vista Twin Homes	10130 Chestnut Ci N	Brooklyn Park	240	07/08/2010	CSLT	WEL	Yes
168	003-263124210029	433874	Active	Observation Well	City Of Coon Rapids	1313 Coonrapids Bl Nw	Coon Rapids	120	02/17/1988	QBAA	WEL	Yes
169	003-253124210051	598987	Active	Elevator	Kerasotes Theatres	10051 Woodcrest Dr	Coon Rapids	10	07/11/1997	Not Available	WEL	Yes
170	053-3312021230057	173140	Active	Domestic	Not Available	11432 Colorado Av N	Champlin	108	01/16/1981	CJDN	WEL	Yes
171	053-3212021110063	155084	Active	Domestic	Not Available	6300 115.5th Av N	Champlin	176	06/23/1978	CJSL	WEL	Yes
172	003-153124430016	265911	Active	Public Supply/non-comm.-non-transient	Church Of The Epiphany A	Not Available	Coon Rapids	0	Not Available	Not Available	WEL	Uncertain
173	003-173124410001	473464	Active	Irrigation Well	Anoka Ramsey Comm Col.	11200 Mississippi Bl	Coon Rapids	350	11/20/1990	CTCW	WEL	Yes
174	053-0311921220029	114390	Active	Domestic	Getchel, Leila	10712 Noble Av N	Brooklyn Park	203	07/23/1976	CSLT	WEL	Yes
175	003-023124440001	224355	Active	Domestic	Coon Rapids Golf	Not Available	Coon Rapids	259	06/30/1970	Not Available	WEL	Uncertain
176	053-0311921440061	403260	Unknown	Other	Not Available	Not Available	Brooklyn Park	41	06/04/1984	Not Available	WEL	Uncertain
177	053-3412021330008	472712	Unknown	Domestic	Daigle, Gary	Box 25	Champlin	186	12/13/1990	Not Available	WEL	Uncertain
178	003-193123220076	501672	Active	Monitoring Well	Mobile Station Mw-3	Not Available	Blaine	30	02/28/1989	Not Available	WEL	Uncertain
179	003-173124140001	492443	Active	Monitoring Well	Wcco Radio/Midwest	3237 Coon Rapids Mw-3 Bl	Coon Rapids	40	08/14/1991	Not Available	WEL	Yes
180	003-163124330018	504605	Active	Monitoring Well	Amoco Oil Co. Mw-4	2998 111th Av Nw	Coon Rapids	30	03/20/1989	Not Available	WEL	Approximate
181	003-163124330018	504604	Active	Monitoring Well	Amoco Oil Co. Mw-3	2998 111th Av Nw	Coon Rapids	30	03/20/1987	Not Available	WEL	Approximate
182	003-163124330018	504603	Active	Monitoring Well	Amoco Oil Co. Mw-2	2998 111th Av Nw	Coon Rapids	30	03/20/1987	Not Available	WEL	Approximate
183	003-163124330018	504602	Active	Monitoring Well	Amoco Oil Co. Mw-1	2998 111th Av Nw	Coon Rapids	35	03/20/1987	Not Available	WEL	Approximate
184	003-153124440006	532728	Active	Elevator	Epiphany Sr. Housing Cor	1800 111 Av Nw	Coon Rapids	33	11/11/1993	Not Available	WEL	Yes
185	003-153124430017	643070	Active	Elevator	Epiphany Assisted Living	10955 Hanson Bl	Coon Rapids	24	02/15/2000	Not Available	WEL	Yes
186	003-153124430017	643069	Active	Elevator	Epiphany Assisted Living	10955 Hanson Bl	Coon Rapids	24	02/11/2000	Not Available	WEL	Yes
187	003-263124220010	707737	Active	Monitoring Well	Mw-2	1440 Coon Rapids Bl	Coon Rapids	20	04/28/2004	Not Available	WEL	Yes
188	003-263124220010	707736	Active	Monitoring Well	Mw-1	1440 Coon Rapids Bl	Coon Rapids	24	04/28/2004	Not Available	WEL	Yes
189	003-153124440006	532729	Active	Elevator	Epiphany Sr. Housing Cor	1800 111 Av Nw	Coon Rapids	32	11/12/1993	Not Available	WEL	Yes
190	003-153124430016	685845	Active	Monitoring Well	Church Of The Epiphany	1900 111th St	Coon Rapids	12.5	06/08/2006	Not Available	WEL	Yes
191	003-153124430016	560400	Unknown	Monitoring Well	Not Available	1900 111th St	Coon Rapids	24	05/15/1996	Not Available	WEL	Yes
192	003-263124210029	560401	Unknown	Monitoring Well	Not Available	1313 Nw Coon Rapids Bl	Coon Rapids	14	05/17/1996	Not Available	WEL	Yes
193	003-173124140001	530318	Unknown	Monitoring Well	Not Available	3237 Coon Rapids Bl	Coon Rapids	40.5	06/24/1993	Not Available	WEL	Yes
194	003-173124140001	524623	Unknown	Monitoring Well	Wcco Am Radio	3237 Coon Rapids Bl	Coon Rapids	38	02/25/1993	Not Available	WEL	Yes
195	003-173124140001	524622	Unknown	Monitoring Well	Not Available	3237 Coon Rapids Bl	Coon Rapids	57	02/24/1993	Not Available	WEL	Yes
196	003-163124320004	539581	Unknown	Monitoring Well	Not Available	3155 Nw Coon Rapids Bl	Coon Rapids	38	04/10/1994	Not Available	WEL	Yes
197	003-163124320004	539580	Unknown	Monitoring Well	Not Available	3155 Nw Coon Rapids Bl	Coon Rapids	37	04/07/1994	Not Available	WEL	Yes
198	003-153124430016	531333	Unknown	Monitoring Well	Not Available	1900 111th Av Nw	Coon Rapids	19	09/28/1993	Not Available	WEL	Yes
199	003-193123220076	519996	Active	Remedial	Ogren, John K.	10873 University Av Ne	Blaine	46	01/21/1993	Not Available	WEL	Approximate
200	003-173124410001	592986	Active	Elevator	Anoka Ramsey Comm. Coll.	11200 Mississippi Bl Nw	Coon Rapids	14	05/12/1997	Not Available	WEL	Yes
201	053-3412021330026	770995	Active	Domestic	Parent, Brent	10984 Mississippi Dr N	Champlin	97	06/03/2011	Not Available	WEL	Yes
202	053-3412021330008	479024	Active	Monitoring Well	Mw-1	10915 River Pk W	Champlin	29	01/28/1992	Not Available	WEL	Approximate
203	053-3412021330008	479025	Active	Monitoring Well	Mw-2	10915 River Pk W	Champlin	28	01/22/1992	Not Available	WEL	Approximate
204	053-3412021330008	479026	Active	Monitoring Well	Mw-3	10915 River Pk W	Champlin	29	01/21/1992	Not Available	WEL	Approximate

Table C-3

PCSI Results - Well Locations in the DWSMAs
City of Coon Rapids Part 2 WHPP Amendment

PCSI ID	PID No.	Unique No.	Status	Use	Well Owner	Well Location	City	Total Depth (Feet)	Date Completed	Aquifer	PCS Code	Location Verified
205	003-263124210029	505218	Active	Test Well	City Of Coon Rapids	1313 Coon Rapids Bl	Coon Rapids	47	06/23/1989	Not Available	WEL	Yes
206	053-3412021330015	503201	Active	Domestic	Menderson, John	10900 West River Rd	Champlin	125	09/12/1989	Not Available	WEL	Approximate
207	003-263124210029	505217	Active	Test Well	City Of Coon Rapids	1313 Coon Rapids Bl	Coon Rapids	25.5	06/23/1989	Not Available	WEL	Yes

Approximate - Parcel not found but location is approximately where that address would exist
Uncertain - Not enough address information to verify location

Table C-4

PCSI Results - Potential Class V Well Locations in the DWSMAs
City of Coon Rapids Part 2 WHPP Amendment

PCSI ID	PID No.	Status	Location Name	Street Address	City or Twp	Generator Size	PCS Code	Location Verified
208	003-163124430009	Active	Aaron Auto Service Inc	2626 Coon Rapids Blvd NW	Coon Rapids	Class 1 Used Oil	CVMVW	Yes
209	003-223124240007	Active	Altra Muffler & Brake	2061 Coon Rapids Blvd NW	Coon Rapids	Class 1 Used Oil	CVMVW	Yes
210	003-223124240003	Active	Auto Zone #3078	2151 Coon Rapids Blvd NW	Coon Rapids	Very Small Quantity Generator	CVMVW	Yes
211	003-163124310019	Active	Coon Rapids Goodyear	11190 Crooked Lake Blvd NW	Coon Rapids	Class 1 Used Oil	CVMVW	Yes
212	003-173124120001	Active	Coon Rapids Rers	3401 Coon Rapids Blvd NW	Coon Rapids	Class 1 Used Oil	CVMVW	Yes
213	003-213124120013	Active	Coon Rapids Service, Inc.	2600 Coon Rapids Blvd NW	Coon Rapids	Class 1 Used Oil	CVMVW	Yes
214	003-163124430011	Active	Dbt Auto Repair Llc	2620 Coon Rapids Blvd NW	Coon Rapids	Class 1 Used Oil	CVMVW	Yes
215	003-153124420008	Active	Dist 11 Vehicle Service Bldg	11299 Hanson Blvd NW	Coon Rapids	Very Small Quantity Generator	CVMVW	Yes
216	003-233124330012	Active	Don's Small Engine Svc., Inc	1449 Coon Rapids Blvd NW	Coon Rapids	Very Small Quantity Generator	CVMVW	Yes
217	003-223124130115	Active	Hi-Ten Service Center	1937 Coon Rapids Blvd NW	Coon Rapids	Very Small Quantity Generator	CVMVW	Yes
218	003-163124340003	Active	Itrust Transmission & Auto Service	2810 Coon Rapids Blvd NW	Coon Rapids	Class 1 Used Oil	CVMVW	Yes
219	003-163124430010	Active	Mckay Collision	2660 Coon Rapids Blvd NW	Coon Rapids	Very Small Quantity Generator	CVMVW	Yes
220	003-223124240006	Active	Midwest Transmission Service	2051 Coon Rapids Blvd NW	Coon Rapids	Very Small Quantity Generator	CVMVW	Yes
221	003-163124430021	Active	Mike's Tire One	2721 Coon Rapids Blvd NW	Coon Rapids	Very Small Quantity Generator	CVMVW	Yes
222	003-223124240004	Active	Neil's Collision Center	2121 Coon Rapids Blvd NW	Coon Rapids	Very Small Quantity Generator	CVMVW	Yes
223	003-133124130053	Active	Northdale Automotive	11401 Foley Blvd NW	Coon Rapids	Very Small Quantity Generator	CVMVW	Yes
224	003-133124240065	Active	O'Reilly Auto Parts - 3241	441 Northdale Blvd NW	Coon Rapids	Very Small Quantity Generator	CVMVW	Yes
225	003-163124340002	Active	Precision Tune Auto Care	2831 Coon Rapids Blvd NW	Coon Rapids	Class 1 Used Oil	CVMVW	Yes
226	003-163124430058	Active	Sandy's Auto Service	2690 Coon Rapids Blvd NW	Coon Rapids	Class 1 Used Oil	CVMVW	Approximate
227	003-163124120001	Active	Ultratech Automotive, Inc	11527 Crooked Lake Blvd NW	Coon Rapids	Very Small Quantity Generator	CVMVW	Yes
228	003-183123430117	Active	Rick Austin's Muffler Shops, Inc.	611 109Th Ave NW	Blaine	Class 1 Used Oil	CVMVW	Yes
229	003-163124310014	Inactive	Firestone Coon Rapids	2920 Coon Rapids Blvd NW	Coon Rapids	Small to Minimal Quantity Generator	CVMVW	Approximate
230	053-2812021330004	Active	Kallstrom Automotive Services	11835 River Rd W	Champlin	Small to Minimal Quantity Generator	CVMVW	Yes

Approximate - Parcel not found but location is approximately where that address would exist

Potential Contaminant Source (PCS) Codes:
CVMVW - Motor Vehicle Waste Disposal Well (potential Class V)

Table C-5

PCSI Results - Storage Tank Locations in the DWSMAs
City of Coon Rapids Part 2 WHPP Amendment

PCSI ID	PCS Code-Material Code	PID Number	MPCA Agency Interests ID	Site	Site Address	City	Tank Number	Install Date	Registration Date	Tank Capacity	Tank Status	Tank Product/Product Released	Above or Under Ground	Release Discovered Date	Release Report Date	Complete Site Closure Date	Location Verified
231	UST - C000	003-173124120001	942	U-Haul - Coon Rapids RERS	3401 Coon Rapids Blvd NW	Coon Rapids	004	2/1/1968	5/30/1986	560	Removed	Transmission Fluid	Underground	Not Applicable	Not Applicable	Not Applicable	Yes
232	UST - F000	003-173124120001	942	U-Haul - Coon Rapids RERS	3401 Coon Rapids Blvd NW	Coon Rapids	001	2/1/1968	5/30/1986	1000	Removed	Motor Oil	Underground	Not Applicable	Not Applicable	Not Applicable	Yes
232	UST - F000	003-173124120001	942	U-Haul - Coon Rapids RERS	3401 Coon Rapids Blvd NW	Coon Rapids	002	2/1/1968	5/30/1986	1000	Removed	Motor Oil	Underground	Not Applicable	Not Applicable	Not Applicable	Yes
232	UST - F000	003-173124120001	942	U-Haul - Coon Rapids RERS	3401 Coon Rapids Blvd NW	Coon Rapids	005	11/1/1989	10/18/1995	550	Removed	Motor Oil	Underground	Not Applicable	Not Applicable	Not Applicable	Yes
232	UST - F000	003-173124120001	942	U-Haul - Coon Rapids RERS	3401 Coon Rapids Blvd NW	Coon Rapids	006	11/1/1989	10/18/1995	1000	Removed	Motor Oil	Underground	Not Applicable	Not Applicable	Not Applicable	Yes
233	UST - W000	003-173124120001	942	U-Haul - Coon Rapids RERS	3401 Coon Rapids Blvd NW	Coon Rapids	003	2/1/1968	5/30/1986	1000	Removed	Used Or Waste Oil	Underground	Not Applicable	Not Applicable	Not Applicable	Yes
233	UST - W000	003-173124120001	942	U-Haul - Coon Rapids RERS	3401 Coon Rapids Blvd NW	Coon Rapids	007	11/1/1989	10/18/1995	1000	Removed	Used Or Waste Oil	Underground	Not Applicable	Not Applicable	Not Applicable	Yes
234	UST - F000	003-193123220002	26518	SuperAmerica 4445	10865 University Ave NE	Blaine	001	7/26/1990	11/26/1990	12000	Active	E-10 - 10% ethanol & 90% gas	Underground	Not Applicable	Not Applicable	Not Applicable	Yes
234	UST - F000	003-193123220002	26518	SuperAmerica 4445	10865 University Ave NE	Blaine	002	7/26/1990	11/26/1990	10000	Active	E-85 - 85% ethanol & 15% gas	Underground	Not Applicable	Not Applicable	Not Applicable	Yes
234	UST - F000	003-193123220002	26518	SuperAmerica 4445	10865 University Ave NE	Blaine	003	7/26/1990	11/26/1990	10000	Active	E-10 - 10% ethanol & 90% gas	Underground	Not Applicable	Not Applicable	Not Applicable	Yes
234	UST - F000	003-193123220002	26518	SuperAmerica 4445	10865 University Ave NE	Blaine	004	7/26/1990	11/26/1990	10000	Active	Diesel	Underground	Not Applicable	Not Applicable	Not Applicable	Yes
235	UST - C000	003-133124440006	28660	Oak Park Amoco	10938 University Ave NW	Coon Rapids	006	10/22/1990	6/20/1991	12000	Removed	Alcohol Blend	Underground	Not Applicable	Not Applicable	Not Applicable	Approximate
235	UST - C000	003-133124440006	28660	Oak Park Amoco	10938 University Ave NW	Coon Rapids	007	10/22/1990	6/20/1991	12000	Removed	Alcohol Blend	Underground	Not Applicable	Not Applicable	Not Applicable	Approximate
235	UST - C000	003-133124440006	28660	Oak Park Amoco	10938 University Ave NW	Coon Rapids	008	10/22/1990	6/20/1991	12000	Removed	Alcohol Blend	Underground	Not Applicable	Not Applicable	Not Applicable	Approximate
236	UST - F000	003-133124440006	28660	Oak Park Amoco	10938 University Ave NW	Coon Rapids	002	1/1/1971	5/28/1986	6000	Removed	Gasoline	Underground	Not Applicable	Not Applicable	Not Applicable	Approximate
236	UST - F000	003-133124440006	28660	Oak Park Amoco	10938 University Ave NW	Coon Rapids	003	1/1/1961	5/28/1986	8000	Removed	Gasoline	Underground	Not Applicable	Not Applicable	Not Applicable	Approximate
236	UST - F000	003-133124440006	28660	Oak Park Amoco	10938 University Ave NW	Coon Rapids	004	1/1/1961	5/28/1986	8000	Removed	Gasoline	Underground	Not Applicable	Not Applicable	Not Applicable	Approximate
236	UST - F000	003-133124440006	28660	Oak Park Amoco	10938 University Ave NW	Coon Rapids	005	1/1/1978	5/28/1986	10000	Removed	Gasoline	Underground	Not Applicable	Not Applicable	Not Applicable	Approximate
237	UST - W000	003-133124440006	28660	Oak Park Amoco	10938 University Ave NW	Coon Rapids	001	1/1/1961	5/28/1986	550	Removed	Used Or Waste Oil	Underground	Not Applicable	Not Applicable	Not Applicable	Approximate
237	UST - W000	003-133124440006	28660	Oak Park Amoco	10938 University Ave NW	Coon Rapids	009	10/22/1990	6/20/1991	550	Removed	Used Or Waste Oil	Underground	Not Applicable	Not Applicable	Not Applicable	Approximate
238	UST - W000	003-223124130023	30452	O'Reilly Auto Parts - 1052	1925 Coon Rapids Blvd NW	Coon Rapids	001	7/16/1993	5/25/1994	600	Removed	Used Or Waste Oil	Underground	Not Applicable	Not Applicable	Not Applicable	Yes
239	UST - F000	003-163124340002	32351	RKH Services Inc dba Auto Max	2841 Coon Rapids Blvd	Coon Rapids	001	12/1/1962	7/2/1987	3000	Removed	Gasoline	Underground	Not Applicable	Not Applicable	Not Applicable	Yes
239	UST - F000	003-163124340002	32351	RKH Services Inc dba Auto Max	2841 Coon Rapids Blvd	Coon Rapids	002	12/1/1962	7/2/1987	5000	Removed	Gasoline	Underground	Not Applicable	Not Applicable	Not Applicable	Yes
239	UST - F000	003-163124340002	32351	RKH Services Inc dba Auto Max	2841 Coon Rapids Blvd	Coon Rapids	003	12/1/1962	7/2/1987	6000	Removed	Gasoline	Underground	Not Applicable	Not Applicable	Not Applicable	Yes
239	UST - F000	003-163124340002	32351	RKH Services Inc dba Auto Max	2841 Coon Rapids Blvd	Coon Rapids	004	9/1/1974	7/2/1987	10000	Removed	Gasoline	Underground	Not Applicable	Not Applicable	Not Applicable	Yes
240	UST - W000	003-163124340002	32351	RKH Services Inc dba Auto Max	2841 Coon Rapids Blvd	Coon Rapids	641	5/8/1987	7/2/1987	560	Removed	Used Or Waste Oil	Underground	Not Applicable	Not Applicable	Not Applicable	Yes
241	Not Available	003-163124430011	30526	DBT Auto Repair LLC	2620 Coon Rapids Blvd NW	Coon Rapids	Not Available	Not Available	Not Available	Not Available	Not Available	Not Available	Not Available	Not Applicable	Not Applicable	Not Applicable	Yes
242	UST - F000	003-153124220001	30530	Coon Rapids Jr High	11600 Raven St NW	Coon Rapids	001	1/1/1968	3/14/1986	17000	Removed	Fuel Oil	Underground	Not Applicable	Not Applicable	Not Applicable	Yes
242	UST - F000	003-153124220001	30530	Coon Rapids Jr High	11600 Raven St NW	Coon Rapids	002	7/22/1996	8/29/1996	10000	Active	Fuel Oil	Underground	Not Applicable	Not Applicable	Not Applicable	Yes
243	AST - W000	003-213124120013	30532	Coon Rapids Service Inc	2600 Coon Rapids Blvd NW	Coon Rapids	1001	3/1/1998	4/15/2003	260	Active	Used Or Waste Oil	Aboveground	Not Applicable	Not Applicable	Not Applicable	Yes
244	UST - F000	003-213124120013	30532	Coon Rapids Service Inc	2600 Coon Rapids Blvd NW	Coon Rapids	001	1/1/1962	4/6/1986	6000	Removed	Gasoline	Underground	Not Applicable	Not Applicable	Not Applicable	Yes
244	UST - F000	003-213124120013	30532	Coon Rapids Service Inc	2600 Coon Rapids Blvd NW	Coon Rapids	002	1/1/1962	4/6/1986	6000	Removed	Gasoline	Underground	Not Applicable	Not Applicable	Not Applicable	Yes
244	UST - F000	003-213124120013	30532	Coon Rapids Service Inc	2600 Coon Rapids Blvd NW	Coon Rapids	003	1/1/1962	4/6/1986	4000	Removed	Gasoline	Underground	Not Applicable	Not Applicable	Not Applicable	Yes
245	UST - W000	003-213124120013	30532	Coon Rapids Service Inc	2600 Coon Rapids Blvd NW	Coon Rapids	004	1/1/1962	4/6/1986	500	Removed	Used Or Waste Oil	Underground	Not Applicable	Not Applicable	Not Applicable	Yes
245	UST - W000	003-213124120013	30532	Coon Rapids Service Inc	2600 Coon Rapids Blvd NW	Coon Rapids	005	1/1/1962	4/6/1986	500	Removed	Used Or Waste Oil	Underground	Not Applicable	Not Applicable	Not Applicable	Yes
246	UST - F000	003-153124420008	39985	ISD 11 Vehicle Service Bldg	11299 Hanson Blvd NW	Coon Rapids	001	1/1/1978	3/14/1986	10000	Removed	Fuel Oil	Underground	Not Applicable	Not Applicable	Not Applicable	Yes
247	UST - F000	003-213124210001	58994	ISD 11 - Mississippi Elementary School	10620 Direct River Dr	Coon Rapids	001	1/1/1978	3/14/1986	10000	Removed	Fuel Oil	Underground	Not Applicable	Not Applicable	Not Applicable	Yes
248	AST	003-173124410001	94145	Anoka Ramsey Community College	11200 Mississippi Blvd NW	Coon Rapids	1002	12/9/1998	12/18/1998	500	Active	Other Substance	Aboveground	Not Applicable	Not Applicable	Not Applicable	Yes
249	UST - F000	003-173124410001	94145	Anoka Ramsey Community College	11200 Mississippi Blvd NW	Coon Rapids	001	1/1/1968	12/16/1985	10000	Removed	Fuel Oil	Underground	Not Applicable	Not Applicable	Not Applicable	Yes
249	UST - F000	003-173124410001	94145	Anoka Ramsey Community College	11200 Mississippi Blvd NW	Coon Rapids	002	1/1/1968	12/16/1985	10000	Removed	Fuel Oil	Underground	Not Applicable	Not Applicable	Not Applicable	Yes
249	UST - F000	003-173124410001	94145	Anoka Ramsey Community College	11200 Mississippi Blvd NW	Coon Rapids	003	1/1/1974	12/16/1985	15000	Removed	Fuel Oil	Underground	Not Applicable	Not Applicable	Not Applicable	Yes
249	UST - F000	003-173124410001	94145	Anoka Ramsey Community College	11200 Mississippi Blvd NW	Coon Rapids	1	11/1/1997	2/27/2008	20000	Active	Fuel Oil	Underground	Not Applicable	Not Applicable	Not Applicable	Yes
250	UST - F000	003-183123430117	103268	Austins Muffler	611 109th Ave	Blaine	004	1/1/1960	7/24/1996	4000	Removed	Gasoline	Underground	Not Applicable	Not Applicable	Not Applicable	Yes
250	UST - F000	003-183123430117	103268	Austins Muffler	611 109th Ave	Blaine	005	1/1/1960	7/24/1996	4000	Removed	Gasoline	Underground	Not Applicable	Not Applicable	Not Applicable	Yes
251	UST - W000	003-183123430117	103268	Austins Muffler	611 109th Ave	Blaine	001	1/1/1960	2/19/1993	1000	Removed	Used Or Waste Oil	Underground	Not Applicable	Not Applicable	Not Applicable	Yes
251	UST - W000	003-183123430117	103268	Austins Muffler	611 109th Ave	Blaine	002	1/1/1960	2/19/1993	1000	Removed	Used Or Waste Oil	Underground	Not Applicable	Not Applicable	Not Applicable	Yes
251	UST - W000	003-183123430117	103268	Austins Muffler	611 109th Ave	Blaine	003	1/1/1960	2/19/1993	1000	Removed	Used Or Waste Oil	Underground	Not Applicable	Not Applicable	Not Applicable	Yes
252	UST - F000	003-193123220062	103284	Stonegate Apartments	10850 6th St NE	Blaine	001	9/17/2004	10/28/2004	1000	Active	Fuel Oil	Underground	Not Applicable	Not Applicable	Not Applicable	Yes
252	UST - F000	003-193123220062	103284	Stonegate Apartments	10850 6th St NE	Blaine	142	9/1/1968	5/7/1986	1500	Removed	Fuel Oil	Underground	Not Applicable	Not Applicable	Not Applicable	Yes
253	UST - C000	003-163124340007	103125	Coon Rapids BP	2825 Coon Rapids Blvd	Coon Rapids	001	9/1/1985	5/27/1986	10000	Temporarily Closed	Alcohol Blend	Underground	Not Applicable	Not Applicable	Not Applicable	Yes
253	UST - C000	003-163124340007	103125	Coon Rapids BP	2825 Coon Rapids Blvd	Coon Rapids	002	9/1/1985	5/27/1986	10000	Temporarily Closed	Alcohol Blend	Underground	Not Applicable	Not Applicable	Not Applicable	Yes
253	UST - C000	003-163124340007	103125	Coon Rapids BP	2825 Coon Rapids Blvd	Coon Rapids	003	9/1/1985	5/27/1986	10000	Temporarily Closed	Alcohol Blend	Underground	Not Applicable	Not Applicable	Not Applicable	Yes
254	UST - F000	003-173124220061	104044	Mercy Health Care Center	3960 Coon Rapids Blvd	Coon Rapids	001	5/23/1974	10/26/1994	12000	Removed	Fuel Oil	Underground	Not Applicable	Not Applicable	Not Applicable	Yes
254	UST - F000	003-173124220061	104044	Mercy Health Care Center	3960 Coon Rapids Blvd	Coon Rapids	002	1/1/1964	7/21/1998	15000	Removed	Fuel Oil	Underground	Not Applicable	Not Applicable	Not Applicable	Yes
254	UST - F000	003-173124220061	104044	Mercy Health Care Center	3960 Coon Rapids Blvd	Coon Rapids	003	1/1/1972	7/2/1998	15000	Removed	Fuel Oil	Underground	Not Applicable	Not Applicable	Not Applicable	Yes
255	UST - F000	003-163124330018	105699	Amoco Ss #7511	2998 111th Ave NW	Coon Rapids	001	1/1/1900	5/27/1986	12000	Removed	Gasoline	Underground	Not Applicable	Not Applicable	Not Applicable	Approximate
255	UST - F000	003-163124330018	105699	Amoco Ss #7511	2998 111th Ave NW	Coon Rapids	002	1/1/1900	5/27/1986	12000	Removed	Gasoline	Underground	Not Applicable	Not Applicable	Not Applicable	Approximate
256	AST - W000	003-163124430021	105587	Coon Rapids Amoco Certicare Center	2721 Coon Rapid Blvd	Coon Rapids	1001	12/1/1997	1/27/1999	780	Active	Used Or Waste Oil	Aboveground	Not Applicable	Not Applicable	Not Applicable	Yes
257	UST - W000	003-163124430021	105587	Coon Rapids Amoco Certicare Center	2721 Coon Rapid Blvd	Coon Rapids	001	10/15/1985	2/18/1986	500	Removed	Used Or Waste Oil	Underground	Not Applicable	Not Applicable	Not Applicable	Yes
258	UST - F000	003-153124430016	105572	Epiphany Church	1900 111th Ave	Coon Rapids	001	1/1/1969	7/28/1986	10000	Removed	Fuel Oil	Underground	Not Applicable	Not Applicable	Not Applicable	Yes
258	UST - F000	003-153124430016	105572	Epiphany Church	1900 111th Ave	Coon Rapids	002	1/1/1976	7/28/1986	550	Removed	Gasoline	Underground	Not Applicable	Not Applicable	Not Applicable	Yes
258	UST - F000	003-153124430016	105572	Epiphany Church	1900 111th Ave	Coon Rapids	003	1/10/1992	1/10/1992	4000	Active	Fuel Oil	Underground	Not Applicable	Not Applicable	Not Applicable	Yes
259	UST - F000	003-083124330021	105690	Around The Block	11872 Round Lake Blvd NW	Coon Rapids	001	9/20/1985	4/30/1986	12000	Active	Gasoline	Underground	Not Applicable	Not Applicable	Not Applicable	Yes
259	UST - F000	003-083124330021	105690	Around The Block	11872 Round Lake Blvd NW	Coon Rapids	002	9/20/1985	4/30/1986	12000	Active	Gasoline	Underground	Not Applicable	Not Applicable	Not Applicable	Yes
259	UST - F000	003-083124330021	105690	Around The Block	11872 Round Lake Blvd NW	Coon Rapids	003	9/20/1985	4/30/1986	10000	Active	Gasoline	Underground	Not Applicable	Not Applicable	Not Applicable	Yes
260	UST - F000	003-173124140001	105694	WCCO Transmitter	3227 Coon Rapids Blvd NW	Coon Rapids	001	1/1/1935	5/16/1986	1500	Removed	Fuel Oil	Underground	Not Applicable	Not Applicable	Not Applicable	Yes
260	UST - F000	003-173124140001	105694	WCCO Transmitter	3227 Coon Rapids Blvd NW	Coon Rapids	002	1/1/1963	5/16/1986	4000	Removed	Fuel Oil	Underground	Not Applicable	Not Applicable	Not Applicable	Yes
260	UST - F000	003-173124140001	105694	WCCO Transmitter	3227 Coon Rapids Blvd NW	Coon Rapids	003	4/26/1991	4/26/1991	10000	Removed	Diesel	Underground	Not Applicable	Not Applicable	Not Applicable	Yes
260	UST - F000	003-173124140001	105694	WCCO Transmitter	3227 Coon Rapids Blvd NW	Coon Rapids	1	8/7/2009	5/6/2010	12000	Active	Diesel	Underground	Not Applicable	Not Applicable	Not Applicable	Yes
261	AST - W000	003-163124310019	106918	Goodyear Tire Center #5763	11190 Crooked Lake Blvd	Coon Rapids	1001	1/1/1900	2/11/1998	185	Active	Used Or Waste Oil	Aboveground	Not Applicable	Not Applicable	Not Applicable	Yes
262	UST - F000	003-163124310019	106918	Goodyear Tire Center #5763	11190 Crooked Lake Blvd	Coon Rapids	001	1/1/1986	4/18/1986	550	Removed	Used Or Waste Oil	Underground	Not Applicable	Not Applicable	Not Applicable	Yes
263	UST - F000	003-133124140007	106678	Eisenhower Elementary School	151 Northdale Blvd	Coon Rapids	001	1/1/1971	3/14/1986	20000	Removed	Fuel Oil	Underground	Not Applicable	Not Applicable	Not Applicable	Yes
263	UST - F000	003-133124140007	106678	Eisenhower Elementary School	151 Northdale Blvd	Coon Rapids	001	6/22/2004	3/14/1986	20000	Removed	Fuel Oil	Underground	Not Applicable	Not Applicable	Not Applicable	Yes
263	UST - F000	003-133124140007	106678	Eisenhower Elementary School	151 Northdale Blvd	Coon Rapids	002	6/22/2004	9/21/2004	10000	Active	Fuel Oil	Underground	Not Applicable	Not Applicable	Not Applicable	Yes
264	UST - F000	003-153124330002	106680	Hoover Elementary School	2369 109th Ave NW	Coon Rapids	001	1/1/1966	3/14/1986	8000	Removed	Fuel Oil	Underground	Not Applicable	Not Applicable	Not Applicable	Yes
264	UST - F000	003-153124330002	106680	Hoover Elementary School	2369 109th Ave NW	Coon Rapids	002	7/5/2000	9/29/2003	10000	Active	Fuel Oil	Underground	Not Applicable	Not Applicable	Not Applicable	Yes
265	UST - F000	003-133124130006	106529	Coon Rapids Marathon	380 Northdale Blvd	Coon Rapids	001	1/1/1977	4/4/1986	8000	Active	E-10 - 10% ethanol & 90% gas	Underground	Not Applicable	Not Applicable	Not Applicable	Yes
265	UST - F000	003-133124130006	106529	Coon Rapids Marathon	380 Northdale Blvd	Coon Rapids	002	1/1/1980	4/4/1986	10000	Active	E-10 - 10% ethanol & 90% gas	Underground	Not Applicable	Not Applicable	Not Applicable	Yes
265	UST - F000	003-133124130006	106529	Coon Rapids Marathon	380 Northdale Blvd	Coon Rapids	003	1/1/1980	4/4/1986	10000	Active	E-10 - 10% ethanol & 90% gas	Underground	Not Applicable	Not Applicable	Not Applicable	Yes
265	UST - F000	003-133124130006	106529	Coon Rapids Marathon	380 Northdale Blvd	Coon Rapids	005	1/1/1900	4/4/1986	1000	Removed	Fuel Oil	Underground	Not Applicable	Not Applicable	Not Applicable	Yes
266	UST - W000	003-133124130006	106529	Coon Rapids Marathon	380 Northdale Blvd	Coon Rapids	004	1/1/1900	4/4/1986	560	Removed	Used Or Waste Oil	Underground	Not Applicable	Not Applicable	Not Applicable	Yes
267	UST - F000	003-223124440005	106681	L O Jacob Elementary School	1700 Coon Rapids Blvd	Coon Rapids	001	1/1/1941	3/14/1986	5000	Removed	Fuel Oil	Underground	Not Applicable	Not Applicable	Not Applicable	Yes
267	UST - F000	003-223124440005	106681	L O Jacob Elementary School	1700 Coon Rapids Blvd	Coon Rapids	002	6/13/1993	7/12/1993	10000	Active	Fuel Oil	Underground	Not Applicable	Not Applicable	Not Applicable	Yes
268	UST - F000	003-223124420064	106532	North Central Public Service Co	1930 Coon Rapids Blvd	Coon Rapids	001	6/10/1961	4/14/1986	10000	Removed	Gasoline	Underground	Not Applicable	Not Applicable	Not Applicable	Yes
268	UST - F000	003-223124420064	106532	North Central Public Service Co	1930 Coon Rapids Blvd	Coon Rapids	002	7/7/1974	4/14/1986	4000	Removed	Gasoline	Underground	Not Applicable	Not Applicable	Not Applicable	Yes
269	UST - F000	003-113124140002	106684	Sand Creek Elementary School	12156 Olive St NW	Coon Rapids	001	1/1/1965	3/14/1986	8000	Removed	Fuel Oil	Underground	Not Applicable	Not Applicable	Not Applicable	Yes
269	UST - F000	003-113124140002	106684	Sand Creek Elementary School	12156 Olive St NW	Coon Rapids	018	6/17/1996	6/24/1996	10000	Active	Fuel Oil	Underground	Not Applicable	Not Applicable	Not Applicable	Yes
270	UST - F000	003-133124230074	106685	Sorteberg Elementary School	11400 Magnolia St NW	Coon Rapids	001	1/1/1960	3/14/1986	8000	Removed	Fuel Oil	Underground	Not Applicable	Not Applicable	Not Applicable	Yes
270	UST - F000	003-133124230074	106685	Sorteberg Elementary School	11400 Magnolia St NW	Coon Rapids	002	6/25/1994	7/8/1994	10000	Active	Fuel Oil	Underground	Not Applicable	Not Applicable	Not Applicable	Yes
271	UST - F000	003-133124420001	106538	Northdale Junior High School	11301 Dogwood St	Coon Rapids	001	1/1/1977	3/18/1986	25000	Removed	Fuel Oil	Underground	Not Applicable	Not Applicable	Not Applicable	Yes
271	UST - F000	003-133124420001	106538	Northdale Junior High School	11301 Dogwood St	Coon Rapids	002	6/18/2002	10/17/2002	10000	Active	Fuel Oil	Underground	Not Applicable	Not Applicable	Not Applicable	Yes
272	UST - F000	003-133124130053	107245	Northdale Automotive Inc	11401 Foley Blvd NW	Coon Rapids	002	6/1/1984	5/5/1986	10000	Temporarily Closed	Gasoline	Underground	Not Applicable	Not Applicable	Not Applicable	Yes
272	UST - F000	003-133124130053	107245	Northdale Automotive Inc	11401 Foley Blvd NW	Coon Rapids	003	6/1/1984	5/5/1986	10000	Temporarily Closed	Gasoline	Underground	Not Applicable	Not Applicable	Not Applicable	Yes
273	UST - W000	003-133124130053	107245	Northdale Automotive Inc	11401 Foley Blvd NW	Coon Rapids	001	7/1/1978	5/5/1986	550	Active	Used Or Waste Oil	Underground	Not Applicable	Not Applicable	Not Applicable	Yes
274	UST - F000	003-273124140001	107174	Coon Rapids Dam	9750 Egret Blvd	Coon Rapids	181	1/1/1978	4/26/1986	1000	Removed	Gasoline	Underground	Not Applicable	Not Applicable	Not Applicable	Yes
274	UST - F000	003-273124140001	107174	Coon Rapids Dam	9750 Egret Blvd	Coon Rapids	182	1/1/1978	4/26/1986	1000	Removed	Gasoline	Underground	Not Applicable	Not Applicable	Not Applicable	Yes
275	UST - F000	003-223124130115	107250	Hi Ten Service	1937 Coon Rapids Blvd	Coon Rapids	001	9/1/1954	5/6/1986	4000	Removed	Gasoline	Underground	Not Applicable	Not Applicable	Not Applicable	Yes
275	UST - F000	003-223124130115	107250	Hi Ten Service	1937 Coon Rapids Blvd	Coon Rapids	002	9/1/1954	5/6/1986	4000	Removed	Gasoline	Underground	Not Applicable	Not Applicable	Not Applicable	Yes
275	UST - F000	003-223124130115	107250	Hi Ten Service	1937 Coon Rapids Blvd	Coon Rapids	003	9/1/1954	5/6/1986	4000	Removed	Gasoline	Underground	Not Applicable	Not Applicable	Not Applicable	Yes
275	UST - F000	003-223124130115	107250	Hi Ten Service	1937 Coon Rapids Blvd	Coon Rapids	004	7/20/1989	7/25/1990	8000	Removed	Gasoline	Underground	Not Applicable	Not Applicable	Not Applicable	Yes
275	UST - F000	003-223124130115	107250	Hi Ten Service	1937 Coon Rapids Blvd	Coon Rapids	005	7/20/1989	7/25/1990	10000	Removed	Gasoline	Underground	Not Applicable	Not Applicable	Not Applicable	Yes

Table C-5

PCSI Results - Storage Tank Locations in the DWSMAs
City of Coon Rapids Part 2 WHPP Amendment

PCSI ID	PCS Code-Material Code	PID Number	MPCA Agency Interests ID	Site	Site Address	City	Tank Number	Install Date	Registration Date	Tank Capacity	Tank Status	Tank Product/Product Released	Above or Under Ground	Release Discovered Date	Release Report Date	Complete Site Closure Date	Location Verified
276	UST - F000	003-173124220015	107237	Carlson Automotive Llc/ Carlson Toyota	3815 Coon Rapids Blvd NW	Coon Rapids	001	1/1/1980	6/9/1994	560	Removed	Motor Oil	Underground	Not Applicable	Not Applicable	Not Applicable	Approximate
276	UST - F000	003-173124220015	107237	Carlson Automotive Llc/ Carlson Toyota	3815 Coon Rapids Blvd NW	Coon Rapids	100	11/1/1979	4/25/1986	500	Removed	Gasoline	Underground	Not Applicable	Not Applicable	Not Applicable	Approximate
277	UST - W000	003-173124220015	107237	Carlson Automotive Llc/ Carlson Toyota	3815 Coon Rapids Blvd NW	Coon Rapids	002	1/1/1980	6/9/1994	560	Removed	Used Or Waste Oil	Underground	Not Applicable	Not Applicable	Not Applicable	Approximate
278	UST - F000	003-233124330038	107243	SuperAmerica	1531 Coon Rapids Blvd	Coon Rapids	001	11/17/1965	2/24/1986	8000	Removed	Gasoline	Underground	Not Applicable	Not Applicable	Not Applicable	Yes
278	UST - F000	003-233124330038	107243	SuperAmerica	1531 Coon Rapids Blvd	Coon Rapids	002	11/17/1965	2/24/1986	8000	Removed	Gasoline	Underground	Not Applicable	Not Applicable	Not Applicable	Yes
278	UST - F000	003-233124330038	107243	SuperAmerica	1531 Coon Rapids Blvd	Coon Rapids	003	11/17/1965	2/24/1986	8000	Removed	Diesel	Underground	Not Applicable	Not Applicable	Not Applicable	Yes
279	UST - W000	003-233124330038	107243	SuperAmerica	1531 Coon Rapids Blvd	Coon Rapids	004	11/17/1965	2/24/1986	560	Removed	Used Or Waste Oil	Underground	Not Applicable	Not Applicable	Not Applicable	Yes
280	AST - F000	003-163124340002	107825	Precision Tune	2831 Coon Rapids Blvd NW	Coon Rapids	1002	4/1/1987	12/15/1992	800	Active	Motor Oil	Aboveground	Not Applicable	Not Applicable	Not Applicable	Yes
280	AST - F000	003-163124340002	107825	Precision Tune	2831 Coon Rapids Blvd NW	Coon Rapids	1003	4/1/1987	12/15/1992	1000	Active	Motor Oil	Aboveground	Not Applicable	Not Applicable	Not Applicable	Yes
281	AST - W000	003-163124340002	107825	Precision Tune	2831 Coon Rapids Blvd NW	Coon Rapids	1001	4/1/1987	12/15/1992	200	Active	Used Or Waste Oil	Aboveground	Not Applicable	Not Applicable	Not Applicable	Yes
282	UST - F000	003-223124240005	109529	Crown EZ Stop	2111 Coon Rapids Blvd NW	Coon Rapids	001	1/1/1978	2/14/1986	12000	Removed	Gasoline	Underground	Not Applicable	Not Applicable	Not Applicable	Yes
282	UST - F000	003-223124240005	109529	Crown EZ Stop	2111 Coon Rapids Blvd NW	Coon Rapids	002	1/1/1979	2/14/1986	10000	Removed	Gasoline	Underground	Not Applicable	Not Applicable	Not Applicable	Yes
282	UST - F000	003-223124240005	109529	Crown EZ Stop	2111 Coon Rapids Blvd NW	Coon Rapids	003	1/1/1984	2/14/1986	10000	Removed	Gasoline	Underground	Not Applicable	Not Applicable	Not Applicable	Yes
282	UST - F000	003-223124240005	109529	Crown EZ Stop	2111 Coon Rapids Blvd NW	Coon Rapids	004	1/1/1982	2/14/1986	6000	Removed	Gasoline	Underground	Not Applicable	Not Applicable	Not Applicable	Yes
282	UST - F000	003-223124240005	109529	Crown EZ Stop	2111 Coon Rapids Blvd NW	Coon Rapids	005	1/1/1982	2/14/1986	2000	Removed	Gasoline	Underground	Not Applicable	Not Applicable	Not Applicable	Yes
282	UST - F000	003-223124240005	109529	Crown EZ Stop	2111 Coon Rapids Blvd NW	Coon Rapids	006	1/1/1984	2/14/1986	2000	Removed	Gasoline	Underground	Not Applicable	Not Applicable	Not Applicable	Yes
283	UST - C000	003-123124220108	109747	Holiday Stationstore #309	12480 Foley Blvd NW	Coon Rapids	001	5/28/1996	6/10/1996	8000	Active	Alcohol Blend	Underground	Not Applicable	Not Applicable	Not Applicable	Yes
283	UST - C000	003-123124220108	109747	Holiday Stationstore #309	12480 Foley Blvd NW	Coon Rapids	002	5/28/1996	6/10/1996	8000	Active	Alcohol Blend	Underground	Not Applicable	Not Applicable	Not Applicable	Yes
283	UST - C000	003-123124220108	109747	Holiday Stationstore #309	12480 Foley Blvd NW	Coon Rapids	003	5/28/1996	6/10/1996	8000	Active	Alcohol Blend	Underground	Not Applicable	Not Applicable	Not Applicable	Yes
283	UST - C000	003-123124220108	109747	Holiday Stationstore #309	12480 Foley Blvd NW	Coon Rapids	004	5/28/1996	6/10/1996	8000	Active	Alcohol Blend	Underground	Not Applicable	Not Applicable	Not Applicable	Yes
284	UST - F000	003-123124220108	109747	Holiday Stationstore #309	12480 Foley Blvd NW	Coon Rapids	`1	5/28/1996	6/10/1996	8000	Active	Diesel	Underground	Not Applicable	Not Applicable	Not Applicable	Yes
285	AST - F000	053-0311921430092	110470	Ken Kiffmeyer Res/const Co	3608 101st Ave N	Brooklyn Park	1001	Not Available	6/4/2001	800	Active	Gasoline	Aboveground	Not Applicable	Not Applicable	Not Applicable	Yes
285	AST - F000	053-0311921430092	110470	Ken Kiffmeyer Res/const Co	3608 101st Ave N	Brooklyn Park	1002	Not Available	6/4/2001	800	Active	Diesel	Aboveground	Not Applicable	Not Applicable	Not Applicable	Yes
285	UST - F000	053-0311921430092	110470	Ken Kiffmeyer Res/const Co	3608 101st Ave N	Brooklyn Park	001	1/1/1988	4/21/1994	500	Removed	Gasoline	Underground	Not Applicable	Not Applicable	Not Applicable	Yes
286	AST - F000	003-163124430009	112086	Sparks Cumputerize Car Care	2650 Coon Rapids Blvd NW	Coon Rapids	1001	10/1/1989	6/5/1990	275	Active	Motor Oil	Aboveground	Not Applicable	Not Applicable	Not Applicable	Yes
286	AST - F000	003-163124430009	112086	Sparks Cumputerize Car Care	2650 Coon Rapids Blvd NW	Coon Rapids	1002	10/1/1989	6/5/1990	275	Active	Motor Oil	Aboveground	Not Applicable	Not Applicable	Not Applicable	Yes
287	AST - W000	003-163124430009	112086	Sparks Cumputerize Car Care	2650 Coon Rapids Blvd NW	Coon Rapids	1003	10/1/1989	6/5/1990	275	Active	Used Or Waste Oil	Aboveground	Not Applicable	Not Applicable	Not Applicable	Yes
288	AST - F000	053-0211921340005	112306	Coon Rapids Dam Regional Park	10360 W River Rd	Brooklyn Park	1001	4/1/1994	5/25/1994	500	Active	Gasoline	Aboveground	Not Applicable	Not Applicable	Not Applicable	Yes
289	UST - C000	053-3212021410059	112058	Amys Mini Mart	11151 Douglas Dr	Champlin	002	12/10/1986	3/24/1987	10000	Active	Alcohol Blend	Underground	Not Applicable	Not Applicable	Not Applicable	Yes
290	UST - F000	053-3212021410059	112058	Amys Mini Mart	11151 Douglas Dr	Champlin	001	12/10/1986	3/24/1987	10000	Active	Gasoline	Underground	Not Applicable	Not Applicable	Not Applicable	Yes
291	UST - F000	003-153124420005	112467	Faith Lutheran Church	11115 Hanson Blvd	Coon Rapids	001	1/1/1900	12/27/1995	560	Removed	Fuel Oil	Underground	Not Applicable	Not Applicable	Not Applicable	Yes
292	UST - F000	003-163124330001	114260	Joseph Cook Memorial Arena	11091 NW Mississippi Blvd	Coon Rapids	001	1/1/1970	4/10/1998	2000	Active	Fuel Oil	Underground	Not Applicable	Not Applicable	Not Applicable	Yes
293	UST - F000	003-173124440003	116499	Mississippi View Apartments	11010-11020 Mississippi Blvd	Coon Rapids	`1	Not Available	Not Available	3000	Removed	Fuel Oil	Underground	Not Applicable	Not Applicable	Not Applicable	Yes
293	UST - F000	003-173124440003	116499	Mississippi View Apartments	11010-11020 Mississippi Blvd	Coon Rapids	`2	Not Available	11/28/2006	3000	Removed	Fuel Oil	Underground	Not Applicable	Not Applicable	Not Applicable	Yes
294	AST - F000	003-223124420065	117171	Centerpoint Energy- Service Center	10511 Hanson Blvd; 1930 Coon Rapids Blvd	Coon Rapids	1002	3/1/1999	2/25/1999	260	Active	Motor Oil	Aboveground	Not Applicable	Not Applicable	Not Applicable	Yes
295	AST - W000	003-223124420065	117171	Centerpoint Energy- Service Center	10511 Hanson Blvd; 1930 Coon Rapids Blvd	Coon Rapids	1001	4/4/1995	4/24/1995	300	Active	Used Or Waste Oil	Aboveground	Not Applicable	Not Applicable	Not Applicable	Yes
296	UST - F000	003-223124420065	117171	Centerpoint Energy- Service Center	10511 Hanson Blvd; 1930 Coon Rapids Blvd	Coon Rapids	001	1/1/1961	10/8/1992	10000	Removed	Gasoline	Underground	Not Applicable	Not Applicable	Not Applicable	Yes
296	UST - F000	003-223124420065	117171	Centerpoint Energy- Service Center	10511 Hanson Blvd; 1930 Coon Rapids Blvd	Coon Rapids	002	1/1/1974	10/8/1992	4000	Removed	Gasoline	Underground	Not Applicable	Not Applicable	Not Applicable	Yes
296	UST - F000	003-223124420065	117171	Centerpoint Energy- Service Center	10511 Hanson Blvd; 1930 Coon Rapids Blvd	Coon Rapids	003	1/1/1980	10/8/1992	1000	Removed	Diesel	Underground	Not Applicable	Not Applicable	Not Applicable	Yes
297	UST - W000	003-223124420065	117171	Centerpoint Energy- Service Center	10511 Hanson Blvd; 1930 Coon Rapids Blvd	Coon Rapids	004	12/12/1992	1/19/1993	560	Removed	Used Or Waste Oil	Underground	Not Applicable	Not Applicable	Not Applicable	Yes
298	UST - F000	053-3412021330022	118349	Bills Superette Inc #5	10917 W River Rd	Champlin	001	10/1/1988	3/26/1990	12000	Removed	Gasoline	Underground	Not Applicable	Not Applicable	Not Applicable	Yes
298	UST - F000	053-3412021330022	118349	Bills Superette Inc #5	10917 W River Rd	Champlin	002	10/1/1988	3/26/1990	12000	Removed	Gasoline	Underground	Not Applicable	Not Applicable	Not Applicable	Yes
298	UST - F000	053-3412021330022	118349	Bills Superette Inc #5	10917 W River Rd	Champlin	003	10/1/1988	3/26/1990	8000	Removed	Gasoline	Underground	Not Applicable	Not Applicable	Not Applicable	Yes
298	UST - F000	053-3412021330022	118349	Bills Superette Inc #5	10917 W River Rd	Champlin	004	10/1/1988	3/26/1990	8000	Removed	Diesel	Underground	Not Applicable	Not Applicable	Not Applicable	Yes
298	UST - F000	053-3412021330022	118349	Bills Superette Inc #5	10917 W River Rd	Champlin	005	11/12/2004	1/11/2005	15000	Active	Gasoline	Underground	Not Applicable	Not Applicable	Not Applicable	Yes
298	UST - F000	053-3412021330022	118349	Bills Superette Inc #5	10917 W River Rd	Champlin	006	11/12/2004	1/11/2005	20000	Active	Gasoline	Underground	Not Applicable	Not Applicable	Not Applicable	Yes
298	UST - F000	053-3412021330022	118349	Bills Superette Inc #5	10917 W River Rd	Champlin	007	11/11/2004	1/11/2005	6000	Active	Gasoline	Underground	Not Applicable	Not Applicable	Not Applicable	Yes
298	UST - F000	053-3412021330022	118349	Bills Superette Inc #5	10917 W River Rd	Champlin	008	11/12/2004	1/11/2005	6000	Active	Diesel	Underground	Not Applicable	Not Applicable	Not Applicable	Yes
299	UST - C000	003-173124140002	131208	Rally Gas	3397 Coon Rapids Blvd	Coon Rapids	002	1/10/1986	1/11/1988	10000	Removed	Alcohol Blend	Underground	Not Applicable	Not Applicable	Not Applicable	Approximate
300	UST - F000	003-173124140002	131208	Rally Gas	3397 Coon Rapids Blvd	Coon Rapids	001	1/10/1988	1/11/1988	10000	Removed	Gasoline	Underground	Not Applicable	Not Applicable	Not Applicable	Approximate
300	UST - F000	003-173124140002	131208	Rally Gas	3397 Coon Rapids Blvd	Coon Rapids	003	1/10/1988	1/11/1988	6000	Removed	Diesel	Underground	Not Applicable	Not Applicable	Not Applicable	Approximate
301	UST - W000	003-153124210025	138171	Former Kmart #7467	2100 Northdale Blvd NW	Coon Rapids	001	11/9/1980	4/28/1986	1000	Removed	Used Or Waste Oil	Underground	Not Applicable	Not Applicable	Not Applicable	Yes
302	LUST	003-173124120001	942	U-Haul - Coon Rapids RERS	3401 Coon Rapids Blvd NW	Coon Rapids	Not Available	Not Available	Not Available	Not Available	Not Available	Used Oil	Not Available	09/04/2001	09/04/2001	08/29/2002	Yes
303	LUST	003-193123220002	26518	SuperAmerica 4445	10865 University Ave NE	Blaine	Not Available	Not Available	Not Available	Not Available	Not Available	Unknown	Not Available	08/21/1998	08/21/1998	11/15/1999	Yes
304	LUST	003-133124440006	28660	Oak Park Amoco	10938 University Ave NW	Coon Rapids	Not Available	Not Available	Not Available	Not Available	Not Available	Gasoline, Unleaded; Used Oil	Not Available	8/30/2005	8/31/2005	8/22/2006	Approximate
304	LUST	003-133124440006	28660	Oak Park Amoco	10938 University Ave NW	Coon Rapids	Not Available	Not Available	Not Available	Not Available	Not Available	Gasoline, Type Unknown	Not Available	Not Available	10/17/1990	01/28/1994	Approximate
305	LUST	003-163124340003	29681	Jule Automotive Inc	2810 Coon Rapids Blvd	Coon Rapids	Not Available	Not Available	Not Available	Not Available	Not Available	Hydraulic Fluid	Not Available	12/30/2011	12/30/2011	05/15/2012	Yes
306	LUST	003-153124220001	30530	Coon Rapids Jr High	11600 Raven St NW	Coon Rapids	Not Available	Not Available	Not Available	Not Available	Not Available	Fuel Oil 1 & 2	Not Available	09/09/1996	09/09/1996	10/08/1997	Yes
307	LUST	003-213124120013	30532	Coon Rapids Service Inc	2600 Coon Rapids Blvd NW	Coon Rapids	Not Available	Not Available	Not Available	Not Available	Not Available	Fuel Oil 1 & 2; Gasoline, Unleaded; Waste Oil	Not Available	06/18/1990	06/18/1990	01/10/1991	Yes
308	LUST	003-153124420008	39985	ISD 11 Vehicle Service Bldg	11299 Hanson Blvd NW	Coon Rapids	Not Available	Not Available	Not Available	Not Available	Not Available	Fuel Oil 1 & 2	Not Available	07/09/1990	04/12/1991	10/21/1991	Yes
309	LUST	003-163124340061	42286	Target Stores T42	11000 Crooked Lake Blvd NW	Coon Rapids	Not Available	Not Available	Not Available	Not Available	Not Available	Not Available	Not Available	06/06/2000	06/08/2000	02/12/2001	Yes
310	LUST	003-213124210001	58994	ISD 11 - Mississippi Elementary School	10620 Direct River Dr	Coon Rapids	Not Available	Not Available	Not Available	Not Available	Not Available	Fuel Oil 1 & 2	Not Available	06/15/1994	06/15/1994	12/22/1994	Yes
311	LUST	003-173124410001	94145	Anoka Ramsey Community College	11200 Mississippi Blvd NW	Coon Rapids	Not Available	Not Available	Not Available	Not Available	Not Available	Fuel Oil 1 & 2	Not Available	11/18/1997	11/19/1997	03/14/2001	Yes
312	LUST	053-3412021330015	100637	Finasstore #604-7505-609	10915 W River Rd	Champlin	Not Available	Not Available	Not Available	Not Available	Not Available	Gasoline Leaded; Gasoline, Unleaded	Not Available	10/17/1990	03/22/1991	05/24/1993	Approximate
313	LUST	003-163124430096	105698	Coon Rapids Chrysler Plymouth	2710 Coon Rapids Blvd NW	Coon Rapids	Not Available	Not Available	Not Available	Not Available	Not Available	Hydraulic Fluid	Not Available	03/04/2004	03/04/2004	01/21/2005	Approximate
314	LUST	003-163124330018	105699	Amoco Ss #7511	2998 111th Ave NW	Coon Rapids	Not Available	Not Available	Not Available	Not Available	Not Available	Gasoline, Type Unknown	Not Available	11/26/1986	12/24/1986	10/13/1992	Approximate
315	LUST	003-173124140001	105694	WCCO Transmitter	3227 Coon Rapids Blvd NW	Coon Rapids	Not Available	Not Available	Not Available	Not Available	Not Available	Fuel Oil 1 & 2	Not Available	06/04/1991	08/07/1991	10/22/1993	Yes
316	LUST	003-153124330002	106680	Hoover Elementary School	2369 109th Ave NW	Coon Rapids	Not Available	Not Available	Not Available	Not Available	Not Available	Fuel Oil 1 & 3	Not Available	07/05/2000	07/06/2000	01/18/2007	Yes
317	LUST	003-133124130006	106529	Coon Rapids Marathon	380 Northdale Blvd	Coon Rapids	Not Available	Not Available	Not Available	Not Available	Not Available	Gasoline, Unleaded	Not Available	11/10/1995	11/10/1995	11/04/1999	Yes
318	LUST	003-223124440005	106681	L O Jacob Elementary School	1700 Coon Rapids Blvd	Coon Rapids	Not Available	Not Available	Not Available	Not Available	Not Available	Fuel Oil 1 & 2	Not Available	06/22/1993	06/22/1993	01/05/1994	Yes
319	LUST	003-113124140002	106684	Sand Creek Elementary School	12156 Olive St NW	Coon Rapids	Not Available	Not Available	Not Available	Not Available	Not Available	Fuel Oil 1 & 2	Not Available	06/27/1996	06/27/1996	07/31/1996	Yes
320	LUST	003-133124230074	106685	Sorteberg Elementary School	11400 Magnolia St NW	Coon Rapids	Not Available	Not Available	Not Available	Not Available	Not Available	Fuel Oil 1 & 2	Not Available	06/23/1994	06/23/1994	03/02/1998	Yes
321	LUST	003-223124130115	107250	Hi Ten Service	1937 Coon Rapids Blvd	Coon Rapids	Not Available	Not Available	Not Available	Not Available	Not Available	Gasoline, Unleaded	Not Available	11/22/2006	11/22/2006	12/20/2007	Yes
322	LUST	003-173124220015	107237	Carlson Automotive Llc/ Carlson Toyota	3815 Coon Rapids Blvd NW	Coon Rapids	Not Available	Not Available	Not Available	Not Available	Not Available	Motor Oil	Not Available	06/09/1997	06/10/1997	09/03/1997	Approximate
323	LUST	003-233124330038	107243	SuperAmerica	1531 Coon Rapids Blvd	Coon Rapids	Not Available	Not Available	Not Available	Not Available	Not Available	Waste Oil	Not Available	07/05/1992	04/07/1997	06/06/1997	Yes
324	LUST	003-223124240005	109529	Crown EZ Stop	2111 Coon Rapids Blvd NW	Coon Rapids	Not Available	Not Available	Not Available	Not Available	Not Available	Gasoline, Unleaded	Not Available	06/26/2012	06/26/2012	02/28/2013	Yes
324	LUST	003-223124240005	109529	Ostlunds Phillips 66	2111 Coon Rapids Blvd NW	Coon Rapids	Not Available	Not Available	Not Available	Not Available	Not Available	Gasoline, Type Unknown	Not Available	09/08/1988	09/09/1988	06/20/1989	Yes
325	LUST	053-3212021410059	112058	Amys Mini Mart	11151 Douglas Dr	Champlin	Not Available	Not Available	Not Available	Not Available	Not Available	Gasoline, Unleaded	Not Available	10/23/2010	10/23/2010	10/30/2015	Yes
326	LUST	053-3412021330022	118349	Bills Superette Inc #5	10917 W River Rd	Champlin	Not Available	Not Available	Not Available	Not Available	Not Available	Diesel; Gasoline, Unleaded	Not Available	05/03/2005	05/03/2005	08/16/2005	Yes
327	LUST	003-173124140002	131208	Rally Gas	3397 Coon Rapids Blvd	Coon Rapids	Not Available	Not Available	Not Available	Not Available	Not Available	Gasoline, Unleaded	Not Available	01/12/2012	01/12/2012	10/28/2014	Approximate
328	LUST	003-153124430016	188455	Church Of The Epiphany	1900 111th Ave NW	Coon Rapids	Not Available	Not Available	Not Available	Not Available	Not Available	Gasoline, Unleaded	Not Available	09/24/1990	09/24/1990	06/15/1994	Yes
329	LUST	003-193123210002	190015	Former Gas Station	384 109th Ave	Blaine	Not Available	Not Available	Not Available	Not Available	Not Available	Unknown	Not Available	10/02/1996	10/03/1996	11/05/1996	Yes
330	LUST	003-153124210025	190928	Village 10 Shopping Center	2100 Northdale Blvd NW	Coon Rapids	Not Available	Not Available	Not Available	Not Available	Not Available	Fuel Oil 1 & 2	Not Available	04/25/1996	04/25/1996	11/22/1996	Yes
331	LUST	003-133124420058	191601	Former Service Building	Foley Blvd & 111th Ln NW	Coon Rapids	Not Available	Not Available	Not Available	Not Available	Not Available	Unknown	Not Available	12/23/1999	12/28/1999	09/29/2003	Approximate
332	LUST	003-223124210065	206929	Gorham Builders C/o Remax	10732 Hanson Blvd	Coon Rapids	Not Available	Not Available	Not Available	Not Available	Not Available	Fuel Oil 1 & 2	Not Available	04/19/2001	04/19/2001	05/16/2001	Yes

LUST - Leaking Underground Storage Tank
Approximate - Parcel not found but location is approximately where that address would exist.

Table C-6

PCSI Results - Chemical Storage Sites in the DWSMAs
City of Coon Rapids Part 2 WHPP Amendment

Non-Agricultural Chemicals							
PCSI ID	**PID Number**	**CAS Number**	**Facility Name**	**Site Address**	**Chemicals**	**PCS Code - Material Code**	**Location Verified**
333	053-0311921410062	270150052	Brooklyn Park Public Utilities Well #15	10441 W River Rd	Chlorine; Hydrofluorosilicic Acid (25% Or Less)	STOR - C000	Approximate
334	003-193123220062	20200049	681 Properties Dba Stonegate	10640 - 10850 6th St Ne	Fuel Oil #2	STOR - F000	Yes
335	003-133124140007	20500041	Eisenhower Elementary School - Isd #11	151 Northdale Blvd	Fuel Oil	STOR - F000	Yes
336	003-153124330002	20500043	Hoover Elementary School - Isd #11	2369 109Th Ave Nw	Fuel Oil	STOR - F000	Yes
337	003-223124440005	20500044	Rivertrail Learning Center At L.O. Jacob - Isd #11	1700 Coon Rapids Blvd	Fuel Oil	STOR - F000	Yes
338	003-213124210001	20500045	Mississippi Elementary School - Isd #11	10620 Direct River Drive	Fuel Oil	STOR - F000	Yes
339	003-113124140002	20500047	Sand Creek Elementary School - Isd #11	12156 Olive St Nw	Fuel Oil	STOR - F000	Yes
340	003-133124230074	20500048	Sorteberg Early Childhood Center - Isd #11	11400 Magnolia St Nw	Fuel Oil	STOR - F000	Yes
341	003-153124220001	20500050	Coon Rapids Middle School - Isd #11	11600 Raven St Nw	Fuel Oil	STOR - F000	Yes
342	003-133124420001	20500051	Northdale Middle School - Isd #11	11301 Dogwood St Nw	Chlorine; Fuel Oil	STOR - C000	Yes
343	003-133124130109	20500054	Coon Rapids East Water Treatment Plant	11300 Dogwood St	Chlorine; Hydrofluorosilicic Acid; Sodium Hydroxide; Sulfur Dioxide	STOR - C000	Yes
344	003-223124230002	20500055	Coon Rapids West Water Treatment Plant	2241 105Th Ave Nw	Chlorine; Hydrofluorosilicic Acid; Sodium Hydroxide; Sulfur Dioxide	STOR - C000	Yes
345	003-213124240044	20500058	Coon Rapids Well #7		Chlorine; Hydrofluorosilicic Acid	STOR - C000	Yes
346	003-273124110043	20500059	Coon Rapids Well #12	10080 Egret Blvd	Chlorine; Hydrofluorosilicic Acid	STOR - C000	Yes
347	003-113124140001	20500061	Coon Rapids Well #16	12280 Olive St	Chlorine; Hydrofluorosilicic Acid	STOR - C000	Yes
348	003-173124410001	20500065	Anoka-Ramsey Community College	11200 Mississippi Blvd	Fuel Oil #2	STOR - F000	Yes
349	003-173124220016	20500071	City Of Coon Rapids Well #6	11611 Yucca St	Chlorine; Hydrofluorosilicic Acid	STOR - C000	Yes
350	003-173124140001	20500074	Wcco Radio Transmitter	3237 Coon Rapids Blvd Nw	Diesel Fuel	STOR - F000	Yes
351	003-083124120015	20500086	The Home Depot Store #2803	3550 124Th Avenue, Nw	Lead; Sulfuric Acid	STOR - C000	Yes
352	003-153124430016	20500092	Epiphany Church	1900 111Th Ave Nw	Fuel Oil	STOR - F000	Yes
353	003-163124340061	20500093	Coon Rapids Ice Center	11000 Crooked Lake Blvd	Ammonia (Anhydrous)	STOR - C000	Yes

Agricultural Chemicals							
PCSI ID	**PID Number**	**Program ID**	**Facility Name**	**Site Address**	**License Type**	**PCS Code - Material Code**	**Location Verified**
354	003-133124220058	20148822	Quality Care Lawn Service	11531 Norway St NW	Fertilizer License	STOR - A050	Yes

Approximate - Parcel not found but location is approximately where that address would exist.

Table C-7

High Capacity Wells within One Mile of the DWSMAs
City of Coon Rapids Part 2 WHPP Amendment

PCSI ID	Unique ID	Status	Permittee	Use	Aquifer	Permitted Volume MGY
1	202926	Active	Coon Rapids, City Of	Municipal/Public Water Supply	St. Lawrence-Eau Claire	3200
2	202929	Active	Coon Rapids, City Of	Municipal/Public Water Supply	St. Lawrence-Mt. Simon	3200
3	202940	Active	Coon Rapids, City Of	Municipal/Public Water Supply	Quaternary Buried Artesian	3200
4	202972	Active	Coon Rapids, City Of	Municipal/Public Water Supply	Tunnel City-Mt. Simon	3200
5	202951	Active	Coon Rapids, City Of	Municipal/Public Water Supply	St. Lawrence-Mt. Simon	3200
6	202937	Active	Coon Rapids, City Of	Municipal/Public Water Supply	Tunnel City	3200
7	202943	Active	Coon Rapids, City Of	Municipal/Public Water Supply	St. Lawrence-Mt. Simon	3200
8	202932	Active	Coon Rapids, City Of	Municipal/Public Water Supply	Tunnel City-Mt. Simon	3200
9	202931	Active	Coon Rapids, City Of	Municipal/Public Water Supply	Tunnel City-Eau Claire	3200
10	202930	Active	Coon Rapids, City Of	Municipal/Public Water Supply	Tunnel City-Mt. Simon	3200
11	202965	Active	Coon Rapids, City Of	Municipal/Public Water Supply	Tunnel City-Mt. Simon	3200
12	168721	Active	Coon Rapids, City Of	Municipal/Public Water Supply	Tunnel City-Mt. Simon	3200
13	168720	Active	Coon Rapids, City Of	Municipal/Public Water Supply	Tunnel City-Mt. Simon	3200
14	110460	Active	Coon Rapids, City Of	Municipal/Public Water Supply	Tunnel City-Mt. Simon	3200
15	110461	Active	Coon Rapids, City Of	Municipal/Public Water Supply	Tunnel City-Mt. Simon	3200
16	161413	Active	Coon Rapids, City Of	Municipal/Public Water Supply	Wonewoc-Eau Claire-Mt. Simon	3200
17	150357	Active	Coon Rapids, City Of	Municipal/Public Water Supply	Quaternary Buried Artesian	3200
18	110469	Active	Coon Rapids, City Of	Municipal/Public Water Supply	Mt. Simon	3200
19	110475	Active	Coon Rapids, City Of	Municipal/Public Water Supply	Quaternary Buried Artesian	3200
20	420956	Active	Coon Rapids, City Of	Municipal/Public Water Supply	Quaternary Buried Artesian	3200
21	474384	Active	Coon Rapids, City Of	Municipal/Public Water Supply	Quaternary Buried Artesian	3200
22	474385	Active	Coon Rapids, City Of	Municipal/Public Water Supply	Quaternary Buried Artesian	3200
23	463020	Active	Coon Rapids, City Of	Municipal/Public Water Supply	Water Table	3200
24	674478	Active	Coon Rapids, City Of	Municipal/Public Water Supply	Tunnel City-Wonewoc	3200
25	674479	Active	Coon Rapids, City Of	Municipal/Public Water Supply	Tunnel City-Wonewoc	3200
42	228438	Active	Champlin, City of	Municipal/Public Water Supply	Tunnel City-Mt. Simon	1131
59	420970	Active	Brooklyn Park, City of - Public Works Dept	Municipal/Public Water Supply	Mt. Simon-Hinckley	3560
121	686058	Active	Pheasant Ridge Townhomes Association	Landscaping/Athletic Field Irrigation	Tunnel City	1.4
133	503723	Active	Reisling Park North Iii	Landscaping/Athletic Field Irrigation	St. Lawrence-Tunnel City	4.1
165	706843	Active	Anoka-Hennepin ISD 11	Landscaping/Athletic Field Irrigation	Tunnel City-Wonewoc	9.2
167	778604	Active	Natureview Vista Association	Landscaping/Athletic Field Irrigation	St. Lawrence-Tunnel City	5
173	473464	Active	Mnscu Anoka-Ramsey Community College	Landscaping/Athletic Field Irrigation	Quaternary Buried Artesian	15
151587	151587	Active	Blaine, City of	Municipal/Public Water Supply	Tunnel City-Eau Claire	3337
191909	191909	Active	Brooklyn Park, City of - Public Works Dept	Landscaping/Athletic Field Irrigation	St. Lawrence-Wonewoc	15
202971	202971	Active	Anoka, City Of	Municipal/Public Water Supply	St. Lawrence-Mt. Simon	1200
208611	208611	Active	Anoka-Hennepin ISD 11	Landscaping/Athletic Field Irrigation	Tunnel City-Eau Claire	16
208615	208615	Active	Blaine, City of	Municipal/Public Water Supply	St. Lawrence-Mt. Simon	3337

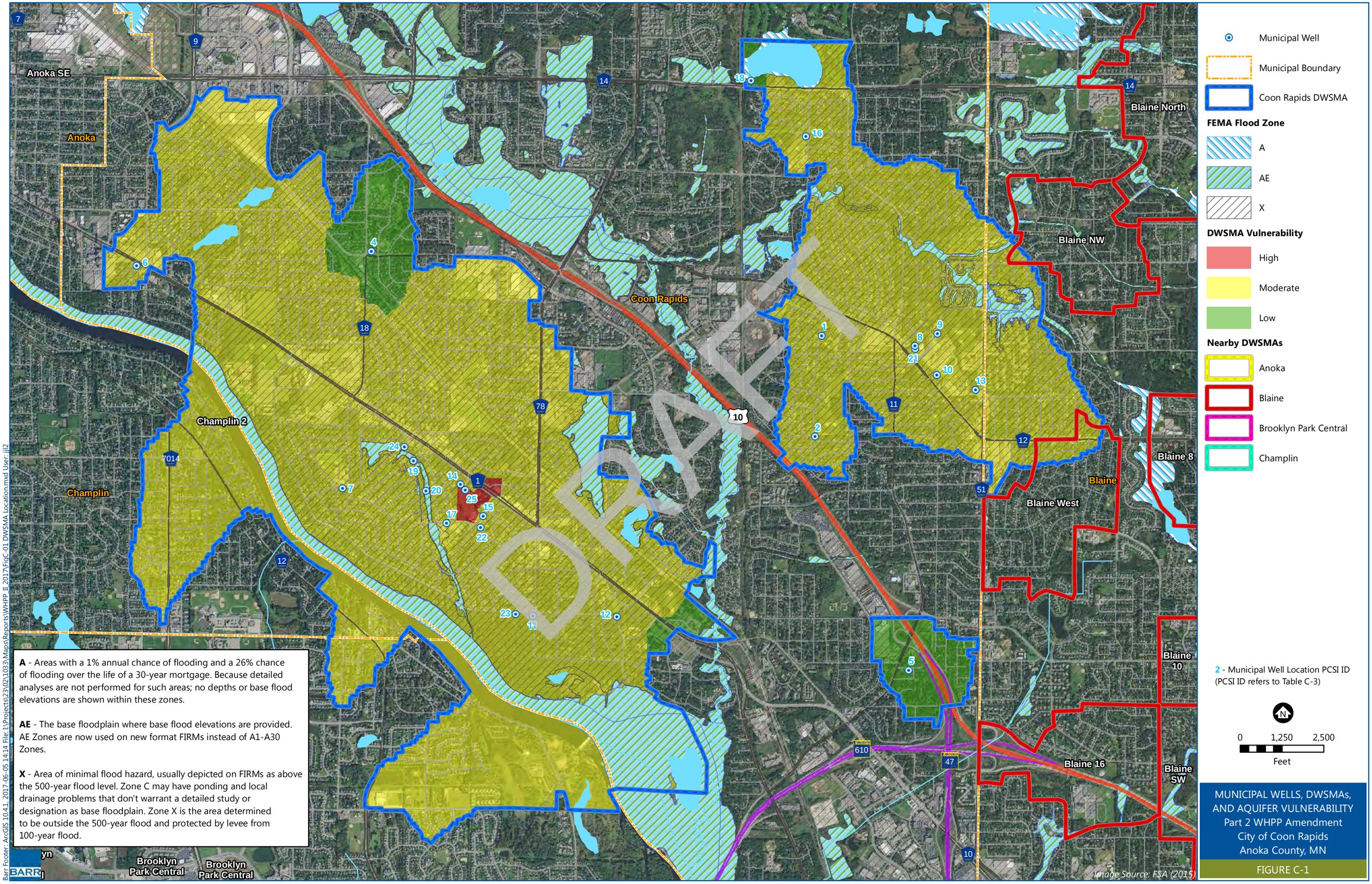
Table C-7

High Capacity Wells within One Mile of the DWSMAs
City of Coon Rapids Part 2 WHPP Amendment

PCSI ID	Unique ID	Status	Permittee	Use	Aquifer	Permitted Volume MGY
208616	208616	Active	Blaine, City of	Municipal/Public Water Supply	Tunnel City-Eau Claire	3337
208628	208628	Active	Blaine, City of	Municipal/Public Water Supply	St. Lawrence-Mt. Simon	3337
208629	208629	Active	Blaine, City of	Municipal/Public Water Supply	Tunnel City-Mt. Simon	3337
208630	208630	Active	Blaine, City of	Municipal/Public Water Supply	Tunnel City-Eau Claire	3337
209305	209305	Active	Federal Cartridge Co	Non-metallic Processing (rubber, plastic, glass, concrete)	Tunnel City-Wonewoc	158.5
209305	209305	Active	Federal Cartridge Co	Other Industrial Processing	Tunnel City-Wonewoc	158.5
209306	209306	Active	Federal Cartridge Co	Non-metallic Processing (rubber, plastic, glass, concrete)	Tunnel City-Wonewoc	158.5
209306	209306	Active	Federal Cartridge Co	Other Industrial Processing	Tunnel City-Wonewoc	158.5
209308	209308	Active	Federal Cartridge Co	Non-metallic Processing (rubber, plastic, glass, concrete)	Tunnel City-Wonewoc	159
209308	209308	Active	Federal Cartridge Co	Other Industrial Processing	Tunnel City-Wonewoc	159
231864	231864	Active	Bunker Hills Golf Club	Golf Course Irrigation	Quaternary Buried Artesian	195
231866	231866	Active	Bunker Hills Golf Club	Golf Course Irrigation	Quaternary Buried Artesian	195
431681	431681	Active	Anoka County Parks And Recreation	Basin (Lake) Level Maintenance	Tunnel City-Wonewoc	7
431681	431681	Active	Anoka County Parks And Recreation	Other Water Level Maintenance	Tunnel City-Wonewoc	7
462964	462964	Active	Anoka-Hennepin ISD 11	Landscaping/Athletic Field Irrigation	Water Table	6
462967	462967	Active	Anoka-Hennepin ISD 11	Landscaping/Athletic Field Irrigation	Quaternary Buried Unconfined	20
482893	482893	Active	Champlin, City of	Landscaping/Athletic Field Irrigation	Tunnel City-Wonewoc	24
500696	500696	Active	Bunker Hills Golf Club	Golf Course Irrigation	Quaternary Buried Artesian	195
503670	503670	Active	Pheasant Ridge Townhomes Association	Landscaping/Athletic Field Irrigation	Tunnel City	1.4
674482	674482	Active	Brooklyn Park, City of - Public Works Dept	Landscaping/Athletic Field Irrigation	Tunnel City-Wonewoc	22.8
676414	676414	Active	Anoka-Hennepin ISD 11	Landscaping/Athletic Field Irrigation	Tunnel City-Wonewoc	23
676448	676448	Active	Anoka-Hennepin ISD 11	Landscaping/Athletic Field Irrigation	Tunnel City-Wonewoc	9
711531	711531	Active	Realife Cooperative of Coon Rapids	Landscaping/Athletic Field Irrigation	Quaternary Buried Artesian	3
768685	768685	Active	Saint Therese At Oxbow Lake Inc	Landscaping/Athletic Field Irrigation	Quaternary Buried Artesian	5
NA1	Not Available	Active	Centerpoint Energy	Construction Dewatering	Not Available	13

Figures

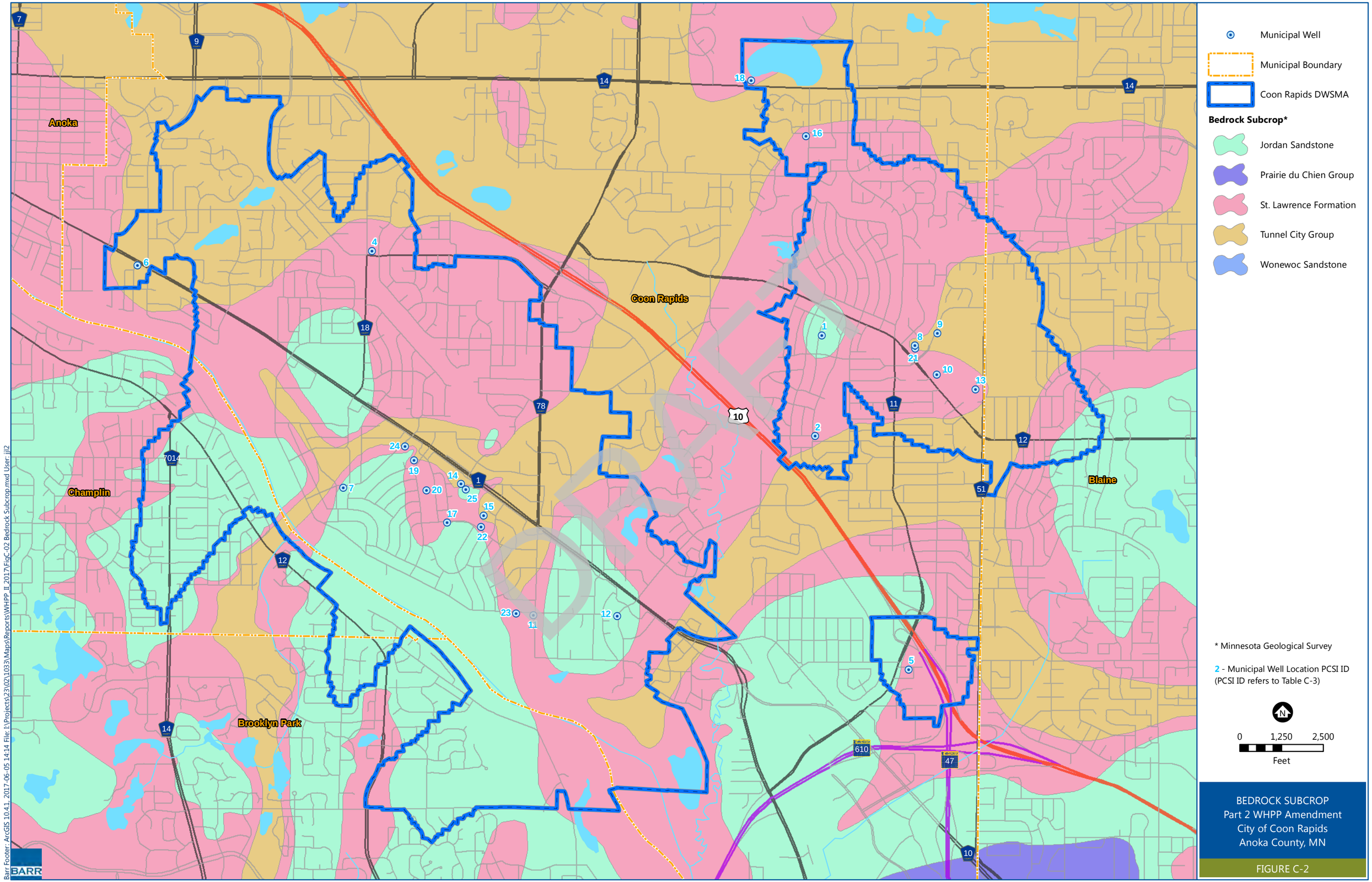
DRAFT

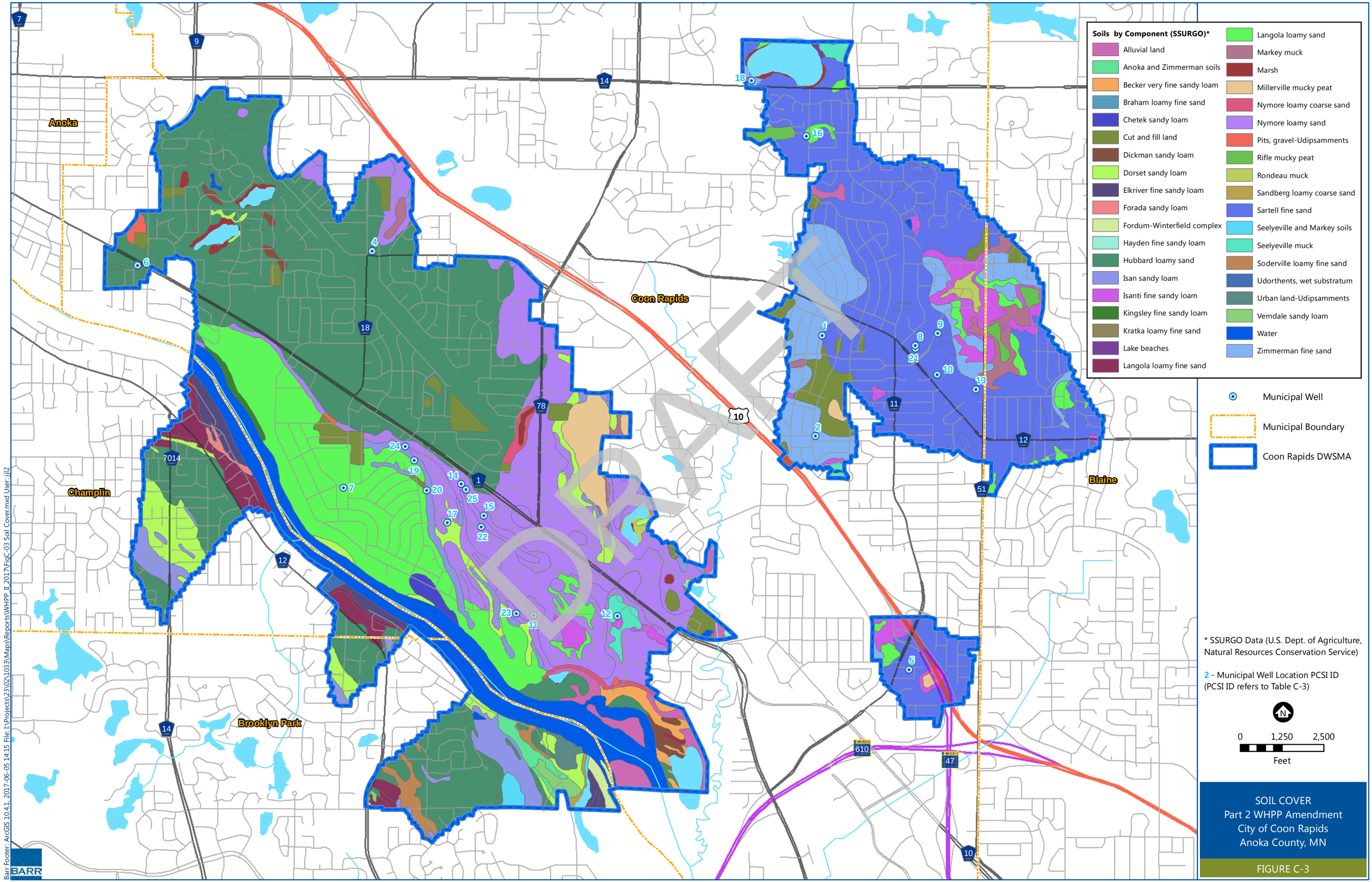


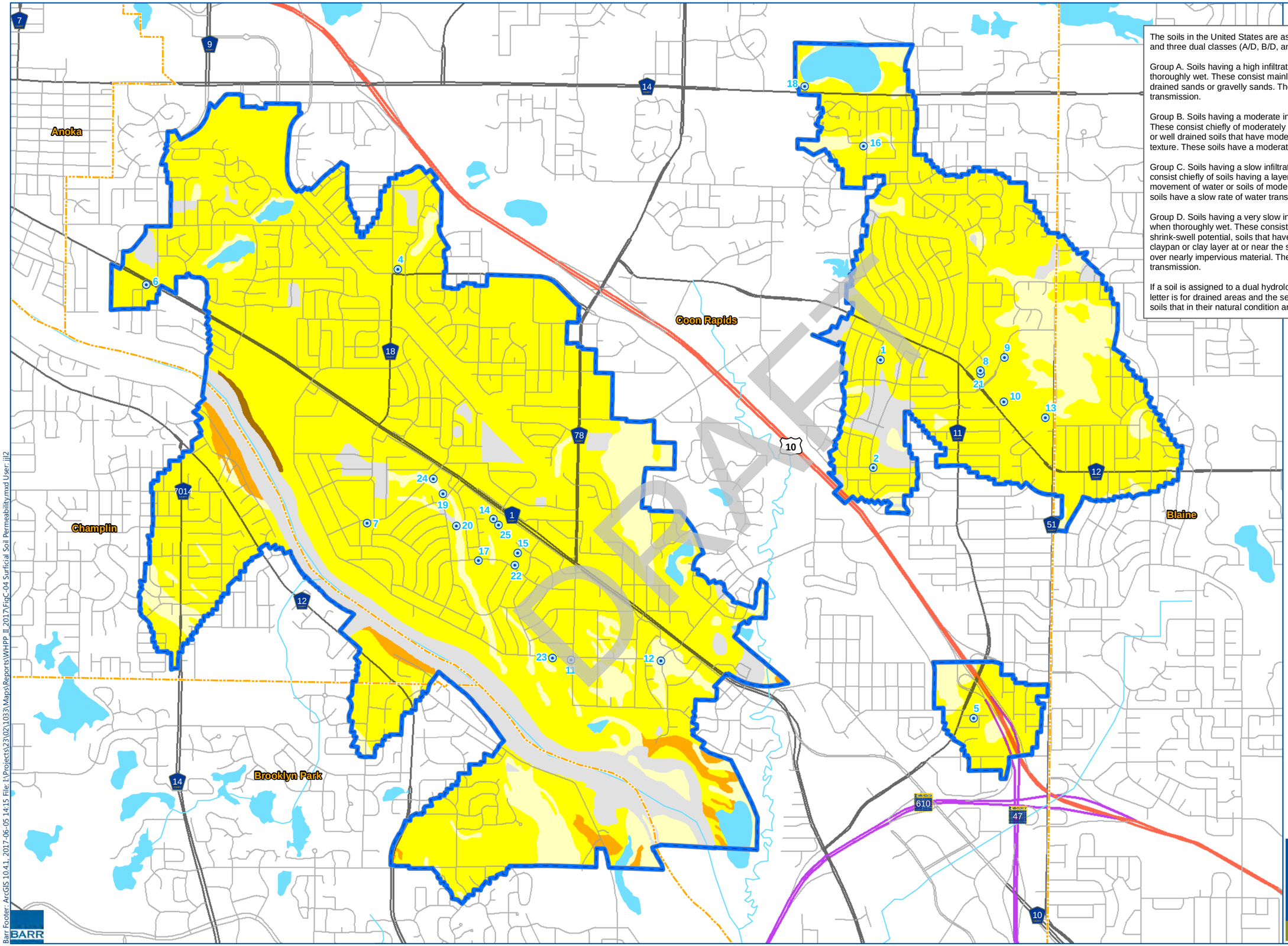
MUNICIPAL WELLS, DWSMAs, AND AQUIFER VULNERABILITY
Part 2 WHPP Amendment
City of Coon Rapids
Anoka County, MN

FIGURE C-1

Barr Footer: ArcGIS 10.4.1, 2017-06-05 14:14 File: I:\Projects\23\02\1033\Maps\Reports\WHPP_II_2017\FigC-01 DWSMA Location.mxd User: jjl2


Municipal Well
Municipal Boundary
Coon Rapids DWSMA
Bedrock Subcrop*
Jordan Sandstone
Prairie du Chien Group
St. Lawrence Formation
Tunnel City Group
Wonewoc Sandstone
Anoka
Coon Rapids
Champlin
Brooklyn Park
Blaine
* Minnesota Geological Survey
2 - Municipal Well Location PCSI ID
(PCSI ID refers to Table C-3)
0
1,250
2,500
Feet
BEDROCK SUBCROP
Part 2 WHPP Amendment
City of Coon Rapids
Anoka County, MN
FIGURE C-2
BARR
Barr Footer: ArcGIS 10.4.1, 2017-06-05 14:14 File: I:\Projects\23\02\1033\Maps\Reports\WHPP_II_2017\FigC-02 Bedrock Subcrop.mxd User: jjl2


Soils by Component (SSURGO)*
Alluvial land
Anoka and Zimmerman soils
Becker very fine sandy loam
Braham loamy fine sand
Chetek sandy loam
Cut and fill land
Dickman sandy loam
Dorset sandy loam
Elkriver fine sandy loam
Forada sandy loam
Fordum-Winterfield complex
Hayden fine sandy loam
Hubbard loamy sand
Isan sandy loam
Isanti fine sandy loam
Kingsley fine sandy loam
Kratka loamy fine sand
Lake beaches
Langola loamy fine sand
Langola loamy sand
Markey muck
Marsh
Millerville mucky peat
Nymore loamy coarse sand
Nymore loamy sand
Pits, gravel-Udipsamments
Rifle mucky peat
Rondeau muck
Sandberg loamy coarse sand
Sartell fine sand
Seelyeville and Markey soils
Seelyeville muck
Soderville loamy fine sand
Udorthents, wet substratum
Urban land-Udipsamments
Verndale sandy loam
Water
Zimmerman fine sand
Municipal Well
Municipal Boundary
Coon Rapids DWSMA
Anoka
Coon Rapids
Champlin
Brooklyn Park
Blaine
DRAFT
* SSURGO Data (U.S. Dept. of Agriculture, Natural Resources Conservation Service)
2 - Municipal Well Location PCSI ID (PCSI ID refers to Table C-3)
N
0 1,250 2,500
Feet
SOIL COVER
Part 2 WHPP Amendment
City of Coon Rapids
Anoka County, MN
FIGURE C-3
BARR
Barr Footer: ArcGIS 10.4.1, 2017-06-05 14:15 File: I:\Projects\23\02\1033\Maps\Reports\WHPP_II_2017\FigC-03 Soil Cover.mxd User: jjl2



The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

Municipal Well

Municipal Boundary

Coon Rapids DWSMA

Soil Permeability Classification*

Not rated or not available

A

A/D

B

B/D

C

C/D

* SSURGO Data (U.S. Dept. of Agriculture, Natural Resources Conservation Service)

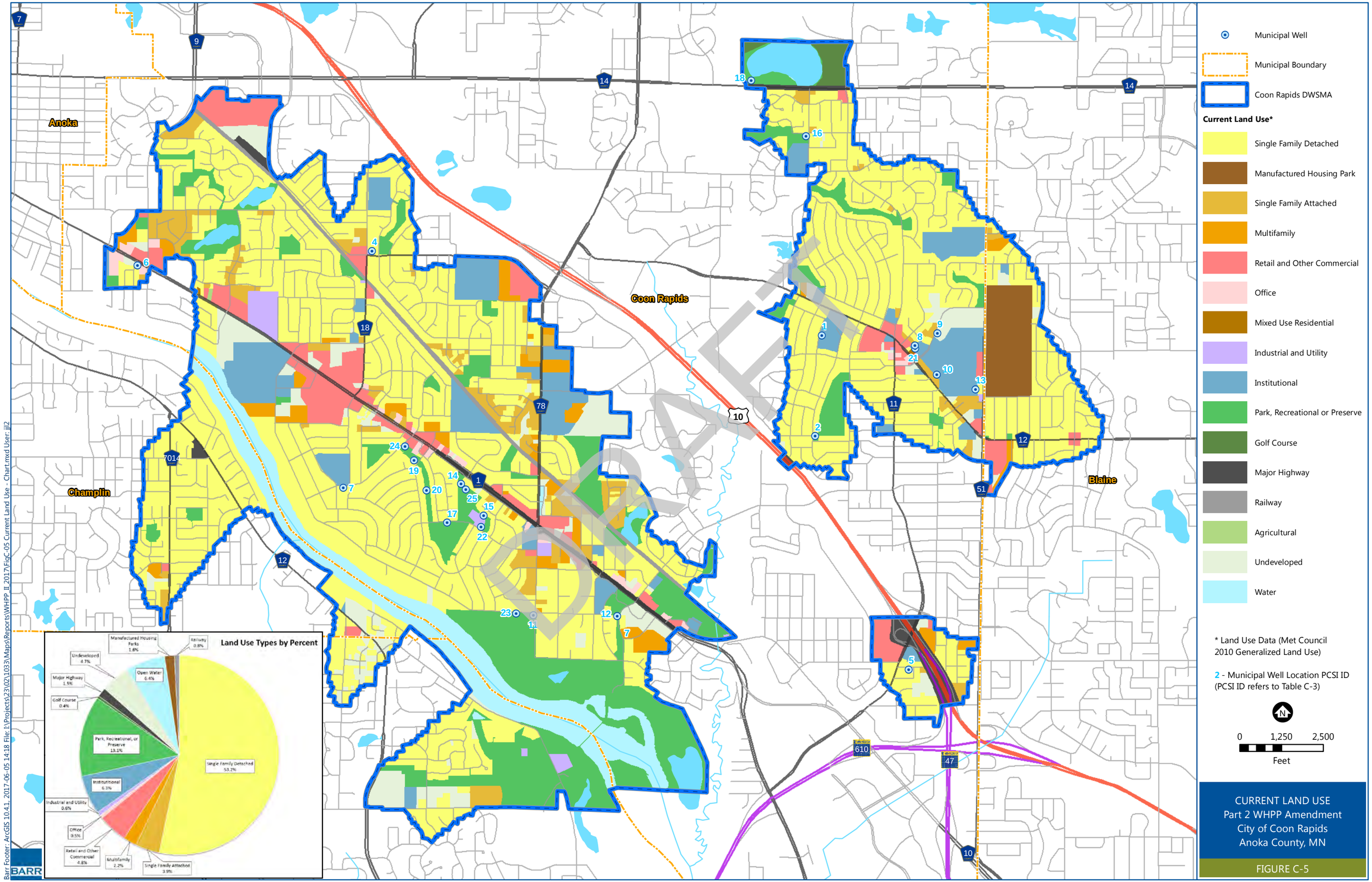
2 - Municipal Well Location PCSI ID (PCSI ID refers to Table C-3)

0 1,250 2,500
Feet

SURFICIAL SOIL PERMEABILITY
Part 2 WHPP Amendment
City of Coon Rapids
Anoka County, MN

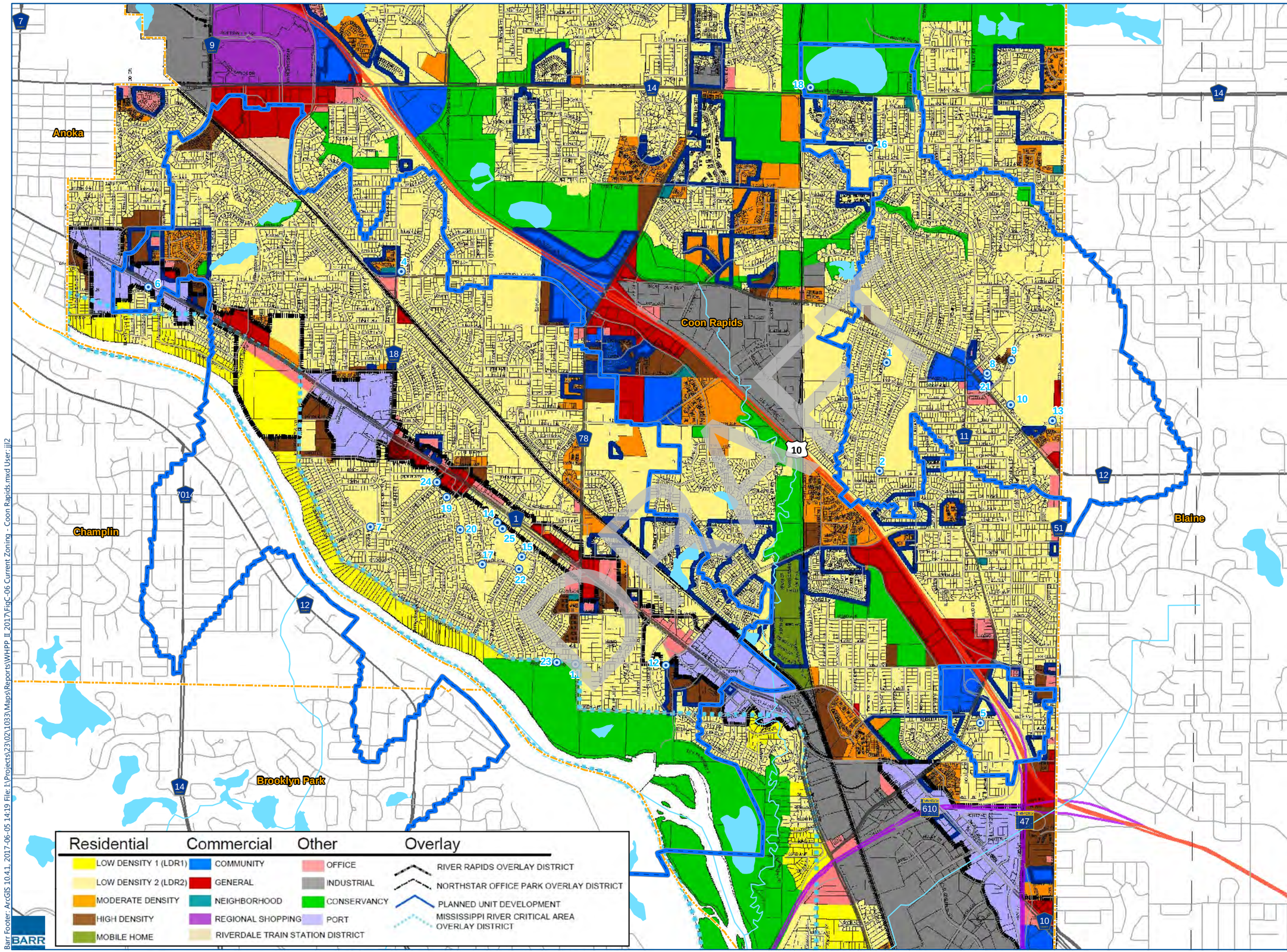
FIGURE C-4

Barr Footer: ArcGIS 10.4.1, 2017-06-05 14:15 File: I:\Projects\23\02\1033\Maps\Reports\WHPP_II_2017\FigC-04 Surficial Soil Permeability.mxd User: jjl2



CURRENT LAND USE
Part 2 WHPP Amendment
City of Coon Rapids
Anoka County, MN

FIGURE C-5



Municipal Well

Municipal Boundary

Coon Rapids DWSMA

* Zoning Data (City of Coon Rapids)

2 - Municipal Well Location PCSI ID (PCSI ID refers to Table C-3)

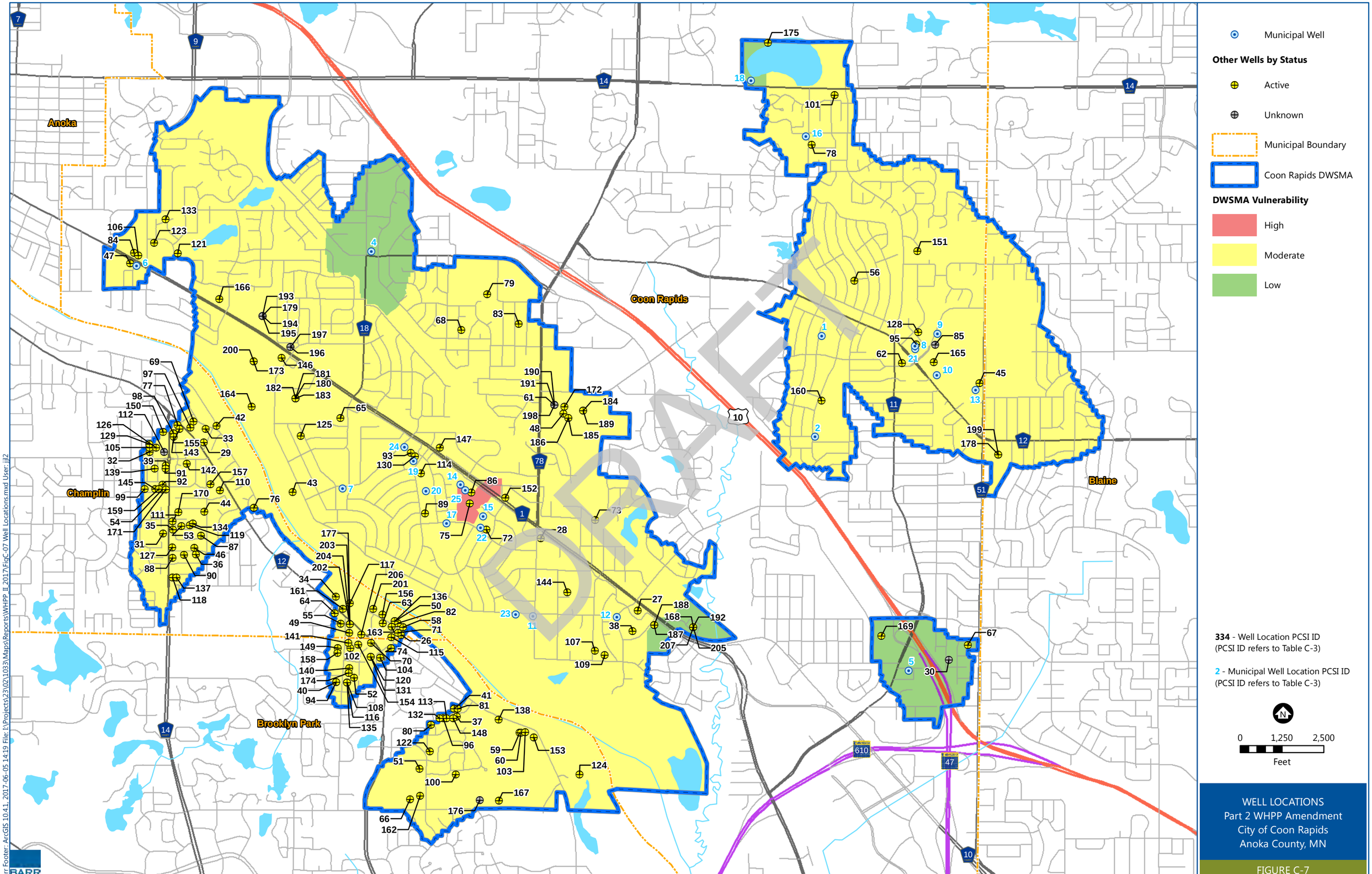
N

0 1,250 2,500

Feet

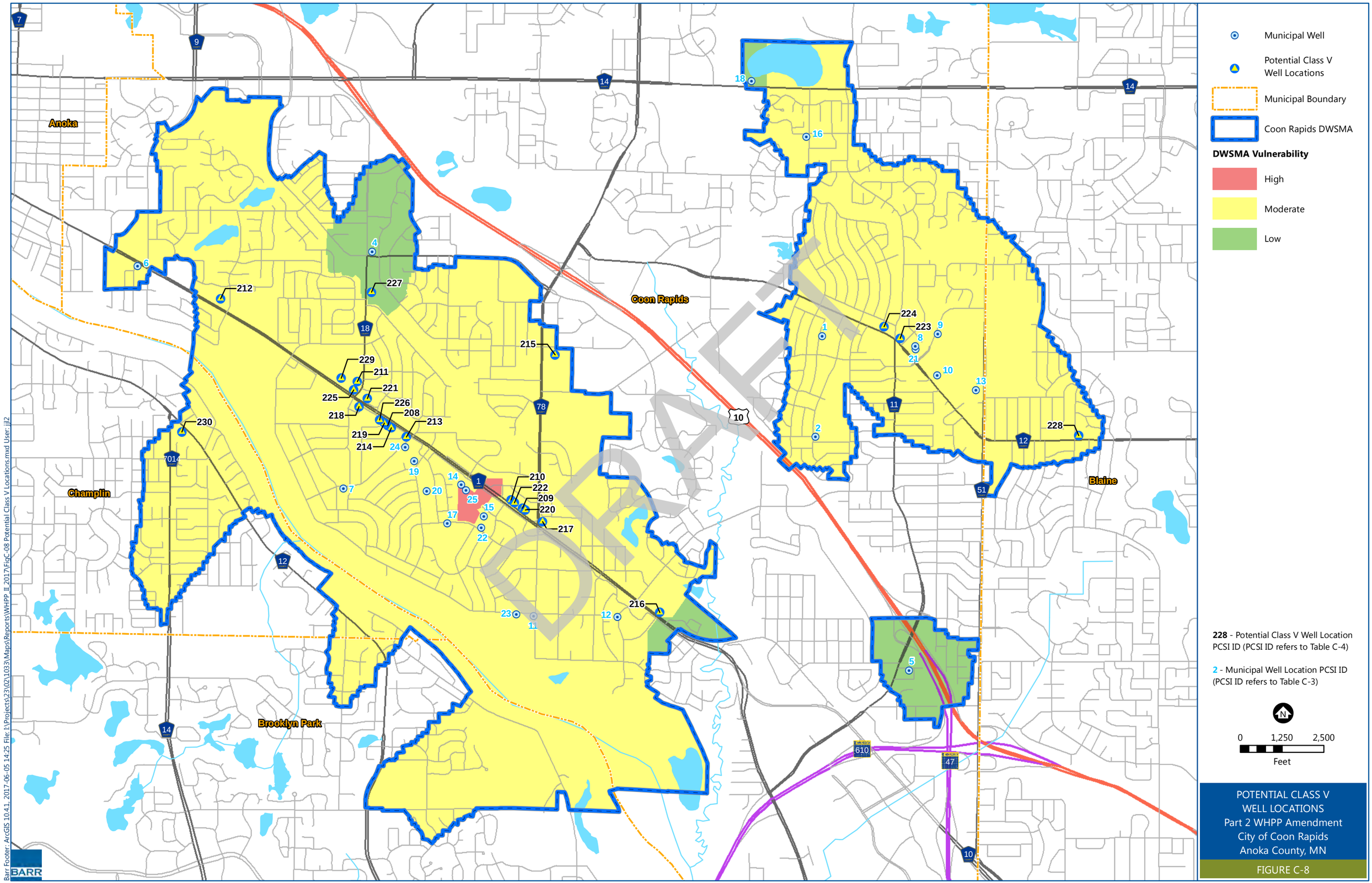
CURRENT ZONING
COON RAPIDS
Part 2 WHPP Amendment
City of Coon Rapids
Anoka County, MN

FIGURE C-6



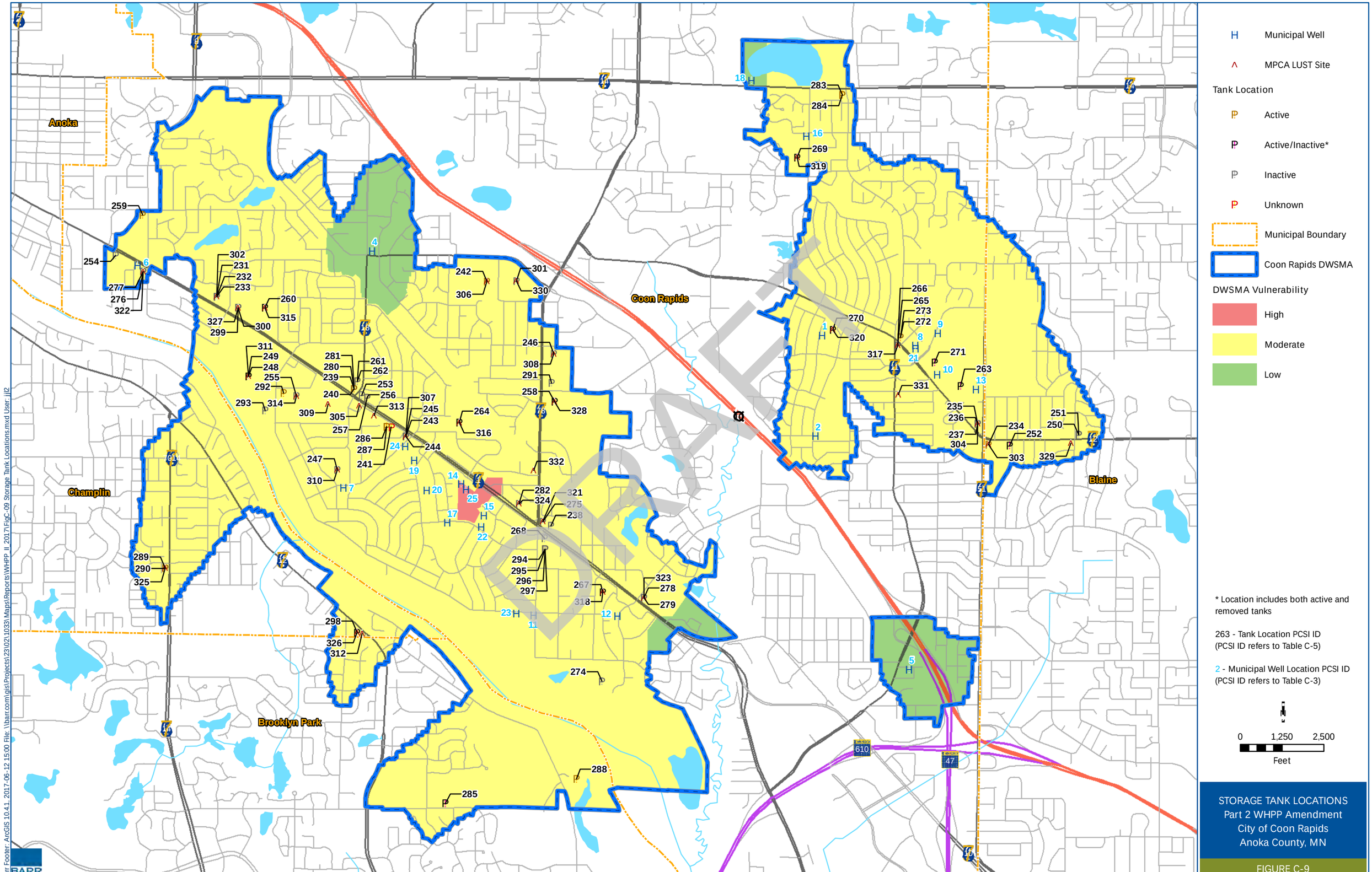
WELL LOCATIONS
Part 2 WHPP Amendment
City of Coon Rapids
Anoka County, MN

FIGURE C-7

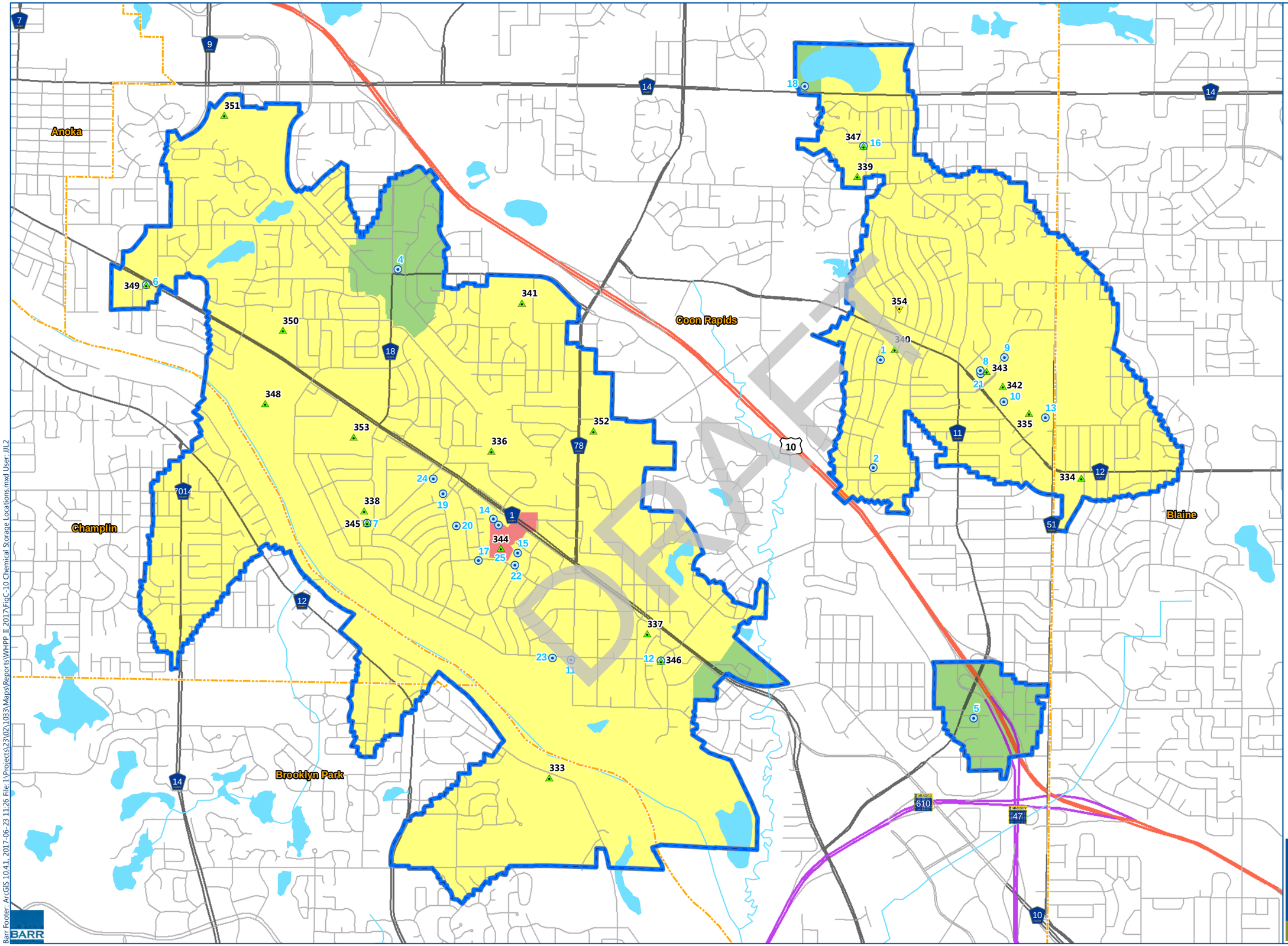


POTENTIAL CLASS V WELL LOCATIONS
Part 2 WHPP Amendment
City of Coon Rapids
Anoka County, MN

FIGURE C-8



Barr Footer: ArcGIS 10.4.1, 2017-06-12 15:00 File: \\barr.com\gis\Projects\23\02\1033\Maps\Reports\WHPP_II_2017\FigC-09 Storage Tank Locations.mxd User: jjl2



Municipal Well

Chemical Storage Location

Agricultural Chemical Storage Location

Municipal Boundary

Coon Rapids DWSMA

DWSMA Vulnerability

High

Moderate

Low

334 - Chemical Storage Location PCSI ID (PCSI ID refers to Table C-6)

2 - Municipal Well Location PCSI ID (PCSI ID refers to Table C-3)

N

0 1,250 2,500

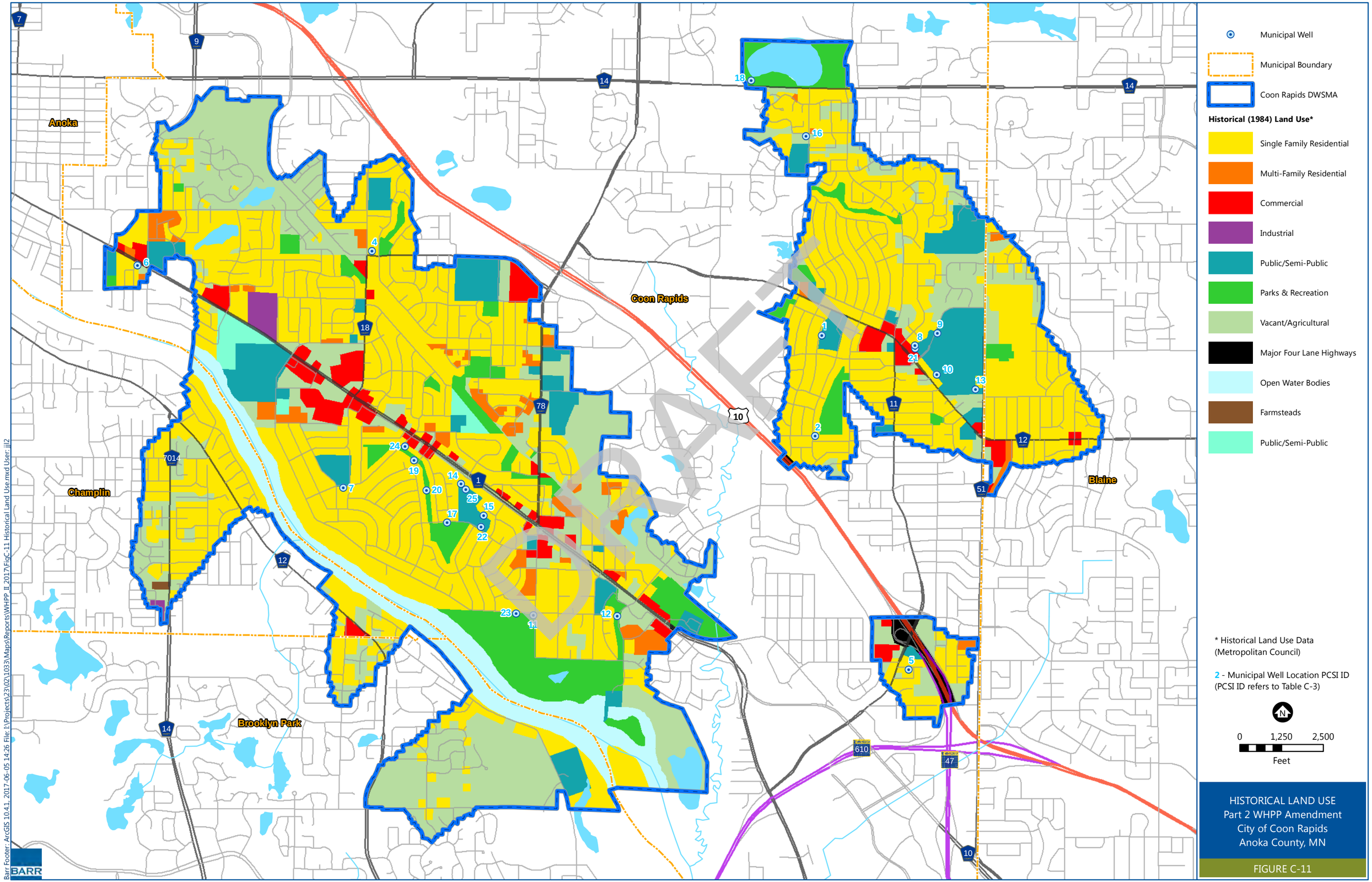
Feet

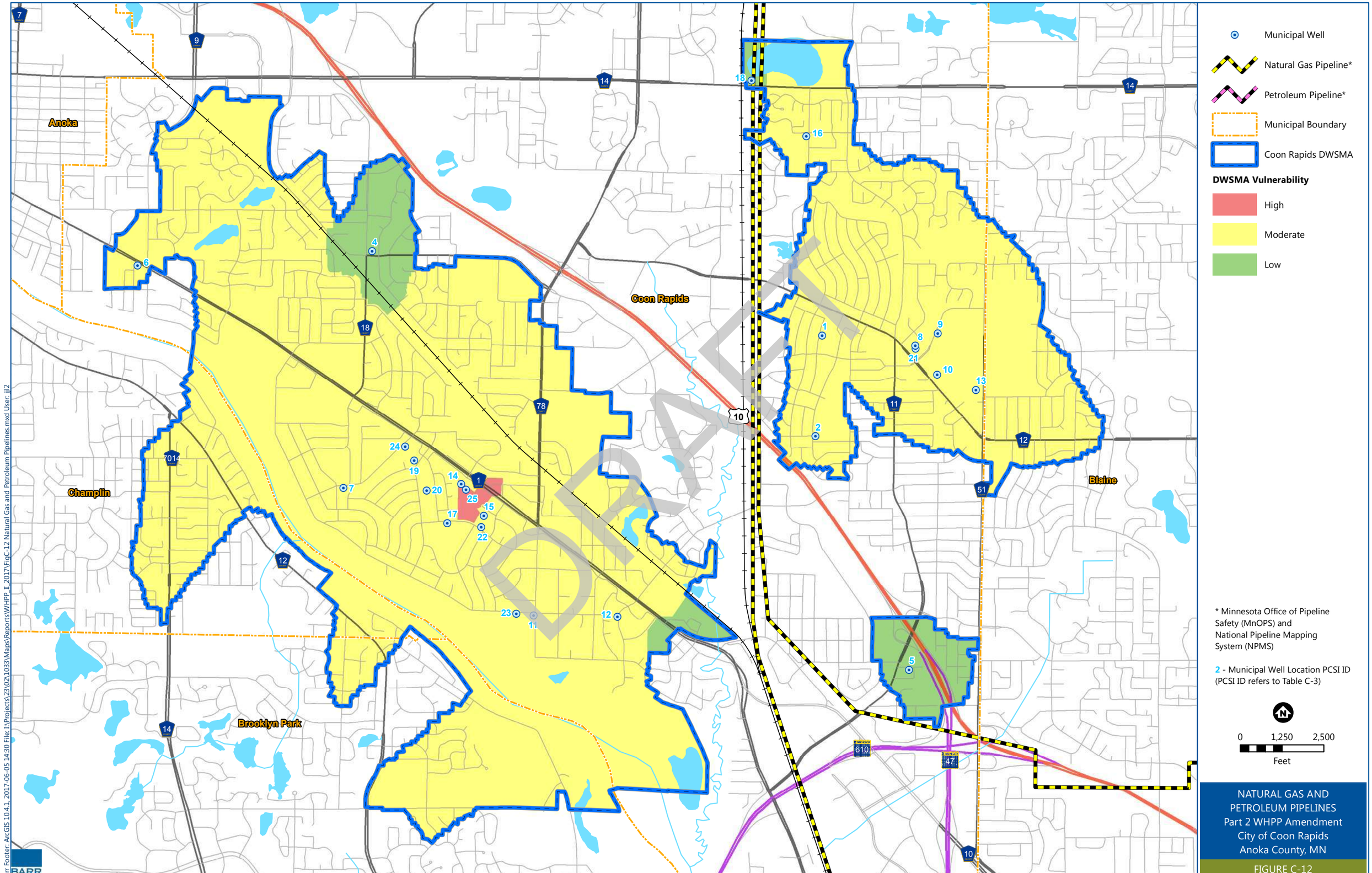
CHEMICAL STORAGE LOCATIONS
Part 2 WHPP Amendment
City of Coon Rapids
Anoka County, MN

FIGURE C-10

BARR

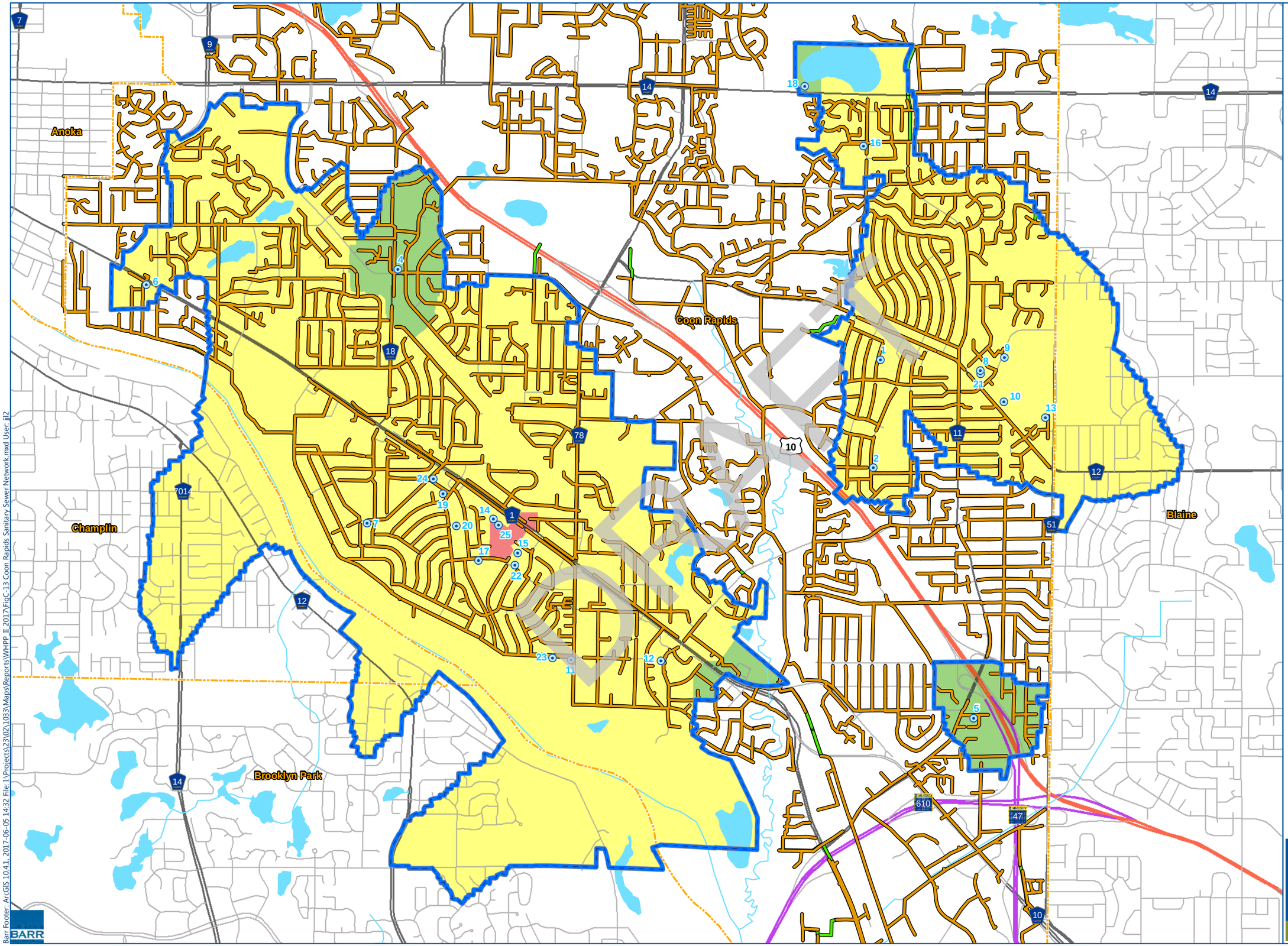
Barr Footer: ArcGIS 10.4.1, 2017-06-23 11:26 File: I:\Projects\23\02\1033\Maps\Reports\WHPP_II_2017\FigC-10 Chemical Storage Locations.mxd User: JJL2


Municipal Well
Municipal Boundary
Coon Rapids DWSMA
Historical (1984) Land Use*
Single Family Residential
Multi-Family Residential
Commercial
Industrial
Public/Semi-Public
Parks & Recreation
Vacant/Agricultural
Major Four Lane Highways
Open Water Bodies
Farmsteads
Public/Semi-Public
* Historical Land Use Data (Metropolitan Council)
2 - Municipal Well Location PCSI ID (PCSI ID refers to Table C-3)
0
1,250
2,500
Feet
Anoka
Coon Rapids
Champlin
Brooklyn Park
Blaine
DRAFT
HISTORICAL LAND USE
Part 2 WHPP Amendment
City of Coon Rapids
Anoka County, MN
FIGURE C-11
BARR
Barr Footer: ArcGIS 10.4.1, 2017-06-05 14:26 File: I:\Projects\23\02\1033\Maps\Reports\WHPP_II_2017\FigC-11 Historical Land Use.mxd User: jjl2



NATURAL GAS AND PETROLEUM PIPELINES
Part 2 WHPP Amendment
City of Coon Rapids
Anoka County, MN

FIGURE C-12



Municipal Well

Municipal Boundary

Coon Rapids DWSMA

Sanitary Sewer Pipes*

Gravity Main

Pressurized Main

DWSMA Vulnerability

High

Moderate

Low

* Sewer Data (City of Coon Rapids)

2 - Municipal Well Location PCSI ID (PCSI ID refers to Table C-3)

0 1,250 2,500

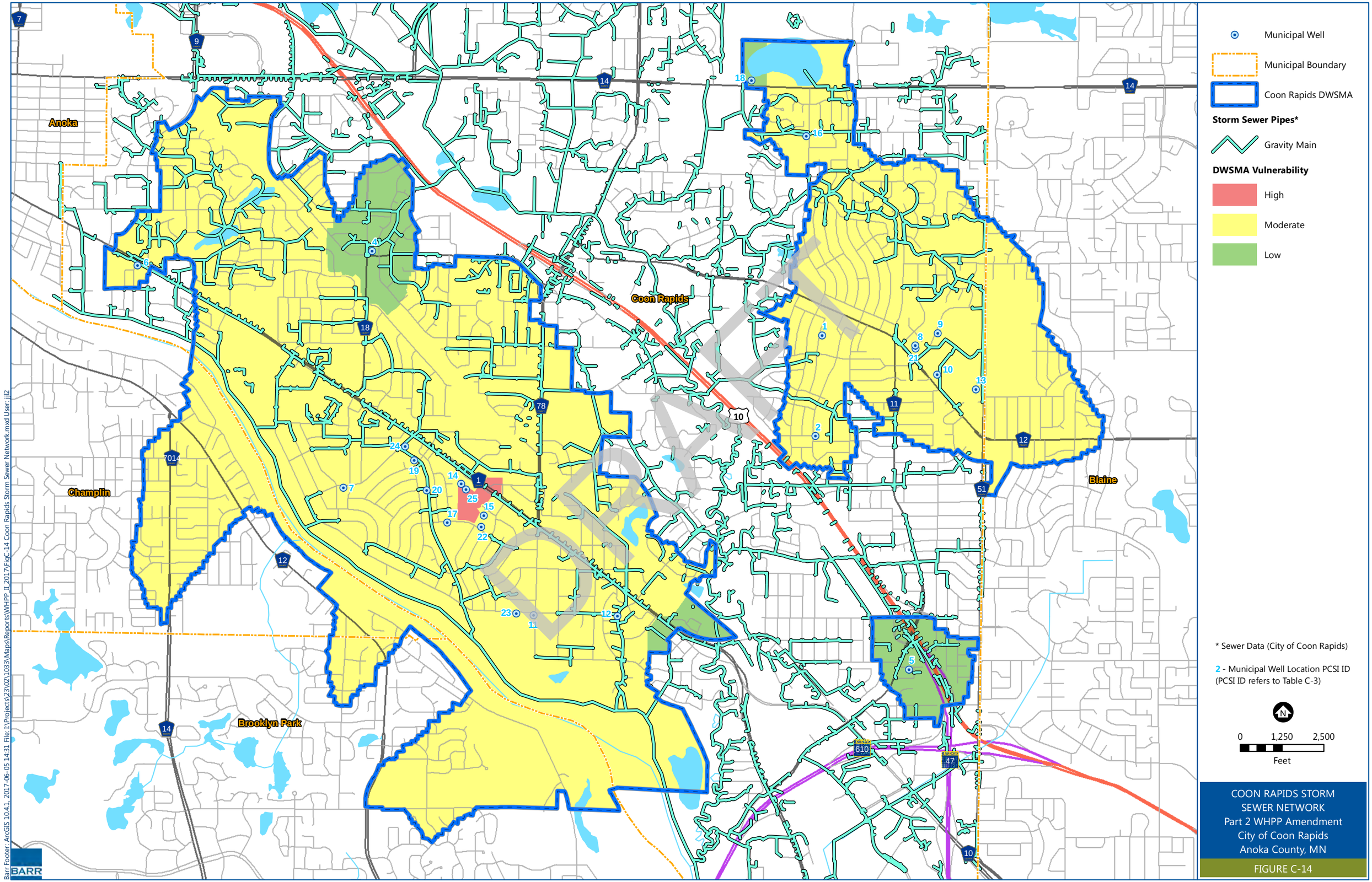
Feet

COON RAPIDS SANITARY SEWER NETWORK
Part 2 WHPP Amendment
City of Coon Rapids
Anoka County, MN

FIGURE C-13

Barr Footer: ArcGIS 10.4.1, 2017-06-05 14:32 File: I:\Projects\23\02\1033\Maps\Reports\WHPP_II_2017\FigC-13 Coon Rapids Sanitary Sewer Network.mxd User: jjl2

BARR



COON RAPIDS STORM SEWER NETWORK
Part 2 WHPP Amendment
City of Coon Rapids
Anoka County, MN

FIGURE C-14

Barr Footer: ArcGIS 10.4.1, 2017-06-05 14:31 File: I:\Projects\23\02\103\Maps\Reports\WHPP_II_2017\FigC-14 Coon Rapids Storm Sewer Network.mxd User: jjl2

Attachment C-1

Precipitation Data

DRAFT

Minnesota Climatology Working Group

State Climatology Office - DNR Division of Ecological and Water Resources University of Minnesota

Annual Reports of Monthly Precipitation Totals

This application creates annual summaries of precipitation data gathered by volunteer-based observation networks throughout Minnesota. The data presented are monthly totals and the data are grouped by county. Observer locations are described using township, range, and section numbers.

Choose a county and year, then click on **"Annual report"**.

ANOKA 2012 Annual report

2012 ANOKA Monthly Precipitation, Totals

cc	ttt	rr	ss	oooooooo	nnnn	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	AGR	HYD	ANN	GRO
2	30N	24W	3	RUSCHY D	DNR	.51	1.68	1.31	2.50	9.64	4.20	5.70	1.12	.51	1.45	1.09	1.34	29.07	28.70	31.05	21.17
2	30N	24W	14		SWCD	.35	2.08	1.55	2.89	10.52	4.38	5.45	1.02	.53	1.81	1.03	1.69	30.40	30.57	33.30	21.90
2	30N	24W	14		BYRG			1.53	2.87	10.90	4.59	5.86	1.21	.62	1.74	.95	1.76				23.18
2	30N	24W	25	RANTA SC	MOSQ				3.05	10.18	4.01	5.03	.95		1.07						
2	31N	22W	29	LINO LAK	MOSQ				2.06	10.43	3.27	4.48	.77	.59	1.42						19.54
2	31N	23W	21	BLAINE	MOSQ				2.37	10.05	3.59	5.20	1.11	.58	1.52						20.53
2	31N	23W	22		BYRG			1.45	2.41	10.20				.50	1.58	1.41	2.51				
2	31N	24W	7	LUBERDA	MOSQ				2.93	10.46	3.68	5.15	1.06	.54	2.89						20.89
2	31N	24W	12		SWCD				2.78	10.43											
2	31N	24W	24	MADETZKE	MOSQ						2.62	4.07	1.02	.55	1.33						
2	32N	22W	14		BYRG	.64	1.08	1.81	2.75	10.28	3.28	5.55	1.29	.58	1.74	.62	1.39	29.37	29.23	31.01	20.98
2	32N	23W	16	JOHNSONB	MOSQ				2.53	9.96	2.88	5.38	.92	.74	1.76						19.88
2	32N	23W	18		SWCD				2.60	10.24	2.54	5.63	3.75	.58	1.44	.90					22.74
2	32N	23W	20		SWCD			1.16	2.37	11.35	2.99	6.95	1.11	.68	1.73	*					23.08
2	32N	23W	21	KIRKMANM	MOSQ				2.56	10.45	2.51	5.78	.83	.62	1.53						20.19
2	32N	24W	4	SPEISER	MOSQ				2.02	12.53	3.12	5.75	.77	.53	.62						22.70
2	32N	24W	23	ANDOVER	NWS	.45	1.61	1.42	2.56	11.03	1.94	4.85	.88	.63	2.70		1.82				19.33
2	32N	24W	26		SWCD	.64	1.57	1.52	2.34	10.68	3.26	5.57	.77	.53	2.41	.89	1.57	28.57	28.41	31.75	20.81
2	32N	24W	35	ANOKA	MOSQ				2.40	9.08	2.88	4.12	.86	.55	1.59						17.49
2	32N	25W	6		SWCD				2.00	11.57	4.38	5.42	1.08	.94	1.03	.88					23.39
2	32N	25W	21	SHEFVELA	MOSQ				2.31	9.91	4.06	4.80	.20								
2	33N	22W	7		SWCD			*	2.13	9.46	2.73	4.04	1.10	.28	1.55						17.61
2	33N	23W	4	EAST BET	MOSQ				2.25	12.46	4.16	6.42	1.05	.40	2.61						24.49
2	33N	23W	18		SWCD			1.44	2.43	12.92	3.21	6.44	1.18	.49	2.39						24.24
2	33N	23W	25		SWCD	.38	1.80	1.29	2.49	10.86	2.84	4.54	1.58	.40	1.85	.91	1.76	27.93	27.66	30.70	20.22
2	33N	23W	35		SWCD				2.50	10.83											
2	33N	24W	16		SWCD				2.04	12.33	3.39	4.68	1.10	.38	.89						21.88
2	33N	24W	32		SWCD	.39	1.74	1.04	2.39	12.45	2.80	5.27	1.02	.37	2.46	.95	1.48	29.24	29.12	32.36	21.91
2	33N	24W	32		SWCD	.14		.93	1.93	9.95	4.03	5.55	1.07	.57							21.17
2	33N	25W	36		SWCD	.60			1.97	12.97	3.03	4.66	.33	.46							21.45
2	33N	25W	36		SWCD				2.41	12.31	2.90	2.99	.93	.51	1.31						19.64
2	34N	22W	27		SWCD			1.32	2.48	11.59	3.10	5.09	1.23	.49	2.11						21.50
2	34N	23W	36		BYRG	.92	1.44	1.44	2.11	13.22	2.47	7.15	1.05	.37	2.12	.85	1.69	31.68	31.52	34.83	24.26

2	34N 24W 32	ST FRANC NWS	.62	1.71	1.15	2.36	15.79	3.65	8.34	1.01	.26	1.48	.65	2.00			39.02	29.05
2	34N 24W 32	STFRANHS MOSQ				2.12	12.98	3.80	5.66	1.18	.36	1.08						23.98
county averages			.51	1.63	1.36	2.41	11.18	3.32	5.36	1.08	.52	1.71	.93	1.73	29.47	29.32	33.00	21.70
# of obs			11	9	15	34	34	32	32	32	31	30	12	11	7	7	8	29

- Data as received and digitized on or before 5/18/2017. **All values are in inches**.
- 'cc ttt rr ss' is county-township-range-section number, 'ooooooo' is community name (where applicable), 'nnnn' is network type.
- 'AGR', 'HYD', and 'ANN' are 12 month precipitation totals starting in Sep 2011, Oct 2011, and Jan 2012, respectively. 'GRO' is growing season (May 2012 thru Sep 2012) precipitation total.
- '*' denotes a partial monthly record, 'e' denotes that value is wholly or partially estimated.
- Prepared by: State Climatology Office - DNR Waters, phone: 651-296-4214, web: http://climate.umn.edu

For some purposes, **daily** precipitation data are required. The precipitation data archive allows a user to interactively retrieve daily precipitation data from the site nearest to a target.

Obtaining Data for Legal Purposes

Last modified: April 10, 2008

Minnesota Climatology Working Group

State Climatology Office - DNR Division of Ecological and Water Resources University of Minnesota

Annual Reports of Monthly Precipitation Totals

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Choose a county and year, then click on **"Annual report"**.

ANOKA 2013 Annual report

2013 ANOKA Monthly Precipitation, Totals

cc	ttt	rr	ss	oooooooo	nnnn	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	AGR	HYD	ANN	GRO
2	30N	24W	3	RUSCHY D	DNR	.66	1.05	2.18	4.28	4.31	7.66	3.68	.80	1.34	4.41	.75	1.41	29.01	29.84	32.53	17.79
2	30N	24W	14		SWCD	.69	1.20	2.03	4.40	4.67	7.46	3.55	1.00	1.20	3.91	.53	1.63	30.06	30.73	32.27	17.88
2	30N	24W	14		BYRG	.69	1.12	2.03	3.78	5.00	7.43	3.61	1.05	1.33	4.06	.44	1.60	29.78	30.49	32.14	18.42
2	30N	24W	25	RANTA SC	MOSQ				2.44	5.85	7.50	2.83	1.05	1.34	4.05						18.57
2	31N	22W	29	LINO LAK	MOSQ				1.65	4.60	6.46	2.47	.62	1.63	4.42						15.78
2	31N	23W	21	BLAINE	MOSQ				3.54	5.08	4.90	3.24	.98	1.46	4.35						15.66
2	31N	23W	22		BYRG	1.18	1.50	2.30	4.13	4.70	5.30										
2	31N	24W	7	LUBERDA	MOSQ				2.94	4.00	5.65	4.12	.77	1.70	4.24						16.24
2	31N	24W	24	MADETZKE	MOSQ				3.11	4.41	5.97	3.49	.91	1.45	4.77						16.23
2	32N	22W	14		BYRG	.51	1.16	2.11	4.37	3.36	5.87	3.86	.51	1.39	3.57	.59	1.63	26.08	26.89	28.93	14.99
2	32N	23W	16	JOHNSONB	MOSQ				3.16	4.95	5.51	3.27	.67	1.66	3.62						16.06
2	32N	23W	18		SWCD			1.11	3.04	4.92	4.98	2.89	1.03	1.48	4.40						15.30
2	32N	23W	20		SWCD				5.70	4.95	5.06	3.63	1.16	1.94	4.41	.63					16.74
2	32N	23W	21	KIRKMANM	MOSQ					4.51	5.46	3.15	1.02	1.59	3.45						15.73
2	32N	24W	4	SPEISER	MOSQ				1.60	4.18	3.75	3.11	.37	2.04	4.70						13.45
2	32N	24W	23	ANDOVER	NWS	.93	1.28	1.75	3.20	3.54	4.27	2.29	.55	2.75	1.96	.38	1.96			24.86	13.40
2	32N	24W	26		SWCD	.70	1.14	2.17	3.16	4.29	5.11	2.77	1.04	1.53	3.82	.66	1.77	25.78	26.78	28.16	14.74
2	32N	24W	35	ANOKA	MOSQ				2.94	4.62	2.99	2.72	.72	1.54	3.63						12.59
2	32N	25W	6		SWCD				2.58	4.30	5.95	4.89	.65	2.62	4.25	.94					18.41
2	33N	22W	7		SWCD				2.46	4.93	4.66	1.96	.97	1.79	2.51						14.31
2	33N	23W	4	EAST BET	MOSQ				3.42	4.05	5.24	3.48	.51	2.52	3.52						15.80
2	33N	23W	18		SWCD				3.31	4.51	5.11	2.92	1.00	2.43	3.79						15.97
2	33N	23W	25		SWCD	.69	.72	1.93	2.39	4.10	4.57	3.50	.57	1.74	3.12	.70	1.31	23.39	24.73	25.34	14.48
2	33N	23W	35		SWCD				3.01	4.02	4.47	2.94	.89	1.64	3.40						13.96
2	33N	24W	16		SWCD				1.90	4.69	5.35	3.77	.56	2.35	3.43						16.72
2	33N	24W	32		SWCD	.62	1.29	2.55	4.32	3.40	6.18	3.65	.61	1.65	3.48	.75	2.40	27.88	29.16	30.90	15.49
2	33N	24W	32		SWCD		1.37	3.50	2.24	3.13	6.12	2.31	.35	1.12	1.70	.61	2.06				13.03
2	33N	25W	36		SWCD				2.71	4.59	5.42	4.19	1.06	1.86	3.73	.92					17.12
2	34N	23W	36		BYRG	.29	1.25	2.56	4.28	4.60	4.87	3.73	.54	2.78	3.59	1.06	2.17	27.15	29.56	31.72	16.52
2	34N	24W	32	ST FRANC	NWS	.79	1.38	3.09	4.19		7.71			2.80	4.54						
2	34N	24W	32	STFRANHS	MOSQ				2.80	5.42	5.44	3.31	.53	1.99	4.01						16.69
county averages						.70	1.21	2.25	3.24	4.46	5.56	3.29	.78	1.82	3.76	.69	1.79	27.39	28.52	29.65	15.80

# of obs	11	12	13	30	30	31	29	29	30	30	13	10	8	8	9	29

- Data as received and digitized on or before 5/18/2017. **All values are in inches**.
- 'cc ttt rr ss' is county-township-range-section number, 'ooooooo' is community name (where applicable), 'nnnn' is network type.
- 'AGR', 'HYD', and 'ANN' are 12 month precipitation totals starting in Sep 2012, Oct 2012, and Jan 2013, respectively. 'GRO' is growing season (May 2013 thru Sep 2013) precipitation total.
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Choose a county and year, then click on **"Annual report"**.

ANOKA 2014 Annual report

2014 ANOKA Monthly Precipitation, Totals

cc	ttt	rr	ss	oooooooo	nnnn	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	AGR	HYD	ANN	GRO
2	30N	24W	3	RUSCHY D	DNR	1.19	1.26	.91	7.82	3.78	9.57	3.17	4.12	2.36	1.08	1.33	.98	39.73	40.75	37.57	23.00
2	30N	24W	14		SWCD	1.37	1.51	.79	7.43	5.08	8.16	2.52	4.23	1.55	1.16	1.15	1.11	38.36	38.71	36.06	21.54
2	30N	24W	14		BYRG					5.02	8.02	2.76	4.39	1.60	*		.95				21.79
2	30N	24W	25	RANTA SC	MOSQ				5.27	4.52	9.50										
2	31N	22W	29	LINO LAK	MOSQ				5.32	3.84	11.39										
2	31N	23W	21	BLAINE	MOSQ				6.48	5.01	9.57										
2	31N	23W	22		BYRG					6.22	8.39		6.73	1.93	.97	1.43	1.13				
2	31N	24W	7	LUBERDA	MOSQ				6.55	4.80	9.91										
2	31N	24W	24	MADETZKE	MOSQ				6.42	5.01	11.29										
2	32N	22W	14		BYRG	1.08	1.62	.88	5.93	4.38	10.80	2.32	5.79	2.85	1.14	1.51	1.01	39.98	41.44	39.31	26.14
2	32N	23W	16	JOHNSONB	MOSQ				5.69	4.11	12.16										
2	32N	23W	18		SWCD			.46	8.70	8.22	8.26	1.98	5.23	1.78	1.21						25.47
2	32N	23W	20		SWCD				6.30	4.54	14.31	2.25	3.68	4.63	1.43						29.41
2	32N	23W	21	KIRKMANM	MOSQ				7.90	4.69	11.45										
2	32N	24W	4	SPEISER	MOSQ				4.83	4.17	10.47										
2	32N	24W	23	ANDOVER	NWS	.55	.92	.75	7.48	3.73	9.16	1.33	3.66	1.74	.59	1.65	.84	34.63	33.62	32.40	19.62
2	32N	24W	26		SWCD	1.23	1.13	.92	6.96	4.48	11.69	1.72	5.45	1.86	.95	1.58	1.03	41.36	41.69	39.00	25.20
2	32N	24W	35	ANOKA	MOSQ				6.70	4.75	14.56										
2	32N	25W	6		SWCD				6.29	7.29	8.39	1.63	4.35	1.03	.79						22.69
2	33N	22W	7		SWCD				5.50	3.47	9.10	1.02	4.99	1.15	1.01						19.73
2	33N	23W	4	EAST BET	MOSQ				5.64	3.89	10.34										
2	33N	23W	18		SWCD				6.12	4.90	11.32	2.20	4.70	1.44	1.02						24.56
2	33N	23W	25		SWCD	1.14	1.28	.69	4.78	6.91	5.82	1.59	7.20	1.25	1.15	.95	1.09	36.28	35.79	33.85	22.77
2	33N	23W	35		SWCD				7.42	5.06	9.13	1.75									
2	33N	24W	16		SWCD					3.94	10.24	2.15	5.52	2.97							24.82
2	33N	24W	32		SWCD	1.45	1.91	.53	7.70	7.81	10.70	1.95	6.36	1.15	.61			46.69	46.19		27.97
2	33N	25W	36		SWCD				7.11	4.62	9.40	1.58	5.40	1.71	.94						22.71
2	34N	23W	36		BYRG	1.23	1.29	.75	8.38	5.18	9.51	1.28	4.85	2.42	.94	2.15	1.24	42.07	41.71	39.22	23.24
2	34N	24W	32	STFRANHS	MOSQ				4.89	4.15	9.99										
county averages						1.16	1.37	.74	6.52	4.95	10.09	1.95	5.10	1.97	1.00	1.47	1.04	39.89	39.99	36.77	23.79
# of obs						8	8	9	26	29	29	17	17	17	15	8	9	8	8	7	16

- Data as received and digitized on or before 5/18/2017. **All values are in inches**.
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- '*' denotes a partial monthly record, 'e' denotes that value is wholly or partially estimated.
- Prepared by: State Climatology Office - DNR Waters, phone: 651-296-4214, web: http://climate.umn.edu

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Obtaining Data for Legal Purposes

Last modified: April 10, 2008

Minnesota Climatology Working Group

State Climatology Office - DNR Division of Ecological and Water Resources University of Minnesota

Annual Reports of Monthly Precipitation Totals

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Choose a county and year, then click on **"Annual report"**.

ANOKA 2015 Annual report

2015 ANOKA Monthly Precipitation, Totals

cc	ttt	rr	ss	oooooooo	nnnn	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	AGR	HYD	ANN	GRO
2	30N	24W	3	RUSCHY D	DNR	.25	.27	.58	1.68	5.59	4.08	7.40	3.84	4.43	2.77	3.76	1.91	29.44	31.51	36.56	25.34
2	30N	24W	14		SWCD	.30	.36	.73	1.88	5.23	3.99	7.13	3.97	4.79	2.75	3.98	1.97	28.56	31.80	37.08	25.11
2	30N	24W	14		BYRG	.23	.32	.72	1.90	5.49	3.82	7.14	4.20	4.56	2.32	3.95	1.55			36.20	25.21
2	31N	23W	22		BYRG	.32	.38	.52	2.10	6.24	4.35	6.35	3.96	3.64	3.46	3.99	1.47	29.68	31.39	36.78	24.54
2	32N	22W	14		BYRG	.24	.23	.59	2.16	5.69	4.40	7.62	5.26	3.43	3.12	3.72	1.56	32.70	33.28	38.02	26.40
2	32N	23W	18		SWCD			.78	2.17	5.88	3.71	7.11	4.34	3.05	3.29	3.87					24.09
2	32N	23W	20		SWCD				1.93	5.27	3.86	6.10	5.00	3.23	3.50	4.60					23.46
2	32N	24W	23	ANDOVER	NWS	.13	.30	.51	1.34	4.14	2.80	7.49	4.49	1.61	3.25	3.52	1.16	26.02	25.89	30.74	20.53
2	32N	24W	26		SWCD	.31	.30	.64	1.96	4.59	3.30	6.94	4.14	2.39	3.25	4.23	1.82	27.60	28.13	33.87	21.36
2	32N	25W	6		SWCD				1.91	5.44	*	6.64	3.61	3.82	4.15	3.74					
2	33N	22W	7		SWCD				1.79	4.77	3.07	6.02	4.04	2.91	2.75						20.81
2	33N	23W	18		SWCD				2.85	5.12	3.94	6.48	3.65	3.14	3.52						22.33
2	33N	23W	25		SWCD	.24	.31	.50	1.96	5.03	3.07	5.96	2.81	2.45	3.58	3.62	1.02	24.32	25.52	30.55	19.32
2	33N	24W	16		SWCD					3.90	3.10	5.48	2.12	3.68							18.28
2	33N	24W	32		SWCD				.52	5.01											
2	33N	25W	36		SWCD				2.72	4.90	4.12	6.39	3.69	3.26	3.70	3.15					22.36
2	34N	23W	36		BYRG	.20	.41	.79	3.04	5.07	4.38	5.36	4.55	3.30	3.71	3.11	1.89	30.55	31.43	35.81	22.66
2	34N	24W	32	ST FRANC	NWS							*									
county averages						.25	.32	.64	1.99	5.14	3.73	6.60	3.98	3.36	3.27	3.79	1.59	28.61	29.87	35.07	22.79
# of obs						9	9	10	16	17	15	16	16	16	15	13	9	8	8	9	15

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Obtaining Data for Legal Purposes

Last modified: April 10, 2008

Minnesota Climatology Working Group

State Climatology Office - DNR Division of Ecological and Water Resources University of Minnesota

Annual Reports of Monthly Precipitation Totals

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Choose a county and year, then click on **"Annual report"**.

ANOKA 2016 Annual report

2016 ANOKA Monthly Precipitation, Totals

cc	ttt	rr	ss	oooooooo	nnnn	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	AGR	HYD	ANN	GRO
2	30N	24W	3	RUSCHY D	DNR	.29	.58	1.62	3.26	3.00	3.71	4.42	7.77	10.73	3.23	3.08	2.28	37.52	43.82	43.97	29.63
2	30N	24W	14		SWCD	.31	.92	1.96	3.73	2.69	2.84	5.02	9.75	8.45	3.08	3.50	1.98	40.71	44.37	44.23	28.75
2	30N	24W	14		BYRG	.28	.50	1.54	4.28	3.14	3.29	4.88	9.66	9.58	3.28	3.39	1.88	39.95	44.97	45.70	30.55
2	30N	24W	15	BENNEK D	MOSQ			3.32		4.74			7.79	7.67							
2	31N	23W	22		BYRG	.41	1.17					4.68	6.81	6.34	2.89	2.83	2.32				
2	32N	22W	14		BYRG	.31	.91	2.11	2.43	2.42	3.50	4.60	7.89	5.01	2.69	2.32	1.43	36.00	37.58	35.62	23.42
2	32N	23W	18		SWCD			2.18	3.11	3.02	4.53	5.39	7.71	5.80	3.37	*					26.45
2	32N	23W	20		SWCD				2.96	3.53	4.73	7.13	8.85	5.75	3.66	2.94					29.99
2	32N	24W	23	ANDOVER	NWS	.20	1.00	1.54	2.29	3.39	3.88	6.59	5.13	3.48	2.26	3.40	1.73	33.56	35.43	34.89	22.47
2	32N	24W	26		SWCD	.29	.68	1.89	2.70	3.87	3.78	6.63	5.97	4.74	3.75	3.24	1.77	37.50	39.85	39.31	24.99
2	32N	25W	6		SWCD				2.85	5.56	2.76	6.77	6.23	4.88	2.87	*					26.20
2	33N	22W	7		SWCD				1.41	3.74	3.29	4.67	5.34	5.15	2.92						22.19
2	33N	23W	18		SWCD				2.21	2.57	3.74	6.05	5.53	6.08	3.77						23.97
2	33N	23W	25		SWCD	.40	.89	1.87	2.07	3.21	4.02	5.57	5.61	5.21	3.50	3.04	1.54	34.31	37.07	36.93	23.62
2	33N	24W	16		SWCD						2.79										
2	33N	24W	16		SWCD					8.05		5.05	2.41	5.50	3.15						
2	33N	24W	32		SWCD				3.89												
2	33N	25W	14		SWCD									6.54	2.89						
2	33N	25W	36		SWCD				3.05	3.81	2.75	*	6.25	5.56	2.55	1.05					
2	34N	23W	36		BYRG	.56		2.97	2.10	2.95	3.79	5.20	5.16	5.15	3.74	3.80	1.84				22.25
county averages						.34	.83	2.10	2.82	3.73	3.56	5.51	6.70	6.20	3.15	2.96	1.86	37.08	40.44	40.09	25.73
# of obs						9	8	10	15	16	15	15	17	18	17	11	9	7	7	7	13

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HENNEPIN 2012 Annual report

2012 HENNEPIN Monthly Precipitation, Totals

cc	ttt	rr	ss	oooooooo	nnnn	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	AGR	HYD	ANN	GRO
27	27N	24W	15		BYRG				2.95	9.97	5.07	3.43	2.35	.57	1.38						21.39
27	27N	24W	20		BYRG				2.91	10.08	4.59	3.12	2.23	.61							20.63
27	28N	24W	12		WSD	.37	1.61	1.50	3.58	9.15	3.44	3.04	1.09	.14	1.12	.71	1.56			27.31	16.86
27	28N	24W	25	MPLS NWS	NWS	.36	1.72	1.40	3.04	9.34	3.59	4.90	1.38	.30	1.30	.63	1.64	27.99	27.93	29.60	19.51
27	29N	23W	30		BYRG	.67	1.58	1.39	2.67	8.65	2.76	4.41	1.17	.37	1.53	.86	1.40	25.85	25.72	27.46	17.36
27	29N	23W	33	METROMOS	MOSQ				3.29	9.44	3.52	5.21	1.00	.42	1.40						19.59
27	29N	24W	1		SWCD	.33	.76	1.54	3.23	9.15	4.19	5.10	1.82	.40	1.16	.69	1.90	28.26	28.31	30.27	20.66
27	29N	24W	11		SWCD				3.09	10.19	3.81	4.78	1.65	.49	1.57	*					20.92
27	29N	24W	23	LSAF	NWS	.67	1.62	1.82	3.44	9.04	3.48	6.24	1.86	.32	1.35	1.02	1.55	31.15	30.58	32.41	20.94
27	116N	22W	7		SWCD			1.16	3.41	10.25	5.30	3.81	2.75	.44	1.29						22.55
27	117N	21W	7		BYRG	.37	2.13	1.50	2.97	8.73	4.23	3.92	1.60	.46	1.20	.89	1.60	28.18	28.30	29.60	18.94
27	117N	21W	8	MURCH TI	MOSQ				3.05	9.31	4.10										
27	117N	22W	15		SWCD				3.01	9.11	4.34	3.26	1.71	.46	1.26						18.88
27	117N	22W	17		BYRG			.98	3.24	9.62	4.65	3.12	2.39	.54							20.32
27	117N	22W	21	MINNETON	MOSQ				3.07	9.41	4.68	3.26	1.57	.48	1.23						19.40
27	117N	22W	29		BYRG				2.87	10.05	4.60	2.72	2.05	.40							19.82
27	117N	23W	19	SPRNG PK	NWS	.49	1.73	1.70	2.96	9.55		4.75	1.50	.30	1.35	.85	1.20				
27	117N	23W	24	DEEPHAVE	MOSQ				2.79	10.57	4.53	2.67	1.77	.42	1.60						19.96
27	117N	23W	26		WSD	.40	1.29	1.57	3.04	8.60	5.39	2.77	1.69	.34	1.32	.81	1.73			28.95	18.79
27	117N	23W	31		BYRG				2.79	10.99	4.82	2.42	1.88	.51	1.55	*					20.62
27	117N	23W	34		BYRG			*	1.74	9.30	5.40			.50							
27	117N	24W	21	MINNETRI	MOSQ				2.40	10.95	4.12	2.76	2.83	.51	.95						21.17
27	117N	24W	27		BYRG	.47	1.56	1.16	1.99	10.19	4.03	2.28	2.83	.45	.93	.59	.93	26.12	26.28	27.41	19.78
27	118N	21W	6		BYRG				2.82	10.20	4.62	4.04	1.13	.60	1.52	.88					20.59
27	118N	21W	17		SWCD				1.44												
27	118N	21W	20	NEW HOPE	NWS	.32	2.21	1.26	2.72	9.17	3.62	4.53	1.64	.50	1.52	.93	1.79	27.70	27.89	30.21	19.46
27	118N	21W	30		SWCD				2.80	8.57	3.69	4.42	1.43	.53	1.32						18.64
27	118N	22W	5	XIONG JA	MOSQ						4.10	3.69	1.35	.53	2.07						
27	118N	22W	13	HANSMANN	MOSQ				2.44	9.74	4.70	4.33	1.15	.39	1.30						20.31
27	118N	22W	17		SWCD				2.98	10.55	5.29	5.76	.96	.58	2.24						23.14
27	118N	22W	18		SWCD				2.77	10.07	5.84	5.10	.92	.54	2.60						22.47
27	118N	22W	22	PLYMOUTH	MOSQ				2.83	9.05	3.90	4.87	1.45	.48	1.67						19.75
27	118N	22W	24	GREEN R	MOSQ				2.42	8.12	3.26	3.71	1.76	.35	1.10						17.20

27	118N	22W	25		BYRG	.72	2.54	1.29	2.76	9.72	3.91	4.81	1.87	.63	1.47	1.09	1.83	29.82	29.96	32.64	20.94
27	118N	22W	31		SWCD				2.71	9.79	4.06	5.27	1.21	.52	1.09						20.85
27	118N	23W	2		WSD	.30	1.55	.81	2.12			4.30	1.08	.64	2.08	.68	1.14				
27	118N	23W	22		SWCD			*	2.08	8.66	3.96										
27	119N	21W	25		BYRG				2.47	9.55	2.95	4.75	.80	.55	1.12						18.60
27	119N	21W	31		BYRG						*										
27	119N	21W	33		BYRG			.95	2.69	9.33	3.89	4.05	1.33	.59	1.71						19.19
27	119N	21W	33		BYRG				2.70	9.00	3.60	4.25	1.05	.35	1.50						18.25
27	119N	21W	34		BYRG			*	2.97	10.56	4.05	4.45	1.43	.82	1.73						21.31
27	119N	22W	1		SWCD			.85	2.89	9.50	4.02	5.32	.99	.98	2.20	.68	1.39				20.81
27	119N	22W	9		SWCD				2.18	10.14	3.13										
27	119N	22W	13	N HENN D	MOSQ						3.52	4.30	.91	.46	1.46						
27	119N	22W	33		BYRG			.88	2.79	10.55	4.36	4.21	.99	.48	1.88	.62					20.59
27	119N	22W	33		SWCD	.39	2.13	1.21	2.70	9.92	4.69	3.92	.83	.43	1.77	.71	1.56	28.53	27.86	30.26	19.79
27	119N	22W	33		BYRG			.81	3.01	11.11	4.53	3.90	.97	.45	1.90	.66					20.96
27	119N	23W	25	CORCORAN	MOSQ						4.27	5.67	.91	.58	2.94						
27	119N	24W	33	ROCKFORD	MOSQ				2.20	13.14	3.53	4.31	1.84	.37	.89						23.19
27	119N	24W	34		SWCD				2.54	11.78	5.04	4.69	1.76	.57	1.53						23.84
27	120N	21W	32	CHAMPLIN	MOSQ				2.63	10.31	3.92	5.05	1.05	.55	1.58						20.88
27	120N	21W	33	CHAMPLIN	MOSQ						3.95	4.88	.94	.53	1.50						
27	120N	22W	16	DAYTON	MOSQ						4.01	4.37	.94	.35							
county averages						.45	1.73	1.25	2.75	9.79	4.18	4.19	1.50	.49	1.53	.78	1.52	28.18	28.09	29.65	20.22
# of obs						13	13	19	48	46	50	48	48	49	44	17	14	9	9	11	41

- Data as received and digitized on or before 5/18/2017. **All values are in inches**.
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- '*' denotes a partial monthly record, 'e' denotes that value is wholly or partially estimated.
- Prepared by: State Climatology Office - DNR Waters, phone: 651-296-4214, web: http://climate.umn.edu

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Obtaining Data for Legal Purposes

Last modified: April 10, 2008

Minnesota Climatology Working Group

State Climatology Office - DNR Division of Ecological and Water Resources University of Minnesota

Annual Reports of Monthly Precipitation Totals

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Choose a county and year, then click on **"Annual report"**.

HENNEPIN 2013 Annual report

2013 HENNEPIN Monthly Precipitation, Totals

cc	ttt	rr	ss	oooooooo	nnnn	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	AGR	HYD	ANN	GRO
27	27N	24W	15		BYRG				5.22	7.64	5.40	5.56	2.13	1.63	2.98						22.36
27	27N	24W	20		BYRG						6.88										
27	28N	24W	12		BYRG								*	1.28	3.73	.54	1.42				
27	28N	24W	25	MPLS NWS	NWS	.86	1.33	2.04	5.22	6.24	5.17	3.51	2.07	1.35	3.00	.52	1.46	30.31	31.36	32.77	18.34
27	29N	23W	30		BYRG	.89	1.41	1.90	5.31	5.70	6.24	2.59	2.31	1.07	3.63	.52	1.52	30.51	31.21	33.09	17.91
27	29N	23W	33	METROMOS	MOSQ				4.24	5.88	5.88	3.45	2.13	1.36	3.66						18.70
27	29N	24W	1		SWCD	.71	1.32	2.32	4.90	6.43	5.35	5.81	1.89	1.68	3.53	.50	1.41	32.88	34.16	35.85	21.16
27	29N	24W	23	LSAF	NWS	.96	1.09	1.89	4.03	5.71	7.25	3.74	2.38	1.27	4.32	.73	1.32	31.29	32.24	34.69	20.35
27	116N	22W	7		SWCD					6.00	6.74	6.11	1.81	1.69	4.28						22.35
27	116N	22W	28	FLYING C	NWS				3.69	5.84	5.90	6.10	1.60	1.51	3.34	*					20.95
27	117N	21W	7		BYRG	.68	1.10	2.06	4.13	5.05	7.16	5.11	1.79	1.22	4.19	.56	1.60	31.23	31.99	34.65	20.33
27	117N	22W	17		BYRG					3.17	6.86	6.05	2.20	1.61	*						19.89
27	117N	22W	21	MINNETON	MOSQ				3.80	5.88	5.53	5.59	2.09	1.30	4.07						20.39
27	117N	22W	29		BYRG				5.37	5.90	5.19	5.52	1.43	1.53							19.57
27	117N	23W	19	SPRNG PK	NWS	.65	.85	1.21	*												
27	117N	23W	24	DEEPHAVE	MOSQ				5.09	6.06	7.02	6.72	1.58								
27	117N	23W	31		BYRG				4.54	5.47	6.05	5.10	1.11	1.25	3.89	*					18.98
27	117N	24W	27		BYRG	.38	.91	1.34	4.15	4.78	6.22	4.44	.78	1.29	2.57	.43	1.41	25.90	26.74	28.70	17.51
27	118N	21W	4	CRYSTAL	NWS				2.95	3.25	7.21	3.11	.93	1.07	3.76						15.57
27	118N	21W	6		BYRG				4.99	5.07	8.33	3.48	1.08	1.32	4.83	.63					19.28
27	118N	21W	20	NEW HOPE	NWS	.70	1.29	2.24	5.46	4.27	8.77	5.83	1.65	1.27	4.48	.59	1.77	34.95	35.72	38.32	21.79
27	118N	22W	13	HANSMANN	MOSQ				2.39	3.80	4.36	2.77	1.58	1.10	3.71						13.61
27	118N	22W	17		SWCD				2.75	6.87	8.07	5.00	1.67	1.46	4.69						23.07
27	118N	22W	18		SWCD					6.65	7.82	4.19	1.34	1.50	3.98						21.50
27	118N	22W	22	PLYMOUTH	MOSQ				3.95	5.44	7.53	4.26	1.51		3.77						
27	118N	22W	24	GREEN R	MOSQ				4.01	4.43	7.98	4.57	1.34	1.04	3.84						19.36
27	118N	22W	25		BYRG	.75	1.39	1.90	5.33	4.97	8.09	4.65	1.21	1.42	4.60	.58	1.97	33.31	34.10	36.86	20.34
27	119N	21W	25		BYRG				3.85	3.50	6.05	3.40	.90	1.20	3.90						15.05
27	119N	21W	31		BYRG					*	7.51	4.86	*	*	*						
27	119N	21W	33		BYRG				4.57	3.34	7.74	3.37	.95	1.39	4.35						16.79
27	119N	21W	33		BYRG				4.05	4.50	6.55	2.95	.70	1.40	4.10						16.10
27	119N	21W	34		BYRG				5.09	4.00	7.88	3.39	1.00	1.65	4.70						17.92
27	119N	22W	1		SWCD	.54	1.02	2.27	4.99	4.40	6.03	3.14	1.41	1.43	4.98	.59	1.56	29.05	29.50	32.36	16.41

27	119N	22W	13	N HENN D	MOSQ				3.30	4.05	6.75								
27	119N	22W	19	MAPLEGRO	MOSQ								1.27	1.35					
27	119N	22W	33		BYRG				3.70	5.27	7.54	3.17	1.19	1.58	4.81	.62			18.75
27	119N	22W	33		SWCD	.58	1.26	2.01	4.06	5.61	7.26	3.36	1.05	1.42	4.51	.48	1.48	29.66 30.65 33.08	18.70
27	119N	22W	33		BYRG				3.13	5.86	8.45	3.63	1.06	1.53	4.81	.61			20.53
27	119N	24W	33	ROCKFORD	MOSQ				2.31	4.84	8.01	3.67	1.17		4.66				
27	119N	24W	34		SWCD				3.63	4.61	7.77	3.10	1.40						
27	120N	21W	32	CHAMPLIN	MOSQ				3.74	4.47	5.86	3.99	.88	1.56	4.73				16.76
27	120N	21W	33	CHAMPLIN	MOSQ								.87						
27	120N	22W	16	DAYTON	MOSQ								.64						
county averages						.70	1.18	1.93	4.18	5.14	6.85	4.31	1.42	1.39	4.08	.56	1.54	30.91 31.77 34.04	19.04
# of obs						11	11	11	33	36	38	36	38	33	32	14	11	10 10 10	31

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Minnesota Climatology Working Group

State Climatology Office - DNR Division of Ecological and Water Resources University of Minnesota

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HENNEPIN 2014 Annual report

2014 HENNEPIN Monthly Precipitation, Totals

cc	ttt	rr	ss	oooooooo	nnnn	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	AGR	HYD	ANN	GRO
27	27N	24W	15		BYRG				6.87	2.24	12.88	2.86	2.25	1.43	2.20						21.66
27	28N	24W	12		BYRG	1.25	1.42	.79	6.67	3.96	11.41	2.85	2.81	2.27	1.49	.92	.81	38.13	39.12	36.65	23.30
27	28N	24W	12		WSD				6.94	4.23	10.64	2.21	3.06	1.57	1.71	.93	.85				21.71
27	28N	24W	25	MPLS NWS	NWS	1.42	1.41	.82	6.27	4.55	11.36	2.27	2.90	.92	1.75	.88	.86	37.33	36.90	35.41	22.00
27	29N	23W	30		BYRG	1.33	1.59	.79	5.84	3.29	8.02	2.97	2.62	1.51	1.40	1.08	1.02	33.19	33.63	31.46	18.41
27	29N	23W	33	METROMOS	MOSQ				6.42	3.54	10.21										
27	29N	24W	1		SWCD	2.21	1.29	.50	5.46												
27	29N	24W	23	LSAF	NWS	1.08	1.27	.69	6.37	3.70	10.15	3.10	2.21	2.86	1.27	1.29	1.03	36.21	37.80	35.02	22.02
27	116N	22W	7		SWCD					5.03	14.08	4.11	3.06	1.78							28.06
27	116N	22W	28	FLYING C	NWS				5.37	4.48	12.41	3.61	4.45	1.16	1.16		*				26.11
27	117N	21W	7		BYRG	1.30	1.24	.65	6.78	4.46	10.33	2.46	3.98	1.49	1.14	.84	.97	38.77	39.04	35.64	22.72
27	117N	22W	15		SWCD					4.49	10.52	2.65	2.91	1.85	1.14						22.42
27	117N	22W	21	MINNETON	MOSQ				6.63	3.98	11.23										
27	117N	22W	29		BYRG				7.47	4.45	10.49	3.26	3.20	.97							22.37
27	117N	23W	24	DEEPHAVE	MOSQ				7.81	4.24	10.52										
27	117N	23W	26		WSD			.51	6.11	4.22	11.33	2.89	2.80	2.03	.75	.94	.82				23.27
27	117N	23W	31		BYRG				6.21	8.33	8.80	2.98	4.12	1.88	1.72	*					26.11
27	117N	24W	27		BYRG	1.00	1.40	.66	5.41	3.73	10.65	2.94	3.07	2.32	.85	.83	.95	34.56	35.59	33.81	22.71
27	118N	21W	4	CRYSTAL	NWS			.52	5.48	4.72	7.12	3.07	3.33	1.13	.95		*				19.37
27	118N	21W	6		BYRG				7.87	4.08	10.71	3.86	2.95	1.23	1.35						22.83
27	118N	21W	20	NEW HOPE	NWS	1.47	1.45	.89	7.79	4.79	10.88	4.07	2.31	1.89	1.08	1.30	1.14	41.76	42.38	39.06	23.94
27	118N	22W	13	HANSMANN	MOSQ				5.35	3.53	9.28										
27	118N	22W	17		SWCD				*	4.95	11.80	3.77	2.90	2.02	*						25.44
27	118N	22W	22	PLYMOUTH	MOSQ				7.58	4.44	10.78										
27	118N	22W	24	GREEN R	MOSQ				6.90	3.51	10.46										
27	118N	22W	25		BYRG	1.80	1.71	.80	8.24	3.76	10.18	3.95	2.76	1.91	1.15	1.34	1.33	41.77	42.26	38.93	22.56
27	118N	23W	2		WSD	.99	.96	.74	6.37	8.13	6.90										
27	118N	23W	20	MEDINA	MOSQ						11.50	4.10	2.70	3.30	.60	.20					
27	119N	21W	25		BYRG				6.76	3.90	9.15	2.70	3.10	1.55	.80						20.40
27	119N	21W	31		BYRG							3.80	2.42	1.57	.87						
27	119N	21W	33		BYRG				6.96	3.93	9.64	3.26	3.41	2.05	1.11						22.29
27	119N	21W	33		BYRG				6.05	4.10	8.90	3.60	2.90	1.85	1.10						21.35
27	119N	21W	34		BYRG				6.40	4.21	9.10	3.44	3.40	2.22	1.22						22.37

27	119N	22W	1		SWCD	1.39	1.40	.90	7.38	8.67	7.15	2.85	3.78	1.96	.96	1.18	.98	42.08	42.61	38.60	24.41
27	119N	22W	9		SWCD					7.04	6.53	3.39	3.46	1.45	.97						21.87
27	119N	22W	33		BYRG				7.10	4.59	11.58										
27	119N	22W	33		SWCD	1.22	.72	.80	7.64	4.53	10.55	3.80	3.45	1.69	.78	1.33	.91	40.60	40.87	37.42	24.02
27	119N	22W	33		BYRG				6.19	8.20	7.96	4.19	2.62	2.70	.93						25.67
27	119N	24W	33	ROCKFORD	MOSQ				7.61	4.83	11.57										
27	120N	21W	32	CHAMPLIN	MOSQ				6.64	4.26	9.15										
county averages						1.37	1.32	.72	6.67	4.68	10.16	3.28	3.07	1.81	1.17	1.00	.97	38.44	39.02	36.20	22.94
# of obs						12	12	14	34	37	38	29	29	29	26	13	12	10	10	10	27

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HENNEPIN 2015 Annual report

2015 HENNEPIN Monthly Precipitation, Totals

cc	ttt	rr	ss	oooooooo	nnnn	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	AGR	HYD	ANN	GRO
27	27N	24W	15		BYRG				2.71	4.28	4.33	7.71	5.45	4.17	2.83						25.94
27	28N	24W	12		BYRG	.43	.28	.74	2.29	4.42	4.99	7.18	2.92	3.54	2.77	4.60	2.40	28.74	30.01	36.56	23.05
27	28N	24W	12		WSD	.34	.29	.81	2.35	4.67	4.95	7.26	3.27	3.14	2.45	4.34	2.49	29.00	30.57	36.36	23.29
27	28N	24W	25	MPLS NWS	NWS	.34	.35	.67	2.42	3.55	4.40	6.87	2.99	4.65	2.61	4.52	1.86	26.00	29.73	35.23	22.46
27	29N	23W	30		BYRG	.30	.27	.67	2.13	4.51	3.99	6.47	1.86	2.82	2.35	4.47	2.21	25.21	26.52	32.05	19.65
27	29N	23W	33	METROMOS	MOSQ				2.19	4.74	4.57	5.95	2.73								
27	29N	24W	23	LSAF	NWS	.33	.32	.72	2.48	5.14	4.14	7.13	2.85	3.75	2.97	4.20	2.51	29.56	30.45	36.54	23.01
27	116N	22W	7		SWCD				2.49	4.75	4.83	8.61	1.53	2.51	2.72						22.23
27	116N	22W	28	FLYING C	NWS	*	*	.62	2.27	3.45	4.38	7.32	4.00	3.08	2.50	3.86	1.28				22.23
27	117N	21W	7		BYRG	*	.32	.58	2.03	3.39	3.54	6.64	3.23	2.82	2.39	4.53	1.54				19.62
27	117N	22W	21	MINNETON	MOSQ				2.02	4.43	5.04	7.83	3.11								
27	117N	22W	29		BYRG				2.12	4.34	5.05	8.06	3.42	3.80	2.72						24.67
27	117N	23W	26		WSD	.42	.36			4.22	4.75	7.31	3.27	4.21	2.64		1.02				23.76
27	117N	23W	31		BYRG				1.70	4.51	3.82	7.94	2.82	3.28	2.81	4.71					22.37
27	117N	24W	27		BYRG	.30	.34	.79	1.28	5.33	3.82	8.81	1.90	4.15	2.90	2.72	1.66	27.52	29.35	34.00	24.01
27	118N	21W	4	CRYSTAL	NWS	*	*	.55	1.72	4.24	3.11	6.20	2.84	4.03	2.70	3.76	1.34				20.42
27	118N	21W	6		BYRG				2.12	4.80	3.30	6.70	3.94		2.86	4.18					
27	118N	21W	20	NEW HOPE	NWS	.34	.38	.80	1.78	4.46	3.37	8.30	2.98	3.79	2.93	4.56	1.86	27.82	29.72	35.55	22.90
27	118N	22W	13	HANSMANN	MOSQ				1.18	3.79	3.43	6.73	2.96								
27	118N	22W	24	GREEN R	MOSQ				1.39	3.92	2.75	5.92	2.52								
27	118N	22W	25		BYRG	.52	.43	.73	1.63	4.92	3.73	8.62	3.09	4.12	3.29	5.07	1.98	29.40	31.61	38.13	24.48
27	118N	23W	2		WSD	.36	.38	.80	1.60		2.38	6.34	3.62	3.24	2.82		1.75				
27	119N	21W	25		BYRG				1.77	4.70	3.60	6.60	3.45	4.75	2.85						23.10
27	119N	21W	31		BYRG				*	4.74	2.95	6.41	3.65	4.09	3.14	*					21.84
27	119N	21W	33		BYRG				2.21	5.08	3.27	7.14	3.31	4.24	3.06						23.04
27	119N	21W	33		BYRG				1.90	4.00	3.55	6.80	3.10	4.05	2.90						21.50
27	119N	21W	34		BYRG				2.24	5.20	3.57	7.16	3.58	4.49	3.69						24.00
27	119N	22W	1		SWCD	.18	.33	.71	1.99	4.45	3.67	6.91	3.85	3.80	3.49	3.99	1.26	27.17	29.01	34.63	22.68
27	119N	22W	33		SWCD	.37	.30	.53	1.43	4.35	3.69	6.17	4.77	3.81	3.10	3.72	1.86	26.32	28.44	34.10	22.79
27	119N	22W	33		BYRG				1.84	4.83	3.53	6.57	4.87	3.62	3.28	4.22					23.42
27	120N	21W	32	CHAMPLIN	MOSQ				1.66	4.45	3.24	6.14	3.48								
county averages						.35	.33	.69	1.96	4.46	3.86	7.09	3.27	3.76	2.88	4.22	1.80	27.67	29.54	35.32	22.77

# of obs	12	13	14	29	30	31	31	31	25	26	16	15	10	10	10	24

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State Climatology Office - DNR Division of Ecological and Water Resources University of Minnesota

Annual Reports of Monthly Precipitation Totals

This application creates annual summaries of precipitation data gathered by volunteer-based observation networks throughout Minnesota. The data presented are monthly totals and the data are grouped by county. Observer locations are described using township, range, and section numbers.

Choose a county and year, then click on **"Annual report"**.

HENNEPIN 2016 Annual report

2016 HENNEPIN Monthly Precipitation, Totals

cc	ttt	rr	ss	oooooooo	nnnn	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	AGR	HYD	ANN	GRO
27	27N	24W	15		BYRG				3.07	2.22	5.19	5.54	8.37	7.00	4.20						28.32
27	28N	24W	12		BYRG	.31	.68	2.32	3.33	2.08	4.55	4.42	8.19	5.67	3.59	2.78	2.27	39.19	41.32	40.19	24.91
27	28N	24W	12		WSD	.26	1.49	2.87		2.61	4.00	4.86	8.62	5.71	3.55	2.91	1.97				25.80
27	28N	24W	25	MPLS NWS	NWS	.31	1.09	2.26	2.84	2.42	4.49	5.09	7.82	5.47	3.41	2.98	2.14	39.96	40.78	40.32	25.29
27	29N	23W	30		BYRG	.35		2.08	3.15	1.84	4.78	3.82	9.35	4.62	3.16	2.76	2.04				24.41
27	29N	24W	23	LSAF	NWS	.34	.79	1.94	4.33	1.59	4.50	4.89	10.60	5.28	2.95	2.67	2.68	42.41	43.94	42.56	26.86
27	116N	21W	18	DUERRE D	NWS							2.80	4.82	5.12	3.70	1.31					
27	116N	22W	7		SWCD					2.23	4.07	6.88	11.03	6.15	3.72						30.36
27	116N	22W	28	FLYING C	NWS			1.59	2.64	2.13	4.32	4.84	9.42	5.60	*	.27	1.48				26.31
27	117N	21W	7		BYRG	.26	.73	1.37	3.83	1.87	2.60	4.38	10.36	5.51	3.23	2.54	2.09	36.68	39.37	38.77	24.72
27	117N	22W	21	MINNETON	MOSQ										3.28						
27	117N	22W	29		BYRG				3.55	2.22	2.31	5.09	10.37	5.11	3.27						25.10
27	117N	23W	26		WSD	.34		1.09	3.44	1.83	4.01	5.33	10.03	5.60	2.97	1.20	1.12				26.80
27	117N	23W	31		BYRG				2.92	1.77	4.05	6.49	10.60	4.45	3.14	*					27.36
27	117N	24W	27		BYRG	.25	.90	1.18	2.95	2.15	4.06	5.94	8.21	4.72	2.42	1.42	1.66	37.07	37.64	35.86	25.08
27	118N	21W	4	CRYSTAL	NWS			1.57	3.12	2.13	2.20	6.73	6.95	6.45	2.95	.75	1.21				24.46
27	118N	21W	6		BYRG				3.43	2.70	2.24	8.14	8.75								
27	118N	21W	20	NEW HOPE	NWS	.31	1.02	1.92	3.73	2.13	3.47	5.74	9.15	7.08	3.25	2.92	2.13	40.61	43.90	42.85	27.57
27	118N	22W	13	HANSMANN	MOSQ				2.60	1.80		6.25	6.77	4.52							
27	118N	22W	24	GREEN R	MOSQ			3.51				5.26	7.37	5.31							
27	118N	22W	25		BYRG	.35	.89	1.67	3.86	2.53	3.39	6.19	10.98	6.99				44.32	47.19		30.08
27	118N	23W	2		WSD	.38	.80	.94	3.11	2.03	2.37	5.93	8.47	8.43	3.00		1.40				27.23
27	119N	21W	25		BYRG				3.63	2.30	2.44	5.65	7.85	9.45	3.00						27.69
27	119N	21W	31		BYRG				*	2.70	2.66	6.93	8.42	8.88	3.15	2.21	1.47				29.59
27	119N	21W	33		BYRG				4.47	2.51	2.72	6.19	8.47	9.43	3.52						29.32
27	119N	21W	33		BYRG				4.10	2.15	2.80	6.95	8.75	6.75	3.62						27.40
27	119N	21W	34		BYRG				4.51	2.70	2.64	7.28	8.15	9.74	3.62	*					30.51
27	119N	22W	1		SWCD	.27	.76	1.54	3.40	3.03	4.21	4.16	8.63	8.24	3.42	2.33	1.77	38.54	42.98	41.76	28.27
27	119N	22W	9		SWCD					2.31	2.64	5.70	6.85	11.10	2.79						28.60
27	119N	22W	33		SWCD	.26	.72	1.28	3.07	2.20	2.95	5.50	7.26	9.45	3.00	1.16	2.15	35.73	41.37	39.00	27.36
27	119N	22W	33		BYRG				3.18	2.13	2.71	6.27	8.95	11.12	3.52	2.31					31.18
27	120N	21W	32	CHAMPLIN	MOSQ					2.80											

county averages	.31	.90	1.82	3.43	2.25	3.42	5.64	8.65	6.86	3.29	2.03	1.84	39.39	42.05	40.16	27.33
# of obs	13	11	16	24	29	27	30	30	29	26	16	15	9	9	8	26

- Data as received and digitized on or before 5/18/2017. **All values are in inches**.
- 'cc ttt rr ss' is county-township-range-section number, 'ooooooo' is community name (where applicable), 'nnnn' is network type.
- 'AGR', 'HYD', and 'ANN' are 12 month precipitation totals starting in Sep 2015, Oct 2015, and Jan 2016, respectively. 'GRO' is growing season (May 2016 thru Sep 2016) precipitation total.
- '*' denotes a partial monthly record, 'e' denotes that value is wholly or partially estimated.
- Prepared by: State Climatology Office - DNR Waters, phone: 651-296-4214, web: http://climate.umn.edu

For some purposes, **daily** precipitation data are required. The precipitation data archive allows a user to interactively retrieve daily precipitation data from the site nearest to a target.

Obtaining Data for Legal Purposes

Last modified: April 10, 2008

Attachment C-2

IWMZ Inventories

DRAFT

Environmental Health Division
Drinking Water Protection Section
P.O. Box 64975
St. Paul, Minnesota 55164-0975

INNER WELLHEAD MANAGEMENT ZONE (IWMZ) - POTENTIAL CONTAMINANT SOURCE INVENTORY (PCSI) REPORT

PUBLIC WATER SYSTEM INFORMATION

PWS ID	1020017	**COMMUNITY**
NAME	Coon Rapids	
ADDRESS	Kory Jorgensen Utilities Supervisor, Public Works Garage, 1831 111th Avenue, Coon Rapids, MN 554333761	

FACILITY (WELL) INFORMATION

NAME	Well #1	**IS THERE A WELL LOG OR ADDITIONAL CONSTRUCTION INFORMATION AVAILABLE?**
FACILITY ID	S25	☐ **YES** (Please attach a copy)
UNIQUE WELL NO.	202926	☐ **NO** ☐ **UNDETERMINED**
COUNTY	Anoka	

PWS ID / FACILITY ID	1020017 S25	**UNIQUE WELL NO.**	202926

PCSI CODE	ACTUAL OR POTENTIAL CONTAMINATION SOURCE	ISOLATION DISTANCES (FEET)				LOCATION	
		Minimum Distances		Sensitive Well[1]	Within 200 Ft. Y / N / U	Dist. from Well	Est. (?)
		Community	Non-community				
Agricultural Related							
*AC1	Agricultural chemical buried piping	50	50		N		
*AC2	Agricultural chemical multiple tanks or containers for residential retail sale or use, no single tank or container exceeding, but aggregate volume exceeding 56 gal. or 100 lbs. dry weight	50	50		N		
ACP	Agricultural chemical tank or container with 25 gal. or more or 100 lbs. or more dry weight, or equipment filling or cleaning area without safeguards	150	150		N		
ACS	Agricultural chemical storage or equipment filling or cleaning area with safeguards	100	100		N		
ACR	Agricultural chemical storage or equipment filling or cleaning area with safeguards and roofed	50	50		N		
ADW	Agricultural drainage well[2] (Class V well - illegal[3])	50	50		N		
AAT	Anhydrous ammonia tank (stationary tank)	50	50		N		
AB1	Animal building, feedlot, confinement area, or kennel, 0.1 to 1.0 animal unit (stockyard)	50	20	100/40	N		
AB2	Animal building or poultry building, including a horse riding area, more than 1.0 animal unit	50	50	100	N		
ABS	Animal burial area, more than 1.0 animal unit	50	50		N		
FWP	Animal feeding or watering area within a pasture, more than 1.0 animal unit	50	50	100	N		
AF1	Animal feedlot, unroofed, 300 or more animal units (stockyard)	100	100	200	N		
AF2	Animal feedlot, more than 1.0, but less than 300 animal units (stockyard)	50	50	100	N		
AMA	Animal manure application	use discretion	use discretion		N		
REN	Animal rendering plant	50	50		N		
MS1	Manure (liquid) storage basin or lagoon, unpermitted or noncertified	300	300	600	N		
MS2	Manure (liquid) storage basin or lagoon, approved earthen liner	150	150	300	N		
MS3	Manure (liquid) storage basin or lagoon, approved concrete or composite liner	100	100	200	N		
MS4	Manure (solid) storage area, not covered with a roof	100	100	200	N		
OSC	Open storage for crops	use discretion	use discretion		N		
SSTS Related							
AA1	Absorption area of a soil dispersal system, average flow greater than 10,000 gal./day	300	300	600	N		
AA2	Absorption area of a soil dispersal system serving a facility handling infectious or pathological wastes, average flow 10,000 gal./day or less	150	150	300	N		
AA3	Absorption area of a soil dispersal system, average flow 10,000 gal./day or less	50	50	100	N		
AA4	Absorption area of a soil dispersal system serving multiple family residences or a non-residential facility and has the capacity to serve 20 or more persons per day (Class V well)[2]	50/300/150[4]	50/300/150[4]	100/600/300[4]	N		
CSP	Cesspool	75	75	150	N		
AGG	Dry well, leaching pit, seepage pit	75	75	150	N		
*FD1	Floor drain, grate, or trough connected to a buried sewer	50	50		N		
*FD2	Floor drain, grate, or trough if buried sewer is air-tested, approved materials, serving one building, or two or less single-family residences	50	20		N		
*GW1	Gray-water dispersal area	50	50	100	N		
LC1	Large capacity cesspools (Class V well - illegal)[2]	75	75	150	N		
MVW	Motor vehicle waste disposal (Class V well - illegal)[2]	illegal	illegal		N		

PWS ID / FACILITY ID	1020017 S25	UNIQUE WELL NO.	202926

PCSI CODE	ACTUAL OR POTENTIAL CONTAMINATION SOURCE	ISOLATION DISTANCES (FEET)				LOCATION	
		Minimum Distances		Sensitive Well[1]	Within 200 Ft. Y / N / U	Dist. from Well	Est. (?)
		Community	Non-community				
PR1	Privy, nonportable	50	50	100	N		
PR2	Portable (privy) or toilet	50	20		N		
*SF1	Watertight sand filter; peat filter; or constructed wetland	50	50		N		
SET	Septic tank	50	50		N		
HTK	Sewage holding tank, watertight	50	50		N		
SS1	Sewage sump capacity 100 gal. or more	50	50		N		
SS2	Sewage sump capacity less than 100 gal., tested, conforming to rule	50	20		N		
*ST1	Sewage treatment device, watertight	50	50		N		
SB1	Sewer, buried, approved materials, tested, serving one building, or two or less single-family residences	50	20		N		
SB2	Sewer, buried, collector, municipal, serving a facility handling infectious or pathological wastes, open-jointed or unapproved materials	50	50		Y	85	N
*WB1	Water treatment backwash holding basin, reclaim basin, or surge tank with a direct sewer connection	50	50		N		
*WB2	Water treatment backwash holding basin, reclaim basin, or surge tank with a backflow protected sewer connection	20	20		N		
Land Application							
SPT	Land spreading area for sewage, septage, or sludge	50	50	100	N		
Solid Waste Related							
COS	Commercial compost site	50	50		N		
CD1	Construction or demolition debris disposal area	50	50	100	N		
*HW1	Household solid waste disposal area, single residence	50	50	100	N		
LF1	Landfill, permitted demolition debris, dump, or mixed municipal solid waste from multiple persons	300	300	600	N		
SVY	Scrap yard	50	50		N		
SWT	Solid waste transfer station	50	50		N		
Storm Water Related							
SD1	Storm water drain pipe, 8 inches or greater in diameter	50	20		N		
SWI	Storm water drainage well[2] (Class V well - illegal[3])	50	50		N		
SM1	Storm water pond greater than 5000 gal.	50	35		N		
Wells and Borings							
*EB1	Elevator boring, not conforming to rule	50	50		N		
*EB2	Elevator boring, conforming to rule	20	20		N		
MON	Monitoring well	record dist.	record dist.		N		
WEL	Operating well	record dist.	record dist.		N		
UUW	Unused, unsealed well or boring	50	50		N		
General							
*CR1	Cistern or reservoir, buried, nonpressurized water supply	20	20		N		
PLM	Contaminant plume	50	50		N		
*CW1	Cooling water pond, industrial	50	50	100	N		
DC1	Deicing chemicals, bulk road	50	50	100	N		
*ET1	Electrical transformer storage area, oil-filled	50	50		N		
GRV	Grave or mausoleum	50	50		N		
GP1	Gravel pocket or French drain for clear water drainage only	20	20		N		
*HS1	Hazardous substance buried piping	50	50		N		
HS2	Hazardous substance tank or container, above ground or underground, 56 gal. or more, or 100 lbs. or more dry weight, without safeguards	150	150		N		
HS3	Hazardous substance tank or container, above ground or underground, 56 gal. or more, or 100 lbs. or more dry weight with safeguards	100	100		N		
HS4	Hazardous substance multiple storage tanks or containers for residential retail sale or use, no single tank or container exceeding 56 gal. or 100 lbs., but aggregate volume exceeding	50	50		N		
HWF	Highest water or flood level	50	N/A		N		
*HG1	Horizontal ground source closed loop heat exchanger buried piping	50	50		N		
*HG2	Horizontal ground source closed loop heat exchanger buried piping and horizontal piping, approved materials and heat transfer fluid	50	10		N		
IWD	Industrial waste disposal well (Class V well)[2]	illegal[3]	illegal[3]		N		
IWS	Interceptor, including a flammable waste or sediment	50	50		N		
OH1	Ordinary high water level of a stream, river, pond, lake, reservoir, or drainage ditch (holds water six months or more)	50	35		N		
*PP1	Petroleum buried piping	50	50		N		
*PP2	Petroleum or crude oil pipeline to a refinery or distribution center	100	100		N		

PWS ID / FACILITY ID	1020017 S25	UNIQUE WELL NO.	202926

PCSI CODE	ACTUAL OR POTENTIAL CONTAMINATION SOURCE	ISOLATION DISTANCES (FEET)				LOCATION	
		Minimum Distances		Sensitive Well[1]	Within 200 Ft. Y / N / U	Dist. from Well	Est. (?)
		Community	Non-community				
PT1	Petroleum tank or container, 1100 gal. or more, without safeguards	150	150		N		
PT2	Petroleum tank or container, 1100 gal. or more, with safeguards	100	100		N		
PT3	Petroleum tank or container, buried, between 56 and 1100 gal.	50	50		N		
PT4	Petroleum tank or container, not buried, between 56 and 1100 gal.	50[5]	20		N		
PU1	Pit or unfilled space more than four feet in depth	20	20		N		
PC1	Pollutant or contaminant that may drain into the soil	50	50	100	N		
SP1	Swimming pool, in-ground	20	20		N		
*VH1	Vertical heat exchanger, horizontal piping conforming to rule	50	10		N		
*VH2	Vertical heat exchanger (vertical) piping, conforming to rule	50	35		N		
*WR1	Wastewater rapid infiltration basin, municipal or industrial	300	300	600	N		
*WA1	Wastewater spray irrigation area, municipal or industrial	150	150	300	N		
*WS1	Wastewater stabilization pond, industrial	150	150	300	N		
*WS2	Wastewater stabilization pond, municipal, 500 or more gal./acre/day of leakage	300	300	600	N		
*WS3	Wastewater stabilization pond, municipal, less than 500 gal./acre/day of leakage	150	150	300	N		
*WT1	Wastewater treatment unit tanks, vessels and components (Package plant)	100	100		N		
*WT2	Water treatment backwash disposal area	50	50	100	N		
Additional Sources (If there is more than one source listed above, please indicate here).							
Potential Contamination Sources and Codes Based on Previous Versions of this Form							
	none found within 200' of this well.						

* New potential contaminant source.

[1] A sensitive well has less than 50 feet of watertight casing, and which is not cased below a confining layer or confining materials of at least 10' in thickness.

[2] These sources, known as Class V underground injection wells, are regulated by the federal U.S. Environmental Protection Agency.

[3] These sources are classified as illegal by Minnesota Rules, Chapter 4725.

[4] Isolation distance is determined by average flow per day or if a facility handles infectious or pathological wastes.

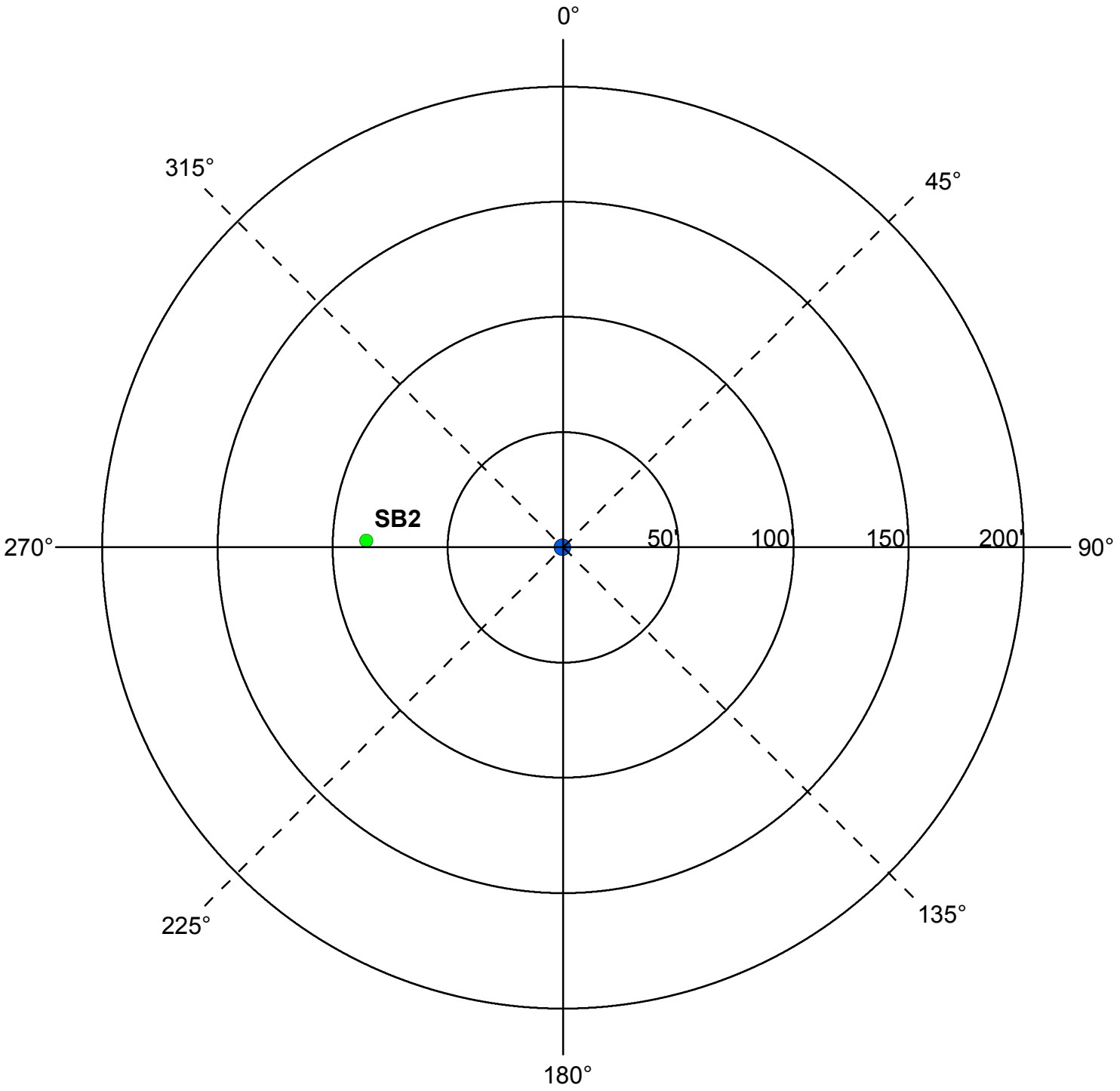
[5] A community public water-supply well must be a minimum of 50 feet from a petroleum tank or container, unless the tank or container is used for emergency pumping and is located in a room or building separate from the community well; and is of double-wall construction with leak detection between walls; or is protected with secondary containment.

This form is based on the new isolation distances in Minnesota Rules, Chapter 4725, related to wells and borings adopted August 4, 2008, and Minnesota Rules, Chapter 4720, related to wellhead protection.

PWS ID / FACILITY ID	1020017 S25	UNIQUE WELL NO.	202926

SETBACK DISTANCES	All potential contaminant sources must be noted on sketch.

Record the distance and approximate compass bearing of each potential contaminant source from the well, and identify the source using the "Source Code". Unlabeled points on the map are unsealed wells.



	Y	N	N/A
Were the isolation distances maintained for the new sources of contamination?			
Is the system monitoring existing nonconforming sources of contamination?			

Reminder Question: Were the wellhead protection measure(s) implemented?

INSPECTOR	Neiman, Dave	DATE	6 - 3 - 2016

PWS ID / FACILITY ID	1020017 S25	UNIQUE WELL NO.	202926

RECOMMENDED WELLHEAD PROTECTION (WHP) MEASURES	WHP MEASURE IMPLEMENTED? Y or N	DATE VERIFIED

COMMENTS

For further information, please contact:

Minnesota Department of Health
Drinking Water Protection Section
Source Water Protection Unit
P.O. Box 64975
St. Paul, Minnesota 55164-0975

Section Receptionist: 651-201-4700
Division TDD: 651-201-5797 or MN Relay Service @ 1-800-627-3529 and ask for 651-201-5000

Environmental Health Division
Drinking Water Protection Section
P.O. Box 64975
St. Paul, Minnesota 55164-0975

INNER WELLHEAD MANAGEMENT ZONE (IWMZ) - POTENTIAL CONTAMINANT SOURCE INVENTORY (PCSI) REPORT

PUBLIC WATER SYSTEM INFORMATION

PWS ID	1020017	**COMMUNITY**
NAME	Coon Rapids	
ADDRESS	Kory Jorgensen Utilities Supervisor, Public Works Garage, 1831 111th Avenue, Coon Rapids, MN 554333761	

FACILITY (WELL) INFORMATION

NAME	Well #2	**IS THERE A WELL LOG OR ADDITIONAL CONSTRUCTION INFORMATION AVAILABLE?**
FACILITY ID	S26	☐ **YES** (Please attach a copy)
UNIQUE WELL NO.	202929	☐ **NO** ☐ **UNDETERMINED**
COUNTY	Anoka	

PWS ID / FACILITY ID	1020017 S26	**UNIQUE WELL NO.**	202929

PCSI CODE	ACTUAL OR POTENTIAL CONTAMINATION SOURCE	ISOLATION DISTANCES (FEET)				LOCATION	
		Minimum Distances		Sensitive Well[1]	Within 200 Ft. Y / N / U	Dist. from Well	Est. (?)
		Community	Non-community				
Agricultural Related							
*AC1	Agricultural chemical buried piping	50	50		N		
*AC2	Agricultural chemical multiple tanks or containers for residential retail sale or use, no single tank or container exceeding, but aggregate volume exceeding 56 gal. or 100 lbs. dry weight	50	50		N		
ACP	Agricultural chemical tank or container with 25 gal. or more or 100 lbs. or more dry weight, or equipment filling or cleaning area without safeguards	150	150		N		
ACS	Agricultural chemical storage or equipment filling or cleaning area with safeguards	100	100		N		
ACR	Agricultural chemical storage or equipment filling or cleaning area with safeguards and roofed	50	50		N		
ADW	Agricultural drainage well[2] (Class V well - illegal[3])	50	50		N		
AAT	Anhydrous ammonia tank (stationary tank)	50	50		N		
AB1	Animal building, feedlot, confinement area, or kennel, 0.1 to 1.0 animal unit (stockyard)	50	20	100/40	N		
AB2	Animal building or poultry building, including a horse riding area, more than 1.0 animal unit	50	50	100	N		
ABS	Animal burial area, more than 1.0 animal unit	50	50		N		
FWP	Animal feeding or watering area within a pasture, more than 1.0 animal unit	50	50	100	N		
AF1	Animal feedlot, unroofed, 300 or more animal units (stockyard)	100	100	200	N		
AF2	Animal feedlot, more than 1.0, but less than 300 animal units (stockyard)	50	50	100	N		
AMA	Animal manure application	use discretion	use discretion		N		
REN	Animal rendering plant	50	50		N		
MS1	Manure (liquid) storage basin or lagoon, unpermitted or noncertified	300	300	600	N		
MS2	Manure (liquid) storage basin or lagoon, approved earthen liner	150	150	300	N		
MS3	Manure (liquid) storage basin or lagoon, approved concrete or composite liner	100	100	200	N		
MS4	Manure (solid) storage area, not covered with a roof	100	100	200	N		
OSC	Open storage for crops	use discretion	use discretion		N		
SSTS Related							
AA1	Absorption area of a soil dispersal system, average flow greater than 10,000 gal./day	300	300	600	N		
AA2	Absorption area of a soil dispersal system serving a facility handling infectious or pathological wastes, average flow 10,000 gal./day or less	150	150	300	N		
AA3	Absorption area of a soil dispersal system, average flow 10,000 gal./day or less	50	50	100	N		
AA4	Absorption area of a soil dispersal system serving multiple family residences or a non-residential facility and has the capacity to serve 20 or more persons per day (Class V well)[2]	50/300/150[4]	50/300/150[4]	100/600/300[4]	N		
CSP	Cesspool	75	75	150	N		
AGG	Dry well, leaching pit, seepage pit	75	75	150	N		
*FD1	Floor drain, grate, or trough connected to a buried sewer	50	50		N		
*FD2	Floor drain, grate, or trough if buried sewer is air-tested, approved materials, serving one building, or two or less single-family residences	50	20		N		
*GW1	Gray-water dispersal area	50	50	100	N		
LC1	Large capacity cesspools (Class V well - illegal)[2]	75	75	150	N		
MVW	Motor vehicle waste disposal (Class V well - illegal)[2]	illegal	illegal		N		

PWS ID / FACILITY ID	1020017 S26	UNIQUE WELL NO.	202929

PCSI CODE	ACTUAL OR POTENTIAL CONTAMINATION SOURCE	ISOLATION DISTANCES (FEET)				LOCATION	
		Minimum Distances		Sensitive Well[1]	Within 200 Ft. Y / N / U	Dist. from Well	Est. (?)
		Community	Non-community				
PR1	Privy, nonportable	50	50	100	N		
PR2	Portable (privy) or toilet	50	20		N		
*SF1	Watertight sand filter; peat filter; or constructed wetland	50	50		N		
SET	Septic tank	50	50		N		
HTK	Sewage holding tank, watertight	50	50		N		
SS1	Sewage sump capacity 100 gal. or more	50	50		N		
SS2	Sewage sump capacity less than 100 gal., tested, conforming to rule	50	20		N		
*ST1	Sewage treatment device, watertight	50	50		N		
SB1	Sewer, buried, approved materials, tested, serving one building, or two or less single-family residences	50	20		N		
SB2	Sewer, buried, collector, municipal, serving a facility handling infectious or pathological wastes, open-jointed or unapproved materials	50	50		Y	75	N
SB2	Sewer, buried, collector, municipal, serving a facility handling infectious or pathological wastes, open-jointed or unapproved materials	50	50		Y	155	N
*WB1	Water treatment backwash holding basin, reclaim basin, or surge tank with a direct sewer connection	50	50		N		
*WB2	Water treatment backwash holding basin, reclaim basin, or surge tank with a backflow protected sewer connection	20	20		N		
Land Application							
SPT	Land spreading area for sewage, septage, or sludge	50	50	100	N		
Solid Waste Related							
COS	Commercial compost site	50	50		N		
CD1	Construction or demolition debris disposal area	50	50	100	N		
*HW1	Household solid waste disposal area, single residence	50	50	100	N		
LF1	Landfill, permitted demolition debris, dump, or mixed municipal solid waste from multiple persons	300	300	600	N		
SVY	Scrap yard	50	50		N		
SWT	Solid waste transfer station	50	50		N		
Storm Water Related							
SD1	Storm water drain pipe, 8 inches or greater in diameter	50	20		N		
SWI	Storm water drainage well[2] (Class V well - illegal[3])	50	50		N		
SM1	Storm water pond greater than 5000 gal.	50	35		N		
Wells and Borings							
*EB1	Elevator boring, not conforming to rule	50	50		N		
*EB2	Elevator boring, conforming to rule	20	20		N		
MON	Monitoring well	record dist.	record dist.		N		
WEL	Operating well	record dist.	record dist.		N		
UUW	Unused, unsealed well or boring	50	50		N		
General							
*CR1	Cistern or reservoir, buried, nonpressurized water supply	20	20		N		
PLM	Contaminant plume	50	50		N		
*CW1	Cooling water pond, industrial	50	50	100	N		
DC1	Deicing chemicals, bulk road	50	50	100	N		
*ET1	Electrical transformer storage area, oil-filled	50	50		N		
GRV	Grave or mausoleum	50	50		N		
GP1	Gravel pocket or French drain for clear water drainage only	20	20		N		
*HS1	Hazardous substance buried piping	50	50		N		
HS2	Hazardous substance tank or container, above ground or underground, 56 gal. or more, or 100 lbs. or more dry weight, without safeguards	150	150		N		
HS3	Hazardous substance tank or container, above ground or underground, 56 gal. or more, or 100 lbs. or more dry weight with safeguards	100	100		N		
HS4	Hazardous substance multiple storage tanks or containers for residential retail sale or use, no single tank or container exceeding 56 gal. or 100 lbs., but aggregate volume exceeding	50	50		N		
HWF	Highest water or flood level	50	N/A		N		
*HG1	Horizontal ground source closed loop heat exchanger buried piping	50	50		N		
*HG2	Horizontal ground source closed loop heat exchanger buried piping and horizontal piping, approved materials and heat transfer fluid	50	10		N		
IWD	Industrial waste disposal well (Class V well)[2]	illegal[3]	illegal[3]		N		
IWS	Interceptor, including a flammable waste or sediment	50	50		N		
OH1	Ordinary high water level of a stream, river, pond, lake, reservoir, or drainage ditch (holds water six months or more)	50	35		N		

PWS ID / FACILITY ID	1020017 S26	UNIQUE WELL NO.	202929

PCSI CODE	ACTUAL OR POTENTIAL CONTAMINATION SOURCE	ISOLATION DISTANCES (FEET)				LOCATION	
		Minimum Distances		Sensitive Well[1]	Within 200 Ft. Y / N / U	Dist. from Well	Est. (?)
		Community	Non-community				
*PP1	Petroleum buried piping	50	50		N		
*PP2	Petroleum or crude oil pipeline to a refinery or distribution center	100	100		N		
PT1	Petroleum tank or container, 1100 gal. or more, without safeguards	150	150		N		
PT2	Petroleum tank or container, 1100 gal. or more, with safeguards	100	100		N		
PT3	Petroleum tank or container, buried, between 56 and 1100 gal.	50	50		N		
PT4	Petroleum tank or container, not buried, between 56 and 1100 gal.	50[5]	20		N		
PU1	Pit or unfilled space more than four feet in depth	20	20		N		
PC1	Pollutant or contaminant that may drain into the soil	50	50	100	N		
SP1	Swimming pool, in-ground	20	20		N		
*VH1	Vertical heat exchanger, horizontal piping conforming to rule	50	10		N		
*VH2	Vertical heat exchanger (vertical) piping, conforming to rule	50	35		N		
*WR1	Wastewater rapid infiltration basin, municipal or industrial	300	300	600	N		
*WA1	Wastewater spray irrigation area, municipal or industrial	150	150	300	N		
*WS1	Wastewater stabilization pond, industrial	150	150	300	N		
*WS2	Wastewater stabilization pond, municipal, 500 or more gal./acre/day of leakage	300	300	600	N		
*WS3	Wastewater stabilization pond, municipal, less than 500 gal./acre/day of leakage	150	150	300	N		
*WT1	Wastewater treatment unit tanks, vessels and components (Package plant)	100	100		N		
*WT2	Water treatment backwash disposal area	50	50	100	N		
Additional Sources (If there is more than one source listed above, please indicate here).							
Potential Contamination Sources and Codes Based on Previous Versions of this Form							
	none found within 200' of this well.						

* New potential contaminant source.

[1] A sensitive well has less than 50 feet of watertight casing, and which is not cased below a confining layer or confining materials of at least 10' in thickness.

[2] These sources, known as Class V underground injection wells, are regulated by the federal U.S. Environmental Protection Agency.

[3] These sources are classified as illegal by Minnesota Rules, Chapter 4725.

[4] Isolation distance is determined by average flow per day or if a facility handles infectious or pathological wastes.

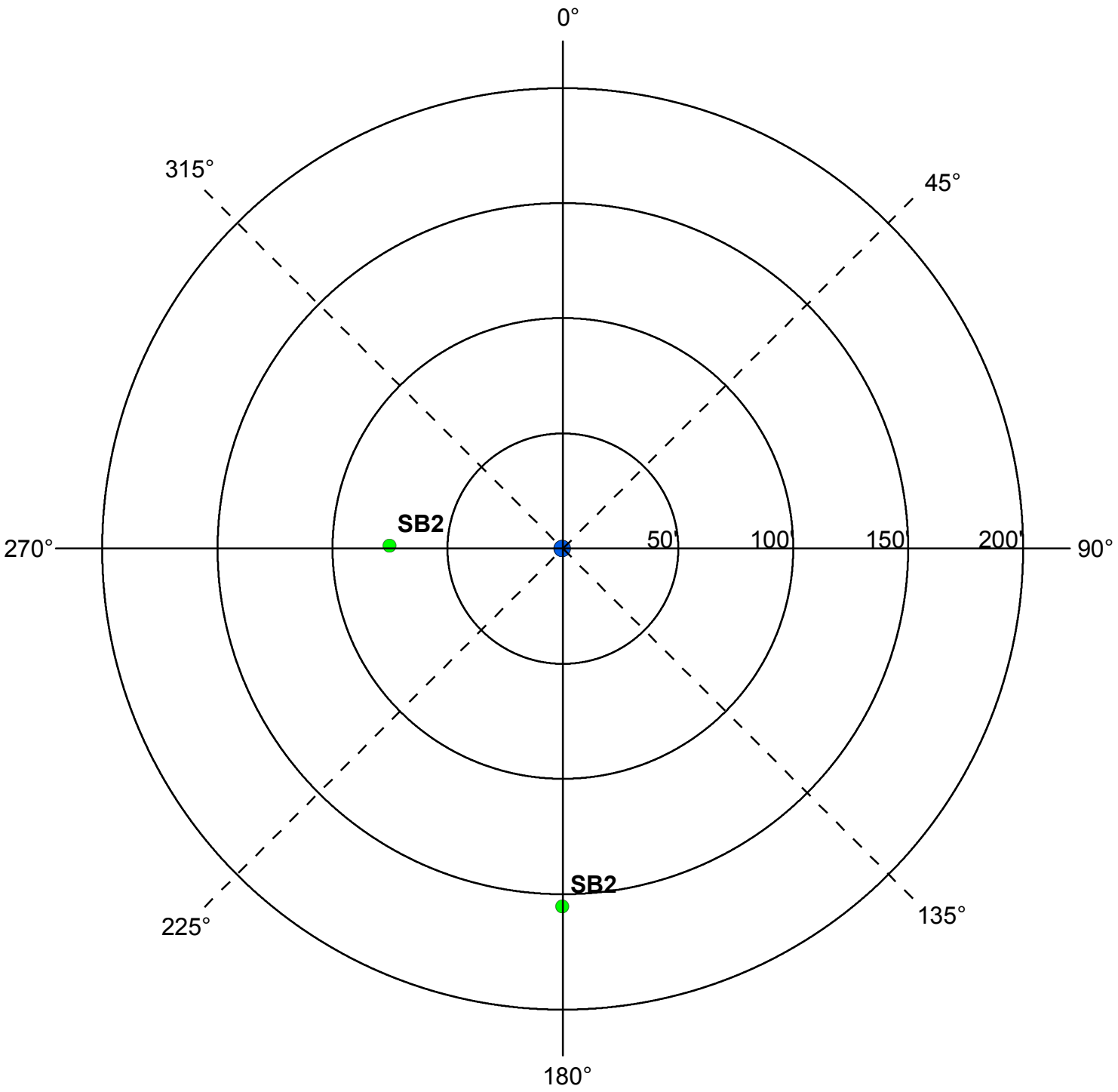
[5] A community public water-supply well must be a minimum of 50 feet from a petroleum tank or container, unless the tank or container is used for emergency pumping and is located in a room or building separate from the community well; and is of double-wall construction with leak detection between walls; or is protected with secondary containment.

This form is based on the new isolation distances in Minnesota Rules, Chapter 4725, related to wells and borings adopted August 4, 2008, and Minnesota Rules, Chapter 4720, related to wellhead protection.

PWS ID / FACILITY ID	1020017 S26	UNIQUE WELL NO.	202929

SETBACK DISTANCES	All potential contaminant sources must be noted on sketch.

Record the distance and approximate compass bearing of each potential contaminant source from the well, and identify the source using the "Source Code". Unlabeled points on the map are unsealed wells.



	Y	N	N/A
Were the isolation distances maintained for the new sources of contamination?			
Is the system monitoring existing nonconforming sources of contamination?			

Reminder Question: Were the wellhead protection measure(s) implemented?

INSPECTOR	Neiman, Dave	DATE	6 - 3 - 2016

PWS ID / FACILITY ID	1020017 S26	UNIQUE WELL NO.	202929

RECOMMENDED WELLHEAD PROTECTION (WHP) MEASURES	WHP MEASURE IMPLEMENTED? Y or N	DATE VERIFIED

COMMENTS

For further information, please contact:

Minnesota Department of Health
Drinking Water Protection Section
Source Water Protection Unit
P.O. Box 64975
St. Paul, Minnesota 55164-0975

Section Receptionist: 651-201-4700
Division TDD: 651-201-5797 or MN Relay Service @ 1-800-627-3529 and ask for 651-201-5000

Environmental Health Division
Drinking Water Protection Section
P.O. Box 64975
St. Paul, Minnesota 55164-0975

INNER WELLHEAD MANAGEMENT ZONE (IWMZ) - POTENTIAL CONTAMINANT SOURCE INVENTORY (PCSI) REPORT

PUBLIC WATER SYSTEM INFORMATION

PWS ID	1020017	**COMMUNITY**
NAME	Coon Rapids	
ADDRESS	Kory Jorgensen Utilities Supervisor, Public Works Garage, 1831 111th Avenue, Coon Rapids, MN 554333761	

FACILITY (WELL) INFORMATION

NAME	Well #4	**IS THERE A WELL LOG OR ADDITIONAL CONSTRUCTION INFORMATION AVAILABLE?**
FACILITY ID	S04	☐ **YES** (Please attach a copy)
UNIQUE WELL NO.	202972	☐ **NO** ☐ **UNDETERMINED**
COUNTY	Anoka	

PWS ID / FACILITY ID	1020017 S04	**UNIQUE WELL NO.**	202972

PCSI CODE	ACTUAL OR POTENTIAL CONTAMINATION SOURCE	ISOLATION DISTANCES (FEET)				LOCATION	
		Minimum Distances		Sensitive Well[1]	Within 200 Ft. Y / N / U	Dist. from Well	Est. (?)
		Community	Non-community				
Agricultural Related							
*AC1	Agricultural chemical buried piping	50	50		N		
*AC2	Agricultural chemical multiple tanks or containers for residential retail sale or use, no single tank or container exceeding, but aggregate volume exceeding 56 gal. or 100 lbs. dry weight	50	50		N		
ACP	Agricultural chemical tank or container with 25 gal. or more or 100 lbs. or more dry weight, or equipment filling or cleaning area without safeguards	150	150		N		
ACS	Agricultural chemical storage or equipment filling or cleaning area with safeguards	100	100		N		
ACR	Agricultural chemical storage or equipment filling or cleaning area with safeguards and roofed	50	50		N		
ADW	Agricultural drainage well[2] (Class V well - illegal[3])	50	50		N		
AAT	Anhydrous ammonia tank (stationary tank)	50	50		N		
AB1	Animal building, feedlot, confinement area, or kennel, 0.1 to 1.0 animal unit (stockyard)	50	20	100/40	N		
AB2	Animal building or poultry building, including a horse riding area, more than 1.0 animal unit	50	50	100	N		
ABS	Animal burial area, more than 1.0 animal unit	50	50		N		
FWP	Animal feeding or watering area within a pasture, more than 1.0 animal unit	50	50	100	N		
AF1	Animal feedlot, unroofed, 300 or more animal units (stockyard)	100	100	200	N		
AF2	Animal feedlot, more than 1.0, but less than 300 animal units (stockyard)	50	50	100	N		
AMA	Animal manure application	use discretion	use discretion		N		
REN	Animal rendering plant	50	50		N		
MS1	Manure (liquid) storage basin or lagoon, unpermitted or noncertified	300	300	600	N		
MS2	Manure (liquid) storage basin or lagoon, approved earthen liner	150	150	300	N		
MS3	Manure (liquid) storage basin or lagoon, approved concrete or composite liner	100	100	200	N		
MS4	Manure (solid) storage area, not covered with a roof	100	100	200	N		
OSC	Open storage for crops	use discretion	use discretion		N		
SSTS Related							
AA1	Absorption area of a soil dispersal system, average flow greater than 10,000 gal./day	300	300	600	N		
AA2	Absorption area of a soil dispersal system serving a facility handling infectious or pathological wastes, average flow 10,000 gal./day or less	150	150	300	N		
AA3	Absorption area of a soil dispersal system, average flow 10,000 gal./day or less	50	50	100	N		
AA4	Absorption area of a soil dispersal system serving multiple family residences or a non-residential facility and has the capacity to serve 20 or more persons per day (Class V well)[2]	50/300/150[4]	50/300/150[4]	100/600/300[4]	N		
CSP	Cesspool	75	75	150	N		
AGG	Dry well, leaching pit, seepage pit	75	75	150	N		
*FD1	Floor drain, grate, or trough connected to a buried sewer	50	50		N		
*FD2	Floor drain, grate, or trough if buried sewer is air-tested, approved materials, serving one building, or two or less single-family residences	50	20		N		
*GW1	Gray-water dispersal area	50	50	100	N		
LC1	Large capacity cesspools (Class V well - illegal)[2]	75	75	150	N		
MVW	Motor vehicle waste disposal (Class V well - illegal)[2]	illegal	illegal		N		

PWS ID / FACILITY ID	1020017 S04	UNIQUE WELL NO.	202972

PCSI CODE	ACTUAL OR POTENTIAL CONTAMINATION SOURCE	ISOLATION DISTANCES (FEET)				LOCATION	
		Minimum Distances		Sensitive Well[1]	Within 200 Ft. Y / N / U	Dist. from Well	Est. (?)
		Community	Non-community				
PR1	Privy, nonportable	50	50	100	N		
PR2	Portable (privy) or toilet	50	20		N		
*SF1	Watertight sand filter; peat filter; or constructed wetland	50	50		N		
SET	Septic tank	50	50		N		
HTK	Sewage holding tank, watertight	50	50		N		
SS1	Sewage sump capacity 100 gal. or more	50	50		N		
SS2	Sewage sump capacity less than 100 gal., tested, conforming to rule	50	20		N		
*ST1	Sewage treatment device, watertight	50	50		N		
SB1	Sewer, buried, approved materials, tested, serving one building, or two or less single-family residences	50	20		N		
SB2	Sewer, buried, collector, municipal, serving a facility handling infectious or pathological wastes, open-jointed or unapproved materials	50	50		Y	190	N
SB2	Sewer, buried, collector, municipal, serving a facility handling infectious or pathological wastes, open-jointed or unapproved materials	50	50		Y	100	N
SB2	Sewer, buried, collector, municipal, serving a facility handling infectious or pathological wastes, open-jointed or unapproved materials	50	50		Y	125	N
*WB1	Water treatment backwash holding basin, reclaim basin, or surge tank with a direct sewer connection	50	50		N		
*WB2	Water treatment backwash holding basin, reclaim basin, or surge tank with a backflow protected sewer connection	20	20		N		
Land Application							
SPT	Land spreading area for sewage, septage, or sludge	50	50	100	N		
Solid Waste Related							
COS	Commercial compost site	50	50		N		
CD1	Construction or demolition debris disposal area	50	50	100	N		
*HW1	Household solid waste disposal area, single residence	50	50	100	N		
LF1	Landfill, permitted demolition debris, dump, or mixed municipal solid waste from multiple persons	300	300	600	N		
SVY	Scrap yard	50	50		N		
SWT	Solid waste transfer station	50	50		N		
Storm Water Related							
SD1	Storm water drain pipe, 8 inches or greater in diameter	50	20		Y	150	N
SD1	Storm water drain pipe, 8 inches or greater in diameter	50	20		Y	195	N
SWI	Storm water drainage well[2] (Class V well - illegal[3])	50	50		N		
SM1	Storm water pond greater than 5000 gal.	50	35		N		
Wells and Borings							
*EB1	Elevator boring, not conforming to rule	50	50		N		
*EB2	Elevator boring, conforming to rule	20	20		N		
MON	Monitoring well	record dist.	record dist.		N		
WEL	Operating well	record dist.	record dist.		N		
UUW	Unused, unsealed well or boring	50	50		N		
General							
*CR1	Cistern or reservoir, buried, nonpressurized water supply	20	20		N		
PLM	Contaminant plume	50	50		N		
*CW1	Cooling water pond, industrial	50	50	100	N		
DC1	Deicing chemicals, bulk road	50	50	100	N		
*ET1	Electrical transformer storage area, oil-filled	50	50		N		
GRV	Grave or mausoleum	50	50		N		
GP1	Gravel pocket or French drain for clear water drainage only	20	20		N		
*HS1	Hazardous substance buried piping	50	50		N		
HS2	Hazardous substance tank or container, above ground or underground, 56 gal. or more, or 100 lbs. or more dry weight, without safeguards	150	150		N		
HS3	Hazardous substance tank or container, above ground or underground, 56 gal. or more, or 100 lbs. or more dry weight with safeguards	100	100		N		
HS4	Hazardous substance multiple storage tanks or containers for residential retail sale or use, no single tank or container exceeding 56 gal. or 100 lbs., but aggregate volume exceeding	50	50		N		
HWF	Highest water or flood level	50	N/A		N		
*HG1	Horizontal ground source closed loop heat exchanger buried piping	50	50		N		
*HG2	Horizontal ground source closed loop heat exchanger buried piping and horizontal piping, approved materials and heat transfer fluid	50	10		N		
IWD	Industrial waste disposal well (Class V well)[2]	illegal[3]	illegal[3]		N		

PWS ID / FACILITY ID	1020017 S04	UNIQUE WELL NO.	202972

PCSI CODE	ACTUAL OR POTENTIAL CONTAMINATION SOURCE	ISOLATION DISTANCES (FEET)				LOCATION	
		Minimum Distances		Sensitive Well[1]	Within 200 Ft. Y / N / U	Dist. from Well	Est. (?)
		Community	Non-community				
IWS	Interceptor, including a flammable waste or sediment	50	50		N		
OH1	Ordinary high water level of a stream, river, pond, lake, reservoir, or drainage ditch (holds water six months or more)	50	35		N		
*PP1	Petroleum buried piping	50	50		N		
*PP2	Petroleum or crude oil pipeline to a refinery or distribution center	100	100		N		
PT1	Petroleum tank or container, 1100 gal. or more, without safeguards	150	150		N		
PT2	Petroleum tank or container, 1100 gal. or more, with safeguards	100	100		N		
PT3	Petroleum tank or container, buried, between 56 and 1100 gal.	50	50		N		
PT4	Petroleum tank or container, not buried, between 56 and 1100 gal.	50[5]	20		N		
PU1	Pit or unfilled space more than four feet in depth	20	20		N		
PC1	Pollutant or contaminant that may drain into the soil	50	50	100	N		
SP1	Swimming pool, in-ground	20	20		N		
*VH1	Vertical heat exchanger, horizontal piping conforming to rule	50	10		N		
*VH2	Vertical heat exchanger (vertical) piping, conforming to rule	50	35		N		
*WR1	Wastewater rapid infiltration basin, municipal or industrial	300	300	600	N		
*WA1	Wastewater spray irrigation area, municipal or industrial	150	150	300	N		
*WS1	Wastewater stabilization pond, industrial	150	150	300	N		
*WS2	Wastewater stabilization pond, municipal, 500 or more gal./acre/day of leakage	300	300	600	N		
*WS3	Wastewater stabilization pond, municipal, less than 500 gal./acre/day of leakage	150	150	300	N		
*WT1	Wastewater treatment unit tanks, vessels and components (Package plant)	100	100		N		
*WT2	Water treatment backwash disposal area	50	50	100	N		
Additional Sources (If there is more than one source listed above, please indicate here).							
Potential Contamination Sources and Codes Based on Previous Versions of this Form							
	none found within 200' of this well.						

* New potential contaminant source.

[1] A sensitive well has less than 50 feet of watertight casing, and which is not cased below a confining layer or confining materials of at least 10' in thickness.

[2] These sources, known as Class V underground injection wells, are regulated by the federal U.S. Environmental Protection Agency.

[3] These sources are classified as illegal by Minnesota Rules, Chapter 4725.

[4] Isolation distance is determined by average flow per day or if a facility handles infectious or pathological wastes.

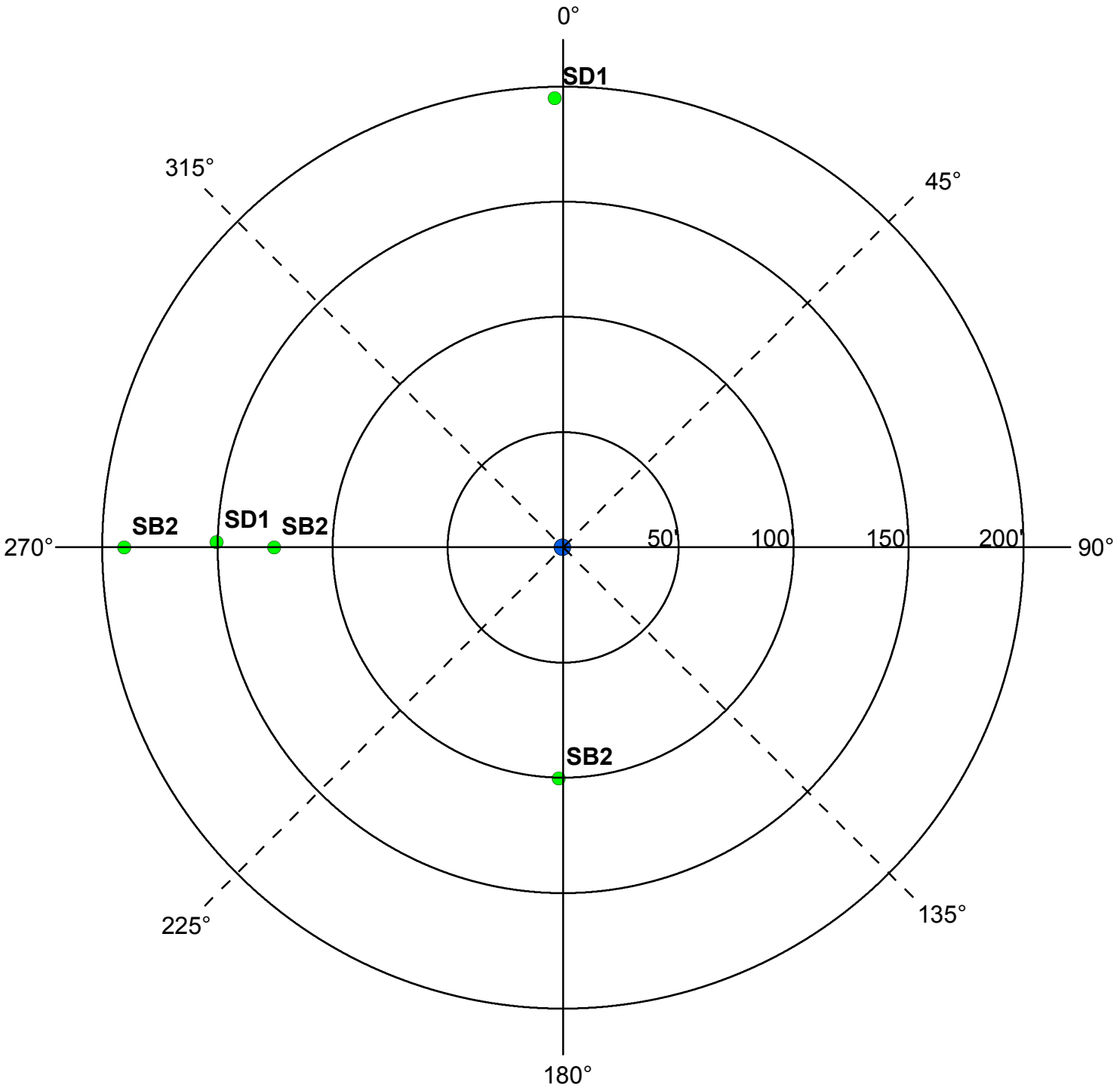
[5] A community public water-supply well must be a minimum of 50 feet from a petroleum tank or container, unless the tank or container is used for emergency pumping and is located in a room or building separate from the community well; and is of double-wall construction with leak detection between walls; or is protected with secondary containment.

This form is based on the new isolation distances in Minnesota Rules, Chapter 4725, related to wells and borings adopted August 4, 2008, and Minnesota Rules, Chapter 4720, related to wellhead protection.

PWS ID / FACILITY ID	1020017 S04	UNIQUE WELL NO.	202972

SETBACK DISTANCES	All potential contaminant sources must be noted on sketch.

Record the distance and approximate compass bearing of each potential contaminant source from the well, and identify the source using the "Source Code". Unlabeled points on the map are unsealed wells.



	Y	N	N/A
Were the isolation distances maintained for the new sources of contamination?			
Is the system monitoring existing nonconforming sources of contamination?			

Reminder Question: Were the wellhead protection measure(s) implemented?

INSPECTOR	Neiman, Dave	DATE	6 - 3 - 2016

PWS ID / FACILITY ID	1020017 S04	UNIQUE WELL NO.	202972

RECOMMENDED WELLHEAD PROTECTION (WHP) MEASURES	WHP MEASURE IMPLEMENTED? Y or N	DATE VERIFIED

COMMENTS

For further information, please contact:

Minnesota Department of Health
Drinking Water Protection Section
Source Water Protection Unit
P.O. Box 64975
St. Paul, Minnesota 55164-0975

Section Receptionist: 651-201-4700
Division TDD: 651-201-5797 or MN Relay Service @ 1-800-627-3529 and ask for 651-201-5000

Environmental Health Division
Drinking Water Protection Section
P.O. Box 64975
St. Paul, Minnesota 55164-0975

INNER WELLHEAD MANAGEMENT ZONE (IWMZ) - POTENTIAL CONTAMINANT SOURCE INVENTORY (PCSI) REPORT

PUBLIC WATER SYSTEM INFORMATION

PWS ID	1020017	**COMMUNITY**
NAME	Coon Rapids	
ADDRESS	Kory Jorgensen Utilities Supervisor, Public Works Garage, 1831 111th Avenue, Coon Rapids, MN 554333761	

FACILITY (WELL) INFORMATION

NAME	Well #5	**IS THERE A WELL LOG OR ADDITIONAL CONSTRUCTION INFORMATION AVAILABLE?**
FACILITY ID	S05	☐ **YES** (Please attach a copy)
UNIQUE WELL NO.	202951	☐ **NO** ☐ **UNDETERMINED**
COUNTY	Anoka	

PWS ID / FACILITY ID	1020017 S05	**UNIQUE WELL NO.**	202951

PCSI CODE	ACTUAL OR POTENTIAL CONTAMINATION SOURCE	ISOLATION DISTANCES (FEET)				LOCATION	
		Minimum Distances		Sensitive Well[1]	Within 200 Ft. Y / N / U	Dist. from Well	Est. (?)
		Community	Non-community				
Agricultural Related							
*AC1	Agricultural chemical buried piping	50	50		N		
*AC2	Agricultural chemical multiple tanks or containers for residential retail sale or use, no single tank or container exceeding, but aggregate volume exceeding 56 gal. or 100 lbs. dry weight	50	50		N		
ACP	Agricultural chemical tank or container with 25 gal. or more or 100 lbs. or more dry weight, or equipment filling or cleaning area without safeguards	150	150		N		
ACS	Agricultural chemical storage or equipment filling or cleaning area with safeguards	100	100		N		
ACR	Agricultural chemical storage or equipment filling or cleaning area with safeguards and roofed	50	50		N		
ADW	Agricultural drainage well[2] (Class V well - illegal[3])	50	50		N		
AAT	Anhydrous ammonia tank (stationary tank)	50	50		N		
AB1	Animal building, feedlot, confinement area, or kennel, 0.1 to 1.0 animal unit (stockyard)	50	20	100/40	N		
AB2	Animal building or poultry building, including a horse riding area, more than 1.0 animal unit	50	50	100	N		
ABS	Animal burial area, more than 1.0 animal unit	50	50		N		
FWP	Animal feeding or watering area within a pasture, more than 1.0 animal unit	50	50	100	N		
AF1	Animal feedlot, unroofed, 300 or more animal units (stockyard)	100	100	200	N		
AF2	Animal feedlot, more than 1.0, but less than 300 animal units (stockyard)	50	50	100	N		
AMA	Animal manure application	use discretion	use discretion		N		
REN	Animal rendering plant	50	50		N		
MS1	Manure (liquid) storage basin or lagoon, unpermitted or noncertified	300	300	600	N		
MS2	Manure (liquid) storage basin or lagoon, approved earthen liner	150	150	300	N		
MS3	Manure (liquid) storage basin or lagoon, approved concrete or composite liner	100	100	200	N		
MS4	Manure (solid) storage area, not covered with a roof	100	100	200	N		
OSC	Open storage for crops	use discretion	use discretion		N		
SSTS Related							
AA1	Absorption area of a soil dispersal system, average flow greater than 10,000 gal./day	300	300	600	N		
AA2	Absorption area of a soil dispersal system serving a facility handling infectious or pathological wastes, average flow 10,000 gal./day or less	150	150	300	N		
AA3	Absorption area of a soil dispersal system, average flow 10,000 gal./day or less	50	50	100	N		
AA4	Absorption area of a soil dispersal system serving multiple family residences or a non-residential facility and has the capacity to serve 20 or more persons per day (Class V well)[2]	50/300/150[4]	50/300/150[4]	100/600/300[4]	N		
CSP	Cesspool	75	75	150	N		
AGG	Dry well, leaching pit, seepage pit	75	75	150	N		
*FD1	Floor drain, grate, or trough connected to a buried sewer	50	50		N		
*FD2	Floor drain, grate, or trough if buried sewer is air-tested, approved materials, serving one building, or two or less single-family residences	50	20		N		
*GW1	Gray-water dispersal area	50	50	100	N		
LC1	Large capacity cesspools (Class V well - illegal)[2]	75	75	150	N		
MVW	Motor vehicle waste disposal (Class V well - illegal)[2]	illegal	illegal		N		

PWS ID / FACILITY ID	1020017 S05	UNIQUE WELL NO.	202951

PCSI CODE	ACTUAL OR POTENTIAL CONTAMINATION SOURCE	ISOLATION DISTANCES (FEET)				LOCATION	
		Minimum Distances		Sensitive Well[1]	Within 200 Ft. Y / N / U	Dist. from Well	Est. (?)
		Community	Non-community				
PR1	Privy, nonportable	50	50	100	N		
PR2	Portable (privy) or toilet	50	20		N		
*SF1	Watertight sand filter; peat filter; or constructed wetland	50	50		N		
SET	Septic tank	50	50		N		
HTK	Sewage holding tank, watertight	50	50		N		
SS1	Sewage sump capacity 100 gal. or more	50	50		N		
SS2	Sewage sump capacity less than 100 gal., tested, conforming to rule	50	20		N		
*ST1	Sewage treatment device, watertight	50	50		N		
SB1	Sewer, buried, approved materials, tested, serving one building, or two or less single-family residences	50	20		N		
SB2	Sewer, buried, collector, municipal, serving a facility handling infectious or pathological wastes, open-jointed or unapproved materials	50	50		Y	153	N
SB2	Sewer, buried, collector, municipal, serving a facility handling infectious or pathological wastes, open-jointed or unapproved materials	50	50		Y	80	N
*WB1	Water treatment backwash holding basin, reclaim basin, or surge tank with a direct sewer connection	50	50		N		
*WB2	Water treatment backwash holding basin, reclaim basin, or surge tank with a backflow protected sewer connection	20	20		N		
Land Application							
SPT	Land spreading area for sewage, septage, or sludge	50	50	100	N		
Solid Waste Related							
COS	Commercial compost site	50	50		N		
CD1	Construction or demolition debris disposal area	50	50	100	N		
*HW1	Household solid waste disposal area, single residence	50	50	100	N		
LF1	Landfill, permitted demolition debris, dump, or mixed municipal solid waste from multiple persons	300	300	600	N		
SVY	Scrap yard	50	50		N		
SWT	Solid waste transfer station	50	50		N		
Storm Water Related							
SD1	Storm water drain pipe, 8 inches or greater in diameter	50	20		Y	155	N
SWI	Storm water drainage well[2] (Class V well - illegal[3])	50	50		N		
SM1	Storm water pond greater than 5000 gal.	50	35		N		
Wells and Borings							
*EB1	Elevator boring, not conforming to rule	50	50		N		
*EB2	Elevator boring, conforming to rule	20	20		N		
MON	Monitoring well	record dist.	record dist.		N		
WEL	Operating well	record dist.	record dist.		N		
UUW	Unused, unsealed well or boring	50	50		N		
General							
*CR1	Cistern or reservoir, buried, nonpressurized water supply	20	20		N		
PLM	Contaminant plume	50	50		N		
*CW1	Cooling water pond, industrial	50	50	100	N		
DC1	Deicing chemicals, bulk road	50	50	100	N		
*ET1	Electrical transformer storage area, oil-filled	50	50		N		
GRV	Grave or mausoleum	50	50		N		
GP1	Gravel pocket or French drain for clear water drainage only	20	20		N		
*HS1	Hazardous substance buried piping	50	50		N		
HS2	Hazardous substance tank or container, above ground or underground, 56 gal. or more, or 100 lbs. or more dry weight, without safeguards	150	150		N		
HS3	Hazardous substance tank or container, above ground or underground, 56 gal. or more, or 100 lbs. or more dry weight with safeguards	100	100		N		
HS4	Hazardous substance multiple storage tanks or containers for residential retail sale or use, no single tank or container exceeding 56 gal. or 100 lbs., but aggregate volume exceeding	50	50		N		
HWF	Highest water or flood level	50	N/A		N		
*HG1	Horizontal ground source closed loop heat exchanger buried piping	50	50		N		
*HG2	Horizontal ground source closed loop heat exchanger buried piping and horizontal piping, approved materials and heat transfer fluid	50	10		N		
IWD	Industrial waste disposal well (Class V well)[2]	illegal[3]	illegal[3]		N		
IWS	Interceptor, including a flammable waste or sediment	50	50		N		
OH1	Ordinary high water level of a stream, river, pond, lake, reservoir, or drainage ditch (holds water six months or more)	50	35		N		

PWS ID / FACILITY ID	1020017 S05	UNIQUE WELL NO.	202951

PCSI CODE	ACTUAL OR POTENTIAL CONTAMINATION SOURCE	ISOLATION DISTANCES (FEET)				LOCATION	
		Minimum Distances		Sensitive Well[1]	Within 200 Ft. Y / N / U	Dist. from Well	Est. (?)
		Community	Non-community				
*PP1	Petroleum buried piping	50	50		N		
*PP2	Petroleum or crude oil pipeline to a refinery or distribution center	100	100		N		
PT1	Petroleum tank or container, 1100 gal. or more, without safeguards	150	150		N		
PT2	Petroleum tank or container, 1100 gal. or more, with safeguards	100	100		N		
PT3	Petroleum tank or container, buried, between 56 and 1100 gal.	50	50		N		
PT4	Petroleum tank or container, not buried, between 56 and 1100 gal.	50[5]	20		N		
PU1	Pit or unfilled space more than four feet in depth	20	20		N		
PC1	Pollutant or contaminant that may drain into the soil	50	50	100	N		
SP1	Swimming pool, in-ground	20	20		N		
*VH1	Vertical heat exchanger, horizontal piping conforming to rule	50	10		N		
*VH2	Vertical heat exchanger (vertical) piping, conforming to rule	50	35		N		
*WR1	Wastewater rapid infiltration basin, municipal or industrial	300	300	600	N		
*WA1	Wastewater spray irrigation area, municipal or industrial	150	150	300	N		
*WS1	Wastewater stabilization pond, industrial	150	150	300	N		
*WS2	Wastewater stabilization pond, municipal, 500 or more gal./acre/day of leakage	300	300	600	N		
*WS3	Wastewater stabilization pond, municipal, less than 500 gal./acre/day of leakage	150	150	300	N		
*WT1	Wastewater treatment unit tanks, vessels and components (Package plant)	100	100		N		
*WT2	Water treatment backwash disposal area	50	50	100	N		
Additional Sources (If there is more than one source listed above, please indicate here).							
Potential Contamination Sources and Codes Based on Previous Versions of this Form							
	none found within 200' of this well.						

* New potential contaminant source.

[1] A sensitive well has less than 50 feet of watertight casing, and which is not cased below a confining layer or confining materials of at least 10' in thickness.

[2] These sources, known as Class V underground injection wells, are regulated by the federal U.S. Environmental Protection Agency.

[3] These sources are classified as illegal by Minnesota Rules, Chapter 4725.

[4] Isolation distance is determined by average flow per day or if a facility handles infectious or pathological wastes.

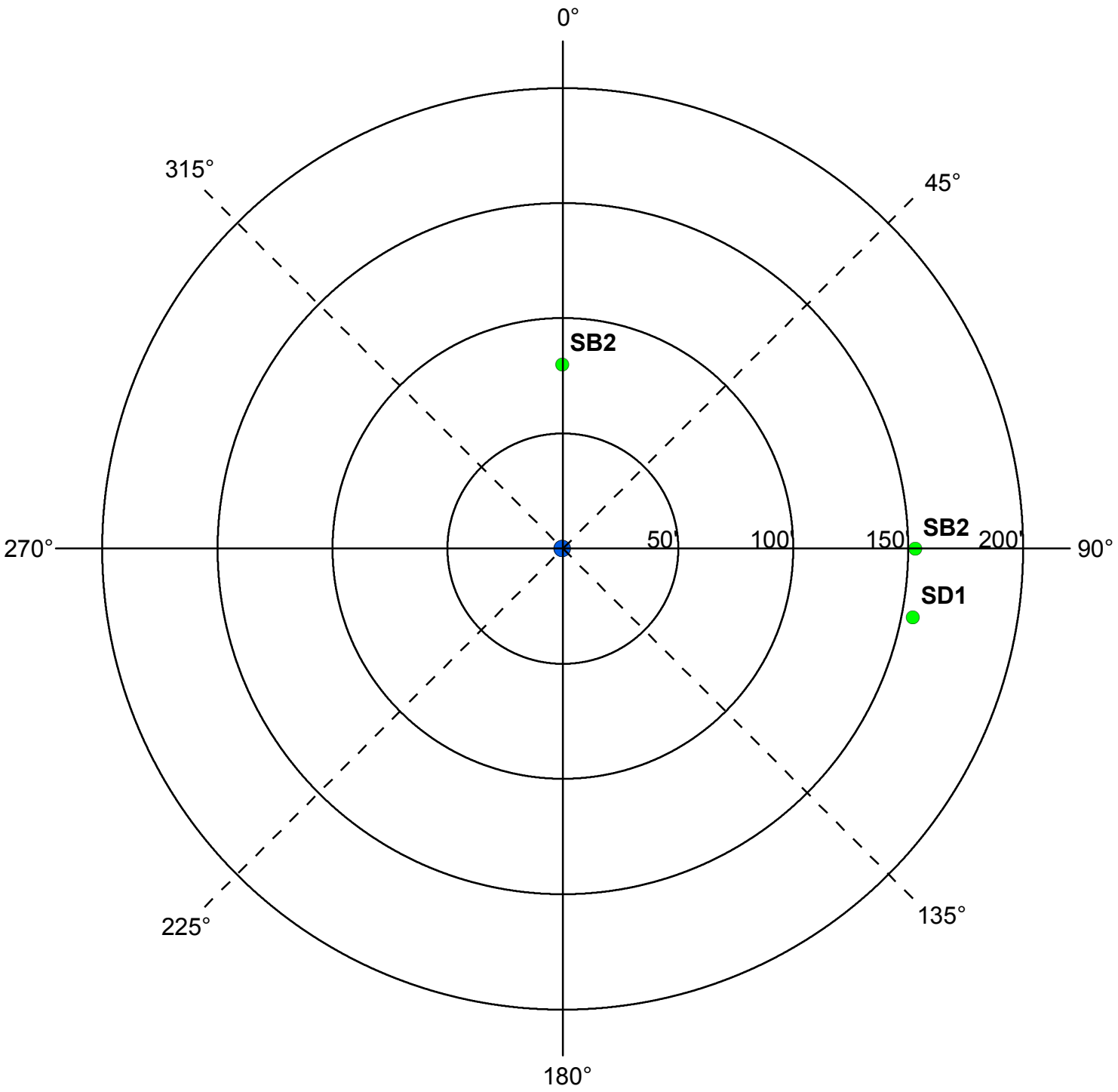
[5] A community public water-supply well must be a minimum of 50 feet from a petroleum tank or container, unless the tank or container is used for emergency pumping and is located in a room or building separate from the community well; and is of double-wall construction with leak detection between walls; or is protected with secondary containment.

This form is based on the new isolation distances in Minnesota Rules, Chapter 4725, related to wells and borings adopted August 4, 2008, and Minnesota Rules, Chapter 4720, related to wellhead protection.

PWS ID / FACILITY ID	1020017 S05	UNIQUE WELL NO.	202951

SETBACK DISTANCES	All potential contaminant sources must be noted on sketch.

Record the distance and approximate compass bearing of each potential contaminant source from the well, and identify the source using the "Source Code". Unlabeled points on the map are unsealed wells.



	Y	N	N/A
Were the isolation distances maintained for the new sources of contamination?			
Is the system monitoring existing nonconforming sources of contamination?			

Reminder Question: Were the wellhead protection measure(s) implemented?

INSPECTOR	Neiman, Dave	DATE	6 - 3 - 2016

PWS ID / FACILITY ID	1020017 S05	UNIQUE WELL NO.	202951

RECOMMENDED WELLHEAD PROTECTION (WHP) MEASURES	WHP MEASURE IMPLEMENTED? Y or N	DATE VERIFIED

COMMENTS

For further information, please contact:

Minnesota Department of Health
Drinking Water Protection Section
Source Water Protection Unit
P.O. Box 64975
St. Paul, Minnesota 55164-0975

Section Receptionist: 651-201-4700
Division TDD: 651-201-5797 or MN Relay Service @ 1-800-627-3529 and ask for 651-201-5000

Environmental Health Division
Drinking Water Protection Section
P.O. Box 64975
St. Paul, Minnesota 55164-0975

INNER WELLHEAD MANAGEMENT ZONE (IWMZ) - POTENTIAL CONTAMINANT SOURCE INVENTORY (PCSI) REPORT

PUBLIC WATER SYSTEM INFORMATION

PWS ID	1020017	**COMMUNITY**
NAME	Coon Rapids	
ADDRESS	Kory Jorgensen Utilities Supervisor, Public Works Garage, 1831 111th Avenue, Coon Rapids, MN 554333761	

FACILITY (WELL) INFORMATION

NAME	Well #6	**IS THERE A WELL LOG OR ADDITIONAL CONSTRUCTION INFORMATION AVAILABLE?**
FACILITY ID	S06	☐ **YES** (Please attach a copy)
UNIQUE WELL NO.	202937	☐ **NO** ☐ **UNDETERMINED**
COUNTY	Anoka	

PWS ID / FACILITY ID	1020017 S06	**UNIQUE WELL NO.**	202937

PCSI CODE	ACTUAL OR POTENTIAL CONTAMINATION SOURCE	ISOLATION DISTANCES (FEET)				LOCATION	
		Minimum Distances		Sensitive Well[1]	Within 200 Ft. Y / N / U	Dist. from Well	Est. (?)
		Community	Non-community				
Agricultural Related							
*AC1	Agricultural chemical buried piping	50	50		N		
*AC2	Agricultural chemical multiple tanks or containers for residential retail sale or use, no single tank or container exceeding, but aggregate volume exceeding 56 gal. or 100 lbs. dry weight	50	50		N		
ACP	Agricultural chemical tank or container with 25 gal. or more or 100 lbs. or more dry weight, or equipment filling or cleaning area without safeguards	150	150		N		
ACS	Agricultural chemical storage or equipment filling or cleaning area with safeguards	100	100		N		
ACR	Agricultural chemical storage or equipment filling or cleaning area with safeguards and roofed	50	50		N		
ADW	Agricultural drainage well[2] (Class V well - illegal[3])	50	50		N		
AAT	Anhydrous ammonia tank (stationary tank)	50	50		N		
AB1	Animal building, feedlot, confinement area, or kennel, 0.1 to 1.0 animal unit (stockyard)	50	20	100/40	N		
AB2	Animal building or poultry building, including a horse riding area, more than 1.0 animal unit	50	50	100	N		
ABS	Animal burial area, more than 1.0 animal unit	50	50		N		
FWP	Animal feeding or watering area within a pasture, more than 1.0 animal unit	50	50	100	N		
AF1	Animal feedlot, unroofed, 300 or more animal units (stockyard)	100	100	200	N		
AF2	Animal feedlot, more than 1.0, but less than 300 animal units (stockyard)	50	50	100	N		
AMA	Animal manure application	use discretion	use discretion		N		
REN	Animal rendering plant	50	50		N		
MS1	Manure (liquid) storage basin or lagoon, unpermitted or noncertified	300	300	600	N		
MS2	Manure (liquid) storage basin or lagoon, approved earthen liner	150	150	300	N		
MS3	Manure (liquid) storage basin or lagoon, approved concrete or composite liner	100	100	200	N		
MS4	Manure (solid) storage area, not covered with a roof	100	100	200	N		
OSC	Open storage for crops	use discretion	use discretion		N		
SSTS Related							
AA1	Absorption area of a soil dispersal system, average flow greater than 10,000 gal./day	300	300	600	N		
AA2	Absorption area of a soil dispersal system serving a facility handling infectious or pathological wastes, average flow 10,000 gal./day or less	150	150	300	N		
AA3	Absorption area of a soil dispersal system, average flow 10,000 gal./day or less	50	50	100	N		
AA4	Absorption area of a soil dispersal system serving multiple family residences or a non-residential facility and has the capacity to serve 20 or more persons per day (Class V well)[2]	50/300/150[4]	50/300/150[4]	100/600/300[4]	N		
CSP	Cesspool	75	75	150	N		
AGG	Dry well, leaching pit, seepage pit	75	75	150	N		
*FD1	Floor drain, grate, or trough connected to a buried sewer	50	50		N		
*FD2	Floor drain, grate, or trough if buried sewer is air-tested, approved materials, serving one building, or two or less single-family residences	50	20		N		
*GW1	Gray-water dispersal area	50	50	100	N		
LC1	Large capacity cesspools (Class V well - illegal)[2]	75	75	150	N		
MVW	Motor vehicle waste disposal (Class V well - illegal)[2]	illegal	illegal		N		

PWS ID / FACILITY ID	1020017 S06	UNIQUE WELL NO.	202937

PCSI CODE	ACTUAL OR POTENTIAL CONTAMINATION SOURCE	ISOLATION DISTANCES (FEET)				LOCATION	
		Minimum Distances		Sensitive Well[1]	Within 200 Ft. Y / N / U	Dist. from Well	Est. (?)
		Community	Non-community				
PR1	Privy, nonportable	50	50	100	N		
PR2	Portable (privy) or toilet	50	20		N		
*SF1	Watertight sand filter; peat filter; or constructed wetland	50	50		N		
SET	Septic tank	50	50		N		
HTK	Sewage holding tank, watertight	50	50		N		
SS1	Sewage sump capacity 100 gal. or more	50	50		N		
SS2	Sewage sump capacity less than 100 gal., tested, conforming to rule	50	20		N		
*ST1	Sewage treatment device, watertight	50	50		N		
SB1	Sewer, buried, approved materials, tested, serving one building, or two or less single-family residences	50	20		N		
SB2	Sewer, buried, collector, municipal, serving a facility handling infectious or pathological wastes, open-jointed or unapproved materials	50	50		Y	90	N
*WB1	Water treatment backwash holding basin, reclaim basin, or surge tank with a direct sewer connection	50	50		N		
*WB2	Water treatment backwash holding basin, reclaim basin, or surge tank with a backflow protected sewer connection	20	20		N		
Land Application							
SPT	Land spreading area for sewage, septage, or sludge	50	50	100	N		
Solid Waste Related							
COS	Commercial compost site	50	50		N		
CD1	Construction or demolition debris disposal area	50	50	100	N		
*HW1	Household solid waste disposal area, single residence	50	50	100	N		
LF1	Landfill, permitted demolition debris, dump, or mixed municipal solid waste from multiple persons	300	300	600	N		
SVY	Scrap yard	50	50		N		
SWT	Solid waste transfer station	50	50		N		
Storm Water Related							
SD1	Storm water drain pipe, 8 inches or greater in diameter	50	20		Y	105	N
SWI	Storm water drainage well[2] (Class V well - illegal[3])	50	50		N		
SM1	Storm water pond greater than 5000 gal.	50	35		N		
Wells and Borings							
*EB1	Elevator boring, not conforming to rule	50	50		N		
*EB2	Elevator boring, conforming to rule	20	20		N		
MON	Monitoring well	record dist.	record dist.		N		
WEL	Operating well	record dist.	record dist.		N		
UUW	Unused, unsealed well or boring	50	50		N		
General							
*CR1	Cistern or reservoir, buried, nonpressurized water supply	20	20		N		
PLM	Contaminant plume	50	50		N		
*CW1	Cooling water pond, industrial	50	50	100	N		
DC1	Deicing chemicals, bulk road	50	50	100	N		
*ET1	Electrical transformer storage area, oil-filled	50	50		N		
GRV	Grave or mausoleum	50	50		N		
GP1	Gravel pocket or French drain for clear water drainage only	20	20		N		
*HS1	Hazardous substance buried piping	50	50		N		
HS2	Hazardous substance tank or container, above ground or underground, 56 gal. or more, or 100 lbs. or more dry weight, without safeguards	150	150		N		
HS3	Hazardous substance tank or container, above ground or underground, 56 gal. or more, or 100 lbs. or more dry weight with safeguards	100	100		N		
HS4	Hazardous substance multiple storage tanks or containers for residential retail sale or use, no single tank or container exceeding 56 gal. or 100 lbs., but aggregate volume exceeding	50	50		N		
HWF	Highest water or flood level	50	N/A		N		
*HG1	Horizontal ground source closed loop heat exchanger buried piping	50	50		N		
*HG2	Horizontal ground source closed loop heat exchanger buried piping and horizontal piping, approved materials and heat transfer fluid	50	10		N		
IWD	Industrial waste disposal well (Class V well)[2]	illegal[3]	illegal[3]		N		
IWS	Interceptor, including a flammable waste or sediment	50	50		N		
OH1	Ordinary high water level of a stream, river, pond, lake, reservoir, or drainage ditch (holds water six months or more)	50	35		N		
*PP1	Petroleum buried piping	50	50		N		
*PP2	Petroleum or crude oil pipeline to a refinery or distribution center	100	100		N		

PWS ID / FACILITY ID	1020017 S06	UNIQUE WELL NO.	202937

PCSI CODE	ACTUAL OR POTENTIAL CONTAMINATION SOURCE	ISOLATION DISTANCES (FEET)				LOCATION	
		Minimum Distances		Sensitive Well[1]	Within 200 Ft. Y / N / U	Dist. from Well	Est. (?)
		Community	Non-community				
PT1	Petroleum tank or container, 1100 gal. or more, without safeguards	150	150		N		
PT2	Petroleum tank or container, 1100 gal. or more, with safeguards	100	100		N		
PT3	Petroleum tank or container, buried, between 56 and 1100 gal.	50	50		N		
PT4	Petroleum tank or container, not buried, between 56 and 1100 gal.	50[5]	20		N		
PU1	Pit or unfilled space more than four feet in depth	20	20		N		
PC1	Pollutant or contaminant that may drain into the soil	50	50	100	N		
SP1	Swimming pool, in-ground	20	20		N		
*VH1	Vertical heat exchanger, horizontal piping conforming to rule	50	10		N		
*VH2	Vertical heat exchanger (vertical) piping, conforming to rule	50	35		N		
*WR1	Wastewater rapid infiltration basin, municipal or industrial	300	300	600	N		
*WA1	Wastewater spray irrigation area, municipal or industrial	150	150	300	N		
*WS1	Wastewater stabilization pond, industrial	150	150	300	N		
*WS2	Wastewater stabilization pond, municipal, 500 or more gal./acre/day of leakage	300	300	600	N		
*WS3	Wastewater stabilization pond, municipal, less than 500 gal./acre/day of leakage	150	150	300	N		
*WT1	Wastewater treatment unit tanks, vessels and components (Package plant)	100	100		N		
*WT2	Water treatment backwash disposal area	50	50	100	N		
Additional Sources (If there is more than one source listed above, please indicate here).							
Potential Contamination Sources and Codes Based on Previous Versions of this Form							
	none found within 200' of this well.						

* New potential contaminant source.

[1] A sensitive well has less than 50 feet of watertight casing, and which is not cased below a confining layer or confining materials of at least 10' in thickness.

[2] These sources, known as Class V underground injection wells, are regulated by the federal U.S. Environmental Protection Agency.

[3] These sources are classified as illegal by Minnesota Rules, Chapter 4725.

[4] Isolation distance is determined by average flow per day or if a facility handles infectious or pathological wastes.

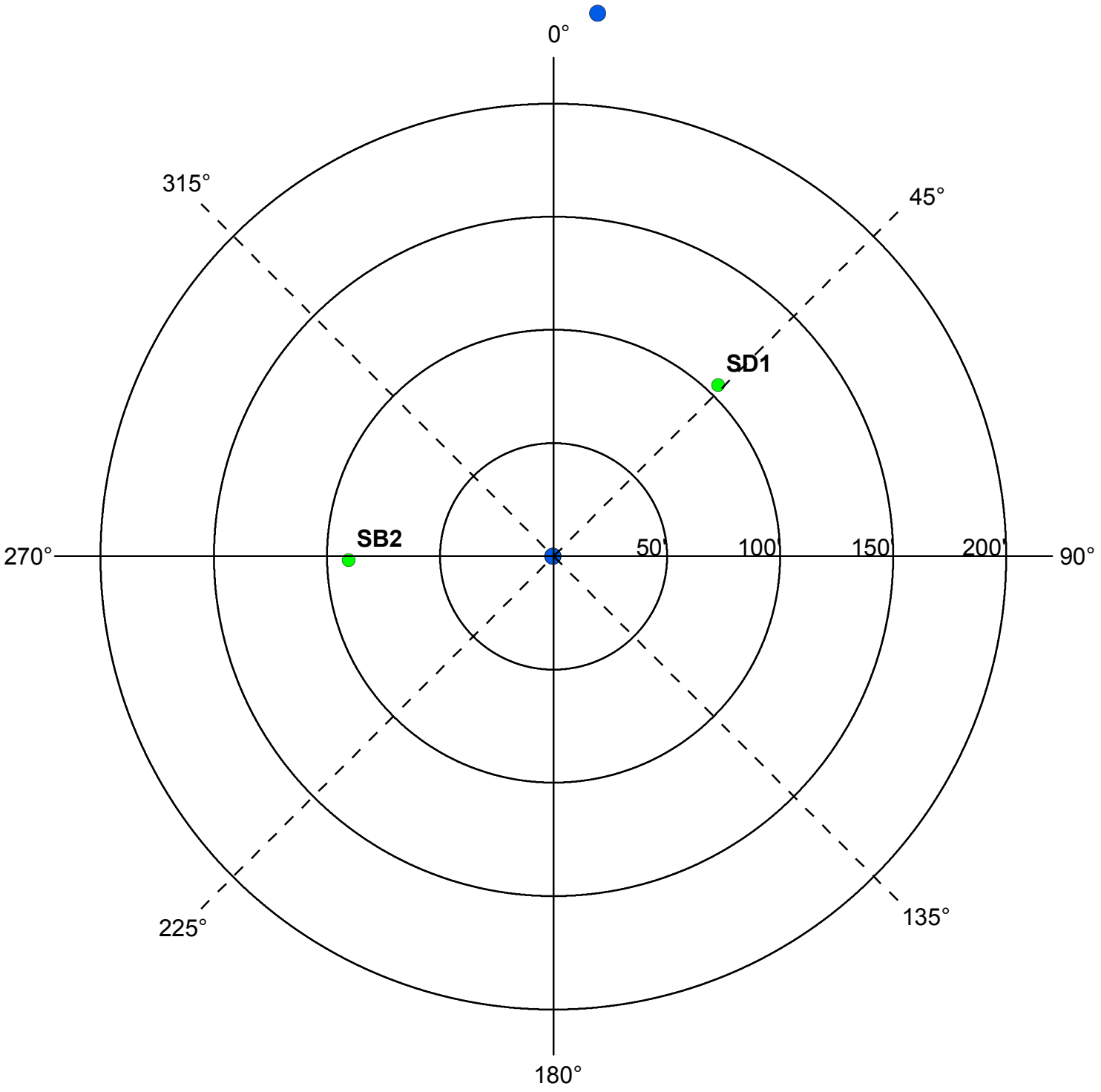
[5] A community public water-supply well must be a minimum of 50 feet from a petroleum tank or container, unless the tank or container is used for emergency pumping and is located in a room or building separate from the community well; and is of double-wall construction with leak detection between walls; or is protected with secondary containment.

This form is based on the new isolation distances in Minnesota Rules, Chapter 4725, related to wells and borings adopted August 4, 2008, and Minnesota Rules, Chapter 4720, related to wellhead protection.

PWS ID / FACILITY ID	1020017 S06	UNIQUE WELL NO.	202937

SETBACK DISTANCES	All potential contaminant sources must be noted on sketch.

Record the distance and approximate compass bearing of each potential contaminant source from the well, and identify the source using the "Source Code". Unlabeled points on the map are unsealed wells.



	Y	N	N/A
Were the isolation distances maintained for the new sources of contamination?			
Is the system monitoring existing nonconforming sources of contamination?			

Reminder Question: Were the wellhead protection measure(s) implemented?

INSPECTOR	Neiman, Dave	DATE	6 - 3 - 2016

PWS ID / FACILITY ID	1020017 S06	UNIQUE WELL NO.	202937

RECOMMENDED WELLHEAD PROTECTION (WHP) MEASURES	WHP MEASURE IMPLEMENTED? Y or N	DATE VERIFIED

COMMENTS

For further information, please contact:

Minnesota Department of Health
Drinking Water Protection Section
Source Water Protection Unit
P.O. Box 64975
St. Paul, Minnesota 55164-0975

Section Receptionist: 651-201-4700
Division TDD: 651-201-5797 or MN Relay Service @ 1-800-627-3529 and ask for 651-201-5000

Environmental Health Division
Drinking Water Protection Section
P.O. Box 64975
St. Paul, Minnesota 55164-0975

INNER WELLHEAD MANAGEMENT ZONE (IWMZ) - POTENTIAL CONTAMINANT SOURCE INVENTORY (PCSI) REPORT

PUBLIC WATER SYSTEM INFORMATION

PWS ID	1020017	**COMMUNITY**
NAME	Coon Rapids	
ADDRESS	Kory Jorgensen Utilities Supervisor, Public Works Garage, 1831 111th Avenue, Coon Rapids, MN 554333761	

FACILITY (WELL) INFORMATION

NAME	Well #7	**IS THERE A WELL LOG OR ADDITIONAL CONSTRUCTION INFORMATION AVAILABLE?**
FACILITY ID	S07	☐ YES (Please attach a copy)
UNIQUE WELL NO.	202943	☐ NO ☐ UNDETERMINED
COUNTY	Anoka	

PWS ID / FACILITY ID	1020017 S07	**UNIQUE WELL NO.**	202943

PCSI CODE	ACTUAL OR POTENTIAL CONTAMINATION SOURCE	ISOLATION DISTANCES (FEET)				LOCATION	
		Minimum Distances		Sensitive Well[1]	Within 200 Ft. Y / N / U	Dist. from Well	Est. (?)
		Community	Non-community				
Agricultural Related							
*AC1	Agricultural chemical buried piping	50	50		N		
*AC2	Agricultural chemical multiple tanks or containers for residential retail sale or use, no single tank or container exceeding, but aggregate volume exceeding 56 gal. or 100 lbs. dry weight	50	50		N		
ACP	Agricultural chemical tank or container with 25 gal. or more or 100 lbs. or more dry weight, or equipment filling or cleaning area without safeguards	150	150		N		
ACS	Agricultural chemical storage or equipment filling or cleaning area with safeguards	100	100		N		
ACR	Agricultural chemical storage or equipment filling or cleaning area with safeguards and roofed	50	50		N		
ADW	Agricultural drainage well[2] (Class V well - illegal[3])	50	50		N		
AAT	Anhydrous ammonia tank (stationary tank)	50	50		N		
AB1	Animal building, feedlot, confinement area, or kennel, 0.1 to 1.0 animal unit (stockyard)	50	20	100/40	N		
AB2	Animal building or poultry building, including a horse riding area, more than 1.0 animal unit	50	50	100	N		
ABS	Animal burial area, more than 1.0 animal unit	50	50		N		
FWP	Animal feeding or watering area within a pasture, more than 1.0 animal unit	50	50	100	N		
AF1	Animal feedlot, unroofed, 300 or more animal units (stockyard)	100	100	200	N		
AF2	Animal feedlot, more than 1.0, but less than 300 animal units (stockyard)	50	50	100	N		
AMA	Animal manure application	use discretion	use discretion		N		
REN	Animal rendering plant	50	50		N		
MS1	Manure (liquid) storage basin or lagoon, unpermitted or noncertified	300	300	600	N		
MS2	Manure (liquid) storage basin or lagoon, approved earthen liner	150	150	300	N		
MS3	Manure (liquid) storage basin or lagoon, approved concrete or composite liner	100	100	200	N		
MS4	Manure (solid) storage area, not covered with a roof	100	100	200	N		
OSC	Open storage for crops	use discretion	use discretion		N		
SSTS Related							
AA1	Absorption area of a soil dispersal system, average flow greater than 10,000 gal./day	300	300	600	N		
AA2	Absorption area of a soil dispersal system serving a facility handling infectious or pathological wastes, average flow 10,000 gal./day or less	150	150	300	N		
AA3	Absorption area of a soil dispersal system, average flow 10,000 gal./day or less	50	50	100	N		
AA4	Absorption area of a soil dispersal system serving multiple family residences or a non-residential facility and has the capacity to serve 20 or more persons per day (Class V well)[2]	50/300/150[4]	50/300/150[4]	100/600/300[4]	N		
CSP	Cesspool	75	75	150	N		
AGG	Dry well, leaching pit, seepage pit	75	75	150	N		
*FD1	Floor drain, grate, or trough connected to a buried sewer	50	50		N		
*FD2	Floor drain, grate, or trough if buried sewer is air-tested, approved materials, serving one building, or two or less single-family residences	50	20		N		
*GW1	Gray-water dispersal area	50	50	100	N		
LC1	Large capacity cesspools (Class V well - illegal)[2]	75	75	150	N		
MVW	Motor vehicle waste disposal (Class V well - illegal)[2]	illegal	illegal		N		

PWS ID / FACILITY ID	1020017 S07	UNIQUE WELL NO.	202943

PCSI CODE	ACTUAL OR POTENTIAL CONTAMINATION SOURCE	ISOLATION DISTANCES (FEET)				LOCATION	
		Minimum Distances		Sensitive Well[1]	Within 200 Ft. Y / N / U	Dist. from Well	Est. (?)
		Community	Non-community				
PR1	Privy, nonportable	50	50	100	N		
PR2	Portable (privy) or toilet	50	20		N		
*SF1	Watertight sand filter; peat filter; or constructed wetland	50	50		N		
SET	Septic tank	50	50		N		
HTK	Sewage holding tank, watertight	50	50		N		
SS1	Sewage sump capacity 100 gal. or more	50	50		N		
SS2	Sewage sump capacity less than 100 gal., tested, conforming to rule	50	20		N		
*ST1	Sewage treatment device, watertight	50	50		N		
SB1	Sewer, buried, approved materials, tested, serving one building, or two or less single-family residences	50	20		N		
SB2	Sewer, buried, collector, municipal, serving a facility handling infectious or pathological wastes, open-jointed or unapproved materials	50	50		Y	185	N
SB2	Sewer, buried, collector, municipal, serving a facility handling infectious or pathological wastes, open-jointed or unapproved materials	50	50		Y	100	N
*WB1	Water treatment backwash holding basin, reclaim basin, or surge tank with a direct sewer connection	50	50		N		
*WB2	Water treatment backwash holding basin, reclaim basin, or surge tank with a backflow protected sewer connection	20	20		N		
Land Application							
SPT	Land spreading area for sewage, septage, or sludge	50	50	100	N		
Solid Waste Related							
COS	Commercial compost site	50	50		N		
CD1	Construction or demolition debris disposal area	50	50	100	N		
*HW1	Household solid waste disposal area, single residence	50	50	100	N		
LF1	Landfill, permitted demolition debris, dump, or mixed municipal solid waste from multiple persons	300	300	600	N		
SVY	Scrap yard	50	50		N		
SWT	Solid waste transfer station	50	50		N		
Storm Water Related							
SD1	Storm water drain pipe, 8 inches or greater in diameter	50	20		N		
SWI	Storm water drainage well[2] (Class V well - illegal[3])	50	50		N		
SM1	Storm water pond greater than 5000 gal.	50	35		N		
Wells and Borings							
*EB1	Elevator boring, not conforming to rule	50	50		N		
*EB2	Elevator boring, conforming to rule	20	20		N		
MON	Monitoring well	record dist.	record dist.		N		
WEL	Operating well	record dist.	record dist.		N		
UUW	Unused, unsealed well or boring	50	50		N		
General							
*CR1	Cistern or reservoir, buried, nonpressurized water supply	20	20		N		
PLM	Contaminant plume	50	50		N		
*CW1	Cooling water pond, industrial	50	50	100	N		
DC1	Deicing chemicals, bulk road	50	50	100	N		
*ET1	Electrical transformer storage area, oil-filled	50	50		N		
GRV	Grave or mausoleum	50	50		N		
GP1	Gravel pocket or French drain for clear water drainage only	20	20		N		
*HS1	Hazardous substance buried piping	50	50		N		
HS2	Hazardous substance tank or container, above ground or underground, 56 gal. or more, or 100 lbs. or more dry weight, without safeguards	150	150		N		
HS3	Hazardous substance tank or container, above ground or underground, 56 gal. or more, or 100 lbs. or more dry weight with safeguards	100	100		N		
HS4	Hazardous substance multiple storage tanks or containers for residential retail sale or use, no single tank or container exceeding 56 gal. or 100 lbs., but aggregate volume exceeding	50	50		N		
HWF	Highest water or flood level	50	N/A		N		
*HG1	Horizontal ground source closed loop heat exchanger buried piping	50	50		N		
*HG2	Horizontal ground source closed loop heat exchanger buried piping and horizontal piping, approved materials and heat transfer fluid	50	10		N		
IWD	Industrial waste disposal well (Class V well)[2]	illegal[3]	illegal[3]		N		
IWS	Interceptor, including a flammable waste or sediment	50	50		N		
OH1	Ordinary high water level of a stream, river, pond, lake, reservoir, or drainage ditch (holds water six months or more)	50	35		N		

PWS ID / FACILITY ID	1020017 S07	UNIQUE WELL NO.	202943

PCSI CODE	ACTUAL OR POTENTIAL CONTAMINATION SOURCE	ISOLATION DISTANCES (FEET)				LOCATION	
		Minimum Distances		Sensitive Well[1]	Within 200 Ft. Y / N / U	Dist. from Well	Est. (?)
		Community	Non-community				
*PP1	Petroleum buried piping	50	50		N		
*PP2	Petroleum or crude oil pipeline to a refinery or distribution center	100	100		N		
PT1	Petroleum tank or container, 1100 gal. or more, without safeguards	150	150		N		
PT2	Petroleum tank or container, 1100 gal. or more, with safeguards	100	100		N		
PT3	Petroleum tank or container, buried, between 56 and 1100 gal.	50	50		N		
PT4	Petroleum tank or container, not buried, between 56 and 1100 gal.	50[5]	20		N		
PU1	Pit or unfilled space more than four feet in depth	20	20		N		
PC1	Pollutant or contaminant that may drain into the soil	50	50	100	N		
SP1	Swimming pool, in-ground	20	20		N		
*VH1	Vertical heat exchanger, horizontal piping conforming to rule	50	10		N		
*VH2	Vertical heat exchanger (vertical) piping, conforming to rule	50	35		N		
*WR1	Wastewater rapid infiltration basin, municipal or industrial	300	300	600	N		
*WA1	Wastewater spray irrigation area, municipal or industrial	150	150	300	N		
*WS1	Wastewater stabilization pond, industrial	150	150	300	N		
*WS2	Wastewater stabilization pond, municipal, 500 or more gal./acre/day of leakage	300	300	600	N		
*WS3	Wastewater stabilization pond, municipal, less than 500 gal./acre/day of leakage	150	150	300	N		
*WT1	Wastewater treatment unit tanks, vessels and components (Package plant)	100	100		N		
*WT2	Water treatment backwash disposal area	50	50	100	N		
Additional Sources (If there is more than one source listed above, please indicate here).							
Potential Contamination Sources and Codes Based on Previous Versions of this Form							
	none found within 200' of this well.						

* New potential contaminant source.

[1] A sensitive well has less than 50 feet of watertight casing, and which is not cased below a confining layer or confining materials of at least 10' in thickness.

[2] These sources, known as Class V underground injection wells, are regulated by the federal U.S. Environmental Protection Agency.

[3] These sources are classified as illegal by Minnesota Rules, Chapter 4725.

[4] Isolation distance is determined by average flow per day or if a facility handles infectious or pathological wastes.

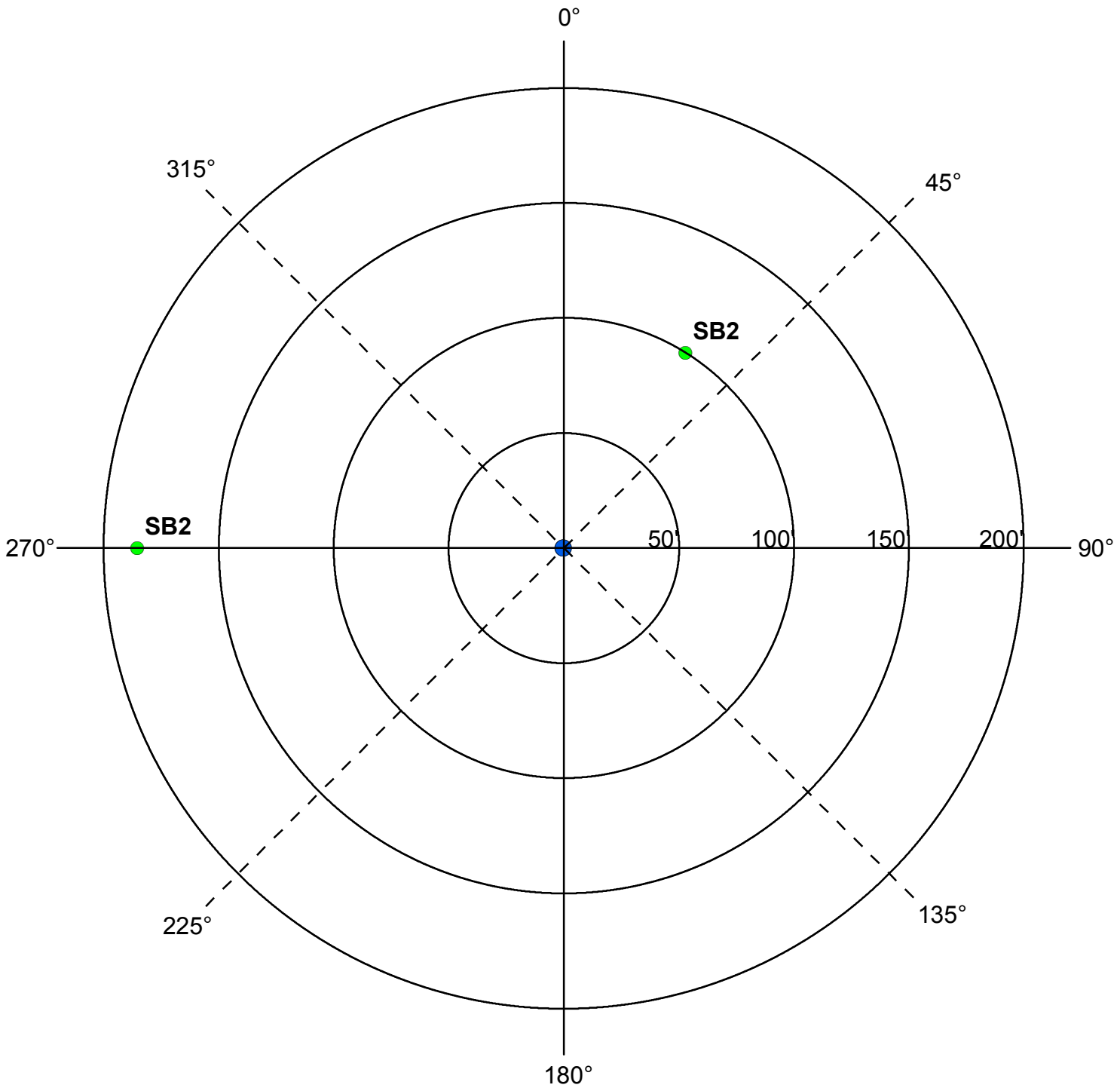
[5] A community public water-supply well must be a minimum of 50 feet from a petroleum tank or container, unless the tank or container is used for emergency pumping and is located in a room or building separate from the community well; and is of double-wall construction with leak detection between walls; or is protected with secondary containment.

This form is based on the new isolation distances in Minnesota Rules, Chapter 4725, related to wells and borings adopted August 4, 2008, and Minnesota Rules, Chapter 4720, related to wellhead protection.

PWS ID / FACILITY ID	1020017 S07	UNIQUE WELL NO.	202943

SETBACK DISTANCES	All potential contaminant sources must be noted on sketch.

Record the distance and approximate compass bearing of each potential contaminant source from the well, and identify the source using the "Source Code". Unlabeled points on the map are unsealed wells.



	Y	N	N/A
Were the isolation distances maintained for the new sources of contamination?			
Is the system monitoring existing nonconforming sources of contamination?			

Reminder Question: Were the wellhead protection measure(s) implemented?

INSPECTOR	Neiman, Dave	DATE	6 - 3 - 2016

PWS ID / FACILITY ID	1020017 S07	UNIQUE WELL NO.	202943

RECOMMENDED WELLHEAD PROTECTION (WHP) MEASURES	WHP MEASURE IMPLEMENTED? Y or N	DATE VERIFIED

COMMENTS

For further information, please contact:

Minnesota Department of Health
Drinking Water Protection Section
Source Water Protection Unit
P.O. Box 64975
St. Paul, Minnesota 55164-0975

Section Receptionist: 651-201-4700
Division TDD: 651-201-5797 or MN Relay Service @ 1-800-627-3529 and ask for 651-201-5000

Environmental Health Division
Drinking Water Protection Section
P.O. Box 64975
St. Paul, Minnesota 55164-0975

INNER WELLHEAD MANAGEMENT ZONE (IWMZ) - POTENTIAL CONTAMINANT SOURCE INVENTORY (PCSI) REPORT

PUBLIC WATER SYSTEM INFORMATION

PWS ID	1020017	**COMMUNITY**
NAME	Coon Rapids	
ADDRESS	Kory Jorgensen Utilities Supervisor, Public Works Garage, 1831 111th Avenue, Coon Rapids, MN 554333761	

FACILITY (WELL) INFORMATION

NAME	Well #8	**IS THERE A WELL LOG OR ADDITIONAL CONSTRUCTION INFORMATION AVAILABLE?**
FACILITY ID	S08	☐ YES (Please attach a copy)
UNIQUE WELL NO.	202932	☐ NO ☐ UNDETERMINED
COUNTY	Anoka	

PWS ID / FACILITY ID	1020017 S08	**UNIQUE WELL NO.**	202932

PCSI CODE	ACTUAL OR POTENTIAL CONTAMINATION SOURCE	ISOLATION DISTANCES (FEET)				LOCATION	
		Minimum Distances		Sensitive Well[1]	Within 200 Ft. Y / N / U	Dist. from Well	Est. (?)
		Community	Non-community				
Agricultural Related							
*AC1	Agricultural chemical buried piping	50	50		N		
*AC2	Agricultural chemical multiple tanks or containers for residential retail sale or use, no single tank or container exceeding, but aggregate volume exceeding 56 gal. or 100 lbs. dry weight	50	50		N		
ACP	Agricultural chemical tank or container with 25 gal. or more or 100 lbs. or more dry weight, or equipment filling or cleaning area without safeguards	150	150		N		
ACS	Agricultural chemical storage or equipment filling or cleaning area with safeguards	100	100		N		
ACR	Agricultural chemical storage or equipment filling or cleaning area with safeguards and roofed	50	50		N		
ADW	Agricultural drainage well[2] (Class V well - illegal[3])	50	50		N		
AAT	Anhydrous ammonia tank (stationary tank)	50	50		N		
AB1	Animal building, feedlot, confinement area, or kennel, 0.1 to 1.0 animal unit (stockyard)	50	20	100/40	N		
AB2	Animal building or poultry building, including a horse riding area, more than 1.0 animal unit	50	50	100	N		
ABS	Animal burial area, more than 1.0 animal unit	50	50		N		
FWP	Animal feeding or watering area within a pasture, more than 1.0 animal unit	50	50	100	N		
AF1	Animal feedlot, unroofed, 300 or more animal units (stockyard)	100	100	200	N		
AF2	Animal feedlot, more than 1.0, but less than 300 animal units (stockyard)	50	50	100	N		
AMA	Animal manure application	use discretion	use discretion		N		
REN	Animal rendering plant	50	50		N		
MS1	Manure (liquid) storage basin or lagoon, unpermitted or noncertified	300	300	600	N		
MS2	Manure (liquid) storage basin or lagoon, approved earthen liner	150	150	300	N		
MS3	Manure (liquid) storage basin or lagoon, approved concrete or composite liner	100	100	200	N		
MS4	Manure (solid) storage area, not covered with a roof	100	100	200	N		
OSC	Open storage for crops	use discretion	use discretion		N		
SSTS Related							
AA1	Absorption area of a soil dispersal system, average flow greater than 10,000 gal./day	300	300	600	N		
AA2	Absorption area of a soil dispersal system serving a facility handling infectious or pathological wastes, average flow 10,000 gal./day or less	150	150	300	N		
AA3	Absorption area of a soil dispersal system, average flow 10,000 gal./day or less	50	50	100	N		
AA4	Absorption area of a soil dispersal system serving multiple family residences or a non-residential facility and has the capacity to serve 20 or more persons per day (Class V well)[2]	50/300/150[4]	50/300/150[4]	100/600/300[4]	N		
CSP	Cesspool	75	75	150	N		
AGG	Dry well, leaching pit, seepage pit	75	75	150	N		
*FD1	Floor drain, grate, or trough connected to a buried sewer	50	50		N		
*FD2	Floor drain, grate, or trough if buried sewer is air-tested, approved materials, serving one building, or two or less single-family residences	50	20		N		
*GW1	Gray-water dispersal area	50	50	100	N		
LC1	Large capacity cesspools (Class V well - illegal)[2]	75	75	150	N		
MVW	Motor vehicle waste disposal (Class V well - illegal)[2]	illegal	illegal		N		

PWS ID / FACILITY ID	1020017 S08	UNIQUE WELL NO.	202932

PCSI CODE	ACTUAL OR POTENTIAL CONTAMINATION SOURCE	ISOLATION DISTANCES (FEET)				LOCATION	
		Minimum Distances		Sensitive Well[1]	Within 200 Ft. Y / N / U	Dist. from Well	Est. (?)
		Community	Non-community				
PR1	Privy, nonportable	50	50	100	N		
PR2	Portable (privy) or toilet	50	20		N		
*SF1	Watertight sand filter; peat filter; or constructed wetland	50	50		N		
SET	Septic tank	50	50		N		
HTK	Sewage holding tank, watertight	50	50		N		
SS1	Sewage sump capacity 100 gal. or more	50	50		N		
SS2	Sewage sump capacity less than 100 gal., tested, conforming to rule	50	20		N		
*ST1	Sewage treatment device, watertight	50	50		N		
SB1	Sewer, buried, approved materials, tested, serving one building, or two or less single-family residences	50	20		N		
SB2	Sewer, buried, collector, municipal, serving a facility handling infectious or pathological wastes, open-jointed or unapproved materials	50	50		N		
*WB1	Water treatment backwash holding basin, reclaim basin, or surge tank with a direct sewer connection	50	50		N		
*WB2	Water treatment backwash holding basin, reclaim basin, or surge tank with a backflow protected sewer connection	20	20		N		
Land Application							
SPT	Land spreading area for sewage, septage, or sludge	50	50	100	N		
Solid Waste Related							
COS	Commercial compost site	50	50		N		
CD1	Construction or demolition debris disposal area	50	50	100	N		
*HW1	Household solid waste disposal area, single residence	50	50	100	N		
LF1	Landfill, permitted demolition debris, dump, or mixed municipal solid waste from multiple persons	300	300	600	N		
SVY	Scrap yard	50	50		N		
SWT	Solid waste transfer station	50	50		N		
Storm Water Related							
SD1	Storm water drain pipe, 8 inches or greater in diameter	50	20		N		
SWI	Storm water drainage well[2] (Class V well - illegal[3])	50	50		N		
SM1	Storm water pond greater than 5000 gal.	50	35		N		
Wells and Borings							
*EB1	Elevator boring, not conforming to rule	50	50		N		
*EB2	Elevator boring, conforming to rule	20	20		N		
MON	Monitoring well	record dist.	record dist.		N		
WEL	Operating well	record dist.	record dist.		Y	66	
WEL	Operating well	record dist.	record dist.		Y	86	
UUW	Unused, unsealed well or boring	50	50		N		
General							
*CR1	Cistern or reservoir, buried, nonpressurized water supply	20	20		N		
PLM	Contaminant plume	50	50		N		
*CW1	Cooling water pond, industrial	50	50	100	N		
DC1	Deicing chemicals, bulk road	50	50	100	N		
*ET1	Electrical transformer storage area, oil-filled	50	50		N		
GRV	Grave or mausoleum	50	50		N		
GP1	Gravel pocket or French drain for clear water drainage only	20	20		N		
*HS1	Hazardous substance buried piping	50	50		N		
HS2	Hazardous substance tank or container, above ground or underground, 56 gal. or more, or 100 lbs. or more dry weight, without safeguards	150	150		N		
HS3	Hazardous substance tank or container, above ground or underground, 56 gal. or more, or 100 lbs. or more dry weight with safeguards	100	100		Y	175	N
HS4	Hazardous substance multiple storage tanks or containers for residential retail sale or use, no single tank or container exceeding 56 gal. or 100 lbs., but aggregate volume exceeding	50	50		N		
HWF	Highest water or flood level	50	N/A		N		
*HG1	Horizontal ground source closed loop heat exchanger buried piping	50	50		N		
*HG2	Horizontal ground source closed loop heat exchanger buried piping and horizontal piping, approved materials and heat transfer fluid	50	10		N		
IWD	Industrial waste disposal well (Class V well)[2]	illegal[3]	illegal[3]		N		
IWS	Interceptor, including a flammable waste or sediment	50	50		N		
OH1	Ordinary high water level of a stream, river, pond, lake, reservoir, or drainage ditch (holds water six months or more)	50	35		N		
*PP1	Petroleum buried piping	50	50		N		

PWS ID / FACILITY ID	1020017 S08	UNIQUE WELL NO.	202932

PCSI CODE	ACTUAL OR POTENTIAL CONTAMINATION SOURCE	ISOLATION DISTANCES (FEET)				LOCATION	
		Minimum Distances		Sensitive Well[1]	Within 200 Ft. Y / N / U	Dist. from Well	Est. (?)
		Community	Non-community				
*PP2	Petroleum or crude oil pipeline to a refinery or distribution center	100	100		N		
PT1	Petroleum tank or container, 1100 gal. or more, without safeguards	150	150		N		
PT2	Petroleum tank or container, 1100 gal. or more, with safeguards	100	100		N		
PT3	Petroleum tank or container, buried, between 56 and 1100 gal.	50	50		N		
PT4	Petroleum tank or container, not buried, between 56 and 1100 gal.	50[5]	20		N		
PU1	Pit or unfilled space more than four feet in depth	20	20		N		
PC1	Pollutant or contaminant that may drain into the soil	50	50	100	N		
SP1	Swimming pool, in-ground	20	20		N		
*VH1	Vertical heat exchanger, horizontal piping conforming to rule	50	10		N		
*VH2	Vertical heat exchanger (vertical) piping, conforming to rule	50	35		N		
*WR1	Wastewater rapid infiltration basin, municipal or industrial	300	300	600	N		
*WA1	Wastewater spray irrigation area, municipal or industrial	150	150	300	N		
*WS1	Wastewater stabilization pond, industrial	150	150	300	N		
*WS2	Wastewater stabilization pond, municipal, 500 or more gal./acre/day of leakage	300	300	600	N		
*WS3	Wastewater stabilization pond, municipal, less than 500 gal./acre/day of leakage	150	150	300	N		
*WT1	Wastewater treatment unit tanks, vessels and components (Package plant)	100	100		N		
*WT2	Water treatment backwash disposal area	50	50	100	N		
Additional Sources (If there is more than one source listed above, please indicate here).							
Potential Contamination Sources and Codes Based on Previous Versions of this Form							
	none found within 200' of this well.						

* New potential contaminant source.

[1] A sensitive well has less than 50 feet of watertight casing, and which is not cased below a confining layer or confining materials of at least 10' in thickness.

[2] These sources, known as Class V underground injection wells, are regulated by the federal U.S. Environmental Protection Agency.

[3] These sources are classified as illegal by Minnesota Rules, Chapter 4725.

[4] Isolation distance is determined by average flow per day or if a facility handles infectious or pathological wastes.

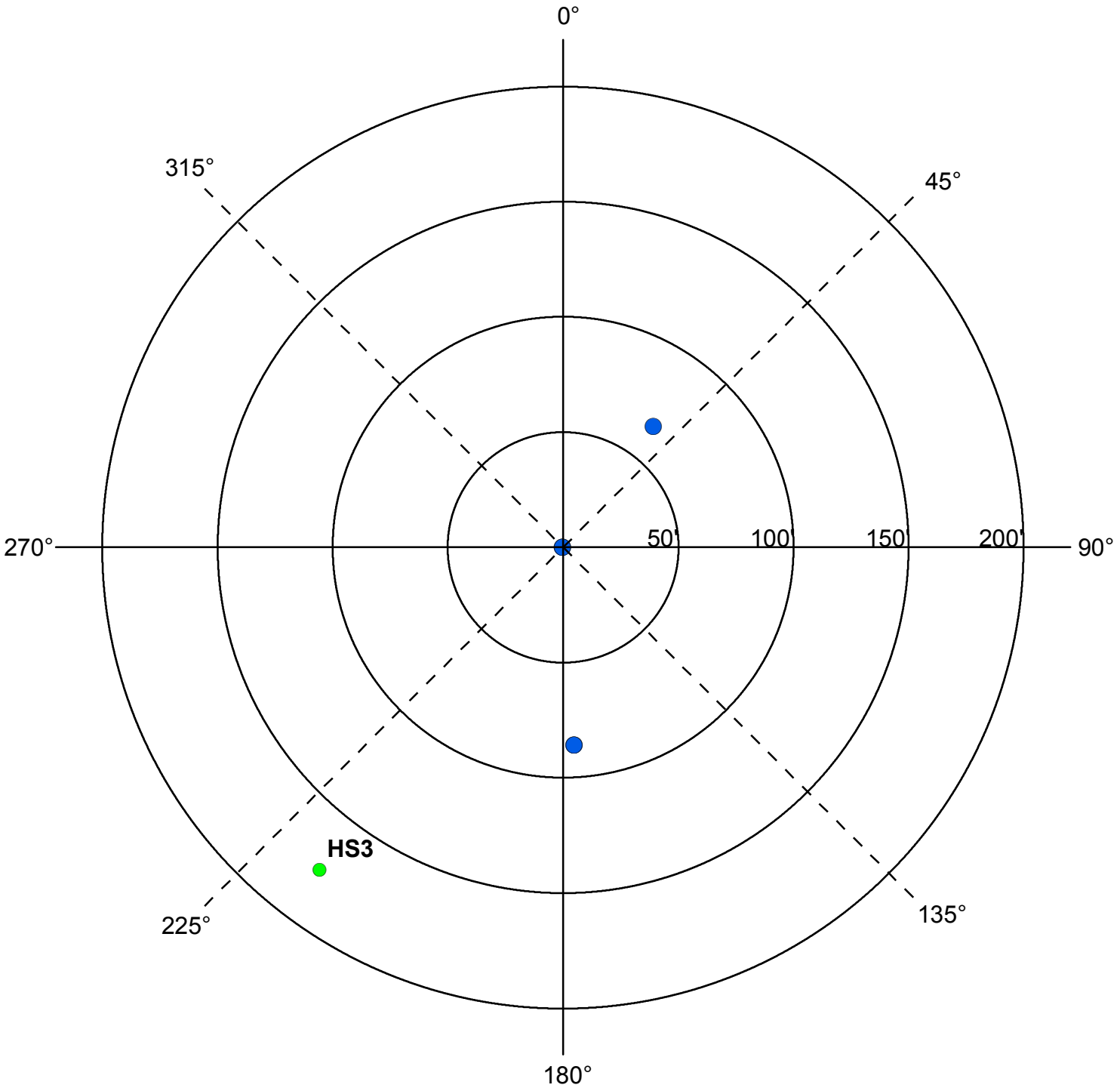
[5] A community public water-supply well must be a minimum of 50 feet from a petroleum tank or container, unless the tank or container is used for emergency pumping and is located in a room or building separate from the community well; and is of double-wall construction with leak detection between walls; or is protected with secondary containment.

This form is based on the new isolation distances in Minnesota Rules, Chapter 4725, related to wells and borings adopted August 4, 2008, and Minnesota Rules, Chapter 4720, related to wellhead protection.

PWS ID / FACILITY ID	1020017 S08	UNIQUE WELL NO.	202932

SETBACK DISTANCES	All potential contaminant sources must be noted on sketch.

Record the distance and approximate compass bearing of each potential contaminant source from the well, and identify the source using the "Source Code". Unlabeled points on the map are unsealed wells.



	Y	N	N/A
Were the isolation distances maintained for the new sources of contamination?			
Is the system monitoring existing nonconforming sources of contamination?			

Reminder Question: Were the wellhead protection measure(s) implemented?

INSPECTOR	Neiman, Dave	DATE	6 - 3 - 2016

PWS ID / FACILITY ID	1020017 S08	UNIQUE WELL NO.	202932

RECOMMENDED WELLHEAD PROTECTION (WHP) MEASURES	WHP MEASURE IMPLEMENTED? Y or N	DATE VERIFIED

COMMENTS

For further information, please contact:

Minnesota Department of Health
Drinking Water Protection Section
Source Water Protection Unit
P.O. Box 64975
St. Paul, Minnesota 55164-0975

Section Receptionist: 651-201-4700
Division TDD: 651-201-5797 or MN Relay Service @ 1-800-627-3529 and ask for 651-201-5000

Environmental Health Division
Drinking Water Protection Section
P.O. Box 64975
St. Paul, Minnesota 55164-0975

INNER WELLHEAD MANAGEMENT ZONE (IWMZ) - POTENTIAL CONTAMINANT SOURCE INVENTORY (PCSI) REPORT

PUBLIC WATER SYSTEM INFORMATION

PWS ID	1020017	**COMMUNITY**
NAME	Coon Rapids	
ADDRESS	Kory Jorgensen Utilities Supervisor, Public Works Garage, 1831 111th Avenue, Coon Rapids, MN 554333761	

FACILITY (WELL) INFORMATION

NAME	Well #9	**IS THERE A WELL LOG OR ADDITIONAL CONSTRUCTION INFORMATION AVAILABLE?**
FACILITY ID	S09	☐ YES (Please attach a copy)
UNIQUE WELL NO.	202931	☐ NO ☐ UNDETERMINED
COUNTY	Anoka	

PWS ID / FACILITY ID	1020017 S09	**UNIQUE WELL NO.**	202931

PCSI CODE	ACTUAL OR POTENTIAL CONTAMINATION SOURCE	ISOLATION DISTANCES (FEET)				LOCATION	
		Minimum Distances		Sensitive Well[1]	Within 200 Ft. Y / N / U	Dist. from Well	Est. (?)
		Community	Non-community				
Agricultural Related							
*AC1	Agricultural chemical buried piping	50	50		N		
*AC2	Agricultural chemical multiple tanks or containers for residential retail sale or use, no single tank or container exceeding, but aggregate volume exceeding 56 gal. or 100 lbs. dry weight	50	50		N		
ACP	Agricultural chemical tank or container with 25 gal. or more or 100 lbs. or more dry weight, or equipment filling or cleaning area without safeguards	150	150		N		
ACS	Agricultural chemical storage or equipment filling or cleaning area with safeguards	100	100		N		
ACR	Agricultural chemical storage or equipment filling or cleaning area with safeguards and roofed	50	50		N		
ADW	Agricultural drainage well[2] (Class V well - illegal[3])	50	50		N		
AAT	Anhydrous ammonia tank (stationary tank)	50	50		N		
AB1	Animal building, feedlot, confinement area, or kennel, 0.1 to 1.0 animal unit (stockyard)	50	20	100/40	N		
AB2	Animal building or poultry building, including a horse riding area, more than 1.0 animal unit	50	50	100	N		
ABS	Animal burial area, more than 1.0 animal unit	50	50		N		
FWP	Animal feeding or watering area within a pasture, more than 1.0 animal unit	50	50	100	N		
AF1	Animal feedlot, unroofed, 300 or more animal units (stockyard)	100	100	200	N		
AF2	Animal feedlot, more than 1.0, but less than 300 animal units (stockyard)	50	50	100	N		
AMA	Animal manure application	use discretion	use discretion		N		
REN	Animal rendering plant	50	50		N		
MS1	Manure (liquid) storage basin or lagoon, unpermitted or noncertified	300	300	600	N		
MS2	Manure (liquid) storage basin or lagoon, approved earthen liner	150	150	300	N		
MS3	Manure (liquid) storage basin or lagoon, approved concrete or composite liner	100	100	200	N		
MS4	Manure (solid) storage area, not covered with a roof	100	100	200	N		
OSC	Open storage for crops	use discretion	use discretion		N		
SSTS Related							
AA1	Absorption area of a soil dispersal system, average flow greater than 10,000 gal./day	300	300	600	N		
AA2	Absorption area of a soil dispersal system serving a facility handling infectious or pathological wastes, average flow 10,000 gal./day or less	150	150	300	N		
AA3	Absorption area of a soil dispersal system, average flow 10,000 gal./day or less	50	50	100	N		
AA4	Absorption area of a soil dispersal system serving multiple family residences or a non-residential facility and has the capacity to serve 20 or more persons per day (Class V well)[2]	50/300/150[4]	50/300/150[4]	100/600/300[4]	N		
CSP	Cesspool	75	75	150	N		
AGG	Dry well, leaching pit, seepage pit	75	75	150	N		
*FD1	Floor drain, grate, or trough connected to a buried sewer	50	50		N		
*FD2	Floor drain, grate, or trough if buried sewer is air-tested, approved materials, serving one building, or two or less single-family residences	50	20		N		
*GW1	Gray-water dispersal area	50	50	100	N		
LC1	Large capacity cesspools (Class V well - illegal)[2]	75	75	150	N		
MVW	Motor vehicle waste disposal (Class V well - illegal)[2]	illegal	illegal		N		

PWS ID / FACILITY ID	1020017 S09	UNIQUE WELL NO.	202931

PCSI CODE	ACTUAL OR POTENTIAL CONTAMINATION SOURCE	ISOLATION DISTANCES (FEET)				LOCATION	
		Minimum Distances		Sensitive Well[1]	Within 200 Ft. Y / N / U	Dist. from Well	Est. (?)
		Community	Non-community				
PR1	Privy, nonportable	50	50	100	N		
PR2	Portable (privy) or toilet	50	20		N		
*SF1	Watertight sand filter; peat filter; or constructed wetland	50	50		N		
SET	Septic tank	50	50		N		
HTK	Sewage holding tank, watertight	50	50		N		
SS1	Sewage sump capacity 100 gal. or more	50	50		N		
SS2	Sewage sump capacity less than 100 gal., tested, conforming to rule	50	20		N		
*ST1	Sewage treatment device, watertight	50	50		N		
SB1	Sewer, buried, approved materials, tested, serving one building, or two or less single-family residences	50	20		N		
SB2	Sewer, buried, collector, municipal, serving a facility handling infectious or pathological wastes, open-jointed or unapproved materials	50	50		Y	140	N
*WB1	Water treatment backwash holding basin, reclaim basin, or surge tank with a direct sewer connection	50	50		N		
*WB2	Water treatment backwash holding basin, reclaim basin, or surge tank with a backflow protected sewer connection	20	20		N		
Land Application							
SPT	Land spreading area for sewage, septage, or sludge	50	50	100	N		
Solid Waste Related							
COS	Commercial compost site	50	50		N		
CD1	Construction or demolition debris disposal area	50	50	100	N		
*HW1	Household solid waste disposal area, single residence	50	50	100	N		
LF1	Landfill, permitted demolition debris, dump, or mixed municipal solid waste from multiple persons	300	300	600	N		
SVY	Scrap yard	50	50		N		
SWT	Solid waste transfer station	50	50		N		
Storm Water Related							
SD1	Storm water drain pipe, 8 inches or greater in diameter	50	20		N		
SWI	Storm water drainage well[2] (Class V well - illegal[3])	50	50		N		
SM1	Storm water pond greater than 5000 gal.	50	35		N		
Wells and Borings							
*EB1	Elevator boring, not conforming to rule	50	50		N		
*EB2	Elevator boring, conforming to rule	20	20		N		
MON	Monitoring well	record dist.	record dist.		N		
WEL	Operating well	record dist.	record dist.		N		
UUW	Unused, unsealed well or boring	50	50		N		
General							
*CR1	Cistern or reservoir, buried, nonpressurized water supply	20	20		N		
PLM	Contaminant plume	50	50		N		
*CW1	Cooling water pond, industrial	50	50	100	N		
DC1	Deicing chemicals, bulk road	50	50	100	N		
*ET1	Electrical transformer storage area, oil-filled	50	50		N		
GRV	Grave or mausoleum	50	50		N		
GP1	Gravel pocket or French drain for clear water drainage only	20	20		N		
*HS1	Hazardous substance buried piping	50	50		N		
HS2	Hazardous substance tank or container, above ground or underground, 56 gal. or more, or 100 lbs. or more dry weight, without safeguards	150	150		N		
HS3	Hazardous substance tank or container, above ground or underground, 56 gal. or more, or 100 lbs. or more dry weight with safeguards	100	100		N		
HS4	Hazardous substance multiple storage tanks or containers for residential retail sale or use, no single tank or container exceeding 56 gal. or 100 lbs., but aggregate volume exceeding	50	50		N		
HWF	Highest water or flood level	50	N/A		N		
*HG1	Horizontal ground source closed loop heat exchanger buried piping	50	50		N		
*HG2	Horizontal ground source closed loop heat exchanger buried piping and horizontal piping, approved materials and heat transfer fluid	50	10		N		
IWD	Industrial waste disposal well (Class V well)[2]	illegal[3]	illegal[3]		N		
IWS	Interceptor, including a flammable waste or sediment	50	50		N		
OH1	Ordinary high water level of a stream, river, pond, lake, reservoir, or drainage ditch (holds water six months or more)	50	35		N		
*PP1	Petroleum buried piping	50	50		N		
*PP2	Petroleum or crude oil pipeline to a refinery or distribution center	100	100		N		

PWS ID / FACILITY ID	1020017 S09	UNIQUE WELL NO.	202931

PCSI CODE	ACTUAL OR POTENTIAL CONTAMINATION SOURCE	ISOLATION DISTANCES (FEET)				LOCATION	
		Minimum Distances		Sensitive Well[1]	Within 200 Ft. Y / N / U	Dist. from Well	Est. (?)
		Community	Non-community				
PT1	Petroleum tank or container, 1100 gal. or more, without safeguards	150	150		N		
PT2	Petroleum tank or container, 1100 gal. or more, with safeguards	100	100		N		
PT3	Petroleum tank or container, buried, between 56 and 1100 gal.	50	50		N		
PT4	Petroleum tank or container, not buried, between 56 and 1100 gal.	50[5]	20		N		
PU1	Pit or unfilled space more than four feet in depth	20	20		N		
PC1	Pollutant or contaminant that may drain into the soil	50	50	100	N		
SP1	Swimming pool, in-ground	20	20		N		
*VH1	Vertical heat exchanger, horizontal piping conforming to rule	50	10		N		
*VH2	Vertical heat exchanger (vertical) piping, conforming to rule	50	35		N		
*WR1	Wastewater rapid infiltration basin, municipal or industrial	300	300	600	N		
*WA1	Wastewater spray irrigation area, municipal or industrial	150	150	300	N		
*WS1	Wastewater stabilization pond, industrial	150	150	300	N		
*WS2	Wastewater stabilization pond, municipal, 500 or more gal./acre/day of leakage	300	300	600	N		
*WS3	Wastewater stabilization pond, municipal, less than 500 gal./acre/day of leakage	150	150	300	N		
*WT1	Wastewater treatment unit tanks, vessels and components (Package plant)	100	100		N		
*WT2	Water treatment backwash disposal area	50	50	100	N		
Additional Sources (If there is more than one source listed above, please indicate here).							
Potential Contamination Sources and Codes Based on Previous Versions of this Form							
	none found within 200' of this well.						

* New potential contaminant source.

[1] A sensitive well has less than 50 feet of watertight casing, and which is not cased below a confining layer or confining materials of at least 10' in thickness.

[2] These sources, known as Class V underground injection wells, are regulated by the federal U.S. Environmental Protection Agency.

[3] These sources are classified as illegal by Minnesota Rules, Chapter 4725.

[4] Isolation distance is determined by average flow per day or if a facility handles infectious or pathological wastes.

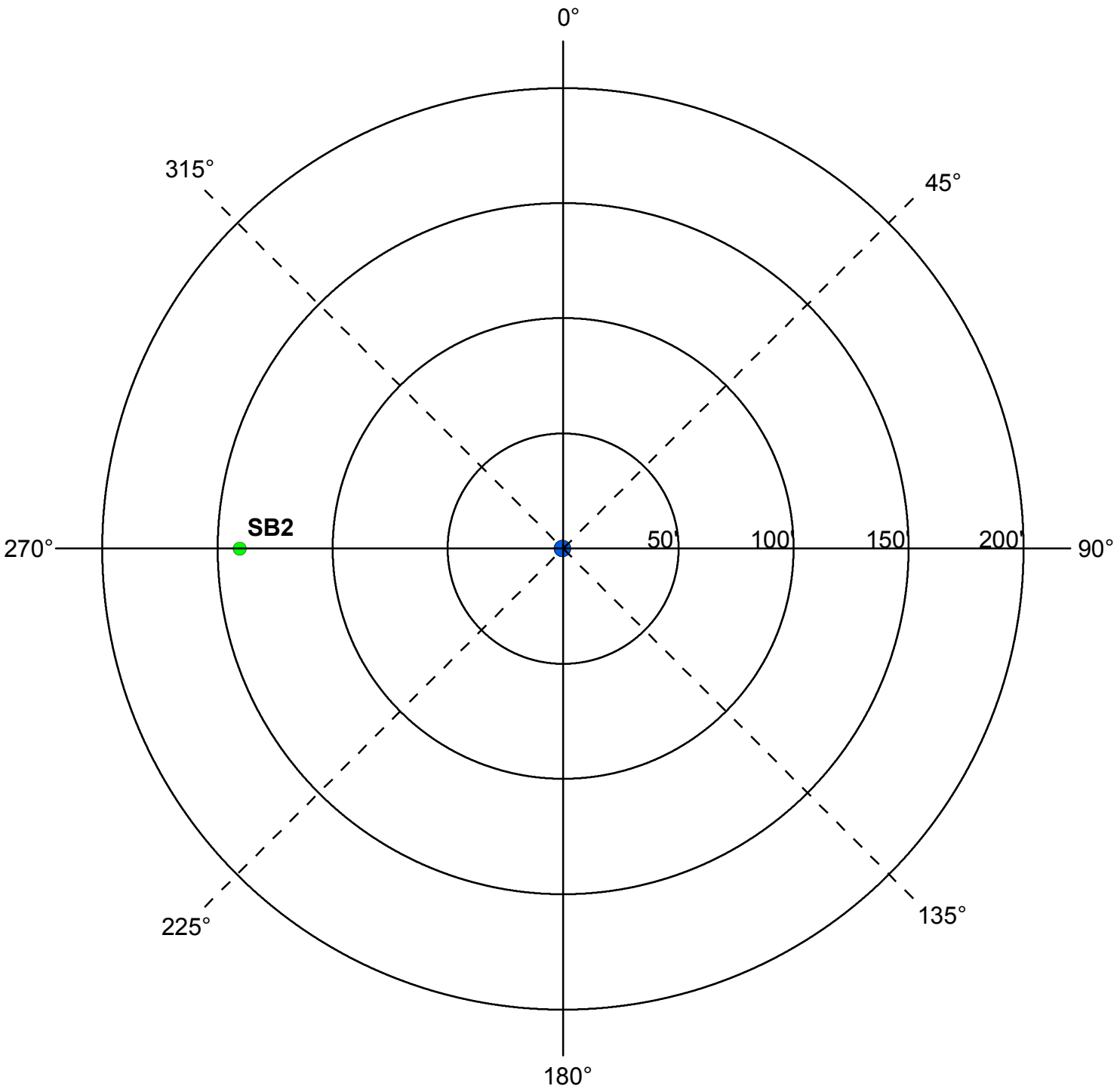
[5] A community public water-supply well must be a minimum of 50 feet from a petroleum tank or container, unless the tank or container is used for emergency pumping and is located in a room or building separate from the community well; and is of double-wall construction with leak detection between walls; or is protected with secondary containment.

This form is based on the new isolation distances in Minnesota Rules, Chapter 4725, related to wells and borings adopted August 4, 2008, and Minnesota Rules, Chapter 4720, related to wellhead protection.

PWS ID / FACILITY ID	1020017 S09	UNIQUE WELL NO.	202931

SETBACK DISTANCES	All potential contaminant sources must be noted on sketch.

Record the distance and approximate compass bearing of each potential contaminant source from the well, and identify the source using the "Source Code". Unlabeled points on the map are unsealed wells.



	Y	N	N/A
Were the isolation distances maintained for the new sources of contamination?			
Is the system monitoring existing nonconforming sources of contamination?			

Reminder Question: Were the wellhead protection measure(s) implemented?

INSPECTOR	Neiman, Dave	DATE	6 - 3 - 2016

PWS ID / FACILITY ID	1020017 S09	UNIQUE WELL NO.	202931

RECOMMENDED WELLHEAD PROTECTION (WHP) MEASURES	WHP MEASURE IMPLEMENTED? Y or N	DATE VERIFIED

COMMENTS

For further information, please contact:

Minnesota Department of Health
Drinking Water Protection Section
Source Water Protection Unit
P.O. Box 64975
St. Paul, Minnesota 55164-0975

Section Receptionist: 651-201-4700
Division TDD: 651-201-5797 or MN Relay Service @ 1-800-627-3529 and ask for 651-201-5000

Environmental Health Division
Drinking Water Protection Section
P.O. Box 64975
St. Paul, Minnesota 55164-0975

INNER WELLHEAD MANAGEMENT ZONE (IWMZ) - POTENTIAL CONTAMINANT SOURCE INVENTORY (PCSI) REPORT

PUBLIC WATER SYSTEM INFORMATION

PWS ID	1020017	**COMMUNITY**
NAME	Coon Rapids	
ADDRESS	Kory Jorgensen Utilities Supervisor, Public Works Garage, 1831 111th Avenue, Coon Rapids, MN 554333761	

FACILITY (WELL) INFORMATION

NAME	Well #10	**IS THERE A WELL LOG OR ADDITIONAL CONSTRUCTION INFORMATION AVAILABLE?**
FACILITY ID	S10	☐ **YES** (Please attach a copy)
UNIQUE WELL NO.	202930	☐ **NO** ☐ **UNDETERMINED**
COUNTY	Anoka	

PWS ID / FACILITY ID	1020017 S10	**UNIQUE WELL NO.**	202930

PCSI CODE	ACTUAL OR POTENTIAL CONTAMINATION SOURCE	ISOLATION DISTANCES (FEET)				LOCATION	
		Minimum Distances		Sensitive Well[1]	Within 200 Ft. Y / N / U	Dist. from Well	Est. (?)
		Community	Non-community				
Agricultural Related							
*AC1	Agricultural chemical buried piping	50	50		N		
*AC2	Agricultural chemical multiple tanks or containers for residential retail sale or use, no single tank or container exceeding, but aggregate volume exceeding 56 gal. or 100 lbs. dry weight	50	50		N		
ACP	Agricultural chemical tank or container with 25 gal. or more or 100 lbs. or more dry weight, or equipment filling or cleaning area without safeguards	150	150		N		
ACS	Agricultural chemical storage or equipment filling or cleaning area with safeguards	100	100		N		
ACR	Agricultural chemical storage or equipment filling or cleaning area with safeguards and roofed	50	50		N		
ADW	Agricultural drainage well[2] (Class V well - illegal[3])	50	50		N		
AAT	Anhydrous ammonia tank (stationary tank)	50	50		N		
AB1	Animal building, feedlot, confinement area, or kennel, 0.1 to 1.0 animal unit (stockyard)	50	20	100/40	N		
AB2	Animal building or poultry building, including a horse riding area, more than 1.0 animal unit	50	50	100	N		
ABS	Animal burial area, more than 1.0 animal unit	50	50		N		
FWP	Animal feeding or watering area within a pasture, more than 1.0 animal unit	50	50	100	N		
AF1	Animal feedlot, unroofed, 300 or more animal units (stockyard)	100	100	200	N		
AF2	Animal feedlot, more than 1.0, but less than 300 animal units (stockyard)	50	50	100	N		
AMA	Animal manure application	use discretion	use discretion		N		
REN	Animal rendering plant	50	50		N		
MS1	Manure (liquid) storage basin or lagoon, unpermitted or noncertified	300	300	600	N		
MS2	Manure (liquid) storage basin or lagoon, approved earthen liner	150	150	300	N		
MS3	Manure (liquid) storage basin or lagoon, approved concrete or composite liner	100	100	200	N		
MS4	Manure (solid) storage area, not covered with a roof	100	100	200	N		
OSC	Open storage for crops	use discretion	use discretion		N		
SSTS Related							
AA1	Absorption area of a soil dispersal system, average flow greater than 10,000 gal./day	300	300	600	N		
AA2	Absorption area of a soil dispersal system serving a facility handling infectious or pathological wastes, average flow 10,000 gal./day or less	150	150	300	N		
AA3	Absorption area of a soil dispersal system, average flow 10,000 gal./day or less	50	50	100	N		
AA4	Absorption area of a soil dispersal system serving multiple family residences or a non-residential facility and has the capacity to serve 20 or more persons per day (Class V well)[2]	50/300/150[4]	50/300/150[4]	100/600/300[4]	N		
CSP	Cesspool	75	75	150	N		
AGG	Dry well, leaching pit, seepage pit	75	75	150	N		
*FD1	Floor drain, grate, or trough connected to a buried sewer	50	50		N		
*FD2	Floor drain, grate, or trough if buried sewer is air-tested, approved materials, serving one building, or two or less single-family residences	50	20		N		
*GW1	Gray-water dispersal area	50	50	100	N		
LC1	Large capacity cesspools (Class V well - illegal)[2]	75	75	150	N		
MVW	Motor vehicle waste disposal (Class V well - illegal)[2]	illegal	illegal		N		

PWS ID / FACILITY ID	1020017 S10	UNIQUE WELL NO.	202930

PCSI CODE	ACTUAL OR POTENTIAL CONTAMINATION SOURCE	ISOLATION DISTANCES (FEET)				LOCATION	
		Minimum Distances		Sensitive Well[1]	Within 200 Ft. Y / N / U	Dist. from Well	Est. (?)
		Community	Non-community				
PR1	Privy, nonportable	50	50	100	N		
PR2	Portable (privy) or toilet	50	20		N		
*SF1	Watertight sand filter; peat filter; or constructed wetland	50	50		N		
SET	Septic tank	50	50		N		
HTK	Sewage holding tank, watertight	50	50		N		
SS1	Sewage sump capacity 100 gal. or more	50	50		N		
SS2	Sewage sump capacity less than 100 gal., tested, conforming to rule	50	20		N		
*ST1	Sewage treatment device, watertight	50	50		N		
SB1	Sewer, buried, approved materials, tested, serving one building, or two or less single-family residences	50	20		N		
SB2	Sewer, buried, collector, municipal, serving a facility handling infectious or pathological wastes, open-jointed or unapproved materials	50	50		N		
*WB1	Water treatment backwash holding basin, reclaim basin, or surge tank with a direct sewer connection	50	50		N		
*WB2	Water treatment backwash holding basin, reclaim basin, or surge tank with a backflow protected sewer connection	20	20		N		
Land Application							
SPT	Land spreading area for sewage, septage, or sludge	50	50	100	N		
Solid Waste Related							
COS	Commercial compost site	50	50		N		
CD1	Construction or demolition debris disposal area	50	50	100	N		
*HW1	Household solid waste disposal area, single residence	50	50	100	N		
LF1	Landfill, permitted demolition debris, dump, or mixed municipal solid waste from multiple persons	300	300	600	N		
SVY	Scrap yard	50	50		N		
SWT	Solid waste transfer station	50	50		N		
Storm Water Related							
SD1	Storm water drain pipe, 8 inches or greater in diameter	50	20		N		
SWI	Storm water drainage well[2] (Class V well - illegal[3])	50	50		N		
SM1	Storm water pond greater than 5000 gal.	50	35		N		
Wells and Borings							
*EB1	Elevator boring, not conforming to rule	50	50		N		
*EB2	Elevator boring, conforming to rule	20	20		N		
MON	Monitoring well	record dist.	record dist.		N		
WEL	Operating well	record dist.	record dist.		N		
UUW	Unused, unsealed well or boring	50	50		N		
General							
*CR1	Cistern or reservoir, buried, nonpressurized water supply	20	20		N		
PLM	Contaminant plume	50	50		N		
*CW1	Cooling water pond, industrial	50	50	100	N		
DC1	Deicing chemicals, bulk road	50	50	100	N		
*ET1	Electrical transformer storage area, oil-filled	50	50		N		
GRV	Grave or mausoleum	50	50		N		
GP1	Gravel pocket or French drain for clear water drainage only	20	20		N		
*HS1	Hazardous substance buried piping	50	50		N		
HS2	Hazardous substance tank or container, above ground or underground, 56 gal. or more, or 100 lbs. or more dry weight, without safeguards	150	150		N		
HS3	Hazardous substance tank or container, above ground or underground, 56 gal. or more, or 100 lbs. or more dry weight with safeguards	100	100		N		
HS4	Hazardous substance multiple storage tanks or containers for residential retail sale or use, no single tank or container exceeding 56 gal. or 100 lbs., but aggregate volume exceeding	50	50		N		
HWF	Highest water or flood level	50	N/A		N		
*HG1	Horizontal ground source closed loop heat exchanger buried piping	50	50		N		
*HG2	Horizontal ground source closed loop heat exchanger buried piping and horizontal piping, approved materials and heat transfer fluid	50	10		N		
IWD	Industrial waste disposal well (Class V well)[2]	illegal[3]	illegal[3]		N		
IWS	Interceptor, including a flammable waste or sediment	50	50		N		
OH1	Ordinary high water level of a stream, river, pond, lake, reservoir, or drainage ditch (holds water six months or more)	50	35		N		
*PP1	Petroleum buried piping	50	50		N		
*PP2	Petroleum or crude oil pipeline to a refinery or distribution center	100	100		N		

PWS ID / FACILITY ID	1020017 S10	UNIQUE WELL NO.	202930

PCSI CODE	ACTUAL OR POTENTIAL CONTAMINATION SOURCE	ISOLATION DISTANCES (FEET)				LOCATION	
		Minimum Distances		Sensitive Well[1]	Within 200 Ft. Y / N / U	Dist. from Well	Est. (?)
		Community	Non-community				
PT1	Petroleum tank or container, 1100 gal. or more, without safeguards	150	150		N		
PT2	Petroleum tank or container, 1100 gal. or more, with safeguards	100	100		N		
PT3	Petroleum tank or container, buried, between 56 and 1100 gal.	50	50		N		
PT4	Petroleum tank or container, not buried, between 56 and 1100 gal.	50[5]	20		N		
PU1	Pit or unfilled space more than four feet in depth	20	20		N		
PC1	Pollutant or contaminant that may drain into the soil	50	50	100	N		
SP1	Swimming pool, in-ground	20	20		N		
*VH1	Vertical heat exchanger, horizontal piping conforming to rule	50	10		N		
*VH2	Vertical heat exchanger (vertical) piping, conforming to rule	50	35		N		
*WR1	Wastewater rapid infiltration basin, municipal or industrial	300	300	600	N		
*WA1	Wastewater spray irrigation area, municipal or industrial	150	150	300	N		
*WS1	Wastewater stabilization pond, industrial	150	150	300	N		
*WS2	Wastewater stabilization pond, municipal, 500 or more gal./acre/day of leakage	300	300	600	N		
*WS3	Wastewater stabilization pond, municipal, less than 500 gal./acre/day of leakage	150	150	300	N		
*WT1	Wastewater treatment unit tanks, vessels and components (Package plant)	100	100		N		
*WT2	Water treatment backwash disposal area	50	50	100	N		
Additional Sources (If there is more than one source listed above, please indicate here).							
Potential Contamination Sources and Codes Based on Previous Versions of this Form							
	none found within 200' of this well.						

* New potential contaminant source.

[1] A sensitive well has less than 50 feet of watertight casing, and which is not cased below a confining layer or confining materials of at least 10' in thickness.

[2] These sources, known as Class V underground injection wells, are regulated by the federal U.S. Environmental Protection Agency.

[3] These sources are classified as illegal by Minnesota Rules, Chapter 4725.

[4] Isolation distance is determined by average flow per day or if a facility handles infectious or pathological wastes.

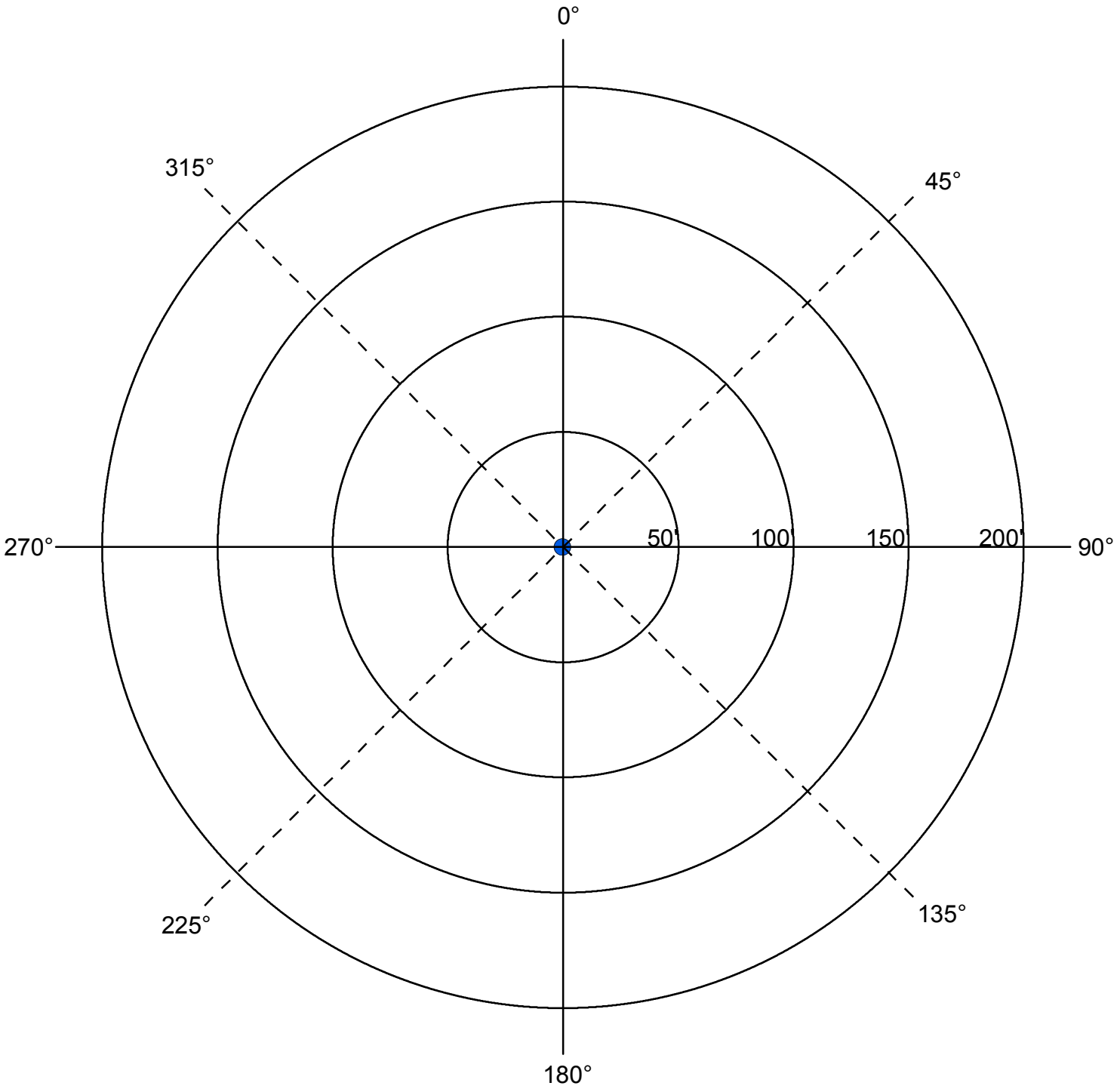
[5] A community public water-supply well must be a minimum of 50 feet from a petroleum tank or container, unless the tank or container is used for emergency pumping and is located in a room or building separate from the community well; and is of double-wall construction with leak detection between walls; or is protected with secondary containment.

This form is based on the new isolation distances in Minnesota Rules, Chapter 4725, related to wells and borings adopted August 4, 2008, and Minnesota Rules, Chapter 4720, related to wellhead protection.

PWS ID / FACILITY ID	1020017 S10	UNIQUE WELL NO.	202930

SETBACK DISTANCES	All potential contaminant sources must be noted on sketch.

Record the distance and approximate compass bearing of each potential contaminant source from the well, and identify the source using the "Source Code". Unlabeled points on the map are unsealed wells.



	Y	N	N/A
Were the isolation distances maintained for the new sources of contamination?			
Is the system monitoring existing nonconforming sources of contamination?			

Reminder Question: Were the wellhead protection measure(s) implemented?

INSPECTOR	Neiman, Dave	DATE	6 - 3 - 2016

PWS ID / FACILITY ID	1020017 S10	UNIQUE WELL NO.	202930

RECOMMENDED WELLHEAD PROTECTION (WHP) MEASURES	WHP MEASURE IMPLEMENTED? Y or N	DATE VERIFIED

COMMENTS

For further information, please contact:

Minnesota Department of Health
Drinking Water Protection Section
Source Water Protection Unit
P.O. Box 64975
St. Paul, Minnesota 55164-0975

Section Receptionist: 651-201-4700
Division TDD: 651-201-5797 or MN Relay Service @ 1-800-627-3529 and ask for 651-201-5000

Environmental Health Division
Drinking Water Protection Section
P.O. Box 64975
St. Paul, Minnesota 55164-0975

INNER WELLHEAD MANAGEMENT ZONE (IWMZ) - POTENTIAL CONTAMINANT SOURCE INVENTORY (PCSI) REPORT

PUBLIC WATER SYSTEM INFORMATION

PWS ID	1020017	**COMMUNITY**
NAME	Coon Rapids	
ADDRESS	Kory Jorgensen Utilities Supervisor, Public Works Garage, 1831 111th Avenue, Coon Rapids, MN 554333761	

FACILITY (WELL) INFORMATION

NAME	Well #11	**IS THERE A WELL LOG OR ADDITIONAL CONSTRUCTION INFORMATION AVAILABLE?**
FACILITY ID	S11	☐ **YES** (Please attach a copy)
UNIQUE WELL NO.	202965	☐ **NO** ☐ **UNDETERMINED**
COUNTY	Anoka	

PWS ID / FACILITY ID	1020017 S11	**UNIQUE WELL NO.**	202965

PCSI CODE	ACTUAL OR POTENTIAL CONTAMINATION SOURCE	ISOLATION DISTANCES (FEET)				LOCATION	
		Minimum Distances		Sensitive Well[1]	Within 200 Ft. Y / N / U	Dist. from Well	Est. (?)
		Community	Non-community				
Agricultural Related							
*AC1	Agricultural chemical buried piping	50	50		N		
*AC2	Agricultural chemical multiple tanks or containers for residential retail sale or use, no single tank or container exceeding, but aggregate volume exceeding 56 gal. or 100 lbs. dry weight	50	50		N		
ACP	Agricultural chemical tank or container with 25 gal. or more or 100 lbs. or more dry weight, or equipment filling or cleaning area without safeguards	150	150		N		
ACS	Agricultural chemical storage or equipment filling or cleaning area with safeguards	100	100		N		
ACR	Agricultural chemical storage or equipment filling or cleaning area with safeguards and roofed	50	50		N		
ADW	Agricultural drainage well[2] (Class V well - illegal[3])	50	50		N		
AAT	Anhydrous ammonia tank (stationary tank)	50	50		N		
AB1	Animal building, feedlot, confinement area, or kennel, 0.1 to 1.0 animal unit (stockyard)	50	20	100/40	N		
AB2	Animal building or poultry building, including a horse riding area, more than 1.0 animal unit	50	50	100	N		
ABS	Animal burial area, more than 1.0 animal unit	50	50		N		
FWP	Animal feeding or watering area within a pasture, more than 1.0 animal unit	50	50	100	N		
AF1	Animal feedlot, unroofed, 300 or more animal units (stockyard)	100	100	200	N		
AF2	Animal feedlot, more than 1.0, but less than 300 animal units (stockyard)	50	50	100	N		
AMA	Animal manure application	use discretion	use discretion		N		
REN	Animal rendering plant	50	50		N		
MS1	Manure (liquid) storage basin or lagoon, unpermitted or noncertified	300	300	600	N		
MS2	Manure (liquid) storage basin or lagoon, approved earthen liner	150	150	300	N		
MS3	Manure (liquid) storage basin or lagoon, approved concrete or composite liner	100	100	200	N		
MS4	Manure (solid) storage area, not covered with a roof	100	100	200	N		
OSC	Open storage for crops	use discretion	use discretion		N		
SSTS Related							
AA1	Absorption area of a soil dispersal system, average flow greater than 10,000 gal./day	300	300	600	N		
AA2	Absorption area of a soil dispersal system serving a facility handling infectious or pathological wastes, average flow 10,000 gal./day or less	150	150	300	N		
AA3	Absorption area of a soil dispersal system, average flow 10,000 gal./day or less	50	50	100	N		
AA4	Absorption area of a soil dispersal system serving multiple family residences or a non-residential facility and has the capacity to serve 20 or more persons per day (Class V well)[2]	50/300/150[4]	50/300/150[4]	100/600/300[4]	N		
CSP	Cesspool	75	75	150	N		
AGG	Dry well, leaching pit, seepage pit	75	75	150	N		
*FD1	Floor drain, grate, or trough connected to a buried sewer	50	50		N		
*FD2	Floor drain, grate, or trough if buried sewer is air-tested, approved materials, serving one building, or two or less single-family residences	50	20		N		
*GW1	Gray-water dispersal area	50	50	100	N		
LC1	Large capacity cesspools (Class V well - illegal)[2]	75	75	150	N		
MVW	Motor vehicle waste disposal (Class V well - illegal)[2]	illegal	illegal		N		

PWS ID / FACILITY ID	1020017 S11	UNIQUE WELL NO.	202965

PCSI CODE	ACTUAL OR POTENTIAL CONTAMINATION SOURCE	ISOLATION DISTANCES (FEET)				LOCATION	
		Minimum Distances		Sensitive Well[1]	Within 200 Ft. Y / N / U	Dist. from Well	Est. (?)
		Community	Non-community				
PR1	Privy, nonportable	50	50	100	N		
PR2	Portable (privy) or toilet	50	20		N		
*SF1	Watertight sand filter; peat filter; or constructed wetland	50	50		N		
SET	Septic tank	50	50		N		
HTK	Sewage holding tank, watertight	50	50		N		
SS1	Sewage sump capacity 100 gal. or more	50	50		N		
SS2	Sewage sump capacity less than 100 gal., tested, conforming to rule	50	20		N		
*ST1	Sewage treatment device, watertight	50	50		N		
SB1	Sewer, buried, approved materials, tested, serving one building, or two or less single-family residences	50	20		N		
SB2	Sewer, buried, collector, municipal, serving a facility handling infectious or pathological wastes, open-jointed or unapproved materials	50	50		Y	80	N
SB2	Sewer, buried, collector, municipal, serving a facility handling infectious or pathological wastes, open-jointed or unapproved materials	50	50		Y	100	N
SB2	Sewer, buried, collector, municipal, serving a facility handling infectious or pathological wastes, open-jointed or unapproved materials	50	50		Y	75	N
*WB1	Water treatment backwash holding basin, reclaim basin, or surge tank with a direct sewer connection	50	50		N		
*WB2	Water treatment backwash holding basin, reclaim basin, or surge tank with a backflow protected sewer connection	20	20		N		
Land Application							
SPT	Land spreading area for sewage, septage, or sludge	50	50	100	N		
Solid Waste Related							
COS	Commercial compost site	50	50		N		
CD1	Construction or demolition debris disposal area	50	50	100	N		
*HW1	Household solid waste disposal area, single residence	50	50	100	N		
LF1	Landfill, permitted demolition debris, dump, or mixed municipal solid waste from multiple persons	300	300	600	N		
SVY	Scrap yard	50	50		N		
SWT	Solid waste transfer station	50	50		N		
Storm Water Related							
SD1	Storm water drain pipe, 8 inches or greater in diameter	50	20		N		
SWI	Storm water drainage well[2] (Class V well - illegal[3])	50	50		N		
SM1	Storm water pond greater than 5000 gal.	50	35		N		
Wells and Borings							
*EB1	Elevator boring, not conforming to rule	50	50		N		
*EB2	Elevator boring, conforming to rule	20	20		N		
MON	Monitoring well	record dist.	record dist.		N		
WEL	Operating well	record dist.	record dist.		N		
UUW	Unused, unsealed well or boring	50	50		N		
General							
*CR1	Cistern or reservoir, buried, nonpressurized water supply	20	20		N		
PLM	Contaminant plume	50	50		N		
*CW1	Cooling water pond, industrial	50	50	100	N		
DC1	Deicing chemicals, bulk road	50	50	100	N		
*ET1	Electrical transformer storage area, oil-filled	50	50		N		
GRV	Grave or mausoleum	50	50		N		
GP1	Gravel pocket or French drain for clear water drainage only	20	20		N		
*HS1	Hazardous substance buried piping	50	50		N		
HS2	Hazardous substance tank or container, above ground or underground, 56 gal. or more, or 100 lbs. or more dry weight, without safeguards	150	150		N		
HS3	Hazardous substance tank or container, above ground or underground, 56 gal. or more, or 100 lbs. or more dry weight with safeguards	100	100		N		
HS4	Hazardous substance multiple storage tanks or containers for residential retail sale or use, no single tank or container exceeding 56 gal. or 100 lbs., but aggregate volume exceeding	50	50		N		
HWF	Highest water or flood level	50	N/A		N		
*HG1	Horizontal ground source closed loop heat exchanger buried piping	50	50		N		
*HG2	Horizontal ground source closed loop heat exchanger buried piping and horizontal piping, approved materials and heat transfer fluid	50	10		N		
IWD	Industrial waste disposal well (Class V well)[2]	illegal[3]	illegal[3]		N		
IWS	Interceptor, including a flammable waste or sediment	50	50		N		

PWS ID / FACILITY ID	1020017 S11	UNIQUE WELL NO.	202965

PCSI CODE	ACTUAL OR POTENTIAL CONTAMINATION SOURCE	ISOLATION DISTANCES (FEET)				LOCATION	
		Minimum Distances		Sensitive Well[1]	Within 200 Ft. Y / N / U	Dist. from Well	Est. (?)
		Community	Non-community				
OH1	Ordinary high water level of a stream, river, pond, lake, reservoir, or drainage ditch (holds water six months or more)	50	35		N		
*PP1	Petroleum buried piping	50	50		N		
*PP2	Petroleum or crude oil pipeline to a refinery or distribution center	100	100		N		
PT1	Petroleum tank or container, 1100 gal. or more, without safeguards	150	150		N		
PT2	Petroleum tank or container, 1100 gal. or more, with safeguards	100	100		N		
PT3	Petroleum tank or container, buried, between 56 and 1100 gal.	50	50		N		
PT4	Petroleum tank or container, not buried, between 56 and 1100 gal.	50[5]	20		N		
PU1	Pit or unfilled space more than four feet in depth	20	20		N		
PC1	Pollutant or contaminant that may drain into the soil	50	50	100	N		
SP1	Swimming pool, in-ground	20	20		N		
*VH1	Vertical heat exchanger, horizontal piping conforming to rule	50	10		N		
*VH2	Vertical heat exchanger (vertical) piping, conforming to rule	50	35		N		
*WR1	Wastewater rapid infiltration basin, municipal or industrial	300	300	600	N		
*WA1	Wastewater spray irrigation area, municipal or industrial	150	150	300	N		
*WS1	Wastewater stabilization pond, industrial	150	150	300	N		
*WS2	Wastewater stabilization pond, municipal, 500 or more gal./acre/day of leakage	300	300	600	N		
*WS3	Wastewater stabilization pond, municipal, less than 500 gal./acre/day of leakage	150	150	300	N		
*WT1	Wastewater treatment unit tanks, vessels and components (Package plant)	100	100		N		
*WT2	Water treatment backwash disposal area	50	50	100	N		
Additional Sources (If there is more than one source listed above, please indicate here).							
Potential Contamination Sources and Codes Based on Previous Versions of this Form							
	none found within 200' of this well.						

* New potential contaminant source.

[1] A sensitive well has less than 50 feet of watertight casing, and which is not cased below a confining layer or confining materials of at least 10' in thickness.

[2] These sources, known as Class V underground injection wells, are regulated by the federal U.S. Environmental Protection Agency.

[3] These sources are classified as illegal by Minnesota Rules, Chapter 4725.

[4] Isolation distance is determined by average flow per day or if a facility handles infectious or pathological wastes.

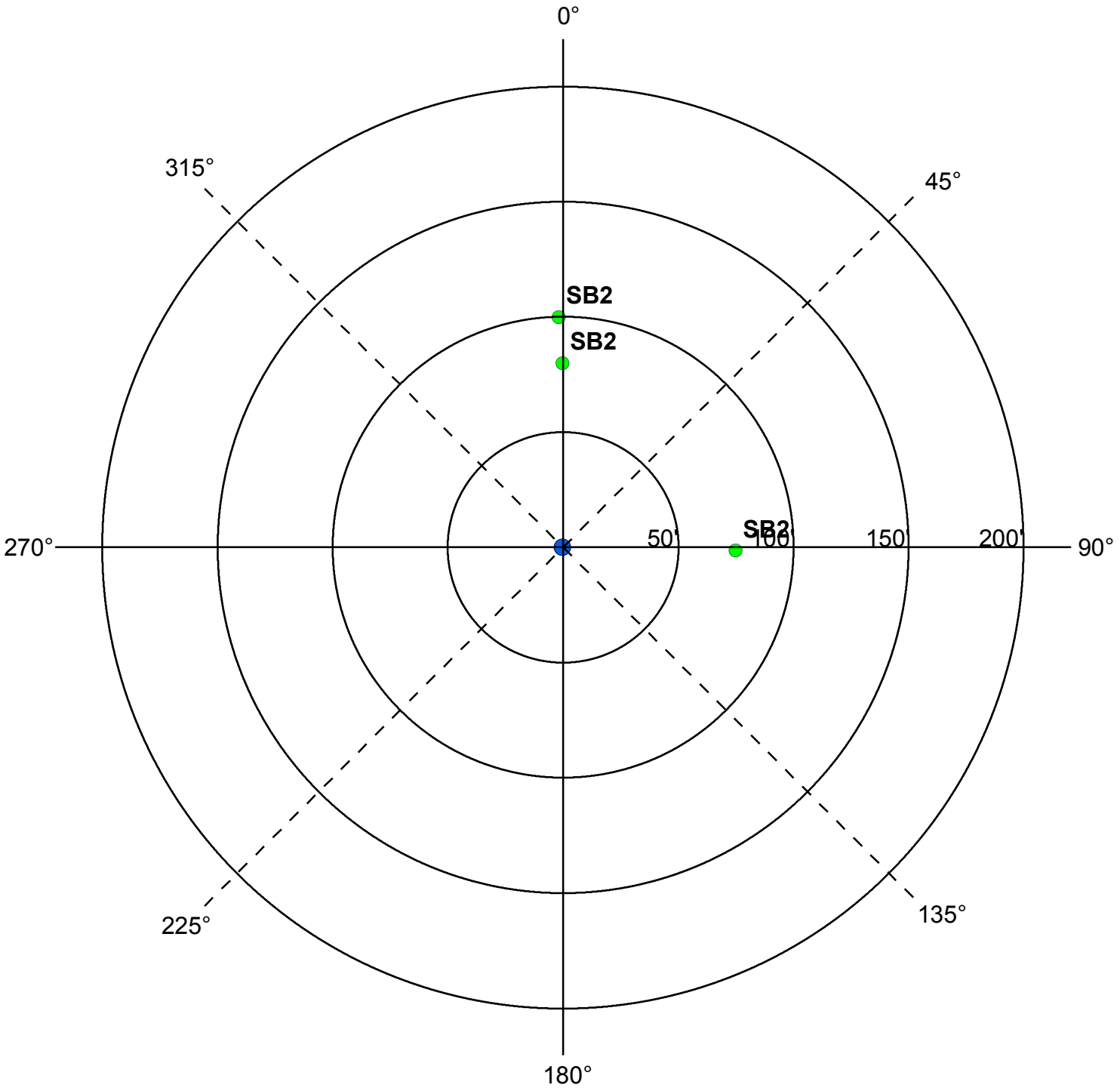
[5] A community public water-supply well must be a minimum of 50 feet from a petroleum tank or container, unless the tank or container is used for emergency pumping and is located in a room or building separate from the community well; and is of double-wall construction with leak detection between walls; or is protected with secondary containment.

This form is based on the new isolation distances in Minnesota Rules, Chapter 4725, related to wells and borings adopted August 4, 2008, and Minnesota Rules, Chapter 4720, related to wellhead protection.

PWS ID / FACILITY ID	1020017 S11	UNIQUE WELL NO.	202965

SETBACK DISTANCES	All potential contaminant sources must be noted on sketch.

Record the distance and approximate compass bearing of each potential contaminant source from the well, and identify the source using the "Source Code". Unlabeled points on the map are unsealed wells.



	Y	N	N/A
Were the isolation distances maintained for the new sources of contamination?			
Is the system monitoring existing nonconforming sources of contamination?			

Reminder Question: Were the wellhead protection measure(s) implemented?

INSPECTOR	Neiman, Dave	DATE	6 - 3 - 2016

PWS ID / FACILITY ID	1020017 S11	UNIQUE WELL NO.	202965

RECOMMENDED WELLHEAD PROTECTION (WHP) MEASURES	WHP MEASURE IMPLEMENTED? Y or N	DATE VERIFIED

COMMENTS

For further information, please contact:

Minnesota Department of Health
Drinking Water Protection Section
Source Water Protection Unit
P.O. Box 64975
St. Paul, Minnesota 55164-0975

Section Receptionist: 651-201-4700
Division TDD: 651-201-5797 or MN Relay Service @ 1-800-627-3529 and ask for 651-201-5000

Environmental Health Division
Drinking Water Protection Section
P.O. Box 64975
St. Paul, Minnesota 55164-0975

INNER WELLHEAD MANAGEMENT ZONE (IWMZ) - POTENTIAL CONTAMINANT SOURCE INVENTORY (PCSI) REPORT

PUBLIC WATER SYSTEM INFORMATION

PWS ID	1020017	**COMMUNITY**
NAME	Coon Rapids	
ADDRESS	Kory Jorgensen Utilities Supervisor, Public Works Garage, 1831 111th Avenue, Coon Rapids, MN 554333761	

FACILITY (WELL) INFORMATION

NAME	Well #12	**IS THERE A WELL LOG OR ADDITIONAL CONSTRUCTION INFORMATION AVAILABLE?**
FACILITY ID	S12	☐ **YES** (Please attach a copy)
UNIQUE WELL NO.	168721	☐ **NO** ☐ **UNDETERMINED**
COUNTY	Anoka	

PWS ID / FACILITY ID	1020017 S12	**UNIQUE WELL NO.**	168721

PCSI CODE	ACTUAL OR POTENTIAL CONTAMINATION SOURCE	ISOLATION DISTANCES (FEET)				LOCATION	
		Minimum Distances		Sensitive Well[1]	Within 200 Ft. Y / N / U	Dist. from Well	Est. (?)
		Community	Non-community				
Agricultural Related							
*AC1	Agricultural chemical buried piping	50	50		N		
*AC2	Agricultural chemical multiple tanks or containers for residential retail sale or use, no single tank or container exceeding, but aggregate volume exceeding 56 gal. or 100 lbs. dry weight	50	50		N		
ACP	Agricultural chemical tank or container with 25 gal. or more or 100 lbs. or more dry weight, or equipment filling or cleaning area without safeguards	150	150		N		
ACS	Agricultural chemical storage or equipment filling or cleaning area with safeguards	100	100		N		
ACR	Agricultural chemical storage or equipment filling or cleaning area with safeguards and roofed	50	50		N		
ADW	Agricultural drainage well[2] (Class V well - illegal[3])	50	50		N		
AAT	Anhydrous ammonia tank (stationary tank)	50	50		N		
AB1	Animal building, feedlot, confinement area, or kennel, 0.1 to 1.0 animal unit (stockyard)	50	20	100/40	N		
AB2	Animal building or poultry building, including a horse riding area, more than 1.0 animal unit	50	50	100	N		
ABS	Animal burial area, more than 1.0 animal unit	50	50		N		
FWP	Animal feeding or watering area within a pasture, more than 1.0 animal unit	50	50	100	N		
AF1	Animal feedlot, unroofed, 300 or more animal units (stockyard)	100	100	200	N		
AF2	Animal feedlot, more than 1.0, but less than 300 animal units (stockyard)	50	50	100	N		
AMA	Animal manure application	use discretion	use discretion		N		
REN	Animal rendering plant	50	50		N		
MS1	Manure (liquid) storage basin or lagoon, unpermitted or noncertified	300	300	600	N		
MS2	Manure (liquid) storage basin or lagoon, approved earthen liner	150	150	300	N		
MS3	Manure (liquid) storage basin or lagoon, approved concrete or composite liner	100	100	200	N		
MS4	Manure (solid) storage area, not covered with a roof	100	100	200	N		
OSC	Open storage for crops	use discretion	use discretion		N		
SSTS Related							
AA1	Absorption area of a soil dispersal system, average flow greater than 10,000 gal./day	300	300	600	N		
AA2	Absorption area of a soil dispersal system serving a facility handling infectious or pathological wastes, average flow 10,000 gal./day or less	150	150	300	N		
AA3	Absorption area of a soil dispersal system, average flow 10,000 gal./day or less	50	50	100	N		
AA4	Absorption area of a soil dispersal system serving multiple family residences or a non-residential facility and has the capacity to serve 20 or more persons per day (Class V well)[2]	50/300/150[4]	50/300/150[4]	100/600/300[4]	N		
CSP	Cesspool	75	75	150	N		
AGG	Dry well, leaching pit, seepage pit	75	75	150	N		
*FD1	Floor drain, grate, or trough connected to a buried sewer	50	50		N		
*FD2	Floor drain, grate, or trough if buried sewer is air-tested, approved materials, serving one building, or two or less single-family residences	50	20		N		
*GW1	Gray-water dispersal area	50	50	100	N		
LC1	Large capacity cesspools (Class V well - illegal)[2]	75	75	150	N		
MVW	Motor vehicle waste disposal (Class V well - illegal)[2]	illegal	illegal		N		

PWS ID / FACILITY ID	1020017 S12	UNIQUE WELL NO.	168721

PCSI CODE	ACTUAL OR POTENTIAL CONTAMINATION SOURCE	ISOLATION DISTANCES (FEET)				LOCATION	
		Minimum Distances		Sensitive Well[1]	Within 200 Ft. Y / N / U	Dist. from Well	Est. (?)
		Community	Non-community				
PR1	Privy, nonportable	50	50	100	N		
PR2	Portable (privy) or toilet	50	20		N		
*SF1	Watertight sand filter; peat filter; or constructed wetland	50	50		N		
SET	Septic tank	50	50		N		
HTK	Sewage holding tank, watertight	50	50		N		
SS1	Sewage sump capacity 100 gal. or more	50	50		N		
SS2	Sewage sump capacity less than 100 gal., tested, conforming to rule	50	20		N		
*ST1	Sewage treatment device, watertight	50	50		N		
SB1	Sewer, buried, approved materials, tested, serving one building, or two or less single-family residences	50	20		N		
SB2	Sewer, buried, collector, municipal, serving a facility handling infectious or pathological wastes, open-jointed or unapproved materials	50	50		Y	75	N
*WB1	Water treatment backwash holding basin, reclaim basin, or surge tank with a direct sewer connection	50	50		N		
*WB2	Water treatment backwash holding basin, reclaim basin, or surge tank with a backflow protected sewer connection	20	20		N		
Land Application							
SPT	Land spreading area for sewage, septage, or sludge	50	50	100	N		
Solid Waste Related							
COS	Commercial compost site	50	50		N		
CD1	Construction or demolition debris disposal area	50	50	100	N		
*HW1	Household solid waste disposal area, single residence	50	50	100	N		
LF1	Landfill, permitted demolition debris, dump, or mixed municipal solid waste from multiple persons	300	300	600	N		
SVY	Scrap yard	50	50		N		
SWT	Solid waste transfer station	50	50		N		
Storm Water Related							
SD1	Storm water drain pipe, 8 inches or greater in diameter	50	20		N		
SWI	Storm water drainage well[2] (Class V well - illegal[3])	50	50		N		
SM1	Storm water pond greater than 5000 gal.	50	35		Y	85	N
Wells and Borings							
*EB1	Elevator boring, not conforming to rule	50	50		N		
*EB2	Elevator boring, conforming to rule	20	20		N		
MON	Monitoring well	record dist.	record dist.		N		
WEL	Operating well	record dist.	record dist.		N		
UUW	Unused, unsealed well or boring	50	50		N		
General							
*CR1	Cistern or reservoir, buried, nonpressurized water supply	20	20		N		
PLM	Contaminant plume	50	50		N		
*CW1	Cooling water pond, industrial	50	50	100	N		
DC1	Deicing chemicals, bulk road	50	50	100	N		
*ET1	Electrical transformer storage area, oil-filled	50	50		N		
GRV	Grave or mausoleum	50	50		N		
GP1	Gravel pocket or French drain for clear water drainage only	20	20		N		
*HS1	Hazardous substance buried piping	50	50		N		
HS2	Hazardous substance tank or container, above ground or underground, 56 gal. or more, or 100 lbs. or more dry weight, without safeguards	150	150		N		
HS3	Hazardous substance tank or container, above ground or underground, 56 gal. or more, or 100 lbs. or more dry weight with safeguards	100	100		N		
HS4	Hazardous substance multiple storage tanks or containers for residential retail sale or use, no single tank or container exceeding 56 gal. or 100 lbs., but aggregate volume exceeding	50	50		N		
HWF	Highest water or flood level	50	N/A		N		
*HG1	Horizontal ground source closed loop heat exchanger buried piping	50	50		N		
*HG2	Horizontal ground source closed loop heat exchanger buried piping and horizontal piping, approved materials and heat transfer fluid	50	10		N		
IWD	Industrial waste disposal well (Class V well)[2]	illegal[3]	illegal[3]		N		
IWS	Interceptor, including a flammable waste or sediment	50	50		N		
OH1	Ordinary high water level of a stream, river, pond, lake, reservoir, or drainage ditch (holds water six months or more)	50	35		Y	50	N
*PP1	Petroleum buried piping	50	50		N		
*PP2	Petroleum or crude oil pipeline to a refinery or distribution center	100	100		N		

PWS ID / FACILITY ID	1020017 S12	UNIQUE WELL NO.	168721

PCSI CODE	ACTUAL OR POTENTIAL CONTAMINATION SOURCE	ISOLATION DISTANCES (FEET)				LOCATION	
		Minimum Distances		Sensitive Well[1]	Within 200 Ft. Y / N / U	Dist. from Well	Est. (?)
		Community	Non-community				
PT1	Petroleum tank or container, 1100 gal. or more, without safeguards	150	150		N		
PT2	Petroleum tank or container, 1100 gal. or more, with safeguards	100	100		N		
PT3	Petroleum tank or container, buried, between 56 and 1100 gal.	50	50		N		
PT4	Petroleum tank or container, not buried, between 56 and 1100 gal.	50[5]	20		N		
PU1	Pit or unfilled space more than four feet in depth	20	20		N		
PC1	Pollutant or contaminant that may drain into the soil	50	50	100	N		
SP1	Swimming pool, in-ground	20	20		N		
*VH1	Vertical heat exchanger, horizontal piping conforming to rule	50	10		N		
*VH2	Vertical heat exchanger (vertical) piping, conforming to rule	50	35		N		
*WR1	Wastewater rapid infiltration basin, municipal or industrial	300	300	600	N		
*WA1	Wastewater spray irrigation area, municipal or industrial	150	150	300	N		
*WS1	Wastewater stabilization pond, industrial	150	150	300	N		
*WS2	Wastewater stabilization pond, municipal, 500 or more gal./acre/day of leakage	300	300	600	N		
*WS3	Wastewater stabilization pond, municipal, less than 500 gal./acre/day of leakage	150	150	300	N		
*WT1	Wastewater treatment unit tanks, vessels and components (Package plant)	100	100		N		
*WT2	Water treatment backwash disposal area	50	50	100	N		
Additional Sources (If there is more than one source listed above, please indicate here).							
Potential Contamination Sources and Codes Based on Previous Versions of this Form							
	none found within 200' of this well.						

* New potential contaminant source.

[1] A sensitive well has less than 50 feet of watertight casing, and which is not cased below a confining layer or confining materials of at least 10' in thickness.

[2] These sources, known as Class V underground injection wells, are regulated by the federal U.S. Environmental Protection Agency.

[3] These sources are classified as illegal by Minnesota Rules, Chapter 4725.

[4] Isolation distance is determined by average flow per day or if a facility handles infectious or pathological wastes.

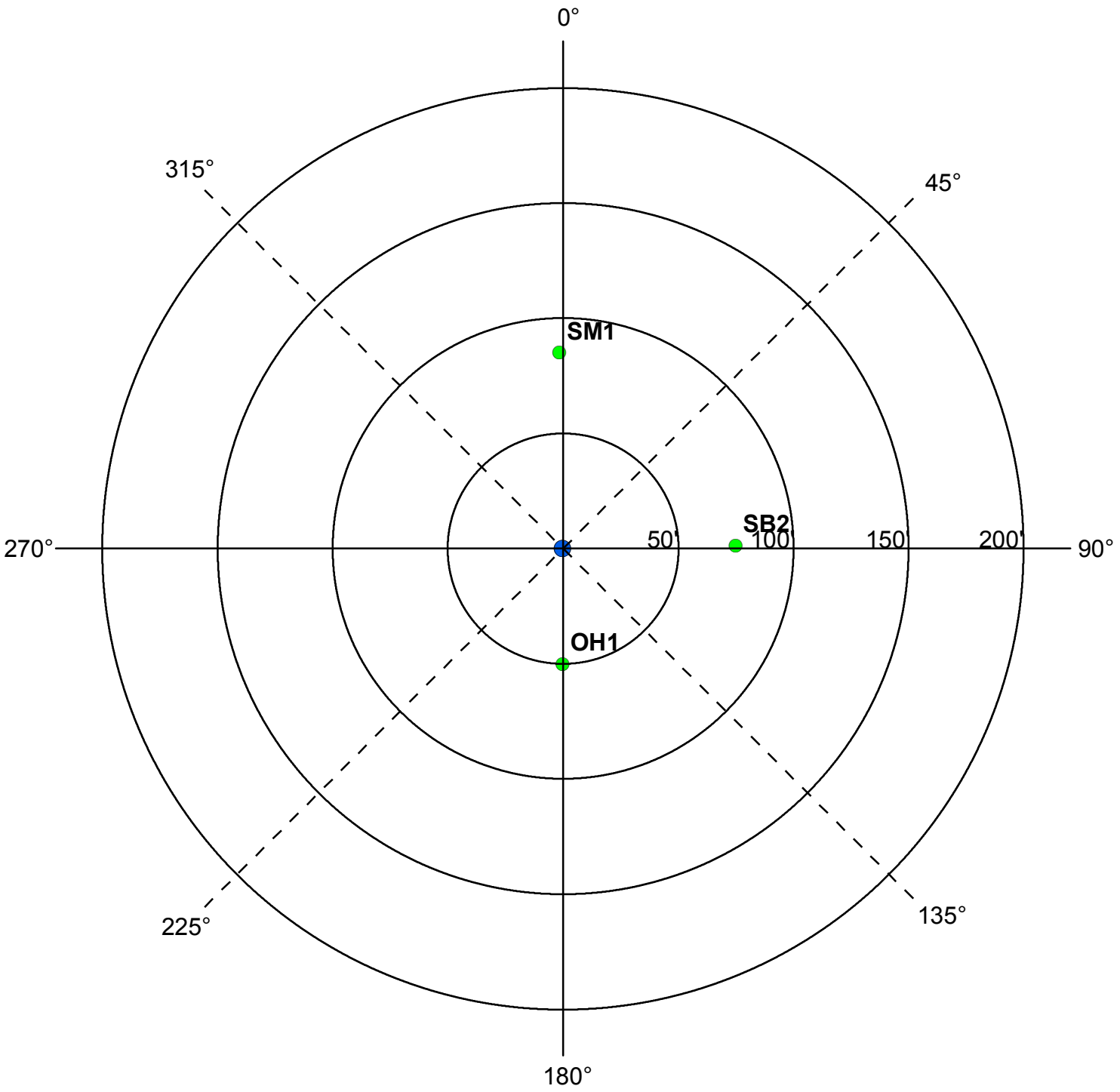
[5] A community public water-supply well must be a minimum of 50 feet from a petroleum tank or container, unless the tank or container is used for emergency pumping and is located in a room or building separate from the community well; and is of double-wall construction with leak detection between walls; or is protected with secondary containment.

This form is based on the new isolation distances in Minnesota Rules, Chapter 4725, related to wells and borings adopted August 4, 2008, and Minnesota Rules, Chapter 4720, related to wellhead protection.

PWS ID / FACILITY ID	1020017 S12	UNIQUE WELL NO.	168721

SETBACK DISTANCES	All potential contaminant sources must be noted on sketch.

Record the distance and approximate compass bearing of each potential contaminant source from the well, and identify the source using the "Source Code". Unlabeled points on the map are unsealed wells.



	Y	N	N/A
Were the isolation distances maintained for the new sources of contamination?			
Is the system monitoring existing nonconforming sources of contamination?			

Reminder Question: Were the wellhead protection measure(s) implemented?

INSPECTOR	Neiman, Dave	DATE	6 - 3 - 2016

PWS ID / FACILITY ID	1020017 S12	UNIQUE WELL NO.	168721

RECOMMENDED WELLHEAD PROTECTION (WHP) MEASURES	WHP MEASURE IMPLEMENTED? Y or N	DATE VERIFIED

COMMENTS

For further information, please contact:

Minnesota Department of Health
Drinking Water Protection Section
Source Water Protection Unit
P.O. Box 64975
St. Paul, Minnesota 55164-0975

Section Receptionist: 651-201-4700
Division TDD: 651-201-5797 or MN Relay Service @ 1-800-627-3529 and ask for 651-201-5000

Environmental Health Division
Drinking Water Protection Section
P.O. Box 64975
St. Paul, Minnesota 55164-0975

INNER WELLHEAD MANAGEMENT ZONE (IWMZ) - POTENTIAL CONTAMINANT SOURCE INVENTORY (PCSI) REPORT

PUBLIC WATER SYSTEM INFORMATION

PWS ID	1020017	**COMMUNITY**
NAME	Coon Rapids	
ADDRESS	Kory Jorgensen Utilities Supervisor, Public Works Garage, 1831 111th Avenue, Coon Rapids, MN 554333761	

FACILITY (WELL) INFORMATION

NAME	Well #13	**IS THERE A WELL LOG OR ADDITIONAL CONSTRUCTION INFORMATION AVAILABLE?**
FACILITY ID	S13	☐ **YES** (Please attach a copy)
UNIQUE WELL NO.	168720	☐ **NO** ☐ **UNDETERMINED**
COUNTY	Anoka	

PWS ID / FACILITY ID	1020017 S13	**UNIQUE WELL NO.**	168720

PCSI CODE	ACTUAL OR POTENTIAL CONTAMINATION SOURCE	ISOLATION DISTANCES (FEET)				LOCATION	
		Minimum Distances		Sensitive Well[1]	Within 200 Ft. Y / N / U	Dist. from Well	Est. (?)
		Community	Non-community				
Agricultural Related							
*AC1	Agricultural chemical buried piping	50	50		N		
*AC2	Agricultural chemical multiple tanks or containers for residential retail sale or use, no single tank or container exceeding, but aggregate volume exceeding 56 gal. or 100 lbs. dry weight	50	50		N		
ACP	Agricultural chemical tank or container with 25 gal. or more or 100 lbs. or more dry weight, or equipment filling or cleaning area without safeguards	150	150		N		
ACS	Agricultural chemical storage or equipment filling or cleaning area with safeguards	100	100		N		
ACR	Agricultural chemical storage or equipment filling or cleaning area with safeguards and roofed	50	50		N		
ADW	Agricultural drainage well[2] (Class V well - illegal[3])	50	50		N		
AAT	Anhydrous ammonia tank (stationary tank)	50	50		N		
AB1	Animal building, feedlot, confinement area, or kennel, 0.1 to 1.0 animal unit (stockyard)	50	20	100/40	N		
AB2	Animal building or poultry building, including a horse riding area, more than 1.0 animal unit	50	50	100	N		
ABS	Animal burial area, more than 1.0 animal unit	50	50		N		
FWP	Animal feeding or watering area within a pasture, more than 1.0 animal unit	50	50	100	N		
AF1	Animal feedlot, unroofed, 300 or more animal units (stockyard)	100	100	200	N		
AF2	Animal feedlot, more than 1.0, but less than 300 animal units (stockyard)	50	50	100	N		
AMA	Animal manure application	use discretion	use discretion		N		
REN	Animal rendering plant	50	50		N		
MS1	Manure (liquid) storage basin or lagoon, unpermitted or noncertified	300	300	600	N		
MS2	Manure (liquid) storage basin or lagoon, approved earthen liner	150	150	300	N		
MS3	Manure (liquid) storage basin or lagoon, approved concrete or composite liner	100	100	200	N		
MS4	Manure (solid) storage area, not covered with a roof	100	100	200	N		
OSC	Open storage for crops	use discretion	use discretion		N		
SSTS Related							
AA1	Absorption area of a soil dispersal system, average flow greater than 10,000 gal./day	300	300	600	N		
AA2	Absorption area of a soil dispersal system serving a facility handling infectious or pathological wastes, average flow 10,000 gal./day or less	150	150	300	N		
AA3	Absorption area of a soil dispersal system, average flow 10,000 gal./day or less	50	50	100	N		
AA4	Absorption area of a soil dispersal system serving multiple family residences or a non-residential facility and has the capacity to serve 20 or more persons per day (Class V well)[2]	50/300/150[4]	50/300/150[4]	100/600/300[4]	N		
CSP	Cesspool	75	75	150	N		
AGG	Dry well, leaching pit, seepage pit	75	75	150	N		
*FD1	Floor drain, grate, or trough connected to a buried sewer	50	50		N		
*FD2	Floor drain, grate, or trough if buried sewer is air-tested, approved materials, serving one building, or two or less single-family residences	50	20		N		
*GW1	Gray-water dispersal area	50	50	100	N		
LC1	Large capacity cesspools (Class V well - illegal)[2]	75	75	150	N		
MVW	Motor vehicle waste disposal (Class V well - illegal)[2]	illegal	illegal		N		

PWS ID / FACILITY ID	1020017 S13	UNIQUE WELL NO.	168720

PCSI CODE	ACTUAL OR POTENTIAL CONTAMINATION SOURCE	ISOLATION DISTANCES (FEET)				LOCATION	
		Minimum Distances		Sensitive Well[1]	Within 200 Ft. Y / N / U	Dist. from Well	Est. (?)
		Community	Non-community				
PR1	Privy, nonportable	50	50	100	N		
PR2	Portable (privy) or toilet	50	20		N		
*SF1	Watertight sand filter; peat filter; or constructed wetland	50	50		N		
SET	Septic tank	50	50		N		
HTK	Sewage holding tank, watertight	50	50		N		
SS1	Sewage sump capacity 100 gal. or more	50	50		N		
SS2	Sewage sump capacity less than 100 gal., tested, conforming to rule	50	20		N		
*ST1	Sewage treatment device, watertight	50	50		N		
SB1	Sewer, buried, approved materials, tested, serving one building, or two or less single-family residences	50	20		N		
SB2	Sewer, buried, collector, municipal, serving a facility handling infectious or pathological wastes, open-jointed or unapproved materials	50	50		Y	90	N
*WB1	Water treatment backwash holding basin, reclaim basin, or surge tank with a direct sewer connection	50	50		N		
*WB2	Water treatment backwash holding basin, reclaim basin, or surge tank with a backflow protected sewer connection	20	20		N		
Land Application							
SPT	Land spreading area for sewage, septage, or sludge	50	50	100	N		
Solid Waste Related							
COS	Commercial compost site	50	50		N		
CD1	Construction or demolition debris disposal area	50	50	100	N		
*HW1	Household solid waste disposal area, single residence	50	50	100	N		
LF1	Landfill, permitted demolition debris, dump, or mixed municipal solid waste from multiple persons	300	300	600	N		
SVY	Scrap yard	50	50		N		
SWT	Solid waste transfer station	50	50		N		
Storm Water Related							
SD1	Storm water drain pipe, 8 inches or greater in diameter	50	20		N		
SWI	Storm water drainage well[2] (Class V well - illegal[3])	50	50		N		
SM1	Storm water pond greater than 5000 gal.	50	35		N		
Wells and Borings							
*EB1	Elevator boring, not conforming to rule	50	50		N		
*EB2	Elevator boring, conforming to rule	20	20		N		
MON	Monitoring well	record dist.	record dist.		N		
WEL	Operating well	record dist.	record dist.		N		
UUW	Unused, unsealed well or boring	50	50		N		
General							
*CR1	Cistern or reservoir, buried, nonpressurized water supply	20	20		N		
PLM	Contaminant plume	50	50		N		
*CW1	Cooling water pond, industrial	50	50	100	N		
DC1	Deicing chemicals, bulk road	50	50	100	N		
*ET1	Electrical transformer storage area, oil-filled	50	50		N		
GRV	Grave or mausoleum	50	50		N		
GP1	Gravel pocket or French drain for clear water drainage only	20	20		N		
*HS1	Hazardous substance buried piping	50	50		N		
HS2	Hazardous substance tank or container, above ground or underground, 56 gal. or more, or 100 lbs. or more dry weight, without safeguards	150	150		N		
HS3	Hazardous substance tank or container, above ground or underground, 56 gal. or more, or 100 lbs. or more dry weight with safeguards	100	100		N		
HS4	Hazardous substance multiple storage tanks or containers for residential retail sale or use, no single tank or container exceeding 56 gal. or 100 lbs., but aggregate volume exceeding	50	50		N		
HWF	Highest water or flood level	50	N/A		N		
*HG1	Horizontal ground source closed loop heat exchanger buried piping	50	50		N		
*HG2	Horizontal ground source closed loop heat exchanger buried piping and horizontal piping, approved materials and heat transfer fluid	50	10		N		
IWD	Industrial waste disposal well (Class V well)[2]	illegal[3]	illegal[3]		N		
IWS	Interceptor, including a flammable waste or sediment	50	50		N		
OH1	Ordinary high water level of a stream, river, pond, lake, reservoir, or drainage ditch (holds water six months or more)	50	35		N		
*PP1	Petroleum buried piping	50	50		N		
*PP2	Petroleum or crude oil pipeline to a refinery or distribution center	100	100		N		

PWS ID / FACILITY ID	1020017 S13	UNIQUE WELL NO.	168720

PCSI CODE	ACTUAL OR POTENTIAL CONTAMINATION SOURCE	ISOLATION DISTANCES (FEET)				LOCATION	
		Minimum Distances		Sensitive Well[1]	Within 200 Ft. Y / N / U	Dist. from Well	Est. (?)
		Community	Non-community				
PT1	Petroleum tank or container, 1100 gal. or more, without safeguards	150	150		N		
PT2	Petroleum tank or container, 1100 gal. or more, with safeguards	100	100		N		
PT3	Petroleum tank or container, buried, between 56 and 1100 gal.	50	50		N		
PT4	Petroleum tank or container, not buried, between 56 and 1100 gal.	50[5]	20		N		
PU1	Pit or unfilled space more than four feet in depth	20	20		N		
PC1	Pollutant or contaminant that may drain into the soil	50	50	100	N		
SP1	Swimming pool, in-ground	20	20		N		
*VH1	Vertical heat exchanger, horizontal piping conforming to rule	50	10		N		
*VH2	Vertical heat exchanger (vertical) piping, conforming to rule	50	35		N		
*WR1	Wastewater rapid infiltration basin, municipal or industrial	300	300	600	N		
*WA1	Wastewater spray irrigation area, municipal or industrial	150	150	300	N		
*WS1	Wastewater stabilization pond, industrial	150	150	300	N		
*WS2	Wastewater stabilization pond, municipal, 500 or more gal./acre/day of leakage	300	300	600	N		
*WS3	Wastewater stabilization pond, municipal, less than 500 gal./acre/day of leakage	150	150	300	N		
*WT1	Wastewater treatment unit tanks, vessels and components (Package plant)	100	100		N		
*WT2	Water treatment backwash disposal area	50	50	100	N		
Additional Sources (If there is more than one source listed above, please indicate here).							
Potential Contamination Sources and Codes Based on Previous Versions of this Form							
	none found within 200' of this well.						

* New potential contaminant source.

[1] A sensitive well has less than 50 feet of watertight casing, and which is not cased below a confining layer or confining materials of at least 10' in thickness.

[2] These sources, known as Class V underground injection wells, are regulated by the federal U.S. Environmental Protection Agency.

[3] These sources are classified as illegal by Minnesota Rules, Chapter 4725.

[4] Isolation distance is determined by average flow per day or if a facility handles infectious or pathological wastes.

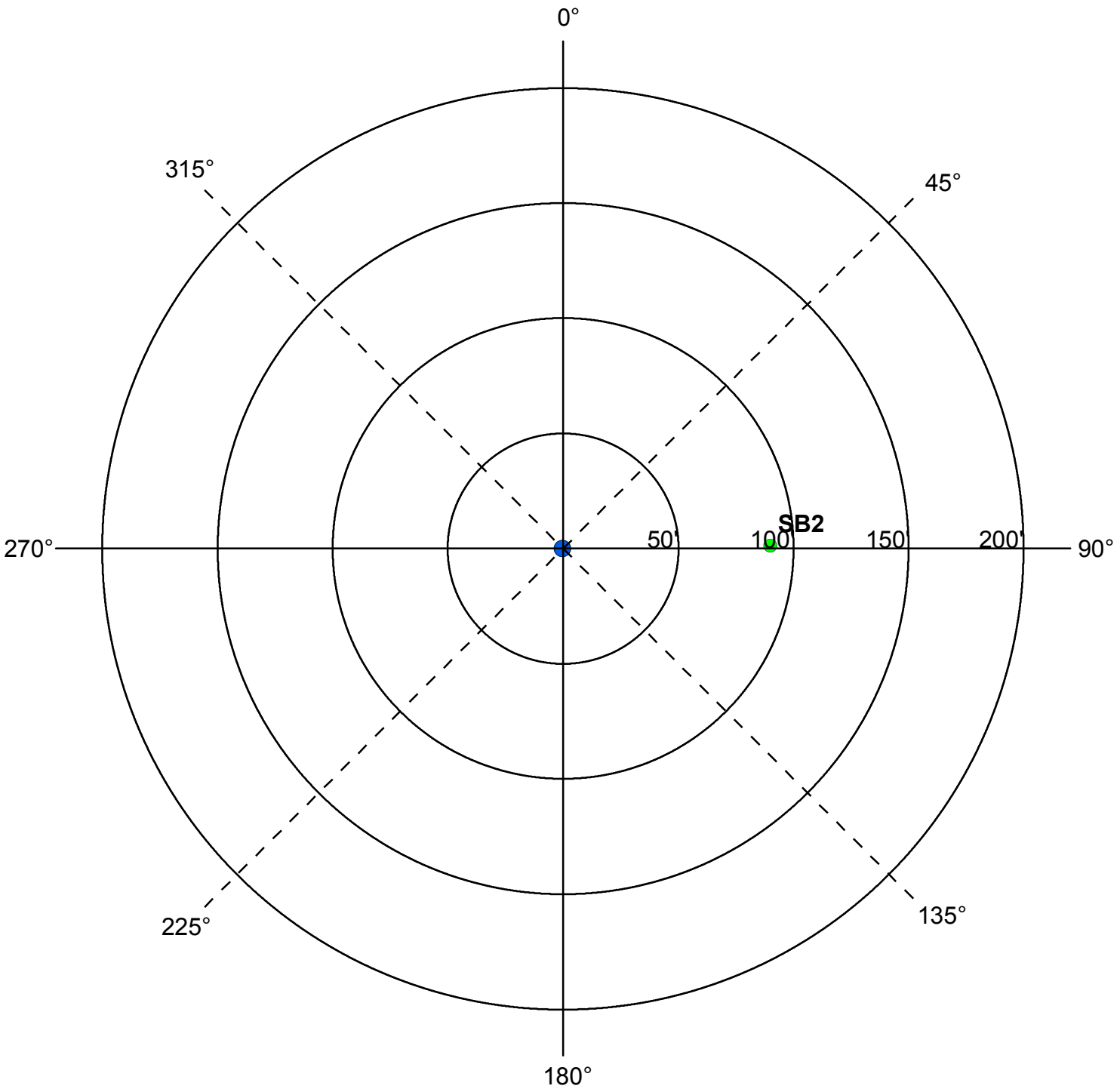
[5] A community public water-supply well must be a minimum of 50 feet from a petroleum tank or container, unless the tank or container is used for emergency pumping and is located in a room or building separate from the community well; and is of double-wall construction with leak detection between walls; or is protected with secondary containment.

This form is based on the new isolation distances in Minnesota Rules, Chapter 4725, related to wells and borings adopted August 4, 2008, and Minnesota Rules, Chapter 4720, related to wellhead protection.

PWS ID / FACILITY ID	1020017 S13	UNIQUE WELL NO.	168720

SETBACK DISTANCES	All potential contaminant sources must be noted on sketch.

Record the distance and approximate compass bearing of each potential contaminant source from the well, and identify the source using the "Source Code". Unlabeled points on the map are unsealed wells.



	Y	N	N/A
Were the isolation distances maintained for the new sources of contamination?			
Is the system monitoring existing nonconforming sources of contamination?			

Reminder Question: Were the wellhead protection measure(s) implemented?

INSPECTOR	Neiman, Dave	DATE	6 - 3 - 2016

PWS ID / FACILITY ID	1020017 S13	UNIQUE WELL NO.	168720

RECOMMENDED WELLHEAD PROTECTION (WHP) MEASURES	WHP MEASURE IMPLEMENTED? Y or N	DATE VERIFIED

COMMENTS

For further information, please contact:

Minnesota Department of Health
Drinking Water Protection Section
Source Water Protection Unit
P.O. Box 64975
St. Paul, Minnesota 55164-0975

Section Receptionist: 651-201-4700
Division TDD: 651-201-5797 or MN Relay Service @ 1-800-627-3529 and ask for 651-201-5000

Environmental Health Division
Drinking Water Protection Section
P.O. Box 64975
St. Paul, Minnesota 55164-0975

INNER WELLHEAD MANAGEMENT ZONE (IWMZ) - POTENTIAL CONTAMINANT SOURCE INVENTORY (PCSI) REPORT

PUBLIC WATER SYSTEM INFORMATION

PWS ID	1020017	**COMMUNITY**
NAME	Coon Rapids	
ADDRESS	Kory Jorgensen Utilities Supervisor, Public Works Garage, 1831 111th Avenue, Coon Rapids, MN 554333761	

FACILITY (WELL) INFORMATION

NAME	Well #14	**IS THERE A WELL LOG OR ADDITIONAL CONSTRUCTION INFORMATION AVAILABLE?**
FACILITY ID	S14	☐ **YES** (Please attach a copy)
UNIQUE WELL NO.	110460	☐ **NO** ☐ **UNDETERMINED**
COUNTY	Anoka	

PWS ID / FACILITY ID	1020017 S14	**UNIQUE WELL NO.**	110460

PCSI CODE	ACTUAL OR POTENTIAL CONTAMINATION SOURCE	ISOLATION DISTANCES (FEET)				LOCATION	
		Minimum Distances		Sensitive Well[1]	Within 200 Ft. Y / N / U	Dist. from Well	Est. (?)
		Community	Non-community				
Agricultural Related							
*AC1	Agricultural chemical buried piping	50	50		N		
*AC2	Agricultural chemical multiple tanks or containers for residential retail sale or use, no single tank or container exceeding, but aggregate volume exceeding 56 gal. or 100 lbs. dry weight	50	50		N		
ACP	Agricultural chemical tank or container with 25 gal. or more or 100 lbs. or more dry weight, or equipment filling or cleaning area without safeguards	150	150		N		
ACS	Agricultural chemical storage or equipment filling or cleaning area with safeguards	100	100		N		
ACR	Agricultural chemical storage or equipment filling or cleaning area with safeguards and roofed	50	50		N		
ADW	Agricultural drainage well[2] (Class V well - illegal[3])	50	50		N		
AAT	Anhydrous ammonia tank (stationary tank)	50	50		N		
AB1	Animal building, feedlot, confinement area, or kennel, 0.1 to 1.0 animal unit (stockyard)	50	20	100/40	N		
AB2	Animal building or poultry building, including a horse riding area, more than 1.0 animal unit	50	50	100	N		
ABS	Animal burial area, more than 1.0 animal unit	50	50		N		
FWP	Animal feeding or watering area within a pasture, more than 1.0 animal unit	50	50	100	N		
AF1	Animal feedlot, unroofed, 300 or more animal units (stockyard)	100	100	200	N		
AF2	Animal feedlot, more than 1.0, but less than 300 animal units (stockyard)	50	50	100	N		
AMA	Animal manure application	use discretion	use discretion		N		
REN	Animal rendering plant	50	50		N		
MS1	Manure (liquid) storage basin or lagoon, unpermitted or noncertified	300	300	600	N		
MS2	Manure (liquid) storage basin or lagoon, approved earthen liner	150	150	300	N		
MS3	Manure (liquid) storage basin or lagoon, approved concrete or composite liner	100	100	200	N		
MS4	Manure (solid) storage area, not covered with a roof	100	100	200	N		
OSC	Open storage for crops	use discretion	use discretion		N		
SSTS Related							
AA1	Absorption area of a soil dispersal system, average flow greater than 10,000 gal./day	300	300	600	N		
AA2	Absorption area of a soil dispersal system serving a facility handling infectious or pathological wastes, average flow 10,000 gal./day or less	150	150	300	N		
AA3	Absorption area of a soil dispersal system, average flow 10,000 gal./day or less	50	50	100	N		
AA4	Absorption area of a soil dispersal system serving multiple family residences or a non-residential facility and has the capacity to serve 20 or more persons per day (Class V well)[2]	50/300/150[4]	50/300/150[4]	100/600/300[4]	N		
CSP	Cesspool	75	75	150	N		
AGG	Dry well, leaching pit, seepage pit	75	75	150	N		
*FD1	Floor drain, grate, or trough connected to a buried sewer	50	50		N		
*FD2	Floor drain, grate, or trough if buried sewer is air-tested, approved materials, serving one building, or two or less single-family residences	50	20		N		
*GW1	Gray-water dispersal area	50	50	100	N		
LC1	Large capacity cesspools (Class V well - illegal)[2]	75	75	150	N		
MVW	Motor vehicle waste disposal (Class V well - illegal)[2]	illegal	illegal		N		

PWS ID / FACILITY ID	1020017 S14	UNIQUE WELL NO.	110460

PCSI CODE	ACTUAL OR POTENTIAL CONTAMINATION SOURCE	ISOLATION DISTANCES (FEET)				LOCATION	
		Minimum Distances		Sensitive Well[1]	Within 200 Ft. Y / N / U	Dist. from Well	Est. (?)
		Community	Non-community				
PR1	Privy, nonportable	50	50	100	N		
PR2	Portable (privy) or toilet	50	20		N		
*SF1	Watertight sand filter; peat filter; or constructed wetland	50	50		N		
SET	Septic tank	50	50		N		
HTK	Sewage holding tank, watertight	50	50		N		
SS1	Sewage sump capacity 100 gal. or more	50	50		N		
SS2	Sewage sump capacity less than 100 gal., tested, conforming to rule	50	20		N		
*ST1	Sewage treatment device, watertight	50	50		N		
SB1	Sewer, buried, approved materials, tested, serving one building, or two or less single-family residences	50	20		N		
SB2	Sewer, buried, collector, municipal, serving a facility handling infectious or pathological wastes, open-jointed or unapproved materials	50	50		N		
*WB1	Water treatment backwash holding basin, reclaim basin, or surge tank with a direct sewer connection	50	50		N		
*WB2	Water treatment backwash holding basin, reclaim basin, or surge tank with a backflow protected sewer connection	20	20		N		
Land Application							
SPT	Land spreading area for sewage, septage, or sludge	50	50	100	N		
Solid Waste Related							
COS	Commercial compost site	50	50		N		
CD1	Construction or demolition debris disposal area	50	50	100	N		
*HW1	Household solid waste disposal area, single residence	50	50	100	N		
LF1	Landfill, permitted demolition debris, dump, or mixed municipal solid waste from multiple persons	300	300	600	N		
SVY	Scrap yard	50	50		N		
SWT	Solid waste transfer station	50	50		N		
Storm Water Related							
SD1	Storm water drain pipe, 8 inches or greater in diameter	50	20		N		
SWI	Storm water drainage well[2] (Class V well - illegal[3])	50	50		N		
SM1	Storm water pond greater than 5000 gal.	50	35		N		
Wells and Borings							
*EB1	Elevator boring, not conforming to rule	50	50		N		
*EB2	Elevator boring, conforming to rule	20	20		N		
MON	Monitoring well	record dist.	record dist.		N		
WEL	Operating well	record dist.	record dist.		N		
UUW	Unused, unsealed well or boring	50	50		N		
General							
*CR1	Cistern or reservoir, buried, nonpressurized water supply	20	20		N		
PLM	Contaminant plume	50	50		N		
*CW1	Cooling water pond, industrial	50	50	100	N		
DC1	Deicing chemicals, bulk road	50	50	100	N		
*ET1	Electrical transformer storage area, oil-filled	50	50		N		
GRV	Grave or mausoleum	50	50		N		
GP1	Gravel pocket or French drain for clear water drainage only	20	20		N		
*HS1	Hazardous substance buried piping	50	50		N		
HS2	Hazardous substance tank or container, above ground or underground, 56 gal. or more, or 100 lbs. or more dry weight, without safeguards	150	150		N		
HS3	Hazardous substance tank or container, above ground or underground, 56 gal. or more, or 100 lbs. or more dry weight with safeguards	100	100		N		
HS4	Hazardous substance multiple storage tanks or containers for residential retail sale or use, no single tank or container exceeding 56 gal. or 100 lbs., but aggregate volume exceeding	50	50		N		
HWF	Highest water or flood level	50	N/A		N		
*HG1	Horizontal ground source closed loop heat exchanger buried piping	50	50		N		
*HG2	Horizontal ground source closed loop heat exchanger buried piping and horizontal piping, approved materials and heat transfer fluid	50	10		N		
IWD	Industrial waste disposal well (Class V well)[2]	illegal[3]	illegal[3]		N		
IWS	Interceptor, including a flammable waste or sediment	50	50		N		
OH1	Ordinary high water level of a stream, river, pond, lake, reservoir, or drainage ditch (holds water six months or more)	50	35		N		
*PP1	Petroleum buried piping	50	50		N		
*PP2	Petroleum or crude oil pipeline to a refinery or distribution center	100	100		N		

PWS ID / FACILITY ID	1020017 S14	UNIQUE WELL NO.	110460

PCSI CODE	ACTUAL OR POTENTIAL CONTAMINATION SOURCE	ISOLATION DISTANCES (FEET)				LOCATION	
		Minimum Distances		Sensitive Well[1]	Within 200 Ft. Y / N / U	Dist. from Well	Est. (?)
		Community	Non-community				
PT1	Petroleum tank or container, 1100 gal. or more, without safeguards	150	150		N		
PT2	Petroleum tank or container, 1100 gal. or more, with safeguards	100	100		N		
PT3	Petroleum tank or container, buried, between 56 and 1100 gal.	50	50		N		
PT4	Petroleum tank or container, not buried, between 56 and 1100 gal.	50[5]	20		N		
PU1	Pit or unfilled space more than four feet in depth	20	20		N		
PC1	Pollutant or contaminant that may drain into the soil	50	50	100	N		
SP1	Swimming pool, in-ground	20	20		N		
*VH1	Vertical heat exchanger, horizontal piping conforming to rule	50	10		N		
*VH2	Vertical heat exchanger (vertical) piping, conforming to rule	50	35		N		
*WR1	Wastewater rapid infiltration basin, municipal or industrial	300	300	600	N		
*WA1	Wastewater spray irrigation area, municipal or industrial	150	150	300	N		
*WS1	Wastewater stabilization pond, industrial	150	150	300	N		
*WS2	Wastewater stabilization pond, municipal, 500 or more gal./acre/day of leakage	300	300	600	N		
*WS3	Wastewater stabilization pond, municipal, less than 500 gal./acre/day of leakage	150	150	300	N		
*WT1	Wastewater treatment unit tanks, vessels and components (Package plant)	100	100		N		
*WT2	Water treatment backwash disposal area	50	50	100	N		
Additional Sources (If there is more than one source listed above, please indicate here).							
Potential Contamination Sources and Codes Based on Previous Versions of this Form							
	none found within 200' of this well.						

* New potential contaminant source.

[1] A sensitive well has less than 50 feet of watertight casing, and which is not cased below a confining layer or confining materials of at least 10' in thickness.

[2] These sources, known as Class V underground injection wells, are regulated by the federal U.S. Environmental Protection Agency.

[3] These sources are classified as illegal by Minnesota Rules, Chapter 4725.

[4] Isolation distance is determined by average flow per day or if a facility handles infectious or pathological wastes.

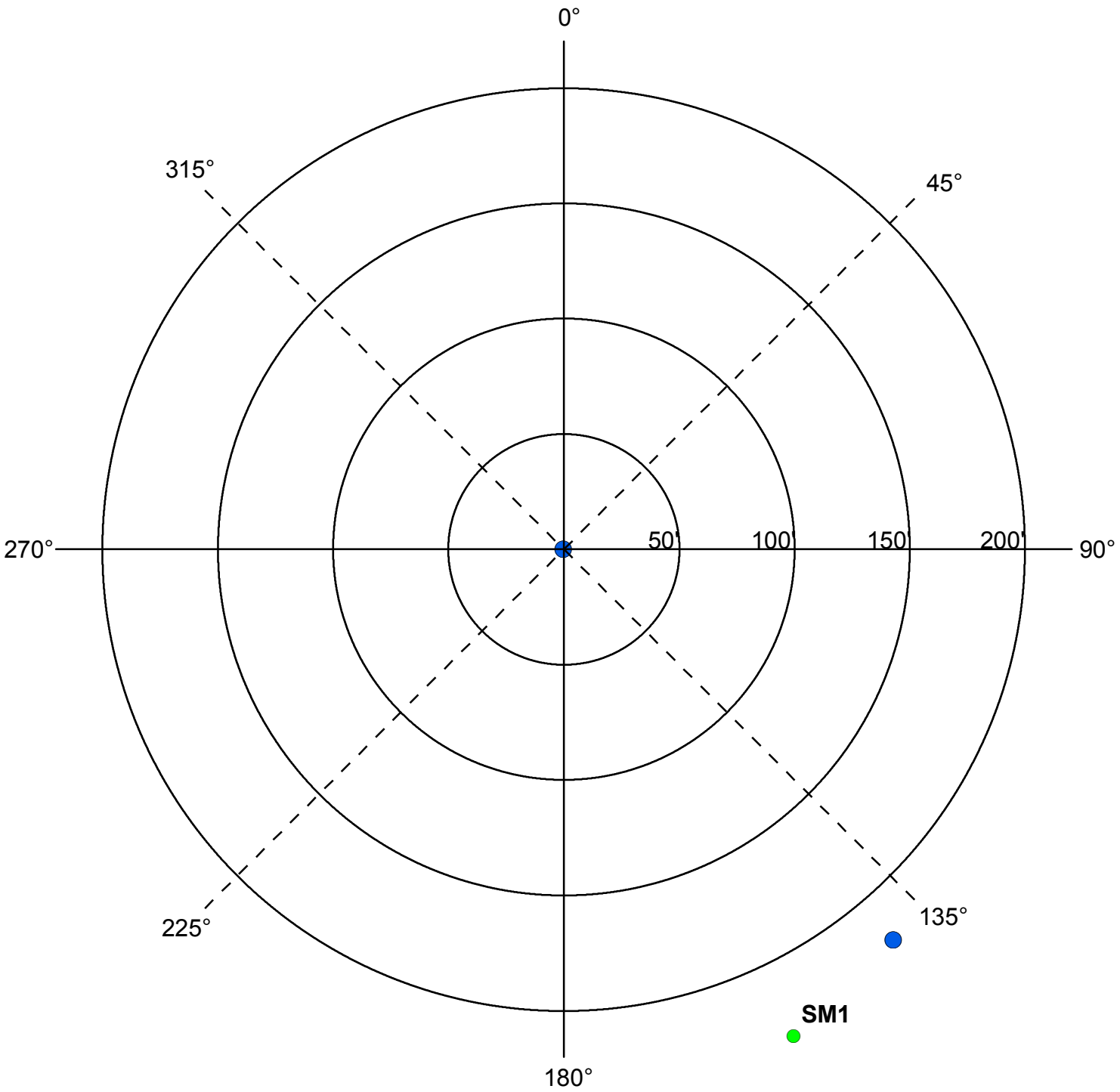
[5] A community public water-supply well must be a minimum of 50 feet from a petroleum tank or container, unless the tank or container is used for emergency pumping and is located in a room or building separate from the community well; and is of double-wall construction with leak detection between walls; or is protected with secondary containment.

This form is based on the new isolation distances in Minnesota Rules, Chapter 4725, related to wells and borings adopted August 4, 2008, and Minnesota Rules, Chapter 4720, related to wellhead protection.

PWS ID / FACILITY ID	1020017 S14	UNIQUE WELL NO.	110460

SETBACK DISTANCES	All potential contaminant sources must be noted on sketch.

Record the distance and approximate compass bearing of each potential contaminant source from the well, and identify the source using the "Source Code". Unlabeled points on the map are unsealed wells.



	Y	N	N/A
Were the isolation distances maintained for the new sources of contamination?			
Is the system monitoring existing nonconforming sources of contamination?			

Reminder Question: Were the wellhead protection measure(s) implemented?

INSPECTOR	Neiman, Dave	DATE	6 - 3 - 2016

PWS ID / FACILITY ID	1020017 S14	UNIQUE WELL NO.	110460

RECOMMENDED WELLHEAD PROTECTION (WHP) MEASURES	WHP MEASURE IMPLEMENTED? Y or N	DATE VERIFIED

COMMENTS

For further information, please contact:

Minnesota Department of Health
Drinking Water Protection Section
Source Water Protection Unit
P.O. Box 64975
St. Paul, Minnesota 55164-0975

Section Receptionist: 651-201-4700
Division TDD: 651-201-5797 or MN Relay Service @ 1-800-627-3529 and ask for 651-201-5000

Environmental Health Division
Drinking Water Protection Section
P.O. Box 64975
St. Paul, Minnesota 55164-0975

INNER WELLHEAD MANAGEMENT ZONE (IWMZ) - POTENTIAL CONTAMINANT SOURCE INVENTORY (PCSI) REPORT

PUBLIC WATER SYSTEM INFORMATION

PWS ID	1020017	**COMMUNITY**
NAME	Coon Rapids	
ADDRESS	Kory Jorgensen Utilities Supervisor, Public Works Garage, 1831 111th Avenue, Coon Rapids, MN 554333761	

FACILITY (WELL) INFORMATION

NAME	Well #15	**IS THERE A WELL LOG OR ADDITIONAL CONSTRUCTION INFORMATION AVAILABLE?**
FACILITY ID	S21	☐ **YES** (Please attach a copy)
UNIQUE WELL NO.	110461	☐ **NO** ☐ **UNDETERMINED**
COUNTY	Anoka	

PWS ID / FACILITY ID	1020017 S21	**UNIQUE WELL NO.**	110461

PCSI CODE	ACTUAL OR POTENTIAL CONTAMINATION SOURCE	ISOLATION DISTANCES (FEET)				LOCATION	
		Minimum Distances		Sensitive Well[1]	Within 200 Ft. Y / N / U	Dist. from Well	Est. (?)
		Community	Non-community				
Agricultural Related							
*AC1	Agricultural chemical buried piping	50	50		N		
*AC2	Agricultural chemical multiple tanks or containers for residential retail sale or use, no single tank or container exceeding, but aggregate volume exceeding 56 gal. or 100 lbs. dry weight	50	50		N		
ACP	Agricultural chemical tank or container with 25 gal. or more or 100 lbs. or more dry weight, or equipment filling or cleaning area without safeguards	150	150		N		
ACS	Agricultural chemical storage or equipment filling or cleaning area with safeguards	100	100		N		
ACR	Agricultural chemical storage or equipment filling or cleaning area with safeguards and roofed	50	50		N		
ADW	Agricultural drainage well[2] (Class V well - illegal[3])	50	50		N		
AAT	Anhydrous ammonia tank (stationary tank)	50	50		N		
AB1	Animal building, feedlot, confinement area, or kennel, 0.1 to 1.0 animal unit (stockyard)	50	20	100/40	N		
AB2	Animal building or poultry building, including a horse riding area, more than 1.0 animal unit	50	50	100	N		
ABS	Animal burial area, more than 1.0 animal unit	50	50		N		
FWP	Animal feeding or watering area within a pasture, more than 1.0 animal unit	50	50	100	N		
AF1	Animal feedlot, unroofed, 300 or more animal units (stockyard)	100	100	200	N		
AF2	Animal feedlot, more than 1.0, but less than 300 animal units (stockyard)	50	50	100	N		
AMA	Animal manure application	use discretion	use discretion		N		
REN	Animal rendering plant	50	50		N		
MS1	Manure (liquid) storage basin or lagoon, unpermitted or noncertified	300	300	600	N		
MS2	Manure (liquid) storage basin or lagoon, approved earthen liner	150	150	300	N		
MS3	Manure (liquid) storage basin or lagoon, approved concrete or composite liner	100	100	200	N		
MS4	Manure (solid) storage area, not covered with a roof	100	100	200	N		
OSC	Open storage for crops	use discretion	use discretion		N		
SSTS Related							
AA1	Absorption area of a soil dispersal system, average flow greater than 10,000 gal./day	300	300	600	N		
AA2	Absorption area of a soil dispersal system serving a facility handling infectious or pathological wastes, average flow 10,000 gal./day or less	150	150	300	N		
AA3	Absorption area of a soil dispersal system, average flow 10,000 gal./day or less	50	50	100	N		
AA4	Absorption area of a soil dispersal system serving multiple family residences or a non-residential facility and has the capacity to serve 20 or more persons per day (Class V well)[2]	50/300/150[4]	50/300/150[4]	100/600/300[4]	N		
CSP	Cesspool	75	75	150	N		
AGG	Dry well, leaching pit, seepage pit	75	75	150	N		
*FD1	Floor drain, grate, or trough connected to a buried sewer	50	50		N		
*FD2	Floor drain, grate, or trough if buried sewer is air-tested, approved materials, serving one building, or two or less single-family residences	50	20		N		
*GW1	Gray-water dispersal area	50	50	100	N		
LC1	Large capacity cesspools (Class V well - illegal)[2]	75	75	150	N		
MVW	Motor vehicle waste disposal (Class V well - illegal)[2]	illegal	illegal		N		

PWS ID / FACILITY ID	1020017 S21	UNIQUE WELL NO.	110461

PCSI CODE	ACTUAL OR POTENTIAL CONTAMINATION SOURCE	ISOLATION DISTANCES (FEET)				LOCATION	
		Minimum Distances		Sensitive Well[1]	Within 200 Ft. Y / N / U	Dist. from Well	Est. (?)
		Community	Non-community				
PR1	Privy, nonportable	50	50	100	N		
PR2	Portable (privy) or toilet	50	20		N		
*SF1	Watertight sand filter; peat filter; or constructed wetland	50	50		N		
SET	Septic tank	50	50		N		
HTK	Sewage holding tank, watertight	50	50		N		
SS1	Sewage sump capacity 100 gal. or more	50	50		N		
SS2	Sewage sump capacity less than 100 gal., tested, conforming to rule	50	20		N		
*ST1	Sewage treatment device, watertight	50	50		N		
SB1	Sewer, buried, approved materials, tested, serving one building, or two or less single-family residences	50	20		N		
SB2	Sewer, buried, collector, municipal, serving a facility handling infectious or pathological wastes, open-jointed or unapproved materials	50	50		N		
*WB1	Water treatment backwash holding basin, reclaim basin, or surge tank with a direct sewer connection	50	50		N		
*WB2	Water treatment backwash holding basin, reclaim basin, or surge tank with a backflow protected sewer connection	20	20		N		
Land Application							
SPT	Land spreading area for sewage, septage, or sludge	50	50	100	N		
Solid Waste Related							
COS	Commercial compost site	50	50		N		
CD1	Construction or demolition debris disposal area	50	50	100	N		
*HW1	Household solid waste disposal area, single residence	50	50	100	N		
LF1	Landfill, permitted demolition debris, dump, or mixed municipal solid waste from multiple persons	300	300	600	N		
SVY	Scrap yard	50	50		N		
SWT	Solid waste transfer station	50	50		N		
Storm Water Related							
SD1	Storm water drain pipe, 8 inches or greater in diameter	50	20		N		
SWI	Storm water drainage well[2] (Class V well - illegal[3])	50	50		N		
SM1	Storm water pond greater than 5000 gal.	50	35		N		
Wells and Borings							
*EB1	Elevator boring, not conforming to rule	50	50		N		
*EB2	Elevator boring, conforming to rule	20	20		N		
MON	Monitoring well	record dist.	record dist.		N		
WEL	Operating well	record dist.	record dist.		N		
UUW	Unused, unsealed well or boring	50	50		N		
General							
*CR1	Cistern or reservoir, buried, nonpressurized water supply	20	20		N		
PLM	Contaminant plume	50	50		N		
*CW1	Cooling water pond, industrial	50	50	100	N		
DC1	Deicing chemicals, bulk road	50	50	100	N		
*ET1	Electrical transformer storage area, oil-filled	50	50		N		
GRV	Grave or mausoleum	50	50		N		
GP1	Gravel pocket or French drain for clear water drainage only	20	20		N		
*HS1	Hazardous substance buried piping	50	50		N		
HS2	Hazardous substance tank or container, above ground or underground, 56 gal. or more, or 100 lbs. or more dry weight, without safeguards	150	150		N		
HS3	Hazardous substance tank or container, above ground or underground, 56 gal. or more, or 100 lbs. or more dry weight with safeguards	100	100		N		
HS4	Hazardous substance multiple storage tanks or containers for residential retail sale or use, no single tank or container exceeding 56 gal. or 100 lbs., but aggregate volume exceeding	50	50		N		
HWF	Highest water or flood level	50	N/A		N		
*HG1	Horizontal ground source closed loop heat exchanger buried piping	50	50		N		
*HG2	Horizontal ground source closed loop heat exchanger buried piping and horizontal piping, approved materials and heat transfer fluid	50	10		N		
IWD	Industrial waste disposal well (Class V well)[2]	illegal[3]	illegal[3]		N		
IWS	Interceptor, including a flammable waste or sediment	50	50		N		
OH1	Ordinary high water level of a stream, river, pond, lake, reservoir, or drainage ditch (holds water six months or more)	50	35		N		
*PP1	Petroleum buried piping	50	50		N		
*PP2	Petroleum or crude oil pipeline to a refinery or distribution center	100	100		N		

PWS ID / FACILITY ID	1020017 S21	UNIQUE WELL NO.	110461

PCSI CODE	ACTUAL OR POTENTIAL CONTAMINATION SOURCE	ISOLATION DISTANCES (FEET)				LOCATION	
		Minimum Distances		Sensitive Well[1]	Within 200 Ft. Y / N / U	Dist. from Well	Est. (?)
		Community	Non-community				
PT1	Petroleum tank or container, 1100 gal. or more, without safeguards	150	150		N		
PT2	Petroleum tank or container, 1100 gal. or more, with safeguards	100	100		N		
PT3	Petroleum tank or container, buried, between 56 and 1100 gal.	50	50		N		
PT4	Petroleum tank or container, not buried, between 56 and 1100 gal.	50[5]	20		N		
PU1	Pit or unfilled space more than four feet in depth	20	20		N		
PC1	Pollutant or contaminant that may drain into the soil	50	50	100	N		
SP1	Swimming pool, in-ground	20	20		N		
*VH1	Vertical heat exchanger, horizontal piping conforming to rule	50	10		N		
*VH2	Vertical heat exchanger (vertical) piping, conforming to rule	50	35		N		
*WR1	Wastewater rapid infiltration basin, municipal or industrial	300	300	600	N		
*WA1	Wastewater spray irrigation area, municipal or industrial	150	150	300	N		
*WS1	Wastewater stabilization pond, industrial	150	150	300	N		
*WS2	Wastewater stabilization pond, municipal, 500 or more gal./acre/day of leakage	300	300	600	N		
*WS3	Wastewater stabilization pond, municipal, less than 500 gal./acre/day of leakage	150	150	300	N		
*WT1	Wastewater treatment unit tanks, vessels and components (Package plant)	100	100		N		
*WT2	Water treatment backwash disposal area	50	50	100	N		
Additional Sources (If there is more than one source listed above, please indicate here).							
Potential Contamination Sources and Codes Based on Previous Versions of this Form							
	none found within 200' of this well.						

* New potential contaminant source.

[1] A sensitive well has less than 50 feet of watertight casing, and which is not cased below a confining layer or confining materials of at least 10' in thickness.

[2] These sources, known as Class V underground injection wells, are regulated by the federal U.S. Environmental Protection Agency.

[3] These sources are classified as illegal by Minnesota Rules, Chapter 4725.

[4] Isolation distance is determined by average flow per day or if a facility handles infectious or pathological wastes.

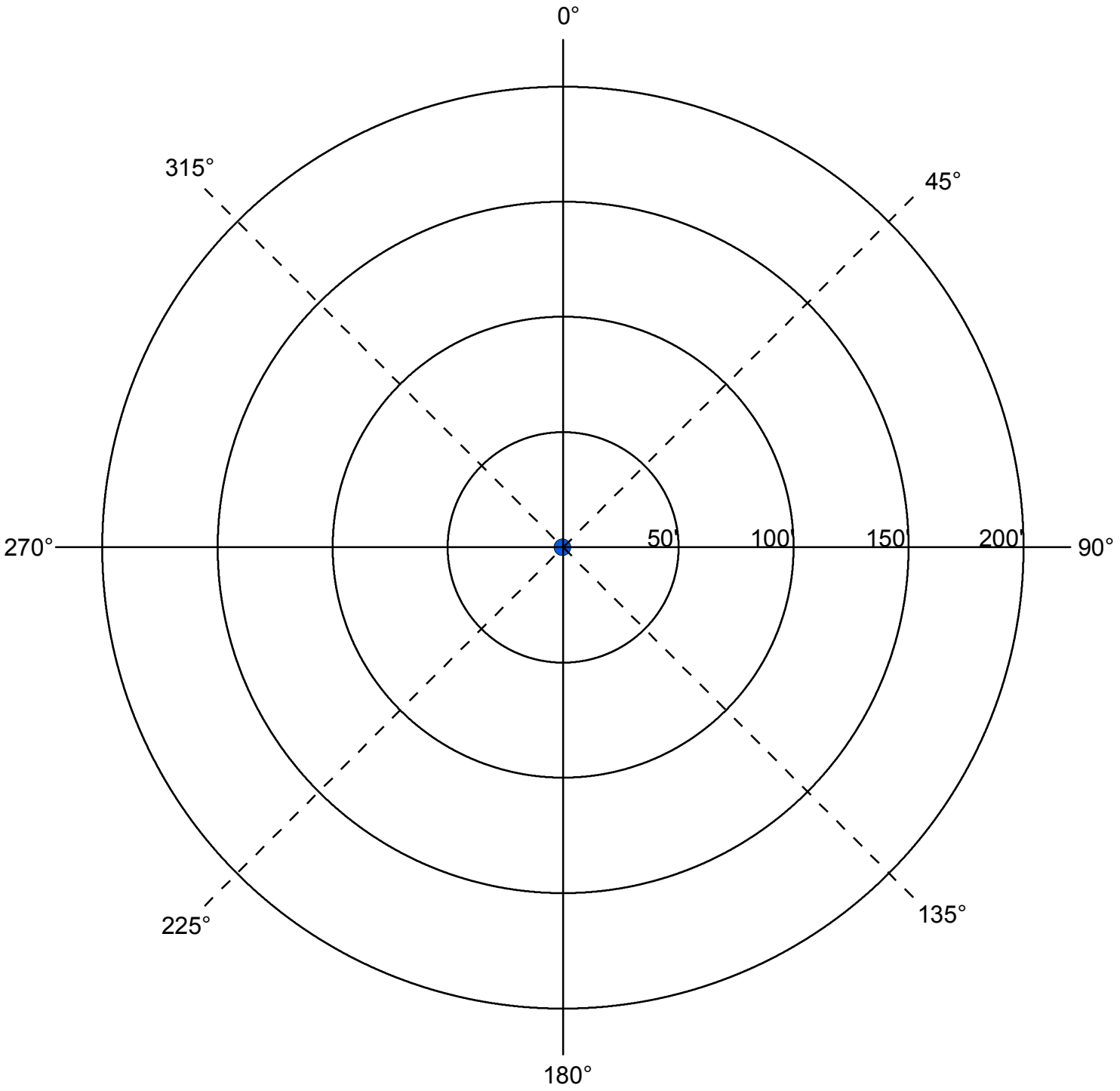
[5] A community public water-supply well must be a minimum of 50 feet from a petroleum tank or container, unless the tank or container is used for emergency pumping and is located in a room or building separate from the community well; and is of double-wall construction with leak detection between walls; or is protected with secondary containment.

This form is based on the new isolation distances in Minnesota Rules, Chapter 4725, related to wells and borings adopted August 4, 2008, and Minnesota Rules, Chapter 4720, related to wellhead protection.

PWS ID / FACILITY ID	1020017 S21	UNIQUE WELL NO.	110461

SETBACK DISTANCES	All potential contaminant sources must be noted on sketch.

Record the distance and approximate compass bearing of each potential contaminant source from the well, and identify the source using the "Source Code". Unlabeled points on the map are unsealed wells.



	Y	N	N/A
Were the isolation distances maintained for the new sources of contamination?			
Is the system monitoring existing nonconforming sources of contamination?			

Reminder Question: Were the wellhead protection measure(s) implemented?

INSPECTOR	Neiman, Dave	DATE	6 - 2 - 2016

PWS ID / FACILITY ID	1020017 S21	UNIQUE WELL NO.	110461

RECOMMENDED WELLHEAD PROTECTION (WHP) MEASURES	WHP MEASURE IMPLEMENTED? Y or N	DATE VERIFIED

COMMENTS

For further information, please contact:

Minnesota Department of Health
Drinking Water Protection Section
Source Water Protection Unit
P.O. Box 64975
St. Paul, Minnesota 55164-0975

Section Receptionist: 651-201-4700
Division TDD: 651-201-5797 or MN Relay Service @ 1-800-627-3529 and ask for 651-201-5000

Environmental Health Division
Drinking Water Protection Section
P.O. Box 64975
St. Paul, Minnesota 55164-0975

INNER WELLHEAD MANAGEMENT ZONE (IWMZ) - POTENTIAL CONTAMINANT SOURCE INVENTORY (PCSI) REPORT

PUBLIC WATER SYSTEM INFORMATION

PWS ID	1020017	**COMMUNITY**
NAME	Coon Rapids	
ADDRESS	Kory Jorgensen Utilities Supervisor, Public Works Garage, 1831 111th Avenue, Coon Rapids, MN 554333761	

FACILITY (WELL) INFORMATION

NAME	Well #16	**IS THERE A WELL LOG OR ADDITIONAL CONSTRUCTION INFORMATION AVAILABLE?**
FACILITY ID	S15	☐ YES (Please attach a copy)
UNIQUE WELL NO.	161413	☐ NO ☐ UNDETERMINED
COUNTY	Anoka	

PWS ID / FACILITY ID	1020017 S15	**UNIQUE WELL NO.**	161413

PCSI CODE	ACTUAL OR POTENTIAL CONTAMINATION SOURCE	ISOLATION DISTANCES (FEET)				LOCATION	
		Minimum Distances		Sensitive Well[1]	Within 200 Ft. Y / N / U	Dist. from Well	Est. (?)
		Community	Non-community				
Agricultural Related							
*AC1	Agricultural chemical buried piping	50	50		N		
*AC2	Agricultural chemical multiple tanks or containers for residential retail sale or use, no single tank or container exceeding, but aggregate volume exceeding 56 gal. or 100 lbs. dry weight	50	50		N		
ACP	Agricultural chemical tank or container with 25 gal. or more or 100 lbs. or more dry weight, or equipment filling or cleaning area without safeguards	150	150		N		
ACS	Agricultural chemical storage or equipment filling or cleaning area with safeguards	100	100		N		
ACR	Agricultural chemical storage or equipment filling or cleaning area with safeguards and roofed	50	50		N		
ADW	Agricultural drainage well[2] (Class V well - illegal[3])	50	50		N		
AAT	Anhydrous ammonia tank (stationary tank)	50	50		N		
AB1	Animal building, feedlot, confinement area, or kennel, 0.1 to 1.0 animal unit (stockyard)	50	20	100/40	N		
AB2	Animal building or poultry building, including a horse riding area, more than 1.0 animal unit	50	50	100	N		
ABS	Animal burial area, more than 1.0 animal unit	50	50		N		
FWP	Animal feeding or watering area within a pasture, more than 1.0 animal unit	50	50	100	N		
AF1	Animal feedlot, unroofed, 300 or more animal units (stockyard)	100	100	200	N		
AF2	Animal feedlot, more than 1.0, but less than 300 animal units (stockyard)	50	50	100	N		
AMA	Animal manure application	use discretion	use discretion		N		
REN	Animal rendering plant	50	50		N		
MS1	Manure (liquid) storage basin or lagoon, unpermitted or noncertified	300	300	600	N		
MS2	Manure (liquid) storage basin or lagoon, approved earthen liner	150	150	300	N		
MS3	Manure (liquid) storage basin or lagoon, approved concrete or composite liner	100	100	200	N		
MS4	Manure (solid) storage area, not covered with a roof	100	100	200	N		
OSC	Open storage for crops	use discretion	use discretion		N		
SSTS Related							
AA1	Absorption area of a soil dispersal system, average flow greater than 10,000 gal./day	300	300	600	N		
AA2	Absorption area of a soil dispersal system serving a facility handling infectious or pathological wastes, average flow 10,000 gal./day or less	150	150	300	N		
AA3	Absorption area of a soil dispersal system, average flow 10,000 gal./day or less	50	50	100	N		
AA4	Absorption area of a soil dispersal system serving multiple family residences or a non-residential facility and has the capacity to serve 20 or more persons per day (Class V well)[2]	50/300/150[4]	50/300/150[4]	100/600/300[4]	N		
CSP	Cesspool	75	75	150	N		
AGG	Dry well, leaching pit, seepage pit	75	75	150	N		
*FD1	Floor drain, grate, or trough connected to a buried sewer	50	50		N		
*FD2	Floor drain, grate, or trough if buried sewer is air-tested, approved materials, serving one building, or two or less single-family residences	50	20		N		
*GW1	Gray-water dispersal area	50	50	100	N		
LC1	Large capacity cesspools (Class V well - illegal)[2]	75	75	150	N		
MVW	Motor vehicle waste disposal (Class V well - illegal)[2]	illegal	illegal		N		

PWS ID / FACILITY ID	1020017 S15	UNIQUE WELL NO.	161413

PCSI CODE	ACTUAL OR POTENTIAL CONTAMINATION SOURCE	ISOLATION DISTANCES (FEET)				LOCATION	
		Minimum Distances		Sensitive Well[1]	Within 200 Ft. Y / N / U	Dist. from Well	Est. (?)
		Community	Non-community				
PR1	Privy, nonportable	50	50	100	N		
PR2	Portable (privy) or toilet	50	20		N		
*SF1	Watertight sand filter; peat filter; or constructed wetland	50	50		N		
SET	Septic tank	50	50		N		
HTK	Sewage holding tank, watertight	50	50		N		
SS1	Sewage sump capacity 100 gal. or more	50	50		N		
SS2	Sewage sump capacity less than 100 gal., tested, conforming to rule	50	20		N		
*ST1	Sewage treatment device, watertight	50	50		N		
SB1	Sewer, buried, approved materials, tested, serving one building, or two or less single-family residences	50	20		N		
SB2	Sewer, buried, collector, municipal, serving a facility handling infectious or pathological wastes, open-jointed or unapproved materials	50	50		Y	120	N
SB2	Sewer, buried, collector, municipal, serving a facility handling infectious or pathological wastes, open-jointed or unapproved materials	50	50		Y	90	N
SB2	Sewer, buried, collector, municipal, serving a facility handling infectious or pathological wastes, open-jointed or unapproved materials	50	50		Y	110	N
*WB1	Water treatment backwash holding basin, reclaim basin, or surge tank with a direct sewer connection	50	50		N		
*WB2	Water treatment backwash holding basin, reclaim basin, or surge tank with a backflow protected sewer connection	20	20		N		
Land Application							
SPT	Land spreading area for sewage, septage, or sludge	50	50	100	N		
Solid Waste Related							
COS	Commercial compost site	50	50		N		
CD1	Construction or demolition debris disposal area	50	50	100	N		
*HW1	Household solid waste disposal area, single residence	50	50	100	N		
LF1	Landfill, permitted demolition debris, dump, or mixed municipal solid waste from multiple persons	300	300	600	N		
SVY	Scrap yard	50	50		N		
SWT	Solid waste transfer station	50	50		N		
Storm Water Related							
SD1	Storm water drain pipe, 8 inches or greater in diameter	50	20		Y	75	N
SD1	Storm water drain pipe, 8 inches or greater in diameter	50	20		Y	130	N
SWI	Storm water drainage well[2] (Class V well - illegal[3])	50	50		N		
SM1	Storm water pond greater than 5000 gal.	50	35		N		
Wells and Borings							
*EB1	Elevator boring, not conforming to rule	50	50		N		
*EB2	Elevator boring, conforming to rule	20	20		N		
MON	Monitoring well	record dist.	record dist.		N		
WEL	Operating well	record dist.	record dist.		N		
UUW	Unused, unsealed well or boring	50	50		N		
General							
*CR1	Cistern or reservoir, buried, nonpressurized water supply	20	20		N		
PLM	Contaminant plume	50	50		N		
*CW1	Cooling water pond, industrial	50	50	100	N		
DC1	Deicing chemicals, bulk road	50	50	100	N		
*ET1	Electrical transformer storage area, oil-filled	50	50		N		
GRV	Grave or mausoleum	50	50		N		
GP1	Gravel pocket or French drain for clear water drainage only	20	20		N		
*HS1	Hazardous substance buried piping	50	50		N		
HS2	Hazardous substance tank or container, above ground or underground, 56 gal. or more, or 100 lbs. or more dry weight, without safeguards	150	150		N		
HS3	Hazardous substance tank or container, above ground or underground, 56 gal. or more, or 100 lbs. or more dry weight with safeguards	100	100		N		
HS4	Hazardous substance multiple storage tanks or containers for residential retail sale or use, no single tank or container exceeding 56 gal. or 100 lbs., but aggregate volume exceeding	50	50		N		
HWF	Highest water or flood level	50	N/A		N		
*HG1	Horizontal ground source closed loop heat exchanger buried piping	50	50		N		
*HG2	Horizontal ground source closed loop heat exchanger buried piping and horizontal piping, approved materials and heat transfer fluid	50	10		N		
IWD	Industrial waste disposal well (Class V well)[2]	illegal[3]	illegal[3]		N		

PWS ID / FACILITY ID	1020017 S15	UNIQUE WELL NO.	161413

PCSI CODE	ACTUAL OR POTENTIAL CONTAMINATION SOURCE	ISOLATION DISTANCES (FEET)				LOCATION	
		Minimum Distances		Sensitive Well[1]	Within 200 Ft. Y / N / U	Dist. from Well	Est. (?)
		Community	Non-community				
IWS	Interceptor, including a flammable waste or sediment	50	50		N		
OH1	Ordinary high water level of a stream, river, pond, lake, reservoir, or drainage ditch (holds water six months or more)	50	35		N		
*PP1	Petroleum buried piping	50	50		N		
*PP2	Petroleum or crude oil pipeline to a refinery or distribution center	100	100		N		
PT1	Petroleum tank or container, 1100 gal. or more, without safeguards	150	150		N		
PT2	Petroleum tank or container, 1100 gal. or more, with safeguards	100	100		N		
PT3	Petroleum tank or container, buried, between 56 and 1100 gal.	50	50		N		
PT4	Petroleum tank or container, not buried, between 56 and 1100 gal.	50[5]	20		N		
PU1	Pit or unfilled space more than four feet in depth	20	20		N		
PC1	Pollutant or contaminant that may drain into the soil	50	50	100	N		
SP1	Swimming pool, in-ground	20	20		N		
*VH1	Vertical heat exchanger, horizontal piping conforming to rule	50	10		N		
*VH2	Vertical heat exchanger (vertical) piping, conforming to rule	50	35		N		
*WR1	Wastewater rapid infiltration basin, municipal or industrial	300	300	600	N		
*WA1	Wastewater spray irrigation area, municipal or industrial	150	150	300	N		
*WS1	Wastewater stabilization pond, industrial	150	150	300	N		
*WS2	Wastewater stabilization pond, municipal, 500 or more gal./acre/day of leakage	300	300	600	N		
*WS3	Wastewater stabilization pond, municipal, less than 500 gal./acre/day of leakage	150	150	300	N		
*WT1	Wastewater treatment unit tanks, vessels and components (Package plant)	100	100		N		
*WT2	Water treatment backwash disposal area	50	50	100	N		
Additional Sources (If there is more than one source listed above, please indicate here).							
Potential Contamination Sources and Codes Based on Previous Versions of this Form							
	none found within 200' of this well.						

* New potential contaminant source.

[1] A sensitive well has less than 50 feet of watertight casing, and which is not cased below a confining layer or confining materials of at least 10' in thickness.

[2] These sources, known as Class V underground injection wells, are regulated by the federal U.S. Environmental Protection Agency.

[3] These sources are classified as illegal by Minnesota Rules, Chapter 4725.

[4] Isolation distance is determined by average flow per day or if a facility handles infectious or pathological wastes.

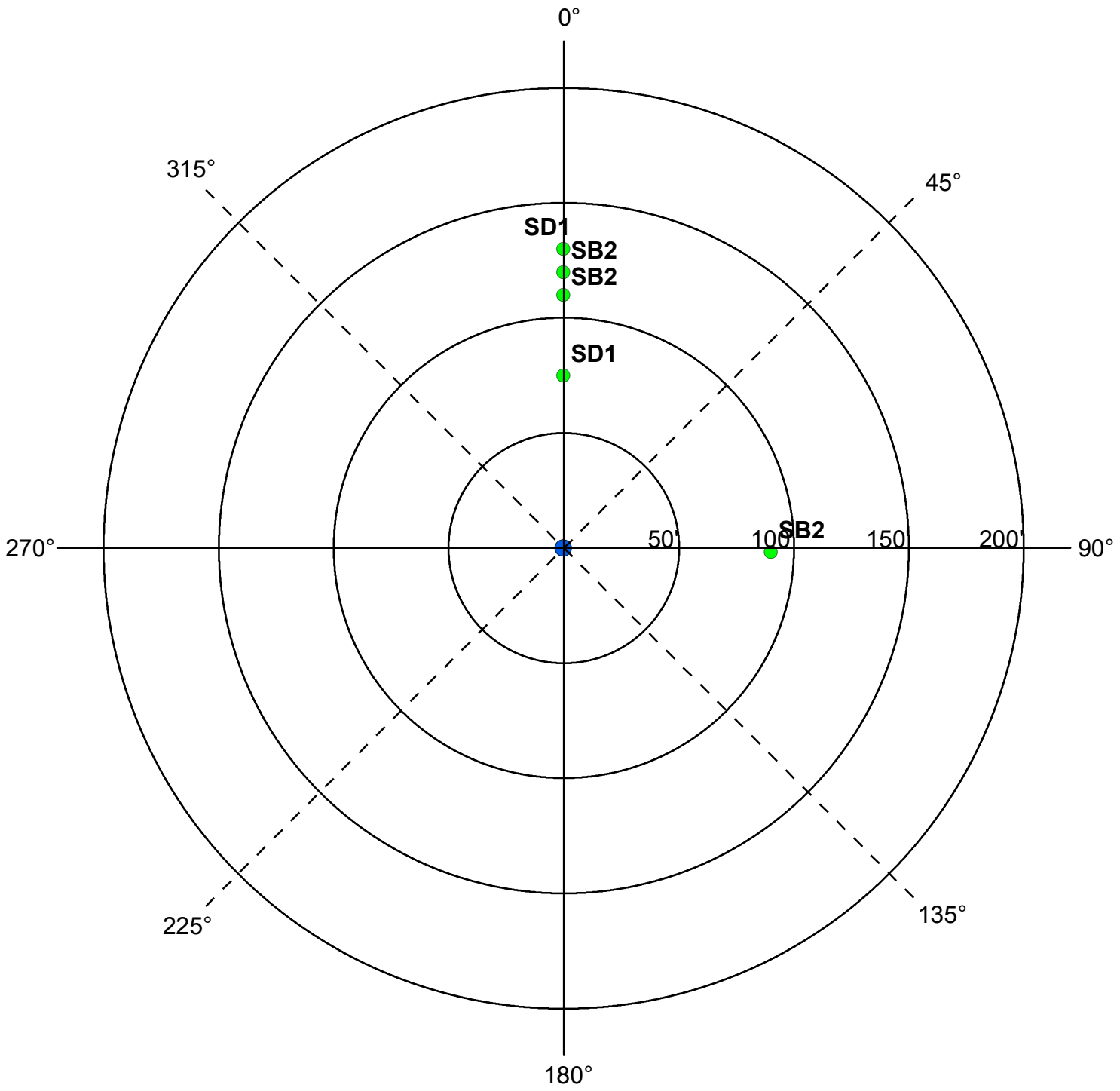
[5] A community public water-supply well must be a minimum of 50 feet from a petroleum tank or container, unless the tank or container is used for emergency pumping and is located in a room or building separate from the community well; and is of double-wall construction with leak detection between walls; or is protected with secondary containment.

This form is based on the new isolation distances in Minnesota Rules, Chapter 4725, related to wells and borings adopted August 4, 2008, and Minnesota Rules, Chapter 4720, related to wellhead protection.

PWS ID / FACILITY ID	1020017 S15	UNIQUE WELL NO.	161413

SETBACK DISTANCES	All potential contaminant sources must be noted on sketch.

Record the distance and approximate compass bearing of each potential contaminant source from the well, and identify the source using the "Source Code". Unlabeled points on the map are unsealed wells.



	Y	N	N/A
Were the isolation distances maintained for the new sources of contamination?			
Is the system monitoring existing nonconforming sources of contamination?			

Reminder Question: Were the wellhead protection measure(s) implemented?

INSPECTOR	Neiman, Dave	DATE	6 - 2 - 2016

PWS ID / FACILITY ID	1020017 S15	UNIQUE WELL NO.	161413

RECOMMENDED WELLHEAD PROTECTION (WHP) MEASURES	WHP MEASURE IMPLEMENTED? Y or N	DATE VERIFIED

COMMENTS

For further information, please contact:

Minnesota Department of Health
Drinking Water Protection Section
Source Water Protection Unit
P.O. Box 64975
St. Paul, Minnesota 55164-0975

Section Receptionist: 651-201-4700
Division TDD: 651-201-5797 or MN Relay Service @ 1-800-627-3529 and ask for 651-201-5000

Environmental Health Division
Drinking Water Protection Section
P.O. Box 64975
St. Paul, Minnesota 55164-0975

INNER WELLHEAD MANAGEMENT ZONE (IWMZ) - POTENTIAL CONTAMINANT SOURCE INVENTORY (PCSI) REPORT

PUBLIC WATER SYSTEM INFORMATION

PWS ID	1020017	**COMMUNITY**
NAME	Coon Rapids	
ADDRESS	Kory Jorgensen Utilities Supervisor, Public Works Garage, 1831 111th Avenue, Coon Rapids, MN 554333761	

FACILITY (WELL) INFORMATION

NAME	Well #17	**IS THERE A WELL LOG OR ADDITIONAL CONSTRUCTION INFORMATION AVAILABLE?**
FACILITY ID	S16	☐ **YES** (Please attach a copy)
UNIQUE WELL NO.	150357	☐ **NO** ☐ **UNDETERMINED**
COUNTY	Anoka	

PWS ID / FACILITY ID	1020017 S16	**UNIQUE WELL NO.**	150357

PCSI CODE	ACTUAL OR POTENTIAL CONTAMINATION SOURCE	ISOLATION DISTANCES (FEET)				LOCATION	
		Minimum Distances		Sensitive Well[1]	Within 200 Ft. Y / N / U	Dist. from Well	Est. (?)
		Community	Non-community				
Agricultural Related							
*AC1	Agricultural chemical buried piping	50	50		N		
*AC2	Agricultural chemical multiple tanks or containers for residential retail sale or use, no single tank or container exceeding, but aggregate volume exceeding 56 gal. or 100 lbs. dry weight	50	50		N		
ACP	Agricultural chemical tank or container with 25 gal. or more or 100 lbs. or more dry weight, or equipment filling or cleaning area without safeguards	150	150		N		
ACS	Agricultural chemical storage or equipment filling or cleaning area with safeguards	100	100		N		
ACR	Agricultural chemical storage or equipment filling or cleaning area with safeguards and roofed	50	50		N		
ADW	Agricultural drainage well[2] (Class V well - illegal[3])	50	50		N		
AAT	Anhydrous ammonia tank (stationary tank)	50	50		N		
AB1	Animal building, feedlot, confinement area, or kennel, 0.1 to 1.0 animal unit (stockyard)	50	20	100/40	N		
AB2	Animal building or poultry building, including a horse riding area, more than 1.0 animal unit	50	50	100	N		
ABS	Animal burial area, more than 1.0 animal unit	50	50		N		
FWP	Animal feeding or watering area within a pasture, more than 1.0 animal unit	50	50	100	N		
AF1	Animal feedlot, unroofed, 300 or more animal units (stockyard)	100	100	200	N		
AF2	Animal feedlot, more than 1.0, but less than 300 animal units (stockyard)	50	50	100	N		
AMA	Animal manure application	use discretion	use discretion		N		
REN	Animal rendering plant	50	50		N		
MS1	Manure (liquid) storage basin or lagoon, unpermitted or noncertified	300	300	600	N		
MS2	Manure (liquid) storage basin or lagoon, approved earthen liner	150	150	300	N		
MS3	Manure (liquid) storage basin or lagoon, approved concrete or composite liner	100	100	200	N		
MS4	Manure (solid) storage area, not covered with a roof	100	100	200	N		
OSC	Open storage for crops	use discretion	use discretion		N		
SSTS Related							
AA1	Absorption area of a soil dispersal system, average flow greater than 10,000 gal./day	300	300	600	N		
AA2	Absorption area of a soil dispersal system serving a facility handling infectious or pathological wastes, average flow 10,000 gal./day or less	150	150	300	N		
AA3	Absorption area of a soil dispersal system, average flow 10,000 gal./day or less	50	50	100	N		
AA4	Absorption area of a soil dispersal system serving multiple family residences or a non-residential facility and has the capacity to serve 20 or more persons per day (Class V well)[2]	50/300/150[4]	50/300/150[4]	100/600/300[4]	N		
CSP	Cesspool	75	75	150	N		
AGG	Dry well, leaching pit, seepage pit	75	75	150	N		
*FD1	Floor drain, grate, or trough connected to a buried sewer	50	50		N		
*FD2	Floor drain, grate, or trough if buried sewer is air-tested, approved materials, serving one building, or two or less single-family residences	50	20		N		
*GW1	Gray-water dispersal area	50	50	100	N		
LC1	Large capacity cesspools (Class V well - illegal)[2]	75	75	150	N		
MVW	Motor vehicle waste disposal (Class V well - illegal)[2]	illegal	illegal		N		

PWS ID / FACILITY ID	1020017 S16	UNIQUE WELL NO.	150357

PCSI CODE	ACTUAL OR POTENTIAL CONTAMINATION SOURCE	ISOLATION DISTANCES (FEET)				LOCATION	
		Minimum Distances		Sensitive Well[1]	Within 200 Ft. Y / N / U	Dist. from Well	Est. (?)
		Community	Non-community				
PR1	Privy, nonportable	50	50	100	N		
PR2	Portable (privy) or toilet	50	20		N		
*SF1	Watertight sand filter; peat filter; or constructed wetland	50	50		N		
SET	Septic tank	50	50		N		
HTK	Sewage holding tank, watertight	50	50		N		
SS1	Sewage sump capacity 100 gal. or more	50	50		N		
SS2	Sewage sump capacity less than 100 gal., tested, conforming to rule	50	20		N		
*ST1	Sewage treatment device, watertight	50	50		N		
SB1	Sewer, buried, approved materials, tested, serving one building, or two or less single-family residences	50	20		N		
SB2	Sewer, buried, collector, municipal, serving a facility handling infectious or pathological wastes, open-jointed or unapproved materials	50	50		Y	80	N
SB2	Sewer, buried, collector, municipal, serving a facility handling infectious or pathological wastes, open-jointed or unapproved materials	50	50		Y	70	N
*WB1	Water treatment backwash holding basin, reclaim basin, or surge tank with a direct sewer connection	50	50		N		
*WB2	Water treatment backwash holding basin, reclaim basin, or surge tank with a backflow protected sewer connection	20	20		N		
Land Application							
SPT	Land spreading area for sewage, septage, or sludge	50	50	100	N		
Solid Waste Related							
COS	Commercial compost site	50	50		N		
CD1	Construction or demolition debris disposal area	50	50	100	N		
*HW1	Household solid waste disposal area, single residence	50	50	100	N		
LF1	Landfill, permitted demolition debris, dump, or mixed municipal solid waste from multiple persons	300	300	600	N		
SVY	Scrap yard	50	50		N		
SWT	Solid waste transfer station	50	50		N		
Storm Water Related							
SD1	Storm water drain pipe, 8 inches or greater in diameter	50	20		N		
SWI	Storm water drainage well[2] (Class V well - illegal[3])	50	50		N		
SM1	Storm water pond greater than 5000 gal.	50	35		N		
Wells and Borings							
*EB1	Elevator boring, not conforming to rule	50	50		N		
*EB2	Elevator boring, conforming to rule	20	20		N		
MON	Monitoring well	record dist.	record dist.		N		
WEL	Operating well	record dist.	record dist.		N		
UUW	Unused, unsealed well or boring	50	50		N		
General							
*CR1	Cistern or reservoir, buried, nonpressurized water supply	20	20		N		
PLM	Contaminant plume	50	50		N		
*CW1	Cooling water pond, industrial	50	50	100	N		
DC1	Deicing chemicals, bulk road	50	50	100	N		
*ET1	Electrical transformer storage area, oil-filled	50	50		N		
GRV	Grave or mausoleum	50	50		N		
GP1	Gravel pocket or French drain for clear water drainage only	20	20		N		
*HS1	Hazardous substance buried piping	50	50		N		
HS2	Hazardous substance tank or container, above ground or underground, 56 gal. or more, or 100 lbs. or more dry weight, without safeguards	150	150		N		
HS3	Hazardous substance tank or container, above ground or underground, 56 gal. or more, or 100 lbs. or more dry weight with safeguards	100	100		N		
HS4	Hazardous substance multiple storage tanks or containers for residential retail sale or use, no single tank or container exceeding 56 gal. or 100 lbs., but aggregate volume exceeding	50	50		N		
HWF	Highest water or flood level	50	N/A		N		
*HG1	Horizontal ground source closed loop heat exchanger buried piping	50	50		N		
*HG2	Horizontal ground source closed loop heat exchanger buried piping and horizontal piping, approved materials and heat transfer fluid	50	10		N		
IWD	Industrial waste disposal well (Class V well)[2]	illegal[3]	illegal[3]		N		
IWS	Interceptor, including a flammable waste or sediment	50	50		N		
OH1	Ordinary high water level of a stream, river, pond, lake, reservoir, or drainage ditch (holds water six months or more)	50	35		N		

PWS ID / FACILITY ID	1020017 S16	UNIQUE WELL NO.	150357

PCSI CODE	ACTUAL OR POTENTIAL CONTAMINATION SOURCE	ISOLATION DISTANCES (FEET)				LOCATION	
		Minimum Distances		Sensitive Well[1]	Within 200 Ft. Y / N / U	Dist. from Well	Est. (?)
		Community	Non-community				
*PP1	Petroleum buried piping	50	50		N		
*PP2	Petroleum or crude oil pipeline to a refinery or distribution center	100	100		N		
PT1	Petroleum tank or container, 1100 gal. or more, without safeguards	150	150		N		
PT2	Petroleum tank or container, 1100 gal. or more, with safeguards	100	100		N		
PT3	Petroleum tank or container, buried, between 56 and 1100 gal.	50	50		N		
PT4	Petroleum tank or container, not buried, between 56 and 1100 gal.	50[5]	20		N		
PU1	Pit or unfilled space more than four feet in depth	20	20		N		
PC1	Pollutant or contaminant that may drain into the soil	50	50	100	N		
SP1	Swimming pool, in-ground	20	20		N		
*VH1	Vertical heat exchanger, horizontal piping conforming to rule	50	10		N		
*VH2	Vertical heat exchanger (vertical) piping, conforming to rule	50	35		N		
*WR1	Wastewater rapid infiltration basin, municipal or industrial	300	300	600	N		
*WA1	Wastewater spray irrigation area, municipal or industrial	150	150	300	N		
*WS1	Wastewater stabilization pond, industrial	150	150	300	N		
*WS2	Wastewater stabilization pond, municipal, 500 or more gal./acre/day of leakage	300	300	600	N		
*WS3	Wastewater stabilization pond, municipal, less than 500 gal./acre/day of leakage	150	150	300	N		
*WT1	Wastewater treatment unit tanks, vessels and components (Package plant)	100	100		N		
*WT2	Water treatment backwash disposal area	50	50	100	N		
Additional Sources (If there is more than one source listed above, please indicate here).							
Potential Contamination Sources and Codes Based on Previous Versions of this Form							
	none found within 200' of this well.						

* New potential contaminant source.

[1] A sensitive well has less than 50 feet of watertight casing, and which is not cased below a confining layer or confining materials of at least 10' in thickness.

[2] These sources, known as Class V underground injection wells, are regulated by the federal U.S. Environmental Protection Agency.

[3] These sources are classified as illegal by Minnesota Rules, Chapter 4725.

[4] Isolation distance is determined by average flow per day or if a facility handles infectious or pathological wastes.

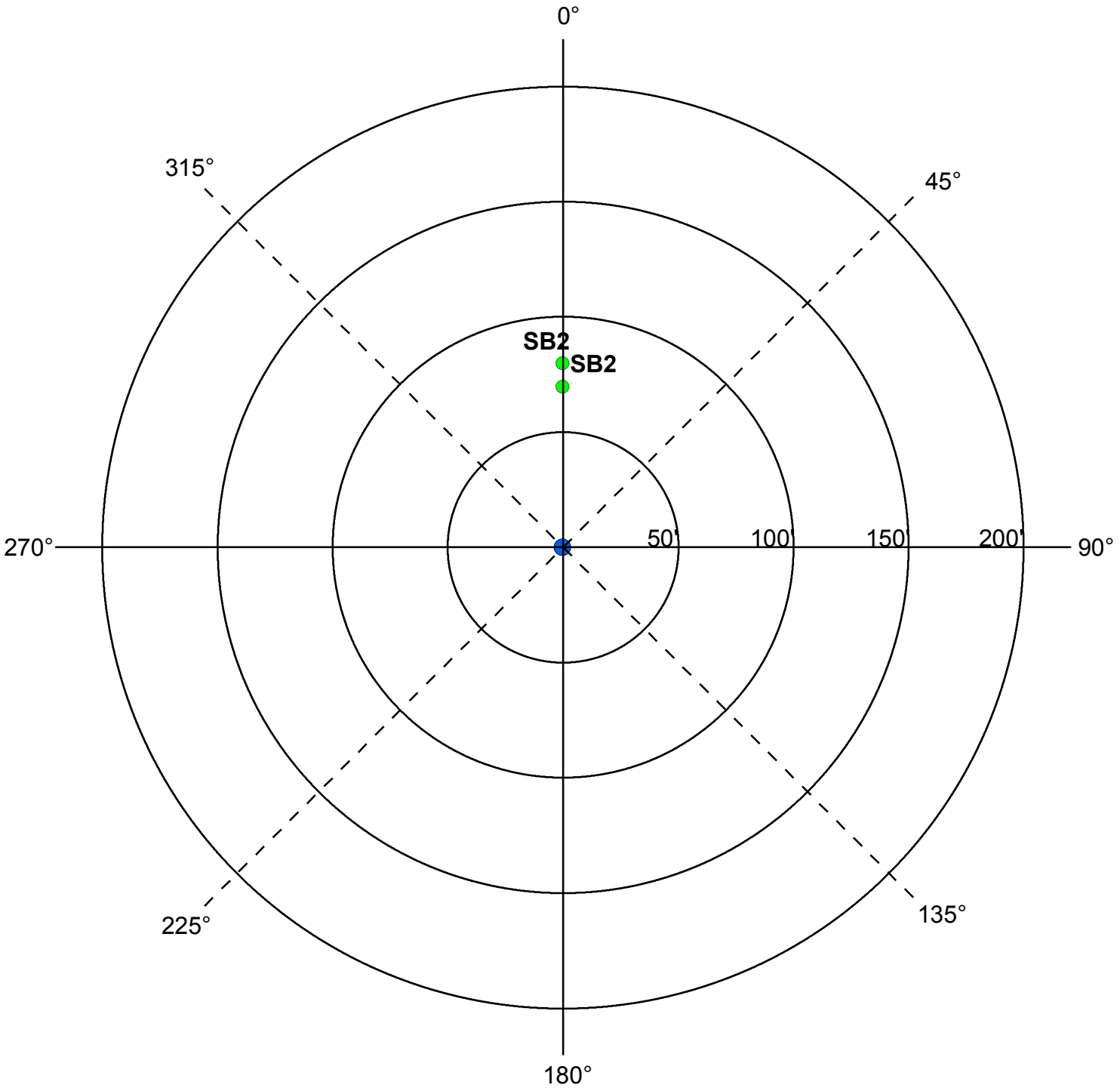
[5] A community public water-supply well must be a minimum of 50 feet from a petroleum tank or container, unless the tank or container is used for emergency pumping and is located in a room or building separate from the community well; and is of double-wall construction with leak detection between walls; or is protected with secondary containment.

This form is based on the new isolation distances in Minnesota Rules, Chapter 4725, related to wells and borings adopted August 4, 2008, and Minnesota Rules, Chapter 4720, related to wellhead protection.

PWS ID / FACILITY ID	1020017 S16	UNIQUE WELL NO.	150357

SETBACK DISTANCES	All potential contaminant sources must be noted on sketch.

Record the distance and approximate compass bearing of each potential contaminant source from the well, and identify the source using the "Source Code". Unlabeled points on the map are unsealed wells.



	Y	N	N/A
Were the isolation distances maintained for the new sources of contamination?			
Is the system monitoring existing nonconforming sources of contamination?			

Reminder Question: Were the wellhead protection measure(s) implemented?

INSPECTOR	Neiman, Dave	DATE	6 - 3 - 2016

PWS ID / FACILITY ID	1020017 S16	UNIQUE WELL NO.	150357

RECOMMENDED WELLHEAD PROTECTION (WHP) MEASURES	WHP MEASURE IMPLEMENTED? Y or N	DATE VERIFIED

COMMENTS

For further information, please contact:

Minnesota Department of Health
Drinking Water Protection Section
Source Water Protection Unit
P.O. Box 64975
St. Paul, Minnesota 55164-0975

Section Receptionist: 651-201-4700
Division TDD: 651-201-5797 or MN Relay Service @ 1-800-627-3529 and ask for 651-201-5000

Environmental Health Division
Drinking Water Protection Section
P.O. Box 64975
St. Paul, Minnesota 55164-0975

INNER WELLHEAD MANAGEMENT ZONE (IWMZ) - POTENTIAL CONTAMINANT SOURCE INVENTORY (PCSI) REPORT

PUBLIC WATER SYSTEM INFORMATION

PWS ID	1020017	**COMMUNITY**
NAME	Coon Rapids	
ADDRESS	Kory Jorgensen Utilities Supervisor, Public Works Garage, 1831 111th Avenue, Coon Rapids, MN 554333761	

FACILITY (WELL) INFORMATION

NAME	Well #18	**IS THERE A WELL LOG OR ADDITIONAL CONSTRUCTION INFORMATION AVAILABLE?**
FACILITY ID	S17	☐ **YES** (Please attach a copy)
UNIQUE WELL NO.	110469	☐ **NO** ☐ **UNDETERMINED**
COUNTY	Anoka	

PWS ID / FACILITY ID	1020017 S17	**UNIQUE WELL NO.**	110469

PCSI CODE	ACTUAL OR POTENTIAL CONTAMINATION SOURCE	ISOLATION DISTANCES (FEET)				LOCATION	
		Minimum Distances		Sensitive Well[1]	Within 200 Ft. Y / N / U	Dist. from Well	Est. (?)
		Community	Non-community				
Agricultural Related							
*AC1	Agricultural chemical buried piping	50	50		N		
*AC2	Agricultural chemical multiple tanks or containers for residential retail sale or use, no single tank or container exceeding, but aggregate volume exceeding 56 gal. or 100 lbs. dry weight	50	50		N		
ACP	Agricultural chemical tank or container with 25 gal. or more or 100 lbs. or more dry weight, or equipment filling or cleaning area without safeguards	150	150		N		
ACS	Agricultural chemical storage or equipment filling or cleaning area with safeguards	100	100		N		
ACR	Agricultural chemical storage or equipment filling or cleaning area with safeguards and roofed	50	50		N		
ADW	Agricultural drainage well[2] (Class V well - illegal[3])	50	50		N		
AAT	Anhydrous ammonia tank (stationary tank)	50	50		N		
AB1	Animal building, feedlot, confinement area, or kennel, 0.1 to 1.0 animal unit (stockyard)	50	20	100/40	N		
AB2	Animal building or poultry building, including a horse riding area, more than 1.0 animal unit	50	50	100	N		
ABS	Animal burial area, more than 1.0 animal unit	50	50		N		
FWP	Animal feeding or watering area within a pasture, more than 1.0 animal unit	50	50	100	N		
AF1	Animal feedlot, unroofed, 300 or more animal units (stockyard)	100	100	200	N		
AF2	Animal feedlot, more than 1.0, but less than 300 animal units (stockyard)	50	50	100	N		
AMA	Animal manure application	use discretion	use discretion		N		
REN	Animal rendering plant	50	50		N		
MS1	Manure (liquid) storage basin or lagoon, unpermitted or noncertified	300	300	600	N		
MS2	Manure (liquid) storage basin or lagoon, approved earthen liner	150	150	300	N		
MS3	Manure (liquid) storage basin or lagoon, approved concrete or composite liner	100	100	200	N		
MS4	Manure (solid) storage area, not covered with a roof	100	100	200	N		
OSC	Open storage for crops	use discretion	use discretion		N		
SSTS Related							
AA1	Absorption area of a soil dispersal system, average flow greater than 10,000 gal./day	300	300	600	N		
AA2	Absorption area of a soil dispersal system serving a facility handling infectious or pathological wastes, average flow 10,000 gal./day or less	150	150	300	N		
AA3	Absorption area of a soil dispersal system, average flow 10,000 gal./day or less	50	50	100	N		
AA4	Absorption area of a soil dispersal system serving multiple family residences or a non-residential facility and has the capacity to serve 20 or more persons per day (Class V well)[2]	50/300/150[4]	50/300/150[4]	100/600/300[4]	N		
CSP	Cesspool	75	75	150	N		
AGG	Dry well, leaching pit, seepage pit	75	75	150	N		
*FD1	Floor drain, grate, or trough connected to a buried sewer	50	50		N		
*FD2	Floor drain, grate, or trough if buried sewer is air-tested, approved materials, serving one building, or two or less single-family residences	50	20		N		
*GW1	Gray-water dispersal area	50	50	100	N		
LC1	Large capacity cesspools (Class V well - illegal)[2]	75	75	150	N		
MVW	Motor vehicle waste disposal (Class V well - illegal)[2]	illegal	illegal		N		

PWS ID / FACILITY ID	1020017 S17	UNIQUE WELL NO.	110469

PCSI CODE	ACTUAL OR POTENTIAL CONTAMINATION SOURCE	ISOLATION DISTANCES (FEET)				LOCATION	
		Minimum Distances		Sensitive Well[1]	Within 200 Ft. Y / N / U	Dist. from Well	Est. (?)
		Community	Non-community				
PR1	Privy, nonportable	50	50	100	N		
PR2	Portable (privy) or toilet	50	20		N		
*SF1	Watertight sand filter; peat filter; or constructed wetland	50	50		N		
SET	Septic tank	50	50		N		
HTK	Sewage holding tank, watertight	50	50		N		
SS1	Sewage sump capacity 100 gal. or more	50	50		N		
SS2	Sewage sump capacity less than 100 gal., tested, conforming to rule	50	20		N		
*ST1	Sewage treatment device, watertight	50	50		N		
SB1	Sewer, buried, approved materials, tested, serving one building, or two or less single-family residences	50	20		N		
SB2	Sewer, buried, collector, municipal, serving a facility handling infectious or pathological wastes, open-jointed or unapproved materials	50	50		N		
*WB1	Water treatment backwash holding basin, reclaim basin, or surge tank with a direct sewer connection	50	50		N		
*WB2	Water treatment backwash holding basin, reclaim basin, or surge tank with a backflow protected sewer connection	20	20		N		
Land Application							
SPT	Land spreading area for sewage, septage, or sludge	50	50	100	N		
Solid Waste Related							
COS	Commercial compost site	50	50		N		
CD1	Construction or demolition debris disposal area	50	50	100	N		
*HW1	Household solid waste disposal area, single residence	50	50	100	N		
LF1	Landfill, permitted demolition debris, dump, or mixed municipal solid waste from multiple persons	300	300	600	N		
SVY	Scrap yard	50	50		N		
SWT	Solid waste transfer station	50	50		N		
Storm Water Related							
SD1	Storm water drain pipe, 8 inches or greater in diameter	50	20		N		
SWI	Storm water drainage well[2] (Class V well - illegal[3])	50	50		N		
SM1	Storm water pond greater than 5000 gal.	50	35		N		
Wells and Borings							
*EB1	Elevator boring, not conforming to rule	50	50		N		
*EB2	Elevator boring, conforming to rule	20	20		N		
MON	Monitoring well	record dist.	record dist.		N		
WEL	Operating well	record dist.	record dist.		N		
UUW	Unused, unsealed well or boring	50	50		N		
General							
*CR1	Cistern or reservoir, buried, nonpressurized water supply	20	20		N		
PLM	Contaminant plume	50	50		N		
*CW1	Cooling water pond, industrial	50	50	100	N		
DC1	Deicing chemicals, bulk road	50	50	100	N		
*ET1	Electrical transformer storage area, oil-filled	50	50		N		
GRV	Grave or mausoleum	50	50		N		
GP1	Gravel pocket or French drain for clear water drainage only	20	20		N		
*HS1	Hazardous substance buried piping	50	50		N		
HS2	Hazardous substance tank or container, above ground or underground, 56 gal. or more, or 100 lbs. or more dry weight, without safeguards	150	150		N		
HS3	Hazardous substance tank or container, above ground or underground, 56 gal. or more, or 100 lbs. or more dry weight with safeguards	100	100		N		
HS4	Hazardous substance multiple storage tanks or containers for residential retail sale or use, no single tank or container exceeding 56 gal. or 100 lbs., but aggregate volume exceeding	50	50		N		
HWF	Highest water or flood level	50	N/A		N		
*HG1	Horizontal ground source closed loop heat exchanger buried piping	50	50		N		
*HG2	Horizontal ground source closed loop heat exchanger buried piping and horizontal piping, approved materials and heat transfer fluid	50	10		N		
IWD	Industrial waste disposal well (Class V well)[2]	illegal[3]	illegal[3]		N		
IWS	Interceptor, including a flammable waste or sediment	50	50		N		
OH1	Ordinary high water level of a stream, river, pond, lake, reservoir, or drainage ditch (holds water six months or more)	50	35		Y	150	N
*PP1	Petroleum buried piping	50	50		N		
*PP2	Petroleum or crude oil pipeline to a refinery or distribution center	100	100		N		

PWS ID / FACILITY ID	1020017 S17	UNIQUE WELL NO.	110469

PCSI CODE	ACTUAL OR POTENTIAL CONTAMINATION SOURCE	ISOLATION DISTANCES (FEET)				LOCATION	
		Minimum Distances		Sensitive Well[1]	Within 200 Ft. Y / N / U	Dist. from Well	Est. (?)
		Community	Non-community				
PT1	Petroleum tank or container, 1100 gal. or more, without safeguards	150	150		N		
PT2	Petroleum tank or container, 1100 gal. or more, with safeguards	100	100		N		
PT3	Petroleum tank or container, buried, between 56 and 1100 gal.	50	50		N		
PT4	Petroleum tank or container, not buried, between 56 and 1100 gal.	50[5]	20		N		
PU1	Pit or unfilled space more than four feet in depth	20	20		N		
PC1	Pollutant or contaminant that may drain into the soil	50	50	100	N		
SP1	Swimming pool, in-ground	20	20		N		
*VH1	Vertical heat exchanger, horizontal piping conforming to rule	50	10		N		
*VH2	Vertical heat exchanger (vertical) piping, conforming to rule	50	35		N		
*WR1	Wastewater rapid infiltration basin, municipal or industrial	300	300	600	N		
*WA1	Wastewater spray irrigation area, municipal or industrial	150	150	300	N		
*WS1	Wastewater stabilization pond, industrial	150	150	300	N		
*WS2	Wastewater stabilization pond, municipal, 500 or more gal./acre/day of leakage	300	300	600	N		
*WS3	Wastewater stabilization pond, municipal, less than 500 gal./acre/day of leakage	150	150	300	N		
*WT1	Wastewater treatment unit tanks, vessels and components (Package plant)	100	100		N		
*WT2	Water treatment backwash disposal area	50	50	100	N		
Additional Sources (If there is more than one source listed above, please indicate here).							
Potential Contamination Sources and Codes Based on Previous Versions of this Form							
	none found within 200' of this well.						

* New potential contaminant source.

[1] A sensitive well has less than 50 feet of watertight casing, and which is not cased below a confining layer or confining materials of at least 10' in thickness.

[2] These sources, known as Class V underground injection wells, are regulated by the federal U.S. Environmental Protection Agency.

[3] These sources are classified as illegal by Minnesota Rules, Chapter 4725.

[4] Isolation distance is determined by average flow per day or if a facility handles infectious or pathological wastes.

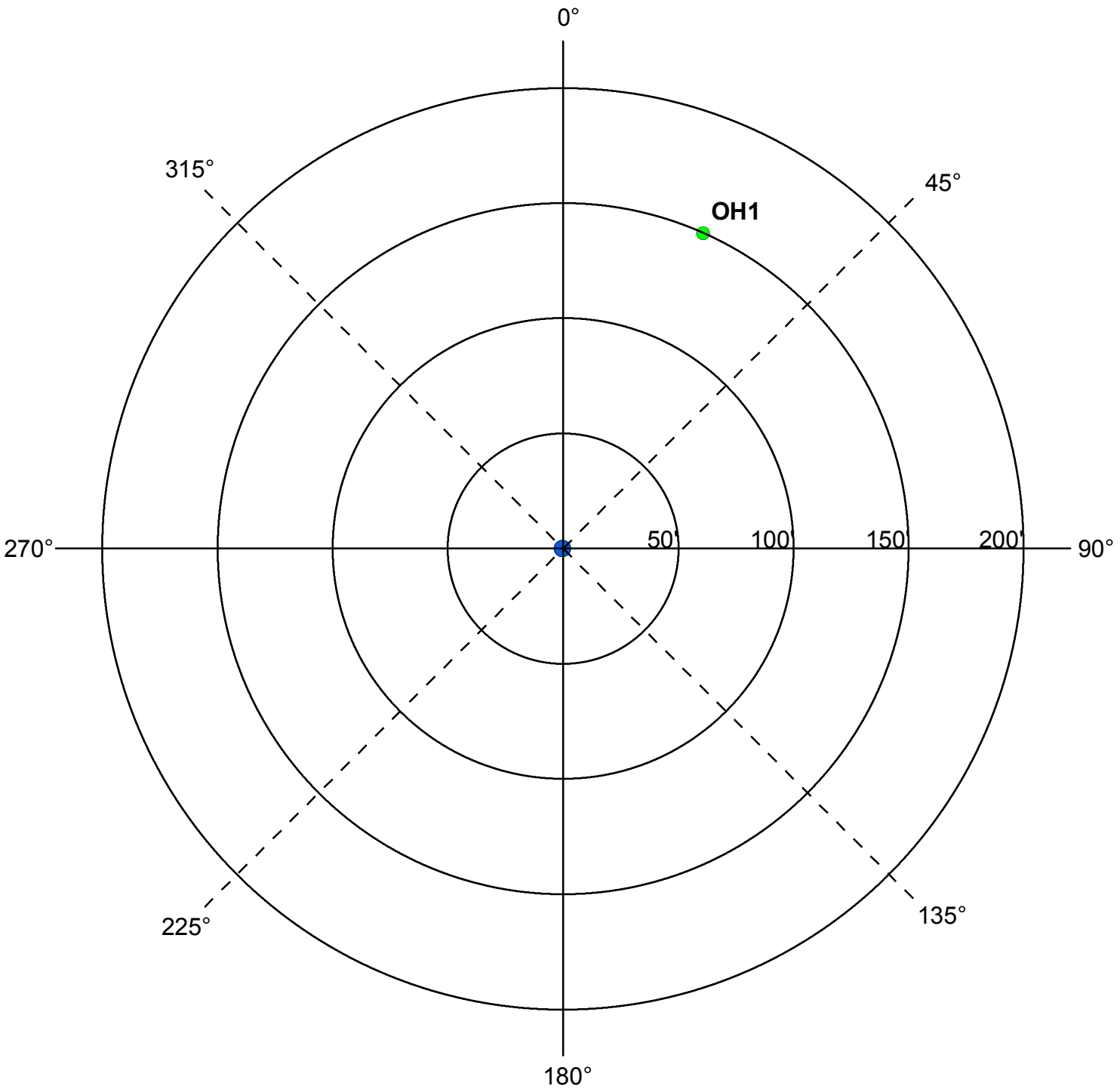
[5] A community public water-supply well must be a minimum of 50 feet from a petroleum tank or container, unless the tank or container is used for emergency pumping and is located in a room or building separate from the community well; and is of double-wall construction with leak detection between walls; or is protected with secondary containment.

This form is based on the new isolation distances in Minnesota Rules, Chapter 4725, related to wells and borings adopted August 4, 2008, and Minnesota Rules, Chapter 4720, related to wellhead protection.

PWS ID / FACILITY ID	1020017 S17	UNIQUE WELL NO.	110469

SETBACK DISTANCES	All potential contaminant sources must be noted on sketch.

Record the distance and approximate compass bearing of each potential contaminant source from the well, and identify the source using the "Source Code". Unlabeled points on the map are unsealed wells.



	Y	N	N/A
Were the isolation distances maintained for the new sources of contamination?			
Is the system monitoring existing nonconforming sources of contamination?			

Reminder Question: Were the wellhead protection measure(s) implemented?

INSPECTOR	Neiman, Dave	DATE	6 - 3 - 2016

PWS ID / FACILITY ID	1020017 S17	UNIQUE WELL NO.	110469

RECOMMENDED WELLHEAD PROTECTION (WHP) MEASURES	WHP MEASURE IMPLEMENTED? Y or N	DATE VERIFIED

COMMENTS

For further information, please contact:

Minnesota Department of Health
Drinking Water Protection Section
Source Water Protection Unit
P.O. Box 64975
St. Paul, Minnesota 55164-0975

Section Receptionist: 651-201-4700
Division TDD: 651-201-5797 or MN Relay Service @ 1-800-627-3529 and ask for 651-201-5000

Environmental Health Division
Drinking Water Protection Section
P.O. Box 64975
St. Paul, Minnesota 55164-0975

INNER WELLHEAD MANAGEMENT ZONE (IWMZ) - POTENTIAL CONTAMINANT SOURCE INVENTORY (PCSI) REPORT

PUBLIC WATER SYSTEM INFORMATION

PWS ID	1020017	**COMMUNITY**
NAME	Coon Rapids	
ADDRESS	Kory Jorgensen Utilities Supervisor, Public Works Garage, 1831 111th Avenue, Coon Rapids, MN 554333761	

FACILITY (WELL) INFORMATION

NAME	Well #19	**IS THERE A WELL LOG OR ADDITIONAL CONSTRUCTION INFORMATION AVAILABLE?**
FACILITY ID	S18	☐ **YES** (Please attach a copy)
UNIQUE WELL NO.	110475	☐ **NO** ☐ **UNDETERMINED**
COUNTY	Anoka	

PWS ID / FACILITY ID	1020017 S18	**UNIQUE WELL NO.**	110475

PCSI CODE	ACTUAL OR POTENTIAL CONTAMINATION SOURCE	ISOLATION DISTANCES (FEET)				LOCATION	
		Minimum Distances		Sensitive Well[1]	Within 200 Ft. Y / N / U	Dist. from Well	Est. (?)
		Community	Non-community				
Agricultural Related							
*AC1	Agricultural chemical buried piping	50	50		N		
*AC2	Agricultural chemical multiple tanks or containers for residential retail sale or use, no single tank or container exceeding, but aggregate volume exceeding 56 gal. or 100 lbs. dry weight	50	50		N		
ACP	Agricultural chemical tank or container with 25 gal. or more or 100 lbs. or more dry weight, or equipment filling or cleaning area without safeguards	150	150		N		
ACS	Agricultural chemical storage or equipment filling or cleaning area with safeguards	100	100		N		
ACR	Agricultural chemical storage or equipment filling or cleaning area with safeguards and roofed	50	50		N		
ADW	Agricultural drainage well[2] (Class V well - illegal[3])	50	50		N		
AAT	Anhydrous ammonia tank (stationary tank)	50	50		N		
AB1	Animal building, feedlot, confinement area, or kennel, 0.1 to 1.0 animal unit (stockyard)	50	20	100/40	N		
AB2	Animal building or poultry building, including a horse riding area, more than 1.0 animal unit	50	50	100	N		
ABS	Animal burial area, more than 1.0 animal unit	50	50		N		
FWP	Animal feeding or watering area within a pasture, more than 1.0 animal unit	50	50	100	N		
AF1	Animal feedlot, unroofed, 300 or more animal units (stockyard)	100	100	200	N		
AF2	Animal feedlot, more than 1.0, but less than 300 animal units (stockyard)	50	50	100	N		
AMA	Animal manure application	use discretion	use discretion		N		
REN	Animal rendering plant	50	50		N		
MS1	Manure (liquid) storage basin or lagoon, unpermitted or noncertified	300	300	600	N		
MS2	Manure (liquid) storage basin or lagoon, approved earthen liner	150	150	300	N		
MS3	Manure (liquid) storage basin or lagoon, approved concrete or composite liner	100	100	200	N		
MS4	Manure (solid) storage area, not covered with a roof	100	100	200	N		
OSC	Open storage for crops	use discretion	use discretion		N		
SSTS Related							
AA1	Absorption area of a soil dispersal system, average flow greater than 10,000 gal./day	300	300	600	N		
AA2	Absorption area of a soil dispersal system serving a facility handling infectious or pathological wastes, average flow 10,000 gal./day or less	150	150	300	N		
AA3	Absorption area of a soil dispersal system, average flow 10,000 gal./day or less	50	50	100	N		
AA4	Absorption area of a soil dispersal system serving multiple family residences or a non-residential facility and has the capacity to serve 20 or more persons per day (Class V well)[2]	50/300/150[4]	50/300/150[4]	100/600/300[4]	N		
CSP	Cesspool	75	75	150	N		
AGG	Dry well, leaching pit, seepage pit	75	75	150	N		
*FD1	Floor drain, grate, or trough connected to a buried sewer	50	50		N		
*FD2	Floor drain, grate, or trough if buried sewer is air-tested, approved materials, serving one building, or two or less single-family residences	50	20		N		
*GW1	Gray-water dispersal area	50	50	100	N		
LC1	Large capacity cesspools (Class V well - illegal)[2]	75	75	150	N		
MVW	Motor vehicle waste disposal (Class V well - illegal)[2]	illegal	illegal		N		

PWS ID / FACILITY ID	1020017 S18	UNIQUE WELL NO.	110475

PCSI CODE	ACTUAL OR POTENTIAL CONTAMINATION SOURCE	ISOLATION DISTANCES (FEET)				LOCATION	
		Minimum Distances		Sensitive Well[1]	Within 200 Ft. Y / N / U	Dist. from Well	Est. (?)
		Community	Non-community				
PR1	Privy, nonportable	50	50	100	N		
PR2	Portable (privy) or toilet	50	20		N		
*SF1	Watertight sand filter; peat filter; or constructed wetland	50	50		N		
SET	Septic tank	50	50		N		
HTK	Sewage holding tank, watertight	50	50		N		
SS1	Sewage sump capacity 100 gal. or more	50	50		N		
SS2	Sewage sump capacity less than 100 gal., tested, conforming to rule	50	20		N		
*ST1	Sewage treatment device, watertight	50	50		N		
SB1	Sewer, buried, approved materials, tested, serving one building, or two or less single-family residences	50	20		N		
SB2	Sewer, buried, collector, municipal, serving a facility handling infectious or pathological wastes, open-jointed or unapproved materials	50	50		Y	125	N
SB2	Sewer, buried, collector, municipal, serving a facility handling infectious or pathological wastes, open-jointed or unapproved materials	50	50		Y	140	N
*WB1	Water treatment backwash holding basin, reclaim basin, or surge tank with a direct sewer connection	50	50		N		
*WB2	Water treatment backwash holding basin, reclaim basin, or surge tank with a backflow protected sewer connection	20	20		N		
Land Application							
SPT	Land spreading area for sewage, septage, or sludge	50	50	100	N		
Solid Waste Related							
COS	Commercial compost site	50	50		N		
CD1	Construction or demolition debris disposal area	50	50	100	N		
*HW1	Household solid waste disposal area, single residence	50	50	100	N		
LF1	Landfill, permitted demolition debris, dump, or mixed municipal solid waste from multiple persons	300	300	600	N		
SVY	Scrap yard	50	50		N		
SWT	Solid waste transfer station	50	50		N		
Storm Water Related							
SD1	Storm water drain pipe, 8 inches or greater in diameter	50	20		N		
SWI	Storm water drainage well[2] (Class V well - illegal[3])	50	50		N		
SM1	Storm water pond greater than 5000 gal.	50	35		N		
Wells and Borings							
*EB1	Elevator boring, not conforming to rule	50	50		N		
*EB2	Elevator boring, conforming to rule	20	20		N		
MON	Monitoring well	record dist.	record dist.		N		
WEL	Operating well	record dist.	record dist.		Y	160	
UUW	Unused, unsealed well or boring	50	50		N		
General							
*CR1	Cistern or reservoir, buried, nonpressurized water supply	20	20		N		
PLM	Contaminant plume	50	50		N		
*CW1	Cooling water pond, industrial	50	50	100	N		
DC1	Deicing chemicals, bulk road	50	50	100	N		
*ET1	Electrical transformer storage area, oil-filled	50	50		N		
GRV	Grave or mausoleum	50	50		N		
GP1	Gravel pocket or French drain for clear water drainage only	20	20		N		
*HS1	Hazardous substance buried piping	50	50		N		
HS2	Hazardous substance tank or container, above ground or underground, 56 gal. or more, or 100 lbs. or more dry weight, without safeguards	150	150		N		
HS3	Hazardous substance tank or container, above ground or underground, 56 gal. or more, or 100 lbs. or more dry weight with safeguards	100	100		N		
HS4	Hazardous substance multiple storage tanks or containers for residential retail sale or use, no single tank or container exceeding 56 gal. or 100 lbs., but aggregate volume exceeding	50	50		N		
HWF	Highest water or flood level	50	N/A		N		
*HG1	Horizontal ground source closed loop heat exchanger buried piping	50	50		N		
*HG2	Horizontal ground source closed loop heat exchanger buried piping and horizontal piping, approved materials and heat transfer fluid	50	10		N		
IWD	Industrial waste disposal well (Class V well)[2]	illegal[3]	illegal[3]		N		
IWS	Interceptor, including a flammable waste or sediment	50	50		N		
OH1	Ordinary high water level of a stream, river, pond, lake, reservoir, or drainage ditch (holds water six months or more)	50	35		Y	150	N

PWS ID / FACILITY ID	1020017 S18	UNIQUE WELL NO.	110475

PCSI CODE	ACTUAL OR POTENTIAL CONTAMINATION SOURCE	ISOLATION DISTANCES (FEET)				LOCATION	
		Minimum Distances		Sensitive Well[1]	Within 200 Ft. Y / N / U	Dist. from Well	Est. (?)
		Community	Non-community				
*PP1	Petroleum buried piping	50	50		N		
*PP2	Petroleum or crude oil pipeline to a refinery or distribution center	100	100		N		
PT1	Petroleum tank or container, 1100 gal. or more, without safeguards	150	150		N		
PT2	Petroleum tank or container, 1100 gal. or more, with safeguards	100	100		N		
PT3	Petroleum tank or container, buried, between 56 and 1100 gal.	50	50		N		
PT4	Petroleum tank or container, not buried, between 56 and 1100 gal.	50[5]	20		N		
PU1	Pit or unfilled space more than four feet in depth	20	20		N		
PC1	Pollutant or contaminant that may drain into the soil	50	50	100	N		
SP1	Swimming pool, in-ground	20	20		N		
*VH1	Vertical heat exchanger, horizontal piping conforming to rule	50	10		N		
*VH2	Vertical heat exchanger (vertical) piping, conforming to rule	50	35		N		
*WR1	Wastewater rapid infiltration basin, municipal or industrial	300	300	600	N		
*WA1	Wastewater spray irrigation area, municipal or industrial	150	150	300	N		
*WS1	Wastewater stabilization pond, industrial	150	150	300	N		
*WS2	Wastewater stabilization pond, municipal, 500 or more gal./acre/day of leakage	300	300	600	N		
*WS3	Wastewater stabilization pond, municipal, less than 500 gal./acre/day of leakage	150	150	300	N		
*WT1	Wastewater treatment unit tanks, vessels and components (Package plant)	100	100		N		
*WT2	Water treatment backwash disposal area	50	50	100	N		
Additional Sources (If there is more than one source listed above, please indicate here).							
Potential Contamination Sources and Codes Based on Previous Versions of this Form							
	none found within 200' of this well.						

* New potential contaminant source.

[1] A sensitive well has less than 50 feet of watertight casing, and which is not cased below a confining layer or confining materials of at least 10' in thickness.

[2] These sources, known as Class V underground injection wells, are regulated by the federal U.S. Environmental Protection Agency.

[3] These sources are classified as illegal by Minnesota Rules, Chapter 4725.

[4] Isolation distance is determined by average flow per day or if a facility handles infectious or pathological wastes.

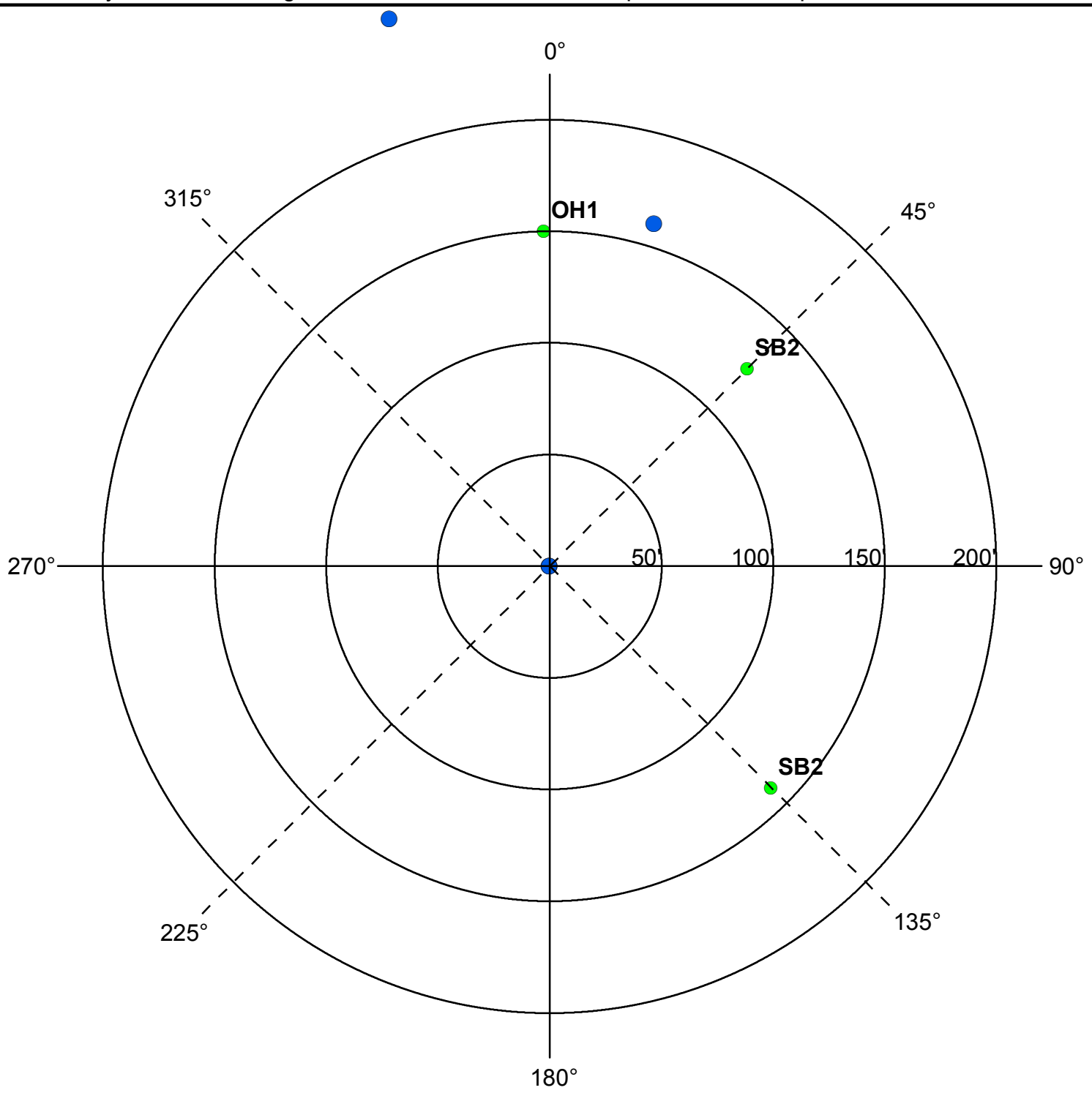
[5] A community public water-supply well must be a minimum of 50 feet from a petroleum tank or container, unless the tank or container is used for emergency pumping and is located in a room or building separate from the community well; and is of double-wall construction with leak detection between walls; or is protected with secondary containment.

This form is based on the new isolation distances in Minnesota Rules, Chapter 4725, related to wells and borings adopted August 4, 2008, and Minnesota Rules, Chapter 4720, related to wellhead protection.

PWS ID / FACILITY ID	1020017 S18	UNIQUE WELL NO.	110475

SETBACK DISTANCES	All potential contaminant sources must be noted on sketch.

Record the distance and approximate compass bearing of each potential contaminant source from the well, and identify the source using the "Source Code". Unlabeled points on the map are unsealed wells.



	Y	N	N/A
Were the isolation distances maintained for the new sources of contamination?			
Is the system monitoring existing nonconforming sources of contamination?			

Reminder Question: Were the wellhead protection measure(s) implemented?

INSPECTOR	Neiman, Dave	DATE	6 - 3 - 2016

PWS ID / FACILITY ID	1020017 S18	UNIQUE WELL NO.	110475

RECOMMENDED WELLHEAD PROTECTION (WHP) MEASURES	WHP MEASURE IMPLEMENTED? Y or N	DATE VERIFIED

COMMENTS

For further information, please contact:

Minnesota Department of Health
Drinking Water Protection Section
Source Water Protection Unit
P.O. Box 64975
St. Paul, Minnesota 55164-0975

Section Receptionist: 651-201-4700
Division TDD: 651-201-5797 or MN Relay Service @ 1-800-627-3529 and ask for 651-201-5000

Environmental Health Division
Drinking Water Protection Section
P.O. Box 64975
St. Paul, Minnesota 55164-0975

INNER WELLHEAD MANAGEMENT ZONE (IWMZ) - POTENTIAL CONTAMINANT SOURCE INVENTORY (PCSI) REPORT

PUBLIC WATER SYSTEM INFORMATION

PWS ID	1020017	**COMMUNITY**
NAME	Coon Rapids	
ADDRESS	Kory Jorgensen Utilities Supervisor, Public Works Garage, 1831 111th Avenue, Coon Rapids, MN 554333761	

FACILITY (WELL) INFORMATION

NAME	Well #20	**IS THERE A WELL LOG OR ADDITIONAL CONSTRUCTION INFORMATION AVAILABLE?**
FACILITY ID	S19	☐ **YES** (Please attach a copy)
UNIQUE WELL NO.	420956	☐ **NO** ☐ **UNDETERMINED**
COUNTY	Anoka	

PWS ID / FACILITY ID	1020017 S19	**UNIQUE WELL NO.**	420956

PCSI CODE	ACTUAL OR POTENTIAL CONTAMINATION SOURCE	ISOLATION DISTANCES (FEET)				LOCATION	
		Minimum Distances		Sensitive Well[1]	Within 200 Ft. Y / N / U	Dist. from Well	Est. (?)
		Community	Non-community				
Agricultural Related							
*AC1	Agricultural chemical buried piping	50	50		N		
*AC2	Agricultural chemical multiple tanks or containers for residential retail sale or use, no single tank or container exceeding, but aggregate volume exceeding 56 gal. or 100 lbs. dry weight	50	50		N		
ACP	Agricultural chemical tank or container with 25 gal. or more or 100 lbs. or more dry weight, or equipment filling or cleaning area without safeguards	150	150		N		
ACS	Agricultural chemical storage or equipment filling or cleaning area with safeguards	100	100		N		
ACR	Agricultural chemical storage or equipment filling or cleaning area with safeguards and roofed	50	50		N		
ADW	Agricultural drainage well[2] (Class V well - illegal[3])	50	50		N		
AAT	Anhydrous ammonia tank (stationary tank)	50	50		N		
AB1	Animal building, feedlot, confinement area, or kennel, 0.1 to 1.0 animal unit (stockyard)	50	20	100/40	N		
AB2	Animal building or poultry building, including a horse riding area, more than 1.0 animal unit	50	50	100	N		
ABS	Animal burial area, more than 1.0 animal unit	50	50		N		
FWP	Animal feeding or watering area within a pasture, more than 1.0 animal unit	50	50	100	N		
AF1	Animal feedlot, unroofed, 300 or more animal units (stockyard)	100	100	200	N		
AF2	Animal feedlot, more than 1.0, but less than 300 animal units (stockyard)	50	50	100	N		
AMA	Animal manure application	use discretion	use discretion		N		
REN	Animal rendering plant	50	50		N		
MS1	Manure (liquid) storage basin or lagoon, unpermitted or noncertified	300	300	600	N		
MS2	Manure (liquid) storage basin or lagoon, approved earthen liner	150	150	300	N		
MS3	Manure (liquid) storage basin or lagoon, approved concrete or composite liner	100	100	200	N		
MS4	Manure (solid) storage area, not covered with a roof	100	100	200	N		
OSC	Open storage for crops	use discretion	use discretion		N		
SSTS Related							
AA1	Absorption area of a soil dispersal system, average flow greater than 10,000 gal./day	300	300	600	N		
AA2	Absorption area of a soil dispersal system serving a facility handling infectious or pathological wastes, average flow 10,000 gal./day or less	150	150	300	N		
AA3	Absorption area of a soil dispersal system, average flow 10,000 gal./day or less	50	50	100	N		
AA4	Absorption area of a soil dispersal system serving multiple family residences or a non-residential facility and has the capacity to serve 20 or more persons per day (Class V well)[2]	50/300/150[4]	50/300/150[4]	100/600/300[4]	N		
CSP	Cesspool	75	75	150	N		
AGG	Dry well, leaching pit, seepage pit	75	75	150	N		
*FD1	Floor drain, grate, or trough connected to a buried sewer	50	50		N		
*FD2	Floor drain, grate, or trough if buried sewer is air-tested, approved materials, serving one building, or two or less single-family residences	50	20		N		
*GW1	Gray-water dispersal area	50	50	100	N		
LC1	Large capacity cesspools (Class V well - illegal)[2]	75	75	150	N		
MVW	Motor vehicle waste disposal (Class V well - illegal)[2]	illegal	illegal		N		

PWS ID / FACILITY ID	1020017 S19	UNIQUE WELL NO.	420956

PCSI CODE	ACTUAL OR POTENTIAL CONTAMINATION SOURCE	ISOLATION DISTANCES (FEET)				LOCATION	
		Minimum Distances		Sensitive Well[1]	Within 200 Ft. Y / N / U	Dist. from Well	Est. (?)
		Community	Non-community				
PR1	Privy, nonportable	50	50	100	N		
PR2	Portable (privy) or toilet	50	20		N		
*SF1	Watertight sand filter; peat filter; or constructed wetland	50	50		N		
SET	Septic tank	50	50		N		
HTK	Sewage holding tank, watertight	50	50		N		
SS1	Sewage sump capacity 100 gal. or more	50	50		N		
SS2	Sewage sump capacity less than 100 gal., tested, conforming to rule	50	20		N		
*ST1	Sewage treatment device, watertight	50	50		N		
SB1	Sewer, buried, approved materials, tested, serving one building, or two or less single-family residences	50	20		N		
SB2	Sewer, buried, collector, municipal, serving a facility handling infectious or pathological wastes, open-jointed or unapproved materials	50	50		N		
*WB1	Water treatment backwash holding basin, reclaim basin, or surge tank with a direct sewer connection	50	50		N		
*WB2	Water treatment backwash holding basin, reclaim basin, or surge tank with a backflow protected sewer connection	20	20		N		
Land Application							
SPT	Land spreading area for sewage, septage, or sludge	50	50	100	N		
Solid Waste Related							
COS	Commercial compost site	50	50		N		
CD1	Construction or demolition debris disposal area	50	50	100	N		
*HW1	Household solid waste disposal area, single residence	50	50	100	N		
LF1	Landfill, permitted demolition debris, dump, or mixed municipal solid waste from multiple persons	300	300	600	N		
SVY	Scrap yard	50	50		N		
SWT	Solid waste transfer station	50	50		N		
Storm Water Related							
SD1	Storm water drain pipe, 8 inches or greater in diameter	50	20		N		
SWI	Storm water drainage well[2] (Class V well - illegal[3])	50	50		N		
SM1	Storm water pond greater than 5000 gal.	50	35		N		
Wells and Borings							
*EB1	Elevator boring, not conforming to rule	50	50		N		
*EB2	Elevator boring, conforming to rule	20	20		N		
MON	Monitoring well	record dist.	record dist.		N		
WEL	Operating well	record dist.	record dist.		N		
UUW	Unused, unsealed well or boring	50	50		N		
General							
*CR1	Cistern or reservoir, buried, nonpressurized water supply	20	20		N		
PLM	Contaminant plume	50	50		N		
*CW1	Cooling water pond, industrial	50	50	100	N		
DC1	Deicing chemicals, bulk road	50	50	100	N		
*ET1	Electrical transformer storage area, oil-filled	50	50		N		
GRV	Grave or mausoleum	50	50		N		
GP1	Gravel pocket or French drain for clear water drainage only	20	20		N		
*HS1	Hazardous substance buried piping	50	50		N		
HS2	Hazardous substance tank or container, above ground or underground, 56 gal. or more, or 100 lbs. or more dry weight, without safeguards	150	150		N		
HS3	Hazardous substance tank or container, above ground or underground, 56 gal. or more, or 100 lbs. or more dry weight with safeguards	100	100		N		
HS4	Hazardous substance multiple storage tanks or containers for residential retail sale or use, no single tank or container exceeding 56 gal. or 100 lbs., but aggregate volume exceeding	50	50		N		
HWF	Highest water or flood level	50	N/A		N		
*HG1	Horizontal ground source closed loop heat exchanger buried piping	50	50		N		
*HG2	Horizontal ground source closed loop heat exchanger buried piping and horizontal piping, approved materials and heat transfer fluid	50	10		N		
IWD	Industrial waste disposal well (Class V well)[2]	illegal[3]	illegal[3]		N		
IWS	Interceptor, including a flammable waste or sediment	50	50		N		
OH1	Ordinary high water level of a stream, river, pond, lake, reservoir, or drainage ditch (holds water six months or more)	50	35		Y	50	N
*PP1	Petroleum buried piping	50	50		N		
*PP2	Petroleum or crude oil pipeline to a refinery or distribution center	100	100		N		

PWS ID / FACILITY ID	1020017 S19	UNIQUE WELL NO.	420956

PCSI CODE	ACTUAL OR POTENTIAL CONTAMINATION SOURCE	ISOLATION DISTANCES (FEET)				LOCATION	
		Minimum Distances		Sensitive Well[1]	Within 200 Ft. Y / N / U	Dist. from Well	Est. (?)
		Community	Non-community				
PT1	Petroleum tank or container, 1100 gal. or more, without safeguards	150	150		N		
PT2	Petroleum tank or container, 1100 gal. or more, with safeguards	100	100		N		
PT3	Petroleum tank or container, buried, between 56 and 1100 gal.	50	50		N		
PT4	Petroleum tank or container, not buried, between 56 and 1100 gal.	50[5]	20		N		
PU1	Pit or unfilled space more than four feet in depth	20	20		N		
PC1	Pollutant or contaminant that may drain into the soil	50	50	100	N		
SP1	Swimming pool, in-ground	20	20		N		
*VH1	Vertical heat exchanger, horizontal piping conforming to rule	50	10		N		
*VH2	Vertical heat exchanger (vertical) piping, conforming to rule	50	35		N		
*WR1	Wastewater rapid infiltration basin, municipal or industrial	300	300	600	N		
*WA1	Wastewater spray irrigation area, municipal or industrial	150	150	300	N		
*WS1	Wastewater stabilization pond, industrial	150	150	300	N		
*WS2	Wastewater stabilization pond, municipal, 500 or more gal./acre/day of leakage	300	300	600	N		
*WS3	Wastewater stabilization pond, municipal, less than 500 gal./acre/day of leakage	150	150	300	N		
*WT1	Wastewater treatment unit tanks, vessels and components (Package plant)	100	100		N		
*WT2	Water treatment backwash disposal area	50	50	100	N		
Additional Sources (If there is more than one source listed above, please indicate here).							
Potential Contamination Sources and Codes Based on Previous Versions of this Form							
	none found within 200' of this well.						

* New potential contaminant source.

[1] A sensitive well has less than 50 feet of watertight casing, and which is not cased below a confining layer or confining materials of at least 10' in thickness.

[2] These sources, known as Class V underground injection wells, are regulated by the federal U.S. Environmental Protection Agency.

[3] These sources are classified as illegal by Minnesota Rules, Chapter 4725.

[4] Isolation distance is determined by average flow per day or if a facility handles infectious or pathological wastes.

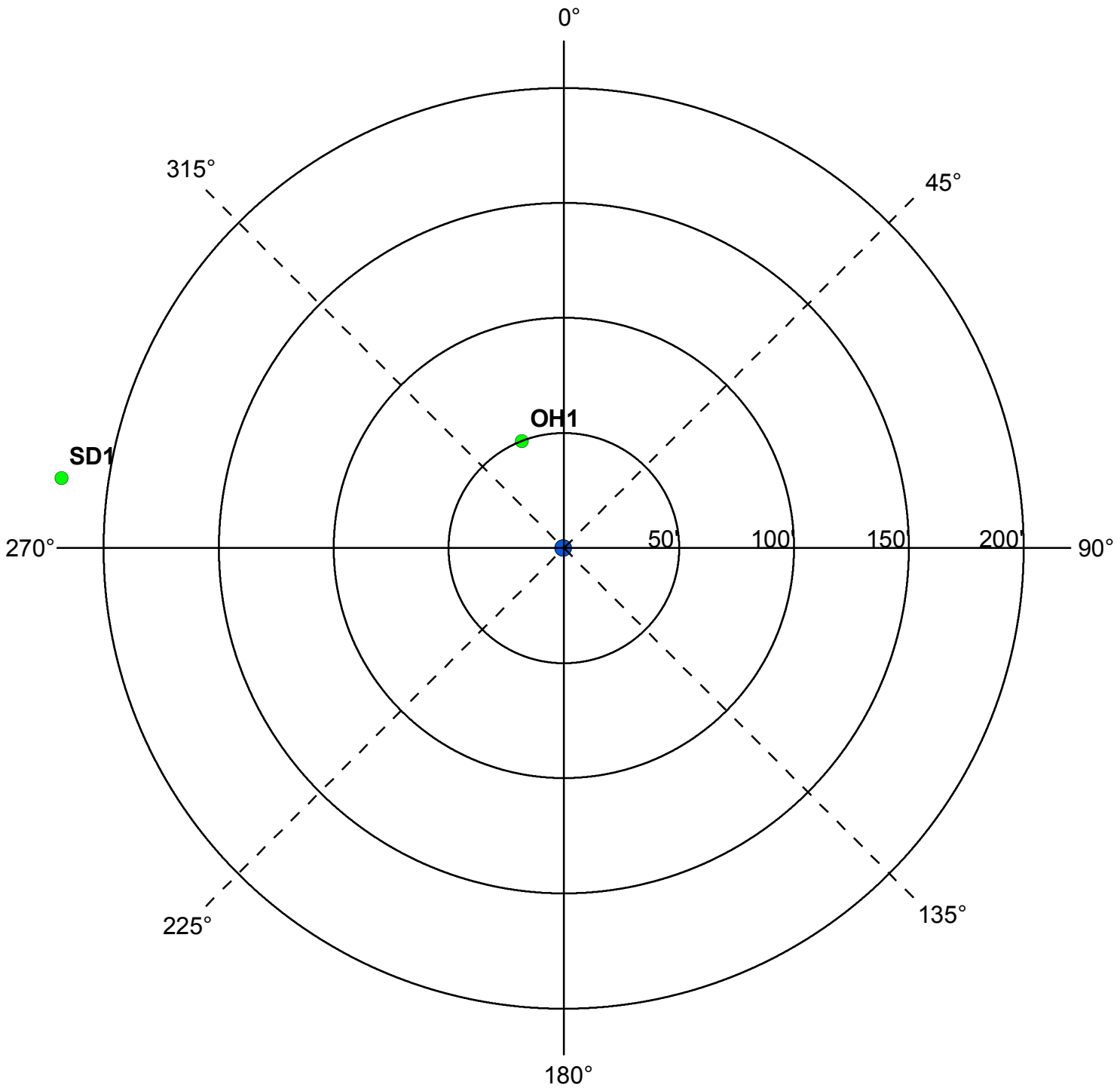
[5] A community public water-supply well must be a minimum of 50 feet from a petroleum tank or container, unless the tank or container is used for emergency pumping and is located in a room or building separate from the community well; and is of double-wall construction with leak detection between walls; or is protected with secondary containment.

This form is based on the new isolation distances in Minnesota Rules, Chapter 4725, related to wells and borings adopted August 4, 2008, and Minnesota Rules, Chapter 4720, related to wellhead protection.

PWS ID / FACILITY ID	1020017 S19	UNIQUE WELL NO.	420956

SETBACK DISTANCES	All potential contaminant sources must be noted on sketch.

Record the distance and approximate compass bearing of each potential contaminant source from the well, and identify the source using the "Source Code". Unlabeled points on the map are unsealed wells.



	Y	N	N/A
Were the isolation distances maintained for the new sources of contamination?			
Is the system monitoring existing nonconforming sources of contamination?			

Reminder Question: Were the wellhead protection measure(s) implemented?

INSPECTOR	Neiman, Dave	DATE	6 - 3 - 2016

PWS ID / FACILITY ID	1020017 S19	UNIQUE WELL NO.	420956

RECOMMENDED WELLHEAD PROTECTION (WHP) MEASURES	WHP MEASURE IMPLEMENTED? Y or N	DATE VERIFIED

COMMENTS

For further information, please contact:

Minnesota Department of Health
Drinking Water Protection Section
Source Water Protection Unit
P.O. Box 64975
St. Paul, Minnesota 55164-0975

Section Receptionist: 651-201-4700
Division TDD: 651-201-5797 or MN Relay Service @ 1-800-627-3529 and ask for 651-201-5000

Environmental Health Division
Drinking Water Protection Section
P.O. Box 64975
St. Paul, Minnesota 55164-0975

INNER WELLHEAD MANAGEMENT ZONE (IWMZ) - POTENTIAL CONTAMINANT SOURCE INVENTORY (PCSI) REPORT

PUBLIC WATER SYSTEM INFORMATION

PWS ID	1020017	**COMMUNITY**
NAME	Coon Rapids	
ADDRESS	Kory Jorgensen Utilities Supervisor, Public Works Garage, 1831 111th Avenue, Coon Rapids, MN 554333761	

FACILITY (WELL) INFORMATION

NAME	Well #21	**IS THERE A WELL LOG OR ADDITIONAL CONSTRUCTION INFORMATION AVAILABLE?**
FACILITY ID	S22	☐ YES (Please attach a copy)
UNIQUE WELL NO.	474384	☐ NO ☐ UNDETERMINED
COUNTY	Anoka	

PWS ID / FACILITY ID	1020017 S22	**UNIQUE WELL NO.**	474384

PCSI CODE	ACTUAL OR POTENTIAL CONTAMINATION SOURCE	ISOLATION DISTANCES (FEET)				LOCATION	
		Minimum Distances		Sensitive Well[1]	Within 200 Ft. Y / N / U	Dist. from Well	Est. (?)
		Community	Non-community				
Agricultural Related							
*AC1	Agricultural chemical buried piping	50	50		N		
*AC2	Agricultural chemical multiple tanks or containers for residential retail sale or use, no single tank or container exceeding, but aggregate volume exceeding 56 gal. or 100 lbs. dry weight	50	50		N		
ACP	Agricultural chemical tank or container with 25 gal. or more or 100 lbs. or more dry weight, or equipment filling or cleaning area without safeguards	150	150		N		
ACS	Agricultural chemical storage or equipment filling or cleaning area with safeguards	100	100		N		
ACR	Agricultural chemical storage or equipment filling or cleaning area with safeguards and roofed	50	50		N		
ADW	Agricultural drainage well[2] (Class V well - illegal[3])	50	50		N		
AAT	Anhydrous ammonia tank (stationary tank)	50	50		N		
AB1	Animal building, feedlot, confinement area, or kennel, 0.1 to 1.0 animal unit (stockyard)	50	20	100/40	N		
AB2	Animal building or poultry building, including a horse riding area, more than 1.0 animal unit	50	50	100	N		
ABS	Animal burial area, more than 1.0 animal unit	50	50		N		
FWP	Animal feeding or watering area within a pasture, more than 1.0 animal unit	50	50	100	N		
AF1	Animal feedlot, unroofed, 300 or more animal units (stockyard)	100	100	200	N		
AF2	Animal feedlot, more than 1.0, but less than 300 animal units (stockyard)	50	50	100	N		
AMA	Animal manure application	use discretion	use discretion		N		
REN	Animal rendering plant	50	50		N		
MS1	Manure (liquid) storage basin or lagoon, unpermitted or noncertified	300	300	600	N		
MS2	Manure (liquid) storage basin or lagoon, approved earthen liner	150	150	300	N		
MS3	Manure (liquid) storage basin or lagoon, approved concrete or composite liner	100	100	200	N		
MS4	Manure (solid) storage area, not covered with a roof	100	100	200	N		
OSC	Open storage for crops	use discretion	use discretion		N		
SSTS Related							
AA1	Absorption area of a soil dispersal system, average flow greater than 10,000 gal./day	300	300	600	N		
AA2	Absorption area of a soil dispersal system serving a facility handling infectious or pathological wastes, average flow 10,000 gal./day or less	150	150	300	N		
AA3	Absorption area of a soil dispersal system, average flow 10,000 gal./day or less	50	50	100	N		
AA4	Absorption area of a soil dispersal system serving multiple family residences or a non-residential facility and has the capacity to serve 20 or more persons per day (Class V well)[2]	50/300/150[4]	50/300/150[4]	100/600/300[4]	N		
CSP	Cesspool	75	75	150	N		
AGG	Dry well, leaching pit, seepage pit	75	75	150	N		
*FD1	Floor drain, grate, or trough connected to a buried sewer	50	50		N		
*FD2	Floor drain, grate, or trough if buried sewer is air-tested, approved materials, serving one building, or two or less single-family residences	50	20		N		
*GW1	Gray-water dispersal area	50	50	100	N		
LC1	Large capacity cesspools (Class V well - illegal)[2]	75	75	150	N		
MVW	Motor vehicle waste disposal (Class V well - illegal)[2]	illegal	illegal		N		

PWS ID / FACILITY ID	1020017 S22	UNIQUE WELL NO.	474384

PCSI CODE	ACTUAL OR POTENTIAL CONTAMINATION SOURCE	ISOLATION DISTANCES (FEET)				LOCATION	
		Minimum Distances		Sensitive Well[1]	Within 200 Ft. Y / N / U	Dist. from Well	Est. (?)
		Community	Non-community				
PR1	Privy, nonportable	50	50	100	N		
PR2	Portable (privy) or toilet	50	20		N		
*SF1	Watertight sand filter; peat filter; or constructed wetland	50	50		N		
SET	Septic tank	50	50		N		
HTK	Sewage holding tank, watertight	50	50		N		
SS1	Sewage sump capacity 100 gal. or more	50	50		N		
SS2	Sewage sump capacity less than 100 gal., tested, conforming to rule	50	20		N		
*ST1	Sewage treatment device, watertight	50	50		N		
SB1	Sewer, buried, approved materials, tested, serving one building, or two or less single-family residences	50	20		N		
SB2	Sewer, buried, collector, municipal, serving a facility handling infectious or pathological wastes, open-jointed or unapproved materials	50	50		N		
*WB1	Water treatment backwash holding basin, reclaim basin, or surge tank with a direct sewer connection	50	50		N		
*WB2	Water treatment backwash holding basin, reclaim basin, or surge tank with a backflow protected sewer connection	20	20		N		
Land Application							
SPT	Land spreading area for sewage, septage, or sludge	50	50	100	N		
Solid Waste Related							
COS	Commercial compost site	50	50		N		
CD1	Construction or demolition debris disposal area	50	50	100	N		
*HW1	Household solid waste disposal area, single residence	50	50	100	N		
LF1	Landfill, permitted demolition debris, dump, or mixed municipal solid waste from multiple persons	300	300	600	N		
SVY	Scrap yard	50	50		N		
SWT	Solid waste transfer station	50	50		N		
Storm Water Related							
SD1	Storm water drain pipe, 8 inches or greater in diameter	50	20		N		
SWI	Storm water drainage well[2] (Class V well - illegal[3])	50	50		N		
SM1	Storm water pond greater than 5000 gal.	50	35		N		
Wells and Borings							
*EB1	Elevator boring, not conforming to rule	50	50		N		
*EB2	Elevator boring, conforming to rule	20	20		N		
MON	Monitoring well	record dist.	record dist.		N		
WEL	Operating well	record dist.	record dist.		Y	143	
WEL	Operating well	record dist.	record dist.		Y	86	
UUW	Unused, unsealed well or boring	50	50		N		
General							
*CR1	Cistern or reservoir, buried, nonpressurized water supply	20	20		N		
PLM	Contaminant plume	50	50		N		
*CW1	Cooling water pond, industrial	50	50	100	N		
DC1	Deicing chemicals, bulk road	50	50	100	N		
*ET1	Electrical transformer storage area, oil-filled	50	50		N		
GRV	Grave or mausoleum	50	50		N		
GP1	Gravel pocket or French drain for clear water drainage only	20	20		N		
*HS1	Hazardous substance buried piping	50	50		N		
HS2	Hazardous substance tank or container, above ground or underground, 56 gal. or more, or 100 lbs. or more dry weight, without safeguards	150	150		N		
HS3	Hazardous substance tank or container, above ground or underground, 56 gal. or more, or 100 lbs. or more dry weight with safeguards	100	100		Y	123	N**
HS4	Hazardous substance multiple storage tanks or containers for residential retail sale or use, no single tank or container exceeding 56 gal. or 100 lbs., but aggregate volume exceeding	50	50		N		
HWF	Highest water or flood level	50	N/A		N		
*HG1	Horizontal ground source closed loop heat exchanger buried piping	50	50		N		
*HG2	Horizontal ground source closed loop heat exchanger buried piping and horizontal piping, approved materials and heat transfer fluid	50	10		N		
IWD	Industrial waste disposal well (Class V well)[2]	illegal[3]	illegal[3]		N		
IWS	Interceptor, including a flammable waste or sediment	50	50		N		
OH1	Ordinary high water level of a stream, river, pond, lake, reservoir, or drainage ditch (holds water six months or more)	50	35		N		
*PP1	Petroleum buried piping	50	50		N		

PWS ID / FACILITY ID	1020017 S22	UNIQUE WELL NO.	474384

PCSI CODE	ACTUAL OR POTENTIAL CONTAMINATION SOURCE	ISOLATION DISTANCES (FEET)				LOCATION	
		Minimum Distances		Sensitive Well[1]	Within 200 Ft. Y / N / U	Dist. from Well	Est. (?)
		Community	Non-community				
*PP2	Petroleum or crude oil pipeline to a refinery or distribution center	100	100		N		
PT1	Petroleum tank or container, 1100 gal. or more, without safeguards	150	150		N		
PT2	Petroleum tank or container, 1100 gal. or more, with safeguards	100	100		N		
PT3	Petroleum tank or container, buried, between 56 and 1100 gal.	50	50		N		
PT4	Petroleum tank or container, not buried, between 56 and 1100 gal.	50[5]	20		N		
PU1	Pit or unfilled space more than four feet in depth	20	20		N		
PC1	Pollutant or contaminant that may drain into the soil	50	50	100	N		
SP1	Swimming pool, in-ground	20	20		N		
*VH1	Vertical heat exchanger, horizontal piping conforming to rule	50	10		N		
*VH2	Vertical heat exchanger (vertical) piping, conforming to rule	50	35		N		
*WR1	Wastewater rapid infiltration basin, municipal or industrial	300	300	600	N		
*WA1	Wastewater spray irrigation area, municipal or industrial	150	150	300	N		
*WS1	Wastewater stabilization pond, industrial	150	150	300	N		
*WS2	Wastewater stabilization pond, municipal, 500 or more gal./acre/day of leakage	300	300	600	N		
*WS3	Wastewater stabilization pond, municipal, less than 500 gal./acre/day of leakage	150	150	300	N		
*WT1	Wastewater treatment unit tanks, vessels and components (Package plant)	100	100		N		
*WT2	Water treatment backwash disposal area	50	50	100	N		
Additional Sources (If there is more than one source listed above, please indicate here).							
Potential Contamination Sources and Codes Based on Previous Versions of this Form							
	none found within 200' of this well.						

* New potential contaminant source.

** This number is the estimated distance that this potential source is from this well even though it was identified during an inventory for an adjacent well.

[1] A sensitive well has less than 50 feet of watertight casing, and which is not cased below a confining layer or confining materials of at least 10' in thickness.

[2] These sources, known as Class V underground injection wells, are regulated by the federal U.S. Environmental Protection Agency.

[3] These sources are classified as illegal by Minnesota Rules, Chapter 4725.

[4] Isolation distance is determined by average flow per day or if a facility handles infectious or pathological wastes.

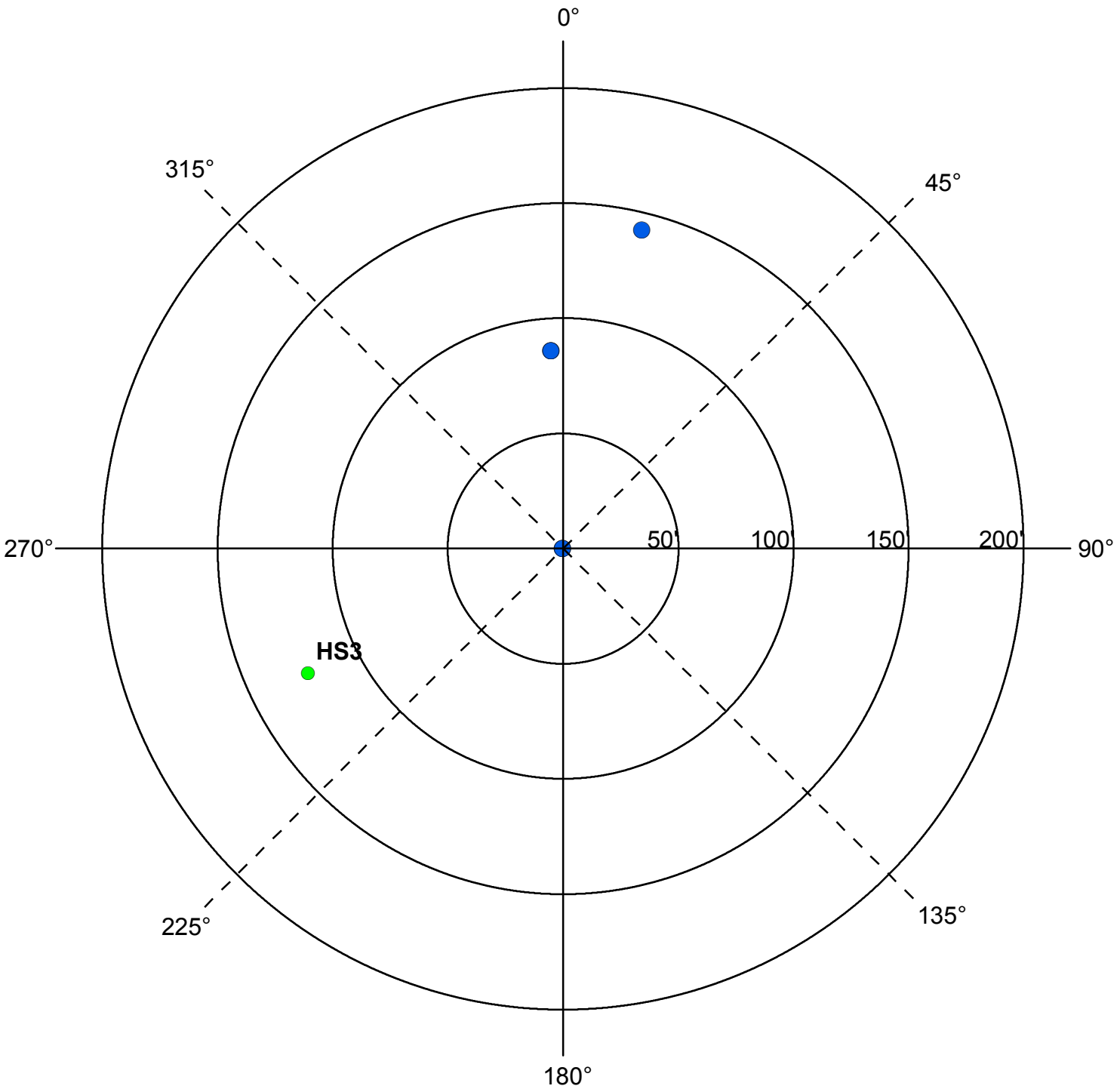
[5] A community public water-supply well must be a minimum of 50 feet from a petroleum tank or container, unless the tank or container is used for emergency pumping and is located in a room or building separate from the community well; and is of double-wall construction with leak detection between walls; or is protected with secondary containment.

This form is based on the new isolation distances in Minnesota Rules, Chapter 4725, related to wells and borings adopted August 4, 2008, and Minnesota Rules, Chapter 4720, related to wellhead protection.

PWS ID / FACILITY ID	1020017 S22	UNIQUE WELL NO.	474384

SETBACK DISTANCES	All potential contaminant sources must be noted on sketch.

Record the distance and approximate compass bearing of each potential contaminant source from the well, and identify the source using the "Source Code". Unlabeled points on the map are unsealed wells.



	Y	N	N/A
Were the isolation distances maintained for the new sources of contamination?			
Is the system monitoring existing nonconforming sources of contamination?			

Reminder Question: Were the wellhead protection measure(s) implemented?

INSPECTOR	Neiman, Dave	DATE	6 - 3 - 2016

PWS ID / FACILITY ID	1020017 S22	UNIQUE WELL NO.	474384

RECOMMENDED WELLHEAD PROTECTION (WHP) MEASURES	WHP MEASURE IMPLEMENTED? Y or N	DATE VERIFIED

COMMENTS

For further information, please contact:

Minnesota Department of Health
Drinking Water Protection Section
Source Water Protection Unit
P.O. Box 64975
St. Paul, Minnesota 55164-0975

Section Receptionist: 651-201-4700
Division TDD: 651-201-5797 or MN Relay Service @ 1-800-627-3529 and ask for 651-201-5000

Environmental Health Division
Drinking Water Protection Section
P.O. Box 64975
St. Paul, Minnesota 55164-0975

INNER WELLHEAD MANAGEMENT ZONE (IWMZ) - POTENTIAL CONTAMINANT SOURCE INVENTORY (PCSI) REPORT

PUBLIC WATER SYSTEM INFORMATION

PWS ID	1020017	**COMMUNITY**
NAME	Coon Rapids	
ADDRESS	Kory Jorgensen Utilities Supervisor, Public Works Garage, 1831 111th Avenue, Coon Rapids, MN 554333761	

FACILITY (WELL) INFORMATION

NAME	Well #22	**IS THERE A WELL LOG OR ADDITIONAL CONSTRUCTION INFORMATION AVAILABLE?**
FACILITY ID	S23	☐ **YES** (Please attach a copy)
UNIQUE WELL NO.	474385	☐ **NO** ☐ **UNDETERMINED**
COUNTY	Anoka	

PWS ID / FACILITY ID	1020017 S23	**UNIQUE WELL NO.**	474385

PCSI CODE	ACTUAL OR POTENTIAL CONTAMINATION SOURCE	ISOLATION DISTANCES (FEET)				LOCATION	
		Minimum Distances		Sensitive Well[1]	Within 200 Ft. Y / N / U	Dist. from Well	Est. (?)
		Community	Non-community				
Agricultural Related							
*AC1	Agricultural chemical buried piping	50	50		N		
*AC2	Agricultural chemical multiple tanks or containers for residential retail sale or use, no single tank or container exceeding, but aggregate volume exceeding 56 gal. or 100 lbs. dry weight	50	50		N		
ACP	Agricultural chemical tank or container with 25 gal. or more or 100 lbs. or more dry weight, or equipment filling or cleaning area without safeguards	150	150		N		
ACS	Agricultural chemical storage or equipment filling or cleaning area with safeguards	100	100		N		
ACR	Agricultural chemical storage or equipment filling or cleaning area with safeguards and roofed	50	50		N		
ADW	Agricultural drainage well[2] (Class V well - illegal[3])	50	50		N		
AAT	Anhydrous ammonia tank (stationary tank)	50	50		N		
AB1	Animal building, feedlot, confinement area, or kennel, 0.1 to 1.0 animal unit (stockyard)	50	20	100/40	N		
AB2	Animal building or poultry building, including a horse riding area, more than 1.0 animal unit	50	50	100	N		
ABS	Animal burial area, more than 1.0 animal unit	50	50		N		
FWP	Animal feeding or watering area within a pasture, more than 1.0 animal unit	50	50	100	N		
AF1	Animal feedlot, unroofed, 300 or more animal units (stockyard)	100	100	200	N		
AF2	Animal feedlot, more than 1.0, but less than 300 animal units (stockyard)	50	50	100	N		
AMA	Animal manure application	use discretion	use discretion		N		
REN	Animal rendering plant	50	50		N		
MS1	Manure (liquid) storage basin or lagoon, unpermitted or noncertified	300	300	600	N		
MS2	Manure (liquid) storage basin or lagoon, approved earthen liner	150	150	300	N		
MS3	Manure (liquid) storage basin or lagoon, approved concrete or composite liner	100	100	200	N		
MS4	Manure (solid) storage area, not covered with a roof	100	100	200	N		
OSC	Open storage for crops	use discretion	use discretion		N		
SSTS Related							
AA1	Absorption area of a soil dispersal system, average flow greater than 10,000 gal./day	300	300	600	N		
AA2	Absorption area of a soil dispersal system serving a facility handling infectious or pathological wastes, average flow 10,000 gal./day or less	150	150	300	N		
AA3	Absorption area of a soil dispersal system, average flow 10,000 gal./day or less	50	50	100	N		
AA4	Absorption area of a soil dispersal system serving multiple family residences or a non-residential facility and has the capacity to serve 20 or more persons per day (Class V well)[2]	50/300/150[4]	50/300/150[4]	100/600/300[4]	N		
CSP	Cesspool	75	75	150	N		
AGG	Dry well, leaching pit, seepage pit	75	75	150	N		
*FD1	Floor drain, grate, or trough connected to a buried sewer	50	50		N		
*FD2	Floor drain, grate, or trough if buried sewer is air-tested, approved materials, serving one building, or two or less single-family residences	50	20		N		
*GW1	Gray-water dispersal area	50	50	100	N		
LC1	Large capacity cesspools (Class V well - illegal)[2]	75	75	150	N		
MVW	Motor vehicle waste disposal (Class V well - illegal)[2]	illegal	illegal		N		

PWS ID / FACILITY ID	1020017 S23	UNIQUE WELL NO.	474385

PCSI CODE	ACTUAL OR POTENTIAL CONTAMINATION SOURCE	ISOLATION DISTANCES (FEET)				LOCATION	
		Minimum Distances		Sensitive Well[1]	Within 200 Ft. Y / N / U	Dist. from Well	Est. (?)
		Community	Non-community				
PR1	Privy, nonportable	50	50	100	N		
PR2	Portable (privy) or toilet	50	20		N		
*SF1	Watertight sand filter; peat filter; or constructed wetland	50	50		N		
SET	Septic tank	50	50		N		
HTK	Sewage holding tank, watertight	50	50		N		
SS1	Sewage sump capacity 100 gal. or more	50	50		N		
SS2	Sewage sump capacity less than 100 gal., tested, conforming to rule	50	20		N		
*ST1	Sewage treatment device, watertight	50	50		N		
SB1	Sewer, buried, approved materials, tested, serving one building, or two or less single-family residences	50	20		N		
SB2	Sewer, buried, collector, municipal, serving a facility handling infectious or pathological wastes, open-jointed or unapproved materials	50	50		Y	170	N
*WB1	Water treatment backwash holding basin, reclaim basin, or surge tank with a direct sewer connection	50	50		N		
*WB2	Water treatment backwash holding basin, reclaim basin, or surge tank with a backflow protected sewer connection	20	20		N		
Land Application							
SPT	Land spreading area for sewage, septage, or sludge	50	50	100	N		
Solid Waste Related							
COS	Commercial compost site	50	50		N		
CD1	Construction or demolition debris disposal area	50	50	100	N		
*HW1	Household solid waste disposal area, single residence	50	50	100	N		
LF1	Landfill, permitted demolition debris, dump, or mixed municipal solid waste from multiple persons	300	300	600	N		
SVY	Scrap yard	50	50		N		
SWT	Solid waste transfer station	50	50		N		
Storm Water Related							
SD1	Storm water drain pipe, 8 inches or greater in diameter	50	20		N		
SWI	Storm water drainage well[2] (Class V well - illegal[3])	50	50		N		
SM1	Storm water pond greater than 5000 gal.	50	35		N		
Wells and Borings							
*EB1	Elevator boring, not conforming to rule	50	50		N		
*EB2	Elevator boring, conforming to rule	20	20		N		
MON	Monitoring well	record dist.	record dist.		N		
WEL	Operating well	record dist.	record dist.		Y	182	
UUW	Unused, unsealed well or boring	50	50		N		
General							
*CR1	Cistern or reservoir, buried, nonpressurized water supply	20	20		N		
PLM	Contaminant plume	50	50		N		
*CW1	Cooling water pond, industrial	50	50	100	N		
DC1	Deicing chemicals, bulk road	50	50	100	N		
*ET1	Electrical transformer storage area, oil-filled	50	50		N		
GRV	Grave or mausoleum	50	50		N		
GP1	Gravel pocket or French drain for clear water drainage only	20	20		N		
*HS1	Hazardous substance buried piping	50	50		N		
HS2	Hazardous substance tank or container, above ground or underground, 56 gal. or more, or 100 lbs. or more dry weight, without safeguards	150	150		N		
HS3	Hazardous substance tank or container, above ground or underground, 56 gal. or more, or 100 lbs. or more dry weight with safeguards	100	100		N		
HS4	Hazardous substance multiple storage tanks or containers for residential retail sale or use, no single tank or container exceeding 56 gal. or 100 lbs., but aggregate volume exceeding	50	50		N		
HWF	Highest water or flood level	50	N/A		N		
*HG1	Horizontal ground source closed loop heat exchanger buried piping	50	50		N		
*HG2	Horizontal ground source closed loop heat exchanger buried piping and horizontal piping, approved materials and heat transfer fluid	50	10		N		
IWD	Industrial waste disposal well (Class V well)[2]	illegal[3]	illegal[3]		N		
IWS	Interceptor, including a flammable waste or sediment	50	50		N		
OH1	Ordinary high water level of a stream, river, pond, lake, reservoir, or drainage ditch (holds water six months or more)	50	35		N		
*PP1	Petroleum buried piping	50	50		N		
*PP2	Petroleum or crude oil pipeline to a refinery or distribution center	100	100		N		

PWS ID / FACILITY ID	1020017 S23	UNIQUE WELL NO.	474385

PCSI CODE	ACTUAL OR POTENTIAL CONTAMINATION SOURCE	ISOLATION DISTANCES (FEET)				LOCATION	
		Minimum Distances		Sensitive Well[1]	Within 200 Ft. Y / N / U	Dist. from Well	Est. (?)
		Community	Non-community				
PT1	Petroleum tank or container, 1100 gal. or more, without safeguards	150	150		N		
PT2	Petroleum tank or container, 1100 gal. or more, with safeguards	100	100		N		
PT3	Petroleum tank or container, buried, between 56 and 1100 gal.	50	50		N		
PT4	Petroleum tank or container, not buried, between 56 and 1100 gal.	50[5]	20		N		
PU1	Pit or unfilled space more than four feet in depth	20	20		N		
PC1	Pollutant or contaminant that may drain into the soil	50	50	100	N		
SP1	Swimming pool, in-ground	20	20		N		
*VH1	Vertical heat exchanger, horizontal piping conforming to rule	50	10		N		
*VH2	Vertical heat exchanger (vertical) piping, conforming to rule	50	35		N		
*WR1	Wastewater rapid infiltration basin, municipal or industrial	300	300	600	N		
*WA1	Wastewater spray irrigation area, municipal or industrial	150	150	300	N		
*WS1	Wastewater stabilization pond, industrial	150	150	300	N		
*WS2	Wastewater stabilization pond, municipal, 500 or more gal./acre/day of leakage	300	300	600	N		
*WS3	Wastewater stabilization pond, municipal, less than 500 gal./acre/day of leakage	150	150	300	N		
*WT1	Wastewater treatment unit tanks, vessels and components (Package plant)	100	100		N		
*WT2	Water treatment backwash disposal area	50	50	100	N		
Additional Sources (If there is more than one source listed above, please indicate here).							
Potential Contamination Sources and Codes Based on Previous Versions of this Form							
	none found within 200' of this well.						

* New potential contaminant source.

[1] A sensitive well has less than 50 feet of watertight casing, and which is not cased below a confining layer or confining materials of at least 10' in thickness.

[2] These sources, known as Class V underground injection wells, are regulated by the federal U.S. Environmental Protection Agency.

[3] These sources are classified as illegal by Minnesota Rules, Chapter 4725.

[4] Isolation distance is determined by average flow per day or if a facility handles infectious or pathological wastes.

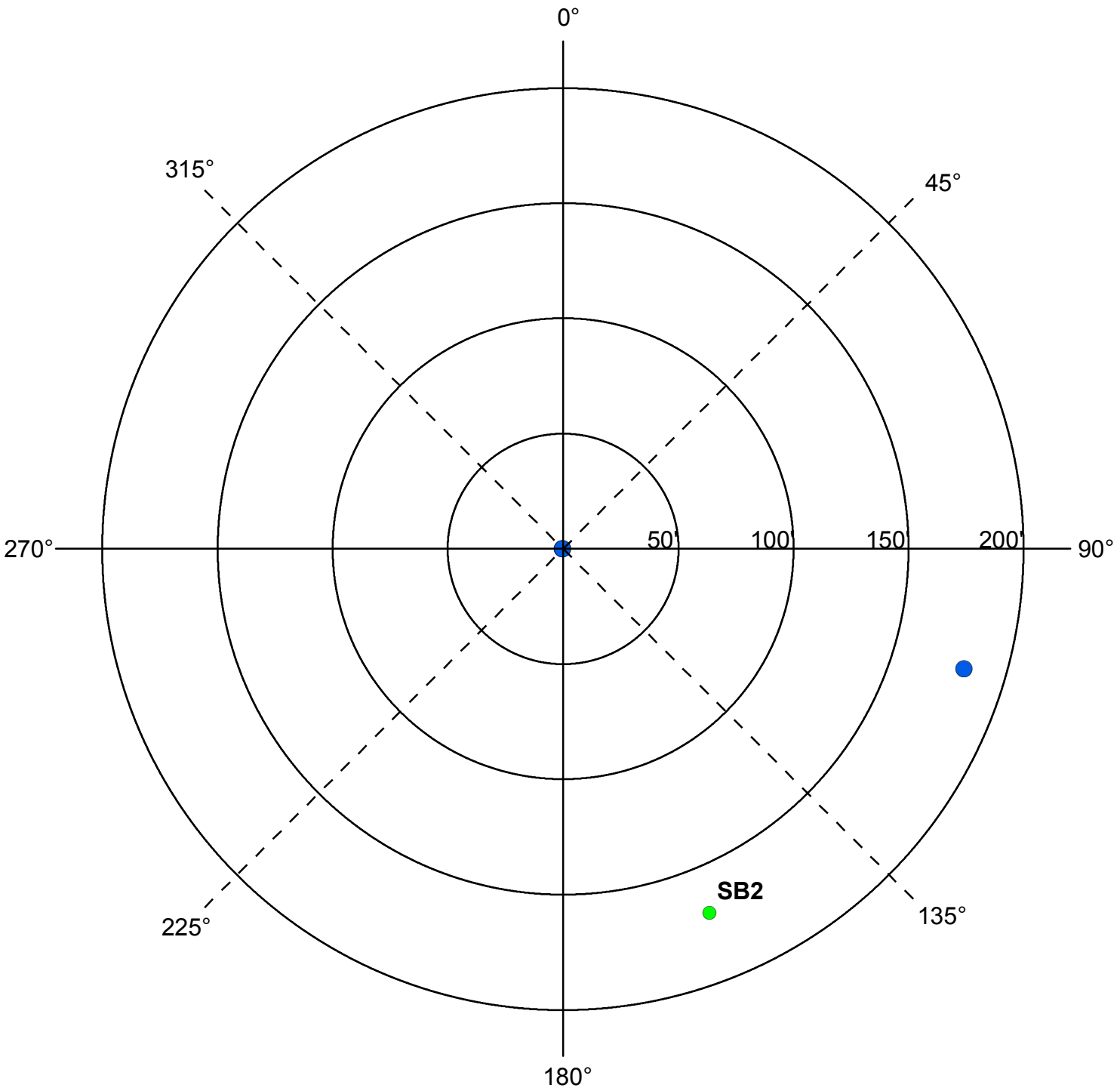
[5] A community public water-supply well must be a minimum of 50 feet from a petroleum tank or container, unless the tank or container is used for emergency pumping and is located in a room or building separate from the community well; and is of double-wall construction with leak detection between walls; or is protected with secondary containment.

This form is based on the new isolation distances in Minnesota Rules, Chapter 4725, related to wells and borings adopted August 4, 2008, and Minnesota Rules, Chapter 4720, related to wellhead protection.

PWS ID / FACILITY ID	1020017 S23	UNIQUE WELL NO.	474385

SETBACK DISTANCES	All potential contaminant sources must be noted on sketch.

Record the distance and approximate compass bearing of each potential contaminant source from the well, and identify the source using the "Source Code". Unlabeled points on the map are unsealed wells.



	Y	N	N/A
Were the isolation distances maintained for the new sources of contamination?			
Is the system monitoring existing nonconforming sources of contamination?			

Reminder Question: Were the wellhead protection measure(s) implemented?

INSPECTOR	Neiman, Dave	DATE	6 - 3 - 2016

PWS ID / FACILITY ID	1020017 S23	UNIQUE WELL NO.	474385

RECOMMENDED WELLHEAD PROTECTION (WHP) MEASURES	WHP MEASURE IMPLEMENTED? Y or N	DATE VERIFIED

COMMENTS

For further information, please contact:

Minnesota Department of Health
Drinking Water Protection Section
Source Water Protection Unit
P.O. Box 64975
St. Paul, Minnesota 55164-0975

Section Receptionist: 651-201-4700
Division TDD: 651-201-5797 or MN Relay Service @ 1-800-627-3529 and ask for 651-201-5000

Environmental Health Division
Drinking Water Protection Section
P.O. Box 64975
St. Paul, Minnesota 55164-0975

INNER WELLHEAD MANAGEMENT ZONE (IWMZ) - POTENTIAL CONTAMINANT SOURCE INVENTORY (PCSI) REPORT

PUBLIC WATER SYSTEM INFORMATION

PWS ID	1020017	**COMMUNITY**
NAME	Coon Rapids	
ADDRESS	Kory Jorgensen Utilities Supervisor, Public Works Garage, 1831 111th Avenue, Coon Rapids, MN 554333761	

FACILITY (WELL) INFORMATION

NAME	Well #23	**IS THERE A WELL LOG OR ADDITIONAL CONSTRUCTION INFORMATION AVAILABLE?**
FACILITY ID	S24	☐ **YES** (Please attach a copy)
UNIQUE WELL NO.	463020	☐ **NO** ☐ **UNDETERMINED**
COUNTY	Anoka	

PWS ID / FACILITY ID	1020017 S24	**UNIQUE WELL NO.**	463020

PCSI CODE	ACTUAL OR POTENTIAL CONTAMINATION SOURCE	ISOLATION DISTANCES (FEET)				LOCATION	
		Minimum Distances		Sensitive Well[1]	Within 200 Ft. Y / N / U	Dist. from Well	Est. (?)
		Community	Non-community				
Agricultural Related							
*AC1	Agricultural chemical buried piping	50	50		N		
*AC2	Agricultural chemical multiple tanks or containers for residential retail sale or use, no single tank or container exceeding, but aggregate volume exceeding 56 gal. or 100 lbs. dry weight	50	50		N		
ACP	Agricultural chemical tank or container with 25 gal. or more or 100 lbs. or more dry weight, or equipment filling or cleaning area without safeguards	150	150		N		
ACS	Agricultural chemical storage or equipment filling or cleaning area with safeguards	100	100		N		
ACR	Agricultural chemical storage or equipment filling or cleaning area with safeguards and roofed	50	50		N		
ADW	Agricultural drainage well[2] (Class V well - illegal[3])	50	50		N		
AAT	Anhydrous ammonia tank (stationary tank)	50	50		N		
AB1	Animal building, feedlot, confinement area, or kennel, 0.1 to 1.0 animal unit (stockyard)	50	20	100/40	N		
AB2	Animal building or poultry building, including a horse riding area, more than 1.0 animal unit	50	50	100	N		
ABS	Animal burial area, more than 1.0 animal unit	50	50		N		
FWP	Animal feeding or watering area within a pasture, more than 1.0 animal unit	50	50	100	N		
AF1	Animal feedlot, unroofed, 300 or more animal units (stockyard)	100	100	200	N		
AF2	Animal feedlot, more than 1.0, but less than 300 animal units (stockyard)	50	50	100	N		
AMA	Animal manure application	use discretion	use discretion		N		
REN	Animal rendering plant	50	50		N		
MS1	Manure (liquid) storage basin or lagoon, unpermitted or noncertified	300	300	600	N		
MS2	Manure (liquid) storage basin or lagoon, approved earthen liner	150	150	300	N		
MS3	Manure (liquid) storage basin or lagoon, approved concrete or composite liner	100	100	200	N		
MS4	Manure (solid) storage area, not covered with a roof	100	100	200	N		
OSC	Open storage for crops	use discretion	use discretion		N		
SSTS Related							
AA1	Absorption area of a soil dispersal system, average flow greater than 10,000 gal./day	300	300	600	N		
AA2	Absorption area of a soil dispersal system serving a facility handling infectious or pathological wastes, average flow 10,000 gal./day or less	150	150	300	N		
AA3	Absorption area of a soil dispersal system, average flow 10,000 gal./day or less	50	50	100	N		
AA4	Absorption area of a soil dispersal system serving multiple family residences or a non-residential facility and has the capacity to serve 20 or more persons per day (Class V well)[2]	50/300/150[4]	50/300/150[4]	100/600/300[4]	N		
CSP	Cesspool	75	75	150	N		
AGG	Dry well, leaching pit, seepage pit	75	75	150	N		
*FD1	Floor drain, grate, or trough connected to a buried sewer	50	50		N		
*FD2	Floor drain, grate, or trough if buried sewer is air-tested, approved materials, serving one building, or two or less single-family residences	50	20		N		
*GW1	Gray-water dispersal area	50	50	100	N		
LC1	Large capacity cesspools (Class V well - illegal)[2]	75	75	150	N		
MVW	Motor vehicle waste disposal (Class V well - illegal)[2]	illegal	illegal		N		

PWS ID / FACILITY ID	1020017 S24	UNIQUE WELL NO.	463020

PCSI CODE	ACTUAL OR POTENTIAL CONTAMINATION SOURCE	ISOLATION DISTANCES (FEET)				LOCATION	
		Minimum Distances		Sensitive Well[1]	Within 200 Ft. Y / N / U	Dist. from Well	Est. (?)
		Community	Non-community				
PR1	Privy, nonportable	50	50	100	N		
PR2	Portable (privy) or toilet	50	20		N		
*SF1	Watertight sand filter; peat filter; or constructed wetland	50	50		N		
SET	Septic tank	50	50		N		
HTK	Sewage holding tank, watertight	50	50		N		
SS1	Sewage sump capacity 100 gal. or more	50	50		N		
SS2	Sewage sump capacity less than 100 gal., tested, conforming to rule	50	20		N		
*ST1	Sewage treatment device, watertight	50	50		N		
SB1	Sewer, buried, approved materials, tested, serving one building, or two or less single-family residences	50	20		N		
SB2	Sewer, buried, collector, municipal, serving a facility handling infectious or pathological wastes, open-jointed or unapproved materials	50	50		Y	75	N
SB2	Sewer, buried, collector, municipal, serving a facility handling infectious or pathological wastes, open-jointed or unapproved materials	50	50		Y	50	N
*WB1	Water treatment backwash holding basin, reclaim basin, or surge tank with a direct sewer connection	50	50		N		
*WB2	Water treatment backwash holding basin, reclaim basin, or surge tank with a backflow protected sewer connection	20	20		N		
Land Application							
SPT	Land spreading area for sewage, septage, or sludge	50	50	100	N		
Solid Waste Related							
COS	Commercial compost site	50	50		N		
CD1	Construction or demolition debris disposal area	50	50	100	N		
*HW1	Household solid waste disposal area, single residence	50	50	100	N		
LF1	Landfill, permitted demolition debris, dump, or mixed municipal solid waste from multiple persons	300	300	600	N		
SVY	Scrap yard	50	50		N		
SWT	Solid waste transfer station	50	50		N		
Storm Water Related							
SD1	Storm water drain pipe, 8 inches or greater in diameter	50	20		N		
SWI	Storm water drainage well[2] (Class V well - illegal[3])	50	50		N		
SM1	Storm water pond greater than 5000 gal.	50	35		N		
Wells and Borings							
*EB1	Elevator boring, not conforming to rule	50	50		N		
*EB2	Elevator boring, conforming to rule	20	20		N		
MON	Monitoring well	record dist.	record dist.		N		
WEL	Operating well	record dist.	record dist.		N		
UUW	Unused, unsealed well or boring	50	50		N		
General							
*CR1	Cistern or reservoir, buried, nonpressurized water supply	20	20		N		
PLM	Contaminant plume	50	50		N		
*CW1	Cooling water pond, industrial	50	50	100	N		
DC1	Deicing chemicals, bulk road	50	50	100	N		
*ET1	Electrical transformer storage area, oil-filled	50	50		N		
GRV	Grave or mausoleum	50	50		N		
GP1	Gravel pocket or French drain for clear water drainage only	20	20		N		
*HS1	Hazardous substance buried piping	50	50		N		
HS2	Hazardous substance tank or container, above ground or underground, 56 gal. or more, or 100 lbs. or more dry weight, without safeguards	150	150		N		
HS3	Hazardous substance tank or container, above ground or underground, 56 gal. or more, or 100 lbs. or more dry weight with safeguards	100	100		N		
HS4	Hazardous substance multiple storage tanks or containers for residential retail sale or use, no single tank or container exceeding 56 gal. or 100 lbs., but aggregate volume exceeding	50	50		N		
HWF	Highest water or flood level	50	N/A		N		
*HG1	Horizontal ground source closed loop heat exchanger buried piping	50	50		N		
*HG2	Horizontal ground source closed loop heat exchanger buried piping and horizontal piping, approved materials and heat transfer fluid	50	10		N		
IWD	Industrial waste disposal well (Class V well)[2]	illegal[3]	illegal[3]		N		
IWS	Interceptor, including a flammable waste or sediment	50	50		N		
OH1	Ordinary high water level of a stream, river, pond, lake, reservoir, or drainage ditch (holds water six months or more)	50	35		N		

PWS ID / FACILITY ID	1020017 S24	UNIQUE WELL NO.	463020

PCSI CODE	ACTUAL OR POTENTIAL CONTAMINATION SOURCE	ISOLATION DISTANCES (FEET)				LOCATION	
		Minimum Distances		Sensitive Well[1]	Within 200 Ft. Y / N / U	Dist. from Well	Est. (?)
		Community	Non-community				
*PP1	Petroleum buried piping	50	50		N		
*PP2	Petroleum or crude oil pipeline to a refinery or distribution center	100	100		N		
PT1	Petroleum tank or container, 1100 gal. or more, without safeguards	150	150		N		
PT2	Petroleum tank or container, 1100 gal. or more, with safeguards	100	100		N		
PT3	Petroleum tank or container, buried, between 56 and 1100 gal.	50	50		N		
PT4	Petroleum tank or container, not buried, between 56 and 1100 gal.	50[5]	20		N		
PU1	Pit or unfilled space more than four feet in depth	20	20		N		
PC1	Pollutant or contaminant that may drain into the soil	50	50	100	N		
SP1	Swimming pool, in-ground	20	20		N		
*VH1	Vertical heat exchanger, horizontal piping conforming to rule	50	10		N		
*VH2	Vertical heat exchanger (vertical) piping, conforming to rule	50	35		N		
*WR1	Wastewater rapid infiltration basin, municipal or industrial	300	300	600	N		
*WA1	Wastewater spray irrigation area, municipal or industrial	150	150	300	N		
*WS1	Wastewater stabilization pond, industrial	150	150	300	N		
*WS2	Wastewater stabilization pond, municipal, 500 or more gal./acre/day of leakage	300	300	600	N		
*WS3	Wastewater stabilization pond, municipal, less than 500 gal./acre/day of leakage	150	150	300	N		
*WT1	Wastewater treatment unit tanks, vessels and components (Package plant)	100	100		N		
*WT2	Water treatment backwash disposal area	50	50	100	N		
Additional Sources (If there is more than one source listed above, please indicate here).							
Potential Contamination Sources and Codes Based on Previous Versions of this Form							
	none found within 200' of this well.						

* New potential contaminant source.

[1] A sensitive well has less than 50 feet of watertight casing, and which is not cased below a confining layer or confining materials of at least 10' in thickness.

[2] These sources, known as Class V underground injection wells, are regulated by the federal U.S. Environmental Protection Agency.

[3] These sources are classified as illegal by Minnesota Rules, Chapter 4725.

[4] Isolation distance is determined by average flow per day or if a facility handles infectious or pathological wastes.

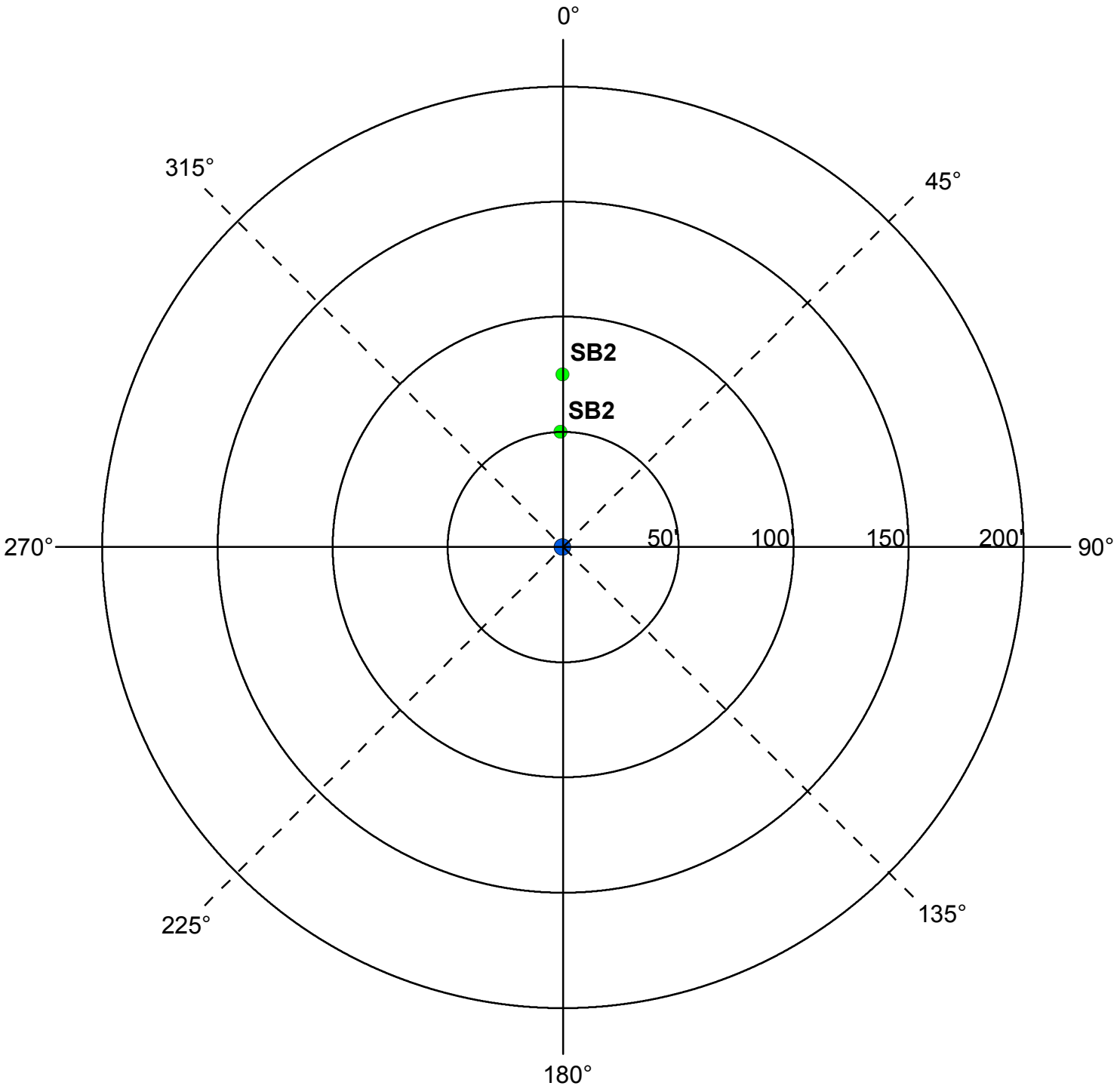
[5] A community public water-supply well must be a minimum of 50 feet from a petroleum tank or container, unless the tank or container is used for emergency pumping and is located in a room or building separate from the community well; and is of double-wall construction with leak detection between walls; or is protected with secondary containment.

This form is based on the new isolation distances in Minnesota Rules, Chapter 4725, related to wells and borings adopted August 4, 2008, and Minnesota Rules, Chapter 4720, related to wellhead protection.

PWS ID / FACILITY ID	1020017 S24	UNIQUE WELL NO.	463020

SETBACK DISTANCES	All potential contaminant sources must be noted on sketch.

Record the distance and approximate compass bearing of each potential contaminant source from the well, and identify the source using the "Source Code". Unlabeled points on the map are unsealed wells.



	Y	N	N/A
Were the isolation distances maintained for the new sources of contamination?			
Is the system monitoring existing nonconforming sources of contamination?			

Reminder Question: Were the wellhead protection measure(s) implemented?

INSPECTOR	Neiman, Dave	DATE	6 - 3 - 2016

PWS ID / FACILITY ID	1020017 S24	UNIQUE WELL NO.	463020

RECOMMENDED WELLHEAD PROTECTION (WHP) MEASURES	WHP MEASURE IMPLEMENTED? Y or N	DATE VERIFIED

COMMENTS

For further information, please contact:

Minnesota Department of Health
Drinking Water Protection Section
Source Water Protection Unit
P.O. Box 64975
St. Paul, Minnesota 55164-0975

Section Receptionist: 651-201-4700
Division TDD: 651-201-5797 or MN Relay Service @ 1-800-627-3529 and ask for 651-201-5000

Environmental Health Division
Drinking Water Protection Section
P.O. Box 64975
St. Paul, Minnesota 55164-0975

INNER WELLHEAD MANAGEMENT ZONE (IWMZ) - POTENTIAL CONTAMINANT SOURCE INVENTORY (PCSI) REPORT

PUBLIC WATER SYSTEM INFORMATION

PWS ID	1020017	**COMMUNITY**
NAME	Coon Rapids	
ADDRESS	Kory Jorgensen Utilities Supervisor, Public Works Garage, 1831 111th Avenue, Coon Rapids, MN 554333761	

FACILITY (WELL) INFORMATION

NAME	Well #24	**IS THERE A WELL LOG OR ADDITIONAL CONSTRUCTION INFORMATION AVAILABLE?**
FACILITY ID	S27	☐ **YES** (Please attach a copy)
UNIQUE WELL NO.	674478	☐ **NO** ☐ **UNDETERMINED**
COUNTY	Anoka	

PWS ID / FACILITY ID	1020017 S27	**UNIQUE WELL NO.**	674478

PCSI CODE	ACTUAL OR POTENTIAL CONTAMINATION SOURCE	ISOLATION DISTANCES (FEET)				LOCATION	
		Minimum Distances		Sensitive Well[1]	Within 200 Ft. Y / N / U	Dist. from Well	Est. (?)
		Community	Non-community				
Agricultural Related							
*AC1	Agricultural chemical buried piping	50	50		N		
*AC2	Agricultural chemical multiple tanks or containers for residential retail sale or use, no single tank or container exceeding, but aggregate volume exceeding 56 gal. or 100 lbs. dry weight	50	50		N		
ACP	Agricultural chemical tank or container with 25 gal. or more or 100 lbs. or more dry weight, or equipment filling or cleaning area without safeguards	150	150		N		
ACS	Agricultural chemical storage or equipment filling or cleaning area with safeguards	100	100		N		
ACR	Agricultural chemical storage or equipment filling or cleaning area with safeguards and roofed	50	50		N		
ADW	Agricultural drainage well[2] (Class V well - illegal[3])	50	50		N		
AAT	Anhydrous ammonia tank (stationary tank)	50	50		N		
AB1	Animal building, feedlot, confinement area, or kennel, 0.1 to 1.0 animal unit (stockyard)	50	20	100/40	N		
AB2	Animal building or poultry building, including a horse riding area, more than 1.0 animal unit	50	50	100	N		
ABS	Animal burial area, more than 1.0 animal unit	50	50		N		
FWP	Animal feeding or watering area within a pasture, more than 1.0 animal unit	50	50	100	N		
AF1	Animal feedlot, unroofed, 300 or more animal units (stockyard)	100	100	200	N		
AF2	Animal feedlot, more than 1.0, but less than 300 animal units (stockyard)	50	50	100	N		
AMA	Animal manure application	use discretion	use discretion		N		
REN	Animal rendering plant	50	50		N		
MS1	Manure (liquid) storage basin or lagoon, unpermitted or noncertified	300	300	600	N		
MS2	Manure (liquid) storage basin or lagoon, approved earthen liner	150	150	300	N		
MS3	Manure (liquid) storage basin or lagoon, approved concrete or composite liner	100	100	200	N		
MS4	Manure (solid) storage area, not covered with a roof	100	100	200	N		
OSC	Open storage for crops	use discretion	use discretion		N		
SSTS Related							
AA1	Absorption area of a soil dispersal system, average flow greater than 10,000 gal./day	300	300	600	N		
AA2	Absorption area of a soil dispersal system serving a facility handling infectious or pathological wastes, average flow 10,000 gal./day or less	150	150	300	N		
AA3	Absorption area of a soil dispersal system, average flow 10,000 gal./day or less	50	50	100	N		
AA4	Absorption area of a soil dispersal system serving multiple family residences or a non-residential facility and has the capacity to serve 20 or more persons per day (Class V well)[2]	50/300/150[4]	50/300/150[4]	100/600/300[4]	N		
CSP	Cesspool	75	75	150	N		
AGG	Dry well, leaching pit, seepage pit	75	75	150	N		
*FD1	Floor drain, grate, or trough connected to a buried sewer	50	50		N		
*FD2	Floor drain, grate, or trough if buried sewer is air-tested, approved materials, serving one building, or two or less single-family residences	50	20		N		
*GW1	Gray-water dispersal area	50	50	100	N		
LC1	Large capacity cesspools (Class V well - illegal)[2]	75	75	150	N		
MVW	Motor vehicle waste disposal (Class V well - illegal)[2]	illegal	illegal		N		

PWS ID / FACILITY ID	1020017 S27	UNIQUE WELL NO.	674478

PCSI CODE	ACTUAL OR POTENTIAL CONTAMINATION SOURCE	ISOLATION DISTANCES (FEET)				LOCATION	
		Minimum Distances		Sensitive Well[1]	Within 200 Ft. Y / N / U	Dist. from Well	Est. (?)
		Community	Non-community				
PR1	Privy, nonportable	50	50	100	N		
PR2	Portable (privy) or toilet	50	20		N		
*SF1	Watertight sand filter; peat filter; or constructed wetland	50	50		N		
SET	Septic tank	50	50		N		
HTK	Sewage holding tank, watertight	50	50		N		
SS1	Sewage sump capacity 100 gal. or more	50	50		N		
SS2	Sewage sump capacity less than 100 gal., tested, conforming to rule	50	20		N		
*ST1	Sewage treatment device, watertight	50	50		N		
SB1	Sewer, buried, approved materials, tested, serving one building, or two or less single-family residences	50	20		N		
SB2	Sewer, buried, collector, municipal, serving a facility handling infectious or pathological wastes, open-jointed or unapproved materials	50	50		Y	85	N
SB2	Sewer, buried, collector, municipal, serving a facility handling infectious or pathological wastes, open-jointed or unapproved materials	50	50		Y	90	N
*WB1	Water treatment backwash holding basin, reclaim basin, or surge tank with a direct sewer connection	50	50		N		
*WB2	Water treatment backwash holding basin, reclaim basin, or surge tank with a backflow protected sewer connection	20	20		N		
Land Application							
SPT	Land spreading area for sewage, septage, or sludge	50	50	100	N		
Solid Waste Related							
COS	Commercial compost site	50	50		N		
CD1	Construction or demolition debris disposal area	50	50	100	N		
*HW1	Household solid waste disposal area, single residence	50	50	100	N		
LF1	Landfill, permitted demolition debris, dump, or mixed municipal solid waste from multiple persons	300	300	600	N		
SVY	Scrap yard	50	50		N		
SWT	Solid waste transfer station	50	50		N		
Storm Water Related							
SD1	Storm water drain pipe, 8 inches or greater in diameter	50	20		Y	70	N
SWI	Storm water drainage well[2] (Class V well - illegal[3])	50	50		N		
SM1	Storm water pond greater than 5000 gal.	50	35		N		
Wells and Borings							
*EB1	Elevator boring, not conforming to rule	50	50		N		
*EB2	Elevator boring, conforming to rule	20	20		N		
MON	Monitoring well	record dist.	record dist.		N		
WEL	Operating well	record dist.	record dist.		N		
UUW	Unused, unsealed well or boring	50	50		N		
General							
*CR1	Cistern or reservoir, buried, nonpressurized water supply	20	20		N		
PLM	Contaminant plume	50	50		N		
*CW1	Cooling water pond, industrial	50	50	100	N		
DC1	Deicing chemicals, bulk road	50	50	100	N		
*ET1	Electrical transformer storage area, oil-filled	50	50		N		
GRV	Grave or mausoleum	50	50		N		
GP1	Gravel pocket or French drain for clear water drainage only	20	20		N		
*HS1	Hazardous substance buried piping	50	50		N		
HS2	Hazardous substance tank or container, above ground or underground, 56 gal. or more, or 100 lbs. or more dry weight, without safeguards	150	150		N		
HS3	Hazardous substance tank or container, above ground or underground, 56 gal. or more, or 100 lbs. or more dry weight with safeguards	100	100		N		
HS4	Hazardous substance multiple storage tanks or containers for residential retail sale or use, no single tank or container exceeding 56 gal. or 100 lbs., but aggregate volume exceeding	50	50		N		
HWF	Highest water or flood level	50	N/A		N		
*HG1	Horizontal ground source closed loop heat exchanger buried piping	50	50		N		
*HG2	Horizontal ground source closed loop heat exchanger buried piping and horizontal piping, approved materials and heat transfer fluid	50	10		N		
IWD	Industrial waste disposal well (Class V well)[2]	illegal[3]	illegal[3]		N		
IWS	Interceptor, including a flammable waste or sediment	50	50		N		
OH1	Ordinary high water level of a stream, river, pond, lake, reservoir, or drainage ditch (holds water six months or more)	50	35		Y	155	N

PWS ID / FACILITY ID	1020017 S27	UNIQUE WELL NO.	674478

PCSI CODE	ACTUAL OR POTENTIAL CONTAMINATION SOURCE	ISOLATION DISTANCES (FEET)				LOCATION	
		Minimum Distances		Sensitive Well[1]	Within 200 Ft. Y / N / U	Dist. from Well	Est. (?)
		Community	Non-community				
*PP1	Petroleum buried piping	50	50		N		
*PP2	Petroleum or crude oil pipeline to a refinery or distribution center	100	100		N		
PT1	Petroleum tank or container, 1100 gal. or more, without safeguards	150	150		N		
PT2	Petroleum tank or container, 1100 gal. or more, with safeguards	100	100		N		
PT3	Petroleum tank or container, buried, between 56 and 1100 gal.	50	50		N		
PT4	Petroleum tank or container, not buried, between 56 and 1100 gal.	50[5]	20		N		
PU1	Pit or unfilled space more than four feet in depth	20	20		N		
PC1	Pollutant or contaminant that may drain into the soil	50	50	100	N		
SP1	Swimming pool, in-ground	20	20		N		
*VH1	Vertical heat exchanger, horizontal piping conforming to rule	50	10		N		
*VH2	Vertical heat exchanger (vertical) piping, conforming to rule	50	35		N		
*WR1	Wastewater rapid infiltration basin, municipal or industrial	300	300	600	N		
*WA1	Wastewater spray irrigation area, municipal or industrial	150	150	300	N		
*WS1	Wastewater stabilization pond, industrial	150	150	300	N		
*WS2	Wastewater stabilization pond, municipal, 500 or more gal./acre/day of leakage	300	300	600	N		
*WS3	Wastewater stabilization pond, municipal, less than 500 gal./acre/day of leakage	150	150	300	N		
*WT1	Wastewater treatment unit tanks, vessels and components (Package plant)	100	100		N		
*WT2	Water treatment backwash disposal area	50	50	100	N		
Additional Sources (If there is more than one source listed above, please indicate here).							
Potential Contamination Sources and Codes Based on Previous Versions of this Form							
	none found within 200' of this well.						

* New potential contaminant source.

[1] A sensitive well has less than 50 feet of watertight casing, and which is not cased below a confining layer or confining materials of at least 10' in thickness.

[2] These sources, known as Class V underground injection wells, are regulated by the federal U.S. Environmental Protection Agency.

[3] These sources are classified as illegal by Minnesota Rules, Chapter 4725.

[4] Isolation distance is determined by average flow per day or if a facility handles infectious or pathological wastes.

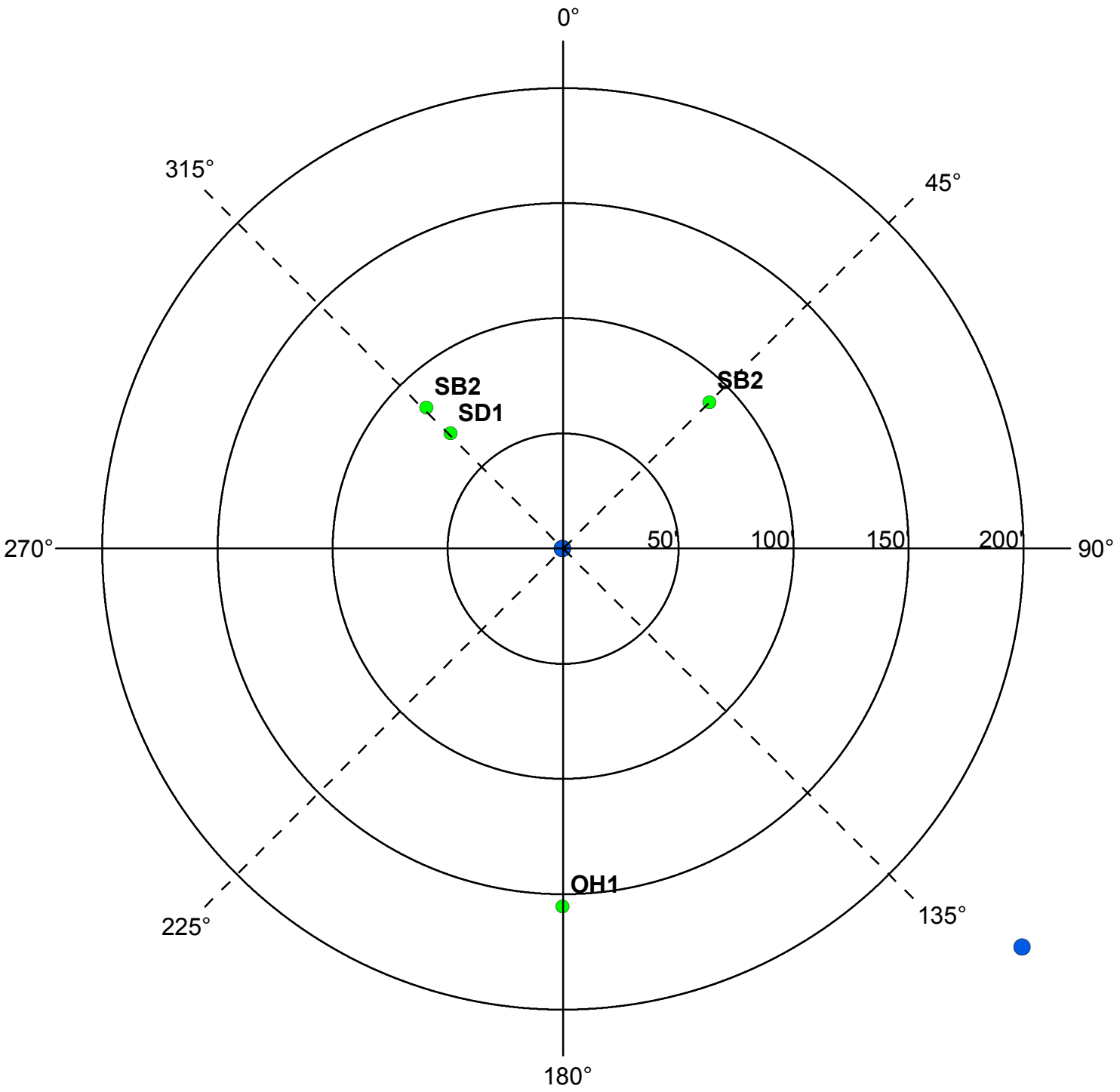
[5] A community public water-supply well must be a minimum of 50 feet from a petroleum tank or container, unless the tank or container is used for emergency pumping and is located in a room or building separate from the community well; and is of double-wall construction with leak detection between walls; or is protected with secondary containment.

This form is based on the new isolation distances in Minnesota Rules, Chapter 4725, related to wells and borings adopted August 4, 2008, and Minnesota Rules, Chapter 4720, related to wellhead protection.

PWS ID / FACILITY ID	1020017 S27	UNIQUE WELL NO.	674478

SETBACK DISTANCES	All potential contaminant sources must be noted on sketch.

Record the distance and approximate compass bearing of each potential contaminant source from the well, and identify the source using the "Source Code". Unlabeled points on the map are unsealed wells.



	Y	N	N/A
Were the isolation distances maintained for the new sources of contamination?			
Is the system monitoring existing nonconforming sources of contamination?			

Reminder Question: Were the wellhead protection measure(s) implemented?

INSPECTOR	Neiman, Dave	DATE	6 - 3 - 2016

PWS ID / FACILITY ID	1020017 S27	UNIQUE WELL NO.	674478

RECOMMENDED WELLHEAD PROTECTION (WHP) MEASURES	WHP MEASURE IMPLEMENTED? Y or N	DATE VERIFIED

COMMENTS

For further information, please contact:

Minnesota Department of Health
Drinking Water Protection Section
Source Water Protection Unit
P.O. Box 64975
St. Paul, Minnesota 55164-0975

Section Receptionist: 651-201-4700
Division TDD: 651-201-5797 or MN Relay Service @ 1-800-627-3529 and ask for 651-201-5000

Environmental Health Division
Drinking Water Protection Section
P.O. Box 64975
St. Paul, Minnesota 55164-0975

INNER WELLHEAD MANAGEMENT ZONE (IWMZ) - POTENTIAL CONTAMINANT SOURCE INVENTORY (PCSI) REPORT

PUBLIC WATER SYSTEM INFORMATION

PWS ID	1020017	**COMMUNITY**
NAME	Coon Rapids	
ADDRESS	Kory Jorgensen Utilities Supervisor, Public Works Garage, 1831 111th Avenue, Coon Rapids, MN 554333761	

FACILITY (WELL) INFORMATION

NAME	Well #25	**IS THERE A WELL LOG OR ADDITIONAL CONSTRUCTION INFORMATION AVAILABLE?**
FACILITY ID	S28	☐ **YES** (Please attach a copy)
UNIQUE WELL NO.	674479	☐ **NO** ☐ **UNDETERMINED**
COUNTY	Anoka	

PWS ID / FACILITY ID	1020017 S28	**UNIQUE WELL NO.**	674479

PCSI CODE	ACTUAL OR POTENTIAL CONTAMINATION SOURCE	ISOLATION DISTANCES (FEET)				LOCATION	
		Minimum Distances		Sensitive Well[1]	Within 200 Ft. Y / N / U	Dist. from Well	Est. (?)
		Community	Non-community				
Agricultural Related							
*AC1	Agricultural chemical buried piping	50	50		N		
*AC2	Agricultural chemical multiple tanks or containers for residential retail sale or use, no single tank or container exceeding, but aggregate volume exceeding 56 gal. or 100 lbs. dry weight	50	50		N		
ACP	Agricultural chemical tank or container with 25 gal. or more or 100 lbs. or more dry weight, or equipment filling or cleaning area without safeguards	150	150		N		
ACS	Agricultural chemical storage or equipment filling or cleaning area with safeguards	100	100		N		
ACR	Agricultural chemical storage or equipment filling or cleaning area with safeguards and roofed	50	50		N		
ADW	Agricultural drainage well[2] (Class V well - illegal[3])	50	50		N		
AAT	Anhydrous ammonia tank (stationary tank)	50	50		N		
AB1	Animal building, feedlot, confinement area, or kennel, 0.1 to 1.0 animal unit (stockyard)	50	20	100/40	N		
AB2	Animal building or poultry building, including a horse riding area, more than 1.0 animal unit	50	50	100	N		
ABS	Animal burial area, more than 1.0 animal unit	50	50		N		
FWP	Animal feeding or watering area within a pasture, more than 1.0 animal unit	50	50	100	N		
AF1	Animal feedlot, unroofed, 300 or more animal units (stockyard)	100	100	200	N		
AF2	Animal feedlot, more than 1.0, but less than 300 animal units (stockyard)	50	50	100	N		
AMA	Animal manure application	use discretion	use discretion		N		
REN	Animal rendering plant	50	50		N		
MS1	Manure (liquid) storage basin or lagoon, unpermitted or noncertified	300	300	600	N		
MS2	Manure (liquid) storage basin or lagoon, approved earthen liner	150	150	300	N		
MS3	Manure (liquid) storage basin or lagoon, approved concrete or composite liner	100	100	200	N		
MS4	Manure (solid) storage area, not covered with a roof	100	100	200	N		
OSC	Open storage for crops	use discretion	use discretion		N		
SSTS Related							
AA1	Absorption area of a soil dispersal system, average flow greater than 10,000 gal./day	300	300	600	N		
AA2	Absorption area of a soil dispersal system serving a facility handling infectious or pathological wastes, average flow 10,000 gal./day or less	150	150	300	N		
AA3	Absorption area of a soil dispersal system, average flow 10,000 gal./day or less	50	50	100	N		
AA4	Absorption area of a soil dispersal system serving multiple family residences or a non-residential facility and has the capacity to serve 20 or more persons per day (Class V well)[2]	50/300/150[4]	50/300/150[4]	100/600/300[4]	N		
CSP	Cesspool	75	75	150	N		
AGG	Dry well, leaching pit, seepage pit	75	75	150	N		
*FD1	Floor drain, grate, or trough connected to a buried sewer	50	50		N		
*FD2	Floor drain, grate, or trough if buried sewer is air-tested, approved materials, serving one building, or two or less single-family residences	50	20		N		
*GW1	Gray-water dispersal area	50	50	100	N		
LC1	Large capacity cesspools (Class V well - illegal)[2]	75	75	150	N		
MVW	Motor vehicle waste disposal (Class V well - illegal)[2]	illegal	illegal		N		

PWS ID / FACILITY ID	1020017 S28	UNIQUE WELL NO.	674479

PCSI CODE	ACTUAL OR POTENTIAL CONTAMINATION SOURCE	ISOLATION DISTANCES (FEET)				LOCATION	
		Minimum Distances		Sensitive Well[1]	Within 200 Ft. Y / N / U	Dist. from Well	Est. (?)
		Community	Non-community				
PR1	Privy, nonportable	50	50	100	N		
PR2	Portable (privy) or toilet	50	20		N		
*SF1	Watertight sand filter; peat filter; or constructed wetland	50	50		N		
SET	Septic tank	50	50		N		
HTK	Sewage holding tank, watertight	50	50		N		
SS1	Sewage sump capacity 100 gal. or more	50	50		N		
SS2	Sewage sump capacity less than 100 gal., tested, conforming to rule	50	20		N		
*ST1	Sewage treatment device, watertight	50	50		N		
SB1	Sewer, buried, approved materials, tested, serving one building, or two or less single-family residences	50	20		N		
SB2	Sewer, buried, collector, municipal, serving a facility handling infectious or pathological wastes, open-jointed or unapproved materials	50	50		N		
*WB1	Water treatment backwash holding basin, reclaim basin, or surge tank with a direct sewer connection	50	50		N		
*WB2	Water treatment backwash holding basin, reclaim basin, or surge tank with a backflow protected sewer connection	20	20		N		
Land Application							
SPT	Land spreading area for sewage, septage, or sludge	50	50	100	N		
Solid Waste Related							
COS	Commercial compost site	50	50		N		
CD1	Construction or demolition debris disposal area	50	50	100	N		
*HW1	Household solid waste disposal area, single residence	50	50	100	N		
LF1	Landfill, permitted demolition debris, dump, or mixed municipal solid waste from multiple persons	300	300	600	N		
SVY	Scrap yard	50	50		N		
SWT	Solid waste transfer station	50	50		N		
Storm Water Related							
SD1	Storm water drain pipe, 8 inches or greater in diameter	50	20		N		
SWI	Storm water drainage well[2] (Class V well - illegal[3])	50	50		N		
SM1	Storm water pond greater than 5000 gal.	50	35		Y	60	N
Wells and Borings							
*EB1	Elevator boring, not conforming to rule	50	50		N		
*EB2	Elevator boring, conforming to rule	20	20		N		
MON	Monitoring well	record dist.	record dist.		Y	190	
WEL	Operating well	record dist.	record dist.		N		
UUW	Unused, unsealed well or boring	50	50		N		
General							
*CR1	Cistern or reservoir, buried, nonpressurized water supply	20	20		N		
PLM	Contaminant plume	50	50		N		
*CW1	Cooling water pond, industrial	50	50	100	N		
DC1	Deicing chemicals, bulk road	50	50	100	N		
*ET1	Electrical transformer storage area, oil-filled	50	50		N		
GRV	Grave or mausoleum	50	50		N		
GP1	Gravel pocket or French drain for clear water drainage only	20	20		N		
*HS1	Hazardous substance buried piping	50	50		N		
HS2	Hazardous substance tank or container, above ground or underground, 56 gal. or more, or 100 lbs. or more dry weight, without safeguards	150	150		N		
HS3	Hazardous substance tank or container, above ground or underground, 56 gal. or more, or 100 lbs. or more dry weight with safeguards	100	100		N		
HS4	Hazardous substance multiple storage tanks or containers for residential retail sale or use, no single tank or container exceeding 56 gal. or 100 lbs., but aggregate volume exceeding	50	50		N		
HWF	Highest water or flood level	50	N/A		N		
*HG1	Horizontal ground source closed loop heat exchanger buried piping	50	50		N		
*HG2	Horizontal ground source closed loop heat exchanger buried piping and horizontal piping, approved materials and heat transfer fluid	50	10		N		
IWD	Industrial waste disposal well (Class V well)[2]	illegal[3]	illegal[3]		N		
IWS	Interceptor, including a flammable waste or sediment	50	50		N		
OH1	Ordinary high water level of a stream, river, pond, lake, reservoir, or drainage ditch (holds water six months or more)	50	35		N		
*PP1	Petroleum buried piping	50	50		N		
*PP2	Petroleum or crude oil pipeline to a refinery or distribution center	100	100		N		

PWS ID / FACILITY ID	1020017 S28	UNIQUE WELL NO.	674479

PCSI CODE	ACTUAL OR POTENTIAL CONTAMINATION SOURCE	ISOLATION DISTANCES (FEET)				LOCATION	
		Minimum Distances		Sensitive Well[1]	Within 200 Ft. Y / N / U	Dist. from Well	Est. (?)
		Community	Non-community				
PT1	Petroleum tank or container, 1100 gal. or more, without safeguards	150	150		N		
PT2	Petroleum tank or container, 1100 gal. or more, with safeguards	100	100		N		
PT3	Petroleum tank or container, buried, between 56 and 1100 gal.	50	50		N		
PT4	Petroleum tank or container, not buried, between 56 and 1100 gal.	50[5]	20		N		
PU1	Pit or unfilled space more than four feet in depth	20	20		N		
PC1	Pollutant or contaminant that may drain into the soil	50	50	100	N		
SP1	Swimming pool, in-ground	20	20		N		
*VH1	Vertical heat exchanger, horizontal piping conforming to rule	50	10		N		
*VH2	Vertical heat exchanger (vertical) piping, conforming to rule	50	35		N		
*WR1	Wastewater rapid infiltration basin, municipal or industrial	300	300	600	N		
*WA1	Wastewater spray irrigation area, municipal or industrial	150	150	300	N		
*WS1	Wastewater stabilization pond, industrial	150	150	300	N		
*WS2	Wastewater stabilization pond, municipal, 500 or more gal./acre/day of leakage	300	300	600	N		
*WS3	Wastewater stabilization pond, municipal, less than 500 gal./acre/day of leakage	150	150	300	N		
*WT1	Wastewater treatment unit tanks, vessels and components (Package plant)	100	100		N		
*WT2	Water treatment backwash disposal area	50	50	100	N		
Additional Sources (If there is more than one source listed above, please indicate here).							
Potential Contamination Sources and Codes Based on Previous Versions of this Form							
	none found within 200' of this well.						

* New potential contaminant source.

[1] A sensitive well has less than 50 feet of watertight casing, and which is not cased below a confining layer or confining materials of at least 10' in thickness.

[2] These sources, known as Class V underground injection wells, are regulated by the federal U.S. Environmental Protection Agency.

[3] These sources are classified as illegal by Minnesota Rules, Chapter 4725.

[4] Isolation distance is determined by average flow per day or if a facility handles infectious or pathological wastes.

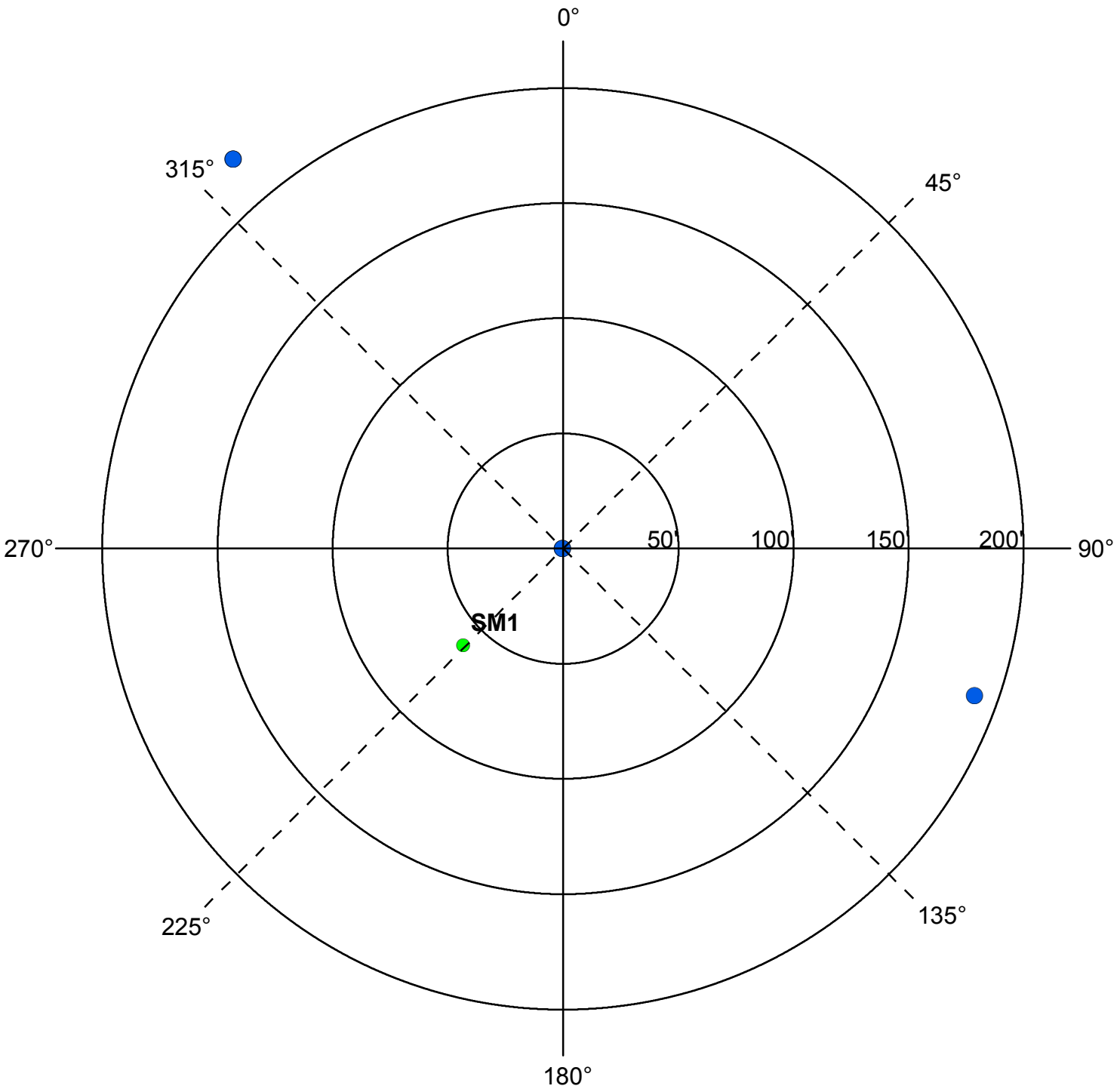
[5] A community public water-supply well must be a minimum of 50 feet from a petroleum tank or container, unless the tank or container is used for emergency pumping and is located in a room or building separate from the community well; and is of double-wall construction with leak detection between walls; or is protected with secondary containment.

This form is based on the new isolation distances in Minnesota Rules, Chapter 4725, related to wells and borings adopted August 4, 2008, and Minnesota Rules, Chapter 4720, related to wellhead protection.

PWS ID / FACILITY ID	1020017 S28	UNIQUE WELL NO.	674479

SETBACK DISTANCES	All potential contaminant sources must be noted on sketch.

Record the distance and approximate compass bearing of each potential contaminant source from the well, and identify the source using the "Source Code". Unlabeled points on the map are unsealed wells.



	Y	N	N/A
Were the isolation distances maintained for the new sources of contamination?			
Is the system monitoring existing nonconforming sources of contamination?			

Reminder Question: Were the wellhead protection measure(s) implemented?

INSPECTOR	Neiman, Dave	DATE	6 - 3 - 2016

PWS ID / FACILITY ID	1020017 S28	UNIQUE WELL NO.	674479

RECOMMENDED WELLHEAD PROTECTION (WHP) MEASURES	WHP MEASURE IMPLEMENTED? Y or N	DATE VERIFIED

COMMENTS

For further information, please contact:

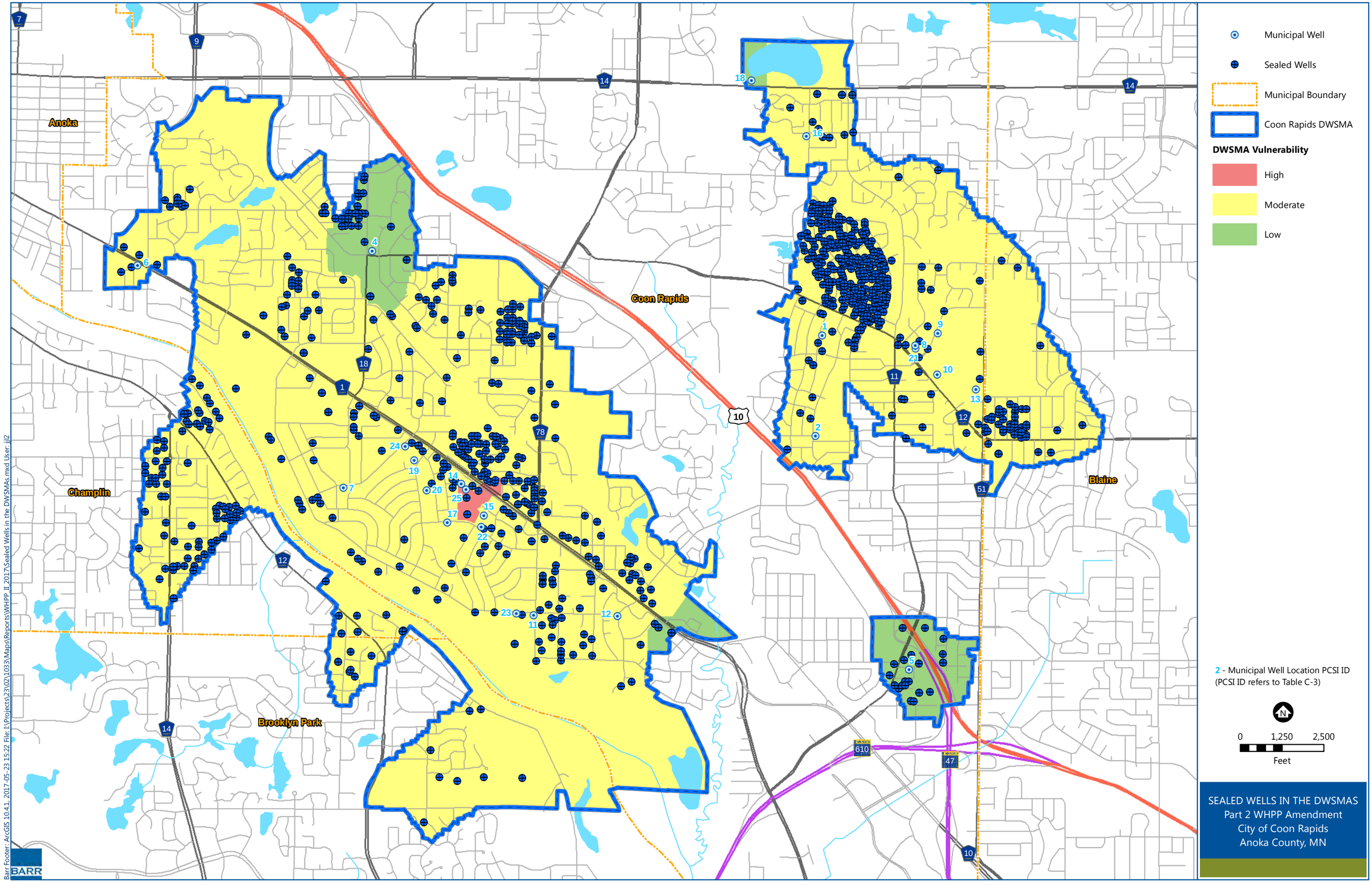
Minnesota Department of Health
Drinking Water Protection Section
Source Water Protection Unit
P.O. Box 64975
St. Paul, Minnesota 55164-0975

Section Receptionist: 651-201-4700
Division TDD: 651-201-5797 or MN Relay Service @ 1-800-627-3529 and ask for 651-201-5000

Attachment C-3

Sealed Wells

DRAFT


Municipal Well
Sealed Wells
Municipal Boundary
Coon Rapids DWSMA
DWSMA Vulnerability
High
Moderate
Low
2 - Municipal Well Location PCSI ID
(PCSI ID refers to Table C-3)
0
1,250
2,500
Feet
Anoka
Coon Rapids
Champlin
Brooklyn Park
Blaine
SEALED WELLS IN THE DWSMAS
Part 2 WHPP Amendment
City of Coon Rapids
Anoka County, MN
BARR
Barr Footer: ArcGIS 10.4.1, 2017-05-23 15:22 File: I:\Projects\23\02\1033\Maps\Reports\WHPP_II_2017\Sealed Wells in the DWSMAs.mxd User: jjl2

PCSI Results - Sealed Wells in the DWSMAs
City of Coon Rapids Part 2 WHPP Amendment

PCSI ID	PID No.	Unique No.	Status	Use	Well Owner	Well Location	City	Total Sealed Depth (Feet)	Date Completed/Sealed	Aquifer	PCS Code	Location Verified
1	003-163124340061	442466	Sealed	Abandoned	Target Rw-1	11000 Crooked Lake Bl Nw	Coon Rapids	44	07/19/1988	QWTA	WEL	Yes
2	003-223124320049	110477	Sealed	Test Well	Coon Rapids Th-2	Not Available	Coon Rapids	110	08/12/1987	Not Available	WEL	Uncertain
3	003-133124130006	596258	Sealed	Abandoned	Mw	380 Northdale Bl	Coon Rapids	25	07/08/1997	QWTA	WEL	Yes
4	003-273124210001	244329	Sealed	Test Well	Coon Rapids Obth-16	Not Available	Coon Rapids	160	Not Available	Not Available	WEL	Uncertain
5	003-163124340061	194890	Sealed	Abandoned	Target Mw-6	11000 Crooked Lake Bl Nw	Coon Rapids	36	09/03/1987	QWTA	WEL	Yes
6	003-223124320065	244338	Sealed	Test Well	Coon Rapids Th-24	Not Available	Coon Rapids	163	03/21/1989	Not Available	WEL	Uncertain
7	003-223124320058	110479	Sealed	Test Well	Coon Rapids Th-1	Not Available	Coon Rapids	110	08/11/1987	Not Available	WEL	Uncertain
8	053-3312021410007	202887	Sealed	Abandoned	Hayden, L.	11116 West River Rd	Champlin	82	02/26/1970	CJDN	WEL	Yes
9	003-273124220001	147471	Sealed	Test Well	Coon Rapids Th-4	Not Available	Coon Rapids	100	08/13/1987	Not Available	WEL	Uncertain
10	003-163124340061	442467	Sealed	Abandoned	Target Stores Rw-2	11000 Crooked Lake Bl Nw	Coon Rapids	44	07/21/1988	QWTA	WEL	Yes
11	003-133124130006	623952	Sealed	Abandoned	Anoka County Library	380 Northdale Bl	Coon Rapids	25	10/28/1998	QWTA	WEL	Yes
12	003-153124330001	673419	Sealed	Abandoned	Coon Rapids Tw-2	109th Av Nw	Coon Rapids	156	06/17/2002	QBAA	WEL	Uncertain
13	003-223124230002	673420	Sealed	Abandoned	Coon Rapids Tw-3	2241 105th Av	Coon Rapids	120	06/17/2002	QBAA	WEL	Yes
14	003-263124210008	629336	Sealed	Abandoned	Coon Rapids Mw-101	1350 Coon Rapids Bl Nw	Coon Rapids	18	08/16/1999	QWTA	WEL	Yes
15	003-163124340061	194891	Sealed	Abandoned	Target Mw-7	11000 Crooked Lake Bl Nw	Coon Rapids	31	09/04/1987	QWTA	WEL	Yes
16	003-273124110053	244327	Sealed	Test Well	Coon Rapids Th-14	Not Available	Coon Rapids	170	Not Available	Not Available	WEL	Uncertain
17	003-213124110022	673418	Sealed	Abandoned	Coon Rapids Tw-1	Direct River Dr	Coon Rapids	152	07/17/2002	QBAA	WEL	Uncertain
18	003-133124130006	586854	Sealed	Abandoned	Pmw-1	380 Northdale Bl	Coon Rapids	25	07/31/1996	Not Available	WEL	Yes
19	003-133124130109	244331	Sealed	Test Well	Coon Rapids Th-18	Not Available	Coon Rapids	250	Not Available	Not Available	WEL	Uncertain
20	Not Available	244342	Sealed	Test Well	Coon Rapids Th-29	Not Available	Coon Rapids	139	02/19/1990	Not Available	WEL	Uncertain
21	003-273124210001	474383	Sealed	Abandoned	Coon Rapids Th27-A	10110 Mississippi Bl	Coon Rapids	161	02/18/1991	Not Available	WEL	Approximate
22	003-223124420017	249655	Sealed	Commercial	Not Available	1827 Coon Rapids Bl Nw	Coon Rapids	244	00/00/1967	CTCG	WEL	Yes
23	003-223124230001	244340	Sealed	Test Well	Coon Rapids Th-26	Not Available	Coon Rapids	148	03/29/1989	Not Available	WEL	Uncertain
24	053-3312021220095	149762	Sealed	Abandoned	Van Dalen, N.H.	6106 117th Av N	Champlin	174	03/31/1978	CJSL	WEL	Approximate
25	003-273124210001	147472	Sealed	Test Well	Coon Rapids Th-3	Not Available	Coon Rapids	125	08/13/1987	Not Available	WEL	Uncertain
26	003-213124120041	147465	Sealed	Test Well	Coon Rapids Th-10	Not Available	Coon Rapids	137	08/26/1987	Not Available	WEL	Uncertain
27	Not Available	244333	Sealed	Test Well	Coon Rapids Th-19	Not Available	Coon Rapids	247	Not Available	Not Available	WEL	Uncertain
28	003-133124210046	202925	Sealed	Domestic	Not Available	11550 Kumquat St Nw	Coon Rapids	78	06/05/1958	QBAA	WEL	Yes
29	Not Available	244336	Sealed	Test Well	Coon Rapids Th-22	Not Available	Coon Rapids	235	02/21/1989	Not Available	WEL	Uncertain
30	003-133124130006	586856	Sealed	Abandoned	Pmw-3	380 Northdale Bl	Coon Rapids	25	07/31/1996	Not Available	WEL	Yes
31	053-0311921220058	430317	Sealed	Abandoned	Virgillo	10701 Noble Av N	Brooklyn Park	114	08/18/1987	CJDN	WEL	Approximate
32	003-263124220041	202962	Sealed	Community Supply (municipal - Coon Rapids)	Coon Rapids 7.5	Not Available	Coon Rapids	175	10/28/1963	CJSL	WEL	Uncertain
33	003-273124130001	244328	Sealed	Test Well	Coon Rapids Th-15	Not Available	Coon Rapids	120	Not Available	Not Available	WEL	Uncertain
34	003-133124140006	244330	Sealed	Test Well	Coon Rapids Th-17	Not Available	Coon Rapids	238	Not Available	Not Available	WEL	Uncertain
35	003-273124210001	244341	Sealed	Test Well	Coon Rapids Th-27A	10110 Mississippi Bl	Coon Rapids	161	00/00/1991	Not Available	WEL	Approximate
36	003-133124130006	586855	Sealed	Abandoned	Pmw-2	380 Northdale Bl	Coon Rapids	25	07/31/1996	QWTA	WEL	Yes
37	003-273124130001	244326	Sealed	Test Well	Coon Rapids Obth-13	Not Available	Coon Rapids	140	Not Available	Not Available	WEL	Uncertain
38	003-163124340061	194892	Sealed	Abandoned	Target Mw-8	11000 Crooked Lake Bl Nw	Coon Rapids	31	09/04/1987	QWTA	WEL	Yes
39	053-2912021440014	202819	Sealed	Abandoned	Not Available	11708 Edgewood Av	Champlin	101	Not Available	QBAA	WEL	Yes
40	003-273124140001	271980	Sealed	Abandoned	Coon Rapids Dam Regional Park	Not Available	Coon Rapids	390	00/00/1914	MTPL	WEL	Uncertain
41	003-163124340061	194889	Sealed	Abandoned	Target Mw-5	11000 Crooked Lake Bl Nw	Coon Rapids	32	09/02/1987	QWTA	WEL	Yes
42	003-263124210008	629344	Sealed	Abandoned	Coon Rapids Mw-109	1350 Coon Rapids Bl Nw	Coon Rapids	18	08/16/1999	QWTA	WEL	Yes
43	003-163124340061	329638	Sealed	Abandoned	St2	11000 Crooked Lake Bl	Coon Rapids	61	08/11/2009	Not Available	WEL	Yes
44	003-193123220076	461097	Sealed	Abandoned	Super America Mw-10	10873 University Av	Blaine	30	07/30/1991	Not Available	WEL	Approximate
45	003-193123220076	461096	Sealed	Abandoned	Super America Mw-9	10873 University Av	Blaine	32	07/30/1991	Not Available	WEL	Approximate
46	003-193123220076	461095	Sealed	Abandoned	Super America Mw-8	10873 University Av	Blaine	30	07/29/1991	Not Available	WEL	Approximate
47	003-193123220076	461094	Sealed	Abandoned	Super America Mw-11	10873 University Av	Blaine	30	08/01/1991	Not Available	WEL	Approximate
48	003-163124320005	461738	Sealed	Abandoned	Super America	3075 Coonrapids Bl	Coon Rapids	38	01/07/1991	Not Available	WEL	Yes
49	003-193123220076	459183	Sealed	Abandoned	Ogren, John K.	10873 University Av Ne	Blaine	43	04/20/1990	Not Available	WEL	Approximate
50	003-223124240005	452900	Sealed	Abandoned	Crown Ceco Inc Mw-3	2111 Nw Coon Rapids Bl	Coon Rapids	32	01/12/1989	Not Available	WEL	Approximate
51	003-223124240005	452899	Sealed	Abandoned	Crown Ceco Inc Mw-2	2111 Nw Coon Rapids Bl	Coon Rapids	38	01/09/1989	Not Available	WEL	Approximate
52	003-223124240005	452898	Sealed	Abandoned	Crown Ceco Inc Mw-1	2111 Nw Coon Rapids Bl	Coon Rapids	41	01/11/1989	Not Available	WEL	Approximate
53	003-273124210001	474382	Sealed	Abandoned	Coon Rapids Tw 23	10110 Mississippi Bl	Coon Rapids	136	01/22/1991	Not Available	WEL	Approximate
54	003-263124220010	677417	Sealed	Abandoned	Not Available	1440 Coon Rapids Bl	Coon Rapids	18	03/10/2003	Not Available	WEL	Yes
55	003-263124220007	677415	Sealed	Abandoned	Not Available	1406 Coon Rapids Bl	Coon Rapids	18	03/06/2003	Not Available	WEL	Approximate
56	003-263124220007	677420	Sealed	Abandoned	Not Available	1430 100th Av Nw	Coon Rapids	18	03/07/2003	Not Available	WEL	Approximate
57	003-263124220010	677418	Sealed	Abandoned	Not Available	1440 Coon Rapids Bl	Coon Rapids	40	03/10/2003	Not Available	WEL	Yes
58	003-163124320005	496468	Sealed	Abandoned	Cheep Skate Mw-16	3075 Coonrapids Bl	Coon Rapids	38	10/10/1991	Not Available	WEL	Yes
59	003-163124320005	496467	Sealed	Abandoned	Super America Corp Mw-15	3075 Coonrapids Bl	Coon Rapids	34	09/18/1991	Not Available	WEL	Yes
60	003-163124320005	496466	Sealed	Abandoned	Super America Corp Mw-14	3075 Coonrapids Bl	Coon Rapids	34	09/17/1991	Not Available	WEL	Yes
61	003-193123220076	501671	Sealed	Abandoned	Mobile Station Mw-2	Not Available	Blaine	30	02/27/1989	Not Available	WEL	Uncertain
62	003-193123220076	501670	Sealed	Abandoned	Mobile Station Mw-1	Not Available	Blaine	30	02/27/1989	Not Available	WEL	Uncertain
63	003-153124430016	470167	Sealed	Abandoned	Epiphany Ca. Church Mw-3	11001 Hanson Bl	Coon Rapids	15	11/26/1990	Not Available	WEL	Yes
64	003-153124430016	470166	Sealed	Abandoned	Epiphany Ca. Church Mw-2	11001 Hanson Bl	Coon Rapids	15	11/26/1990	Not Available	WEL	Yes
65	003-153124430016	470165	Sealed	Abandoned	Epiphany Ca. Church Mw-1	11001 Hanson Bl	Coon Rapids	15	11/26/1990	Not Available	WEL	Yes
66	003-193123220076	478351	Sealed	Abandoned	Ogren, John K. Mw-7	10873 University Av Ne	Blaine	30	02/27/1991	Not Available	WEL	Approximate
67	003-173124140001	492442	Sealed	Abandoned	Wcco Radio/Tv Mw-2	3237 Coonrapids Bl	Coon Rapids	40	08/14/1991	Not Available	WEL	Yes
68	003-163124320005	477860	Sealed	Abandoned	Super America Mw-10	3075 Coonrapids Bl	Coon Rapids	38	01/09/1991	Not Available	WEL	Yes

PCSI Results - Sealed Wells in the DWSMAs
City of Coon Rapids Part 2 WHPP Amendment

PCSI ID	PID No.	Unique No.	Status	Use	Well Owner	Well Location	City	Total Sealed Depth (Feet)	Date Completed/Sealed	Aquifer	PCS Code	Location Verified
69	003-163124320005	477859	Sealed	Abandoned	Super America Mw-13	3075 Coonrapids Bl	Coon Rapids	37	01/18/1991	Not Available	WEL	Yes
70	003-193123220076	501673	Sealed	Abandoned	Mobile Station Mw-4	Not Available	Blaine	30	03/01/1989	Not Available	WEL	Uncertain
71	003-163124320005	468792	Sealed	Abandoned	Super America Mw-11	3075 Coonrapids Bl	Coon Rapids	39	01/14/1991	Not Available	WEL	Yes
72	003-163124320005	468791	Sealed	Abandoned	Super America Mw-12	3075 Coonrapids Bl	Coon Rapids	37	01/17/1991	Not Available	WEL	Yes
73	003-193123220076	501717	Sealed	Abandoned	Mobil Oil Mw-5	Not Available	Blaine	27	00/00/1989	Not Available	WEL	Uncertain
74	003-133124440006	511298	Sealed	Abandoned	Amoco Oil Company Mw-1	10938 University Av Nw	Coon Rapids	25	02/07/1991	Not Available	WEL	Yes
75	003-163124120002	678241	Sealed	Abandoned	Morevalu Marathon	11517 Crooked Lake Bl	Coon Rapids	34	07/15/2002	Not Available	WEL	Yes
76	003-163124120002	678240	Sealed	Abandoned	Morevalu Marathon	11517 Crooked Lake Bl	Coon Rapids	34	07/15/2002	Not Available	WEL	Yes
77	003-163124120002	678239	Sealed	Abandoned	Morevalu Marathon	11517 Crooked Lake Bl	Coon Rapids	34	07/15/2002	Not Available	WEL	Yes
78	003-163124120002	678238	Sealed	Abandoned	Morevalu Marathon	11517 Crooked Lake Bl	Coon Rapids	34	07/15/2002	Not Available	WEL	Yes
79	003-263124220007	677416	Sealed	Abandoned	Not Available	1406 Coon Rapids Bl	Coon Rapids	18	03/07/2003	Not Available	WEL	Approximate
80	003-263124220003	677421	Sealed	Abandoned	Duben Park	10020 Drake St	Coon Rapids	18	03/07/2003	Not Available	WEL	Yes
81	003-263124220007	677419	Sealed	Abandoned	Parkview Estates	1430 100th Av Nw	Coon Rapids	18	03/07/2003	Not Available	WEL	Approximate
82	003-213124110014	328589	Sealed	Abandoned	City Of Coon Rapids	Not Available	Coon Rapids	152	06/13/2002	Not Available	WEL	Uncertain
83	003-193123220076	501718	Sealed	Abandoned	Mw-6 Mobil Oil	See Remarks	Blaine	27	00/00/1989	Not Available	WEL	Uncertain
84	003-173124140001	492441	Sealed	Abandoned	Wcco Radio/Tv Inc. Mw-1	3237 Coonrapids Bl	Coon Rapids	42	08/13/1991	Not Available	WEL	Yes
85	003-193123220002	461093	Sealed	Not Available	Mobil Oil	109th (& University) Av	Blaine	29	3/24/1995	Not Available	WEL	Uncertain
86	053-2812021330013	H000001847	Sealed	Not Available	Dahl, James	11817 Porter Dr	Champlin	33	6/15/1990	Not Available	WEL	Yes
87	053-0411921110049	H000001789	Sealed	Not Available	Beck, Ronnie	10741 Noble Av N	Brooklyn Park	55	2/13/1990	Not Available	WEL	Yes
88	003-163124420090	H000003196	Sealed	Not Available	Bailey, Ralph	11146 Arrowhead St Nw	Coon Rapids	27	7/28/1990	Not Available	WEL	Yes
89	003-123124340014	H000003197	Sealed	Not Available	Bilborough, Charles	11860 Ilex St Nw	Coon Rapids	30	9/24/1990	Not Available	WEL	Yes
90	003-153124240020	H000003199	Sealed	Not Available	Falck, Dean	11332 Hanson Bl	Coon Rapids	105	9/18/1990	Not Available	WEL	Yes
91	003-273124120014	H000003201	Sealed	Not Available	Thomas, Doug	9949 Hanson Bl	Coon Rapids	63	4/11/1990	Not Available	WEL	Yes
92	003-123124320060	H000003206	Sealed	Not Available	Swenson, Mark	11941 Norway St	Coon Rapids	48	8/22/1990	Not Available	WEL	Yes
93	003-123124230084	H000003207	Sealed	Not Available	Ldk Bldg	646 123rd Av	Coon Rapids	110	8/14/1990	Not Available	WEL	Yes
94	003-153124240057	H000003208	Sealed	Not Available	Windsperger, Rose	11317 Quinn St Nw	Coon Rapids	131	9/20/1990	Not Available	WEL	Yes
95	003-213124110069	H000003209	Sealed	Not Available	Morrell, Jeff	2448 Coon Rapids Bl	Coon Rapids	60	10/17/1990	Not Available	WEL	Yes
96	003-133124220071	H000003211	Sealed	Not Available	Arnold, Thomas	11511 Magnolia St Nw	Coon Rapids	49	7/17/1990	Not Available	WEL	Yes
97	003-163124340019	H000003212	Sealed	Not Available	Jennings, Charles	10901 Crooked Lake Bl	Coon Rapids	68	9/28/1990	Not Available	WEL	Yes
98	003-163124110025	H000003213	Sealed	Not Available	Hoelter, Arlene	11609 Wren St Nw	Coon Rapids	25	9/21/1990	Not Available	WEL	Yes
99	003-153124240045	H000003214	Sealed	Not Available	Hanson, Carl	11416 Partridge St Nw	Coon Rapids	45	9/21/1990	Not Available	WEL	Yes
100	003-223124220063	H000003215	Sealed	Not Available	Brodeen, Randy	2340 108th Av Nw	Coon Rapids	100	10/11/1990	Not Available	WEL	Yes
101	003-163124340018	H000003216	Sealed	Not Available	Peterson, Florence	10911 Crooked Lake Bl	Coon Rapids	68	5/2/1990	Not Available	WEL	Yes
102	003-263124220007	629337	Sealed	Not Available	Coon Rapids, City Of	Coon Rapids (1350-1440) Bl	Coon Rapids	17	4/6/2007	Not Available	WEL	Uncertain
103	003-123124330021	H000010587	Sealed	Not Available	Wilson, Wallace	11741 Larch St	Coon Rapids	28	5/16/1991	Not Available	WEL	Yes
104	003-083124310027	H000010805	Sealed	Not Available	Brask, Randy	11900 Vintage St Nw	Coon Rapids	20	4/16/1991	Not Available	WEL	Yes
105	003-153124240059	H000014355	Sealed	Not Available	Larson, Timothy J	11333 Quinn St Nw	Coon Rapids	116	10/16/1991	Not Available	WEL	Yes
106	003-253124140027	H000014356	Sealed	Not Available	Service West Contracting	9912 Cottonwood St	Coon Rapids	30	9/26/1991	Not Available	WEL	Yes
107	003-253124140027	H000014357	Sealed	Not Available	Service West Contracting	9912 Cottonwood St	Coon Rapids	26	9/26/1991	Not Available	WEL	Yes
108	003-093124340025	H000014358	Sealed	Not Available	Hannu, Rodney	2820 118th La Nw	Coon Rapids	25	9/23/1991	Not Available	WEL	Yes
109	003-133124210072	H000014359	Sealed	Not Available	Cline, Karen	11600 Ilex St Nw	Coon Rapids	33	9/16/1991	Not Available	WEL	Yes
110	003-123124340021	H000008635	Sealed	Not Available	Keith, Don	11801 Juniper St Nw	Coon Rapids	27	1/29/1991	Not Available	WEL	Yes
111	003-133124240030	H000008636	Sealed	Not Available	National Mortgage	541 Northdale Bl	Coon Rapids	40	1/11/1991	Not Available	WEL	Yes
112	003-133124220069	H000016325	Sealed	Not Available	Knudson, Valerie	11716 Larch St	Coon Rapids	32	11/19/1991	Not Available	WEL	Yes
113	003-183123330046	H000017399	Sealed	Not Available	Nelson, Elizabeth	10920 Sixth St Ne	Blaine	23	1/21/1992	Not Available	WEL	Yes
114	003-223124240040	H000012365	Sealed	Not Available	Preimesberger, Gay	2050 107th Av Nw	Coon Rapids	75	8/5/1991	Not Available	WEL	Yes
115	003-183123330039	H000011479	Sealed	Not Available	Tarnowski, Helen	11014 Sixth St Ne	Blaine	34	6/18/1991	Not Available	WEL	Yes
116	003-133124240026	H000011482	Sealed	Not Available	Rodger, Paul	570 115th Av Nw	Coon Rapids	63	6/7/1991	Not Available	WEL	Yes
117	003-133124240037	H000011483	Sealed	Not Available	Breske, Dan	571 114th Av Nw	Coon Rapids	66	5/21/1991	Not Available	WEL	Yes
118	003-123124330016	H000011725	Sealed	Not Available	Oliver, Ron	11840 Kumquat St	Coon Rapids	43	5/30/1991	Not Available	WEL	Yes
119	003-133124320043	H000011726	Sealed	Not Available	Geis, Mary	11267 Olive St Nw	Coon Rapids	19	6/18/1991	Not Available	WEL	Yes
120	053-3312021240057	H000016721	Sealed	Not Available	Mcconnell, Larry	11401 Xenia Av	Champlin	105	10/31/1991	Not Available	WEL	Yes
121	003-153124240083	H000013434	Sealed	Not Available	Aldrich, Robert	11308 Quinn St	Coon Rapids	88	8/28/1991	Not Available	WEL	Yes
122	003-133124240012	H000013435	Sealed	Not Available	Olson,	600 115th Av Nw	Coon Rapids	70	8/28/1991	Not Available	WEL	Yes
123	003-253124130065	H000015125	Sealed	Not Available	Mann, Delores	231 97th Av Nw	Coon Rapids	28	7/31/1991	Not Available	WEL	Yes
124	003-123124320062	H000012940	Sealed	Not Available	Brownings, Kimberly	11956 Norway St Nw	Coon Rapids	28	8/1/1991	Not Available	WEL	Yes
125	003-133124220044	H000012941	Sealed	Not Available	Kelly, John	11630 Magnolia St Nw	Coon Rapids	33	7/24/1991	Not Available	WEL	Yes
126	003-123124330083	H000012942	Sealed	Not Available	Demeules, Bob	11755 Norway St Nw	Coon Rapids	53	7/2/1991	Not Available	WEL	Yes
127	003-213124110014	H000014162	Sealed	Not Available	Coon Rapids, City Of	Coon Rapids Bl	Coon Rapids	145	10/19/1988	Not Available	WEL	Uncertain
128	003-213124110014	H000014163	Sealed	Not Available	Coon Rapids, City Of	Coon Rapids Bl	Coon Rapids	145	10/19/1988	Not Available	WEL	Uncertain
129	003-233124330020	H000010776	Sealed	Not Available	Kurschinski, Mike	1470 Egret Bl Nw	Coon Rapids	108	4/23/1991	Not Available	WEL	Yes
130	053-3212021110035	H000011025	Sealed	Not Available	Gammins, Mike	11600 Florida Av	Champlin	87	6/6/1991	Not Available	WEL	Yes
131	003-133124240011	H000016214	Sealed	Not Available	Johnson, Mathew	11501 Kumquat St	Coon Rapids	44	11/18/1991	Not Available	WEL	Yes
132	003-133124240034	H000016216	Sealed	Not Available	Hertz, Tony	501 Northdale Bl	Coon Rapids	36	11/27/1991	Not Available	WEL	Yes
133	003-093124340009	H000007664	Sealed	Not Available	Lord, Don	2901 118th La	Coon Rapids	25	1/4/1991	Not Available	WEL	Yes
134	053-3312021220095	H000008642	Sealed	Not Available	Vandalen, Nicolas	6101 117th Av N	Champlin	40	2/1/1991	Not Available	WEL	Yes
135	003-183123330125	H000009568	Sealed	Not Available	Leslie, Irene	11043 University Av Ne	Blaine	43	3/26/1991	Not Available	WEL	Yes

PCSI Results - Sealed Wells in the DWSMAs
City of Coon Rapids Part 2 WHPP Amendment

PCSI ID	PID No.	Unique No.	Status	Use	Well Owner	Well Location	City	Total Sealed Depth (Feet)	Date Completed/Sealed	Aquifer	PCS Code	Location Verified
136	003-133124220041	H000009647	Sealed	Not Available	Lord,	11700 Magnolia	Coon Rapids	68	3/13/1991	Not Available	WEL	Yes
137	003-123124330139	H000009367	Sealed	Not Available	Neuman, Loretta	11724 Larch St Nw	Coon Rapids	89	9/17/1990	Not Available	WEL	Yes
138	003-093124340028	H000009368	Sealed	Not Available	Blondine, Spilane	2800 119th Av Nw	Coon Rapids	70	11/20/1990	Not Available	WEL	Yes
139	003-123124340004	H000009725	Sealed	Not Available	Modaff, John	11731 Kumquat St Nw	Coon Rapids	23	3/29/1991	Not Available	WEL	Yes
140	003-123124340048	H000009867	Sealed	Not Available	Janssen, Rick	11680 Ilex St Nw	Coon Rapids	18	3/18/1991	Not Available	WEL	Yes
141	053-3312021240044	H000009217	Sealed	Not Available	Haider, Gary	11432 Yates Av N	Champlin	148	2/2/1991	Not Available	WEL	Yes
142	003-133124220090	H000009246	Sealed	Not Available	Dock, Dennis	740 115th Av Nw	Coon Rapids	32	3/8/1991	Not Available	WEL	Yes
143	003-123124340048	H000009868	Sealed	Not Available	Janssen, Rick	11680 Ilex St Nw	Coon Rapids	25	3/18/1991	Not Available	WEL	Yes
144	003-153124240038	H000009869	Sealed	Not Available	Byland, Steve	11449 Partridge St	Coon Rapids	115	4/10/1991	Not Available	WEL	Yes
145	053-3212021110009	H000008135	Sealed	Not Available	Porter, Connie	6317 115.5th Av N	Champlin	90	10/23/1990	Not Available	WEL	Yes
146	003-273124120052	H000021123	Sealed	Not Available	Miller, Suzette	9949 Linnet St	Coon Rapids	40	6/16/1992	Not Available	WEL	Yes
147	003-133124210082	H000019604	Sealed	Not Available	Lafleur, Richard	11541 Juniper St Nw	Coon Rapids	37	4/13/1992	Not Available	WEL	Yes
148	003-183123330043	H000021230	Sealed	Not Available	Geary, Judy	10938 Sixth St Ne	Blaine	23	5/26/1992	Not Available	WEL	Yes
149	003-223124310064	H000023599	Sealed	Not Available	Anderson, Cary	10470 Osage St Nw	Coon Rapids	28	6/18/1992	Not Available	WEL	Yes
150	003-133124210068	H000023986	Sealed	Not Available	Kelm, Harold/Nancy	11632 Ilex St Nw	Coon Rapids	30	6/18/1992	Not Available	WEL	Yes
151	003-133124210004	H000025853	Sealed	Not Available	Graham, Irene	11671 Kumquat St Nw	Coon Rapids	30	9/15/1992	Not Available	WEL	Yes
152	003-163124230008	H000025112	Sealed	Not Available	Jasper, Richard	11470 Kerry St	Coon Rapids	58	8/26/1992	Not Available	WEL	Yes
153	003-123124330058	H000023223	Sealed	Not Available	Gulbranson, Terry	11817 Magnolia St Nw	Coon Rapids	35	8/12/1992	Not Available	WEL	Yes
154	003-223124440011	H000026671	Sealed	Not Available	Rademacher, Wanda	10244 Ibis St Nw	Coon Rapids	72	4/13/1993	Not Available	WEL	Yes
155	003-223124440011	H000026673	Sealed	Not Available	Rademachor, Wanda	10244 Ibis St Nw	Coon Rapids	26	4/13/1993	Not Available	WEL	Yes
156	003-133124210092	H000026700	Sealed	Not Available	Moberg, Linda	11641 Juniper St Nw	Coon Rapids	35	5/27/1993	Not Available	WEL	Yes
157	003-163124430012	H000024434	Sealed	Not Available	Hayford, Bob	2610 Coon Rapids Bl	Coon Rapids	146	9/9/1992	Not Available	WEL	Yes
158	003-223124230011	H000024907	Sealed	Not Available	Cracauer, Steve	2310 Coon Rapids Bl	Coon Rapids	95	8/21/1992	Not Available	WEL	Yes
159	003-123124320036	H000026793	Sealed	Not Available	Hardy, Adam	11909 Larch St Nw	Coon Rapids	32	10/8/1993	Not Available	WEL	Yes
160	003-133124210075	H000026818	Sealed	Not Available	Zoeller, Robert	11572 Ilex	Coon Rapids	20	4/9/1993	Not Available	WEL	Yes
161	003-223124230011	H000025445	Sealed	Not Available	Cracauer, Steve	2310 Coon Rapids Bl	Coon Rapids	24	8/21/1992	Not Available	WEL	Yes
162	003-133124210007	H000028439	Sealed	Not Available	Yankovich, Nick	11641 Kumquat St Nw	Coon Rapids	37	6/24/1993	Not Available	WEL	Yes
163	003-153124340004	H000028620	Sealed	Not Available	Baum, Dave	11064 Hanson Bl	Coon Rapids	185	6/29/1993	Not Available	WEL	Yes
164	003-123124330033	H000023982	Sealed	Not Available	Moriarty, Jim	11840 Larch St Nw	Coon Rapids	38	6/23/1992	Not Available	WEL	Yes
165	003-163124110118	H000012121	Sealed	Not Available	Poepke, Peter	11512 Yukon St Nw	Coon Rapids	26	6/27/1991	Not Available	WEL	Yes
166	003-123124340055	H000023354	Sealed	Not Available	Hanson, Ronald	11720 Juniper St W	Coon Rapids	42	8/6/1992	Not Available	WEL	Yes
167	003-253124130065	H000015660	Sealed	Not Available	Mann, Delores	231 97th Av Nw	Coon Rapids	30	7/31/1991	Not Available	WEL	Yes
168	003-133124220060	H000025330	Sealed	Not Available	Swensen, Beverly	11551 Norway St Nw	Coon Rapids	53	9/3/1992	Not Available	WEL	Yes
169	003-233124110018	H000018195	Sealed	Not Available	Gehrig, Dalayne	10856 Olive St Nw	Coon Rapids	15	3/9/1992	Not Available	WEL	Yes
170	003-163124220094	H000018196	Sealed	Not Available	Anderson, Norman J.	11567 Jonquil St Nw	Coon Rapids	63	3/5/1992	Not Available	WEL	Yes
171	003-093124340029	H000017818	Sealed	Not Available	Yost, Gary	2810 119th Av	Coon Rapids	28	2/18/1992	Not Available	WEL	Yes
172	003-213124220048	H000018639	Sealed	Not Available	Koss, Susan	10833 Flora St Nw	Coon Rapids	25	12/24/1991	Not Available	WEL	Yes
173	003-123124330018	H000018302	Sealed	Not Available	Klosterboer, Kenneth	11824 Kumquat St	Coon Rapids	43	4/8/1992	Not Available	WEL	Yes
174	003-133124220092	H000019836	Sealed	Not Available	Olson, Neil/Cheri	760 115th Av	Coon Rapids	21	4/21/1992	Not Available	WEL	Yes
175	003-123124330137	H000022845	Sealed	Not Available	Pohl, Dave	11740 Larch St Nw	Coon Rapids	58	7/28/1992	Not Available	WEL	Yes
176	003-223124210028	H000019389	Sealed	Not Available	Metz, Duane	10833 Thrush St Nw	Coon Rapids	42	4/3/1992	Not Available	WEL	Yes
177	003-123124340035	H000019393	Sealed	Not Available	Wallin, Evonne	11730 Ilex St	Coon Rapids	25	4/2/1992	Not Available	WEL	Yes
178	003-113124440020	H000020901	Sealed	Not Available	Baumtrog, Dave	11800 Olive St	Coon Rapids	28	5/5/1992	Not Available	WEL	Yes
179	003-183123330091	H000015546	Sealed	Not Available	Oswald, Douglas D	11007 Fourth St Ne	Blaine	42	9/23/1991	Not Available	WEL	Yes
180	003-223124430030	H000015551	Sealed	Not Available	Bolker, William	10230 Linnet	Coon Rapids	100	10/8/1991	Not Available	WEL	Yes
181	003-153124240080	H000017950	Sealed	Not Available	Winnie Y. Chan, Estate Of	11332 Quinn St Nw	Coon Rapids	129	2/24/1992	Not Available	WEL	Yes
182	003-133124220076	H000017125	Sealed	Not Available	Odle,	11561 Magnolia St Nw	Coon Rapids	36	9/26/1991	Not Available	WEL	Yes
183	003-223124210025	H000017126	Sealed	Not Available	Fryhling, C	10845 Thrush St	Coon Rapids	66	11/11/1991	Not Available	WEL	Yes
184	003-223124140009	H000018952	Sealed	Not Available	Julson, Stan	10505 Ibis St Nw	Coon Rapids	16	4/27/1992	Not Available	WEL	Yes
185	003-223124140009	H000018953	Sealed	Not Available	Julson, Stan/Paula	10505 Ibis St Nw	Coon Rapids	16	4/27/1992	Not Available	WEL	Yes
186	003-123124320049	H000018226	Sealed	Not Available	Johnson, John	11940 Magnolia St	Coon Rapids	32	3/16/1992	Not Available	WEL	Yes
187	003-163124140045	H000020556	Sealed	Not Available	Suthers, Steven K.	11402 Wren St Nw	Coon Rapids	35	4/27/1992	Not Available	WEL	Yes
188	003-123124330121	H000019774	Sealed	Not Available	Hite, John	11781 Olive St Nw	Coon Rapids	40	4/14/1992	Not Available	WEL	Yes
189	003-223124210025	H000018633	Sealed	Not Available	Fryhling, C	10845 Thrush St	Coon Rapids	21	11/11/1991	Not Available	WEL	Yes
190	003-163124220002	H000020583	Sealed	Not Available	Meisinger, Ed	3139 115th Av Nw	Coon Rapids	44	4/30/1992	Not Available	WEL	Yes
191	003-123124330048	H000013279	Sealed	Not Available	Snider, David	11788 Larch St Nw	Coon Rapids	46	9/5/1991	Not Available	WEL	Yes
192	053-3212021140017	H000021362	Sealed	Not Available	Norton	11358 Edgewood Av	Champlin	28	6/3/1992	Not Available	WEL	Yes
193	003-223124220015	H000022240	Sealed	Not Available	Fraki, James	2231 108th Av Nw	Coon Rapids	25	7/15/1992	Not Available	WEL	Yes
194	003-223124220015	H000022241	Sealed	Not Available	Fraki, James	2231 108th Av Nw	Coon Rapids	95	7/15/1992	Not Available	WEL	Yes
195	003-123124340047	H000022243	Sealed	Not Available	Arnold, Griffith	11688 Ilex St Nw	Coon Rapids	25	7/20/1992	Not Available	WEL	Yes
196	003-123124220092	H000030132	Sealed	Not Available	Jordan, Ray	608 Main St	Coon Rapids	30	7/2/1993	Not Available	WEL	Yes
197	003-273124120031	H000041303	Sealed	Not Available	Herber, Kevin	1914 Mississippi Bl Nw	Coon Rapids	120	9/1/1993	Not Available	WEL	Yes
198	003-223124430044	H000041315	Sealed	Not Available	Chesler, David	10115 Hanson Bl	Coon Rapids	95	3/31/1994	Not Available	WEL	Yes
199	003-133124220045	H000041106	Sealed	Not Available	Kruse, Mike	11620 Magnolia St	Coon Rapids	32	9/11/1993	Not Available	WEL	Yes
200	003-163124140096	H000042845	Sealed	Not Available	Kulbeik, Lynn	11402 Heights Dr N	Coon Rapids	25	11/17/1993	Not Available	WEL	Yes
201	053-3312021320012	H000042759	Sealed	Not Available	O'Reilly, Kevin/Chris	6117 112th Av N	Champlin	66	9/27/1993	Not Available	WEL	Yes
202	053-2812021330020	H000042840	Sealed	Not Available	Bouma, Lynn	11812 Porter Dr	Champlin	97	11/11/1993	Not Available	WEL	Yes

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203	053-3212021410002	H000036631	Sealed	Not Available	Nsp Easement	Not Available	Champlin	46	5/25/1993	Not Available	WEL	Uncertain
204	003-133124210055	H000038365	Sealed	Not Available	Denhartod, Craig	11531 Larch St	Coon Rapids	50	11/2/1993	Not Available	WEL	Yes
205	003-083124310030	H000038700	Sealed	Not Available	Vincent, Katie	11919 Woodbine St Nw	Coon Rapids	29	8/10/1993	Not Available	WEL	Yes
206	003-133124220096	H000032149	Sealed	Not Available	Auren, Laurie	751 Northdale Bl	Coon Rapids	40	4/19/1993	Not Available	WEL	Yes
207	003-273124120049	H000020280	Sealed	Not Available	Simon, Steve	1821 99th Av Nw	Coon Rapids	142	6/9/1992	Not Available	WEL	Yes
208	003-133124210070	H000032234	Sealed	Not Available	Hocks, Blanche	11616 Ilex St	Coon Rapids	36	6/6/1993	Not Available	WEL	Yes
209	003-163124120005	H000032316	Sealed	Not Available	Carlson, Kenneth/Lois	2612 Northdale Bl N	Coon Rapids	25	5/26/1993	Not Available	WEL	Yes
210	003-183123330053	H000032341	Sealed	Not Available	Denzer, Lance/Suzann	10915 Fifth St	Blaine	36	7/21/1993	Not Available	WEL	Yes
211	003-183123330053	H000032342	Sealed	Not Available	Denzer, Lance/Suzann	10915 Fifth St	Blaine	27	7/21/1993	Not Available	WEL	Yes
212	003-123124320053	H000024608	Sealed	Not Available	Moe, Richard	11908 Magnolia St	Coon Rapids	30	6/24/1992	Not Available	WEL	Yes
213	003-133124240021	H000024758	Sealed	Not Available	Lintlop, David	520 115th Av Nw	Coon Rapids	35	9/9/1992	Not Available	WEL	Yes
214	003-163124120005	H000032315	Sealed	Not Available	Carlson, Kenneth/Lois	2612 Northdale Bl N	Coon Rapids	66	5/26/1993	Not Available	WEL	Yes
215	003-183123330029	H000034181	Sealed	Not Available	Grose, Dan	11019 Sixth St Ne	Blaine	42	9/13/1993	Not Available	WEL	Yes
216	053-3312021320026	H000029638	Sealed	Not Available	Hanson, Ronald J.	6017 112th Av N	Champlin	53	3/24/1993	Not Available	WEL	Yes
217	053-0311921430024	H000036634	Sealed	Not Available	Nsp Easement	Not Available	Brooklyn Park	31	5/24/1993	Not Available	WEL	Uncertain
218	053-0311921440002	H000036635	Sealed	Not Available	Nsp Easement	Not Available	Brooklyn Park	31	6/4/1993	Not Available	WEL	Uncertain
219	053-0211921330001	H000036636	Sealed	Not Available	Nsp Easement	Not Available	Brooklyn Park	31	5/21/1993	Not Available	WEL	Uncertain
220	003-223124230002	H000034384	Sealed	Not Available	Coon Rapids, City Of	2301 105th Av Nw	Coon Rapids	130	5/21/1993	Not Available	WEL	Approximate
221	003-133124210015	H000035774	Sealed	Not Available	Hagen, Jim	11551 Kumquat St	Coon Rapids	45	4/23/1993	Not Available	WEL	Yes
222	003-133124210047	H000035775	Sealed	Not Available	Frishmon, Timm	11540 Kumquat St	Coon Rapids	35	4/23/1993	Not Available	WEL	Yes
223	003-223124220012	H000034647	Sealed	Not Available	Nemchik, Jim	10758 Thrush St	Coon Rapids	90	4/30/1994	Not Available	WEL	Yes
224	003-253124130002	H000026655	Sealed	Not Available	Stone, Maureen	221 97th Av Nw	Coon Rapids	25	3/12/1993	Not Available	WEL	Yes
225	003-223124210031	H000026666	Sealed	Not Available	Sauer, Greg	10821 Thrush St Nw	Coon Rapids	88	3/31/1993	Not Available	WEL	Yes
226	003-223124320083	H000028603	Sealed	Not Available	Godfrey, Rob/Sandy	10373 Quinn St Nw	Coon Rapids	24	3/19/1993	Not Available	WEL	Yes
227	003-093124310021	H000026584	Sealed	Not Available	Eliason, Arlo	3001 119th Av	Coon Rapids	58	4/2/1993	Not Available	WEL	Yes
228	003-133124430104	H000026639	Sealed	Not Available	Freeman, Richard	330 109th La Nw	Coon Rapids	25	10/6/1997	Not Available	WEL	Yes
229	003-133124210012	H000026651	Sealed	Not Available	Kaiser, Rick	11581 Kumquat St	Coon Rapids	34	3/2/1993	Not Available	WEL	Yes
230	003-163124230022	H000032101	Sealed	Not Available	Dahl, Kathleen	3029 113th Av Nw	Coon Rapids	55	3/23/1993	Not Available	WEL	Yes
231	003-223124420064	H000032135	Sealed	Not Available	Midwest Gas	1930 Coon Rapids Bl Nw	Coon Rapids	215	4/16/1993	Not Available	WEL	Yes
232	003-223124430037	H000048263	Sealed	Not Available	Metcalf, Mitch	10233 Hanson Bl	Coon Rapids	15	6/13/1994	Not Available	WEL	Yes
233	003-273124120016	H000048274	Sealed	Not Available	Garves, Rob	9927 Hanson Bl Nw	Coon Rapids	92	7/18/1994	Not Available	WEL	Yes
234	003-223124220059	H000047923	Sealed	Not Available	Bane, Mike	2380 108th Av Nw	Andover	85	3/25/1994	Not Available	WEL	Yes
235	003-263124230004	H000052020	Sealed	Not Available	Hopper, Keith	1560 97th La	Coon Rapids	128	5/14/1994	Not Available	WEL	Yes
236	003-133124420077	H000052027	Sealed	Not Available	Kapala-Glodek Funeral Service	242 Northdale Bl	Coon Rapids	22	5/28/1994	Not Available	WEL	Yes
237	003-133124420077	H000052032	Sealed	Not Available	Kapala-Glodek Funeral Service	242 Northdale Bl	Coon Rapids	107	5/28/1994	Not Available	WEL	Yes
238	003-123124340025	H000055184	Sealed	Not Available	Ruud, Charles	11841 Juniper S	Coon Rapids	25	7/28/1994	Not Available	WEL	Yes
239	003-183123330022	H000052991	Sealed	Not Available	Hansen, Jean	10925 Sixth St Ne	Blaine	18	9/7/1994	Not Available	WEL	Yes
240	003-193123210049	H000051095	Sealed	Not Available	Blake, Jeff	301 108th Av	Blaine	21	5/10/1994	Not Available	WEL	Yes
241	003-133124240022	H000047693	Sealed	Not Available	Bridges, Connie/Dean	530 115th Av Nw	Coon Rapids	30	4/14/1997	Not Available	WEL	Yes
242	003-113124440014	H000048276	Sealed	Not Available	Fahey, Don	11848 Olive St	Coon Rapids	26	8/5/1994	Not Available	WEL	Yes
243	003-093124310079	H000048281	Sealed	Not Available	Thompson, Mildred	12010 Crooked Lake Bl	Coon Rapids	72	9/19/1994	Not Available	WEL	Yes
244	003-223124220024	H000048283	Sealed	Not Available	Javener, Les	10879 Thrush St	Coon Rapids	120	9/24/1994	Not Available	WEL	Yes
245	003-153124230005	H000051116	Sealed	Not Available	Burnevik, Hazel	11447 Swallow St Nw	Coon Rapids	23	4/19/1994	Not Available	WEL	Yes
246	003-223124220064	H000048290	Sealed	Not Available	Morris, Terry/Donna	2330 108th Av Nw	Coon Rapids	31	12/9/1994	Not Available	WEL	Yes
247	003-133124240028	H000051282	Sealed	Not Available	Buttueiler, Rita	561 Northdale Bl	Coon Rapids	46	9/13/1994	Not Available	WEL	Yes
248	003-093124310011	H000038902	Sealed	Not Available	Christiansen, Donald	11943 Eidelweiss Nw	Coon Rapids	30	9/24/1993	Not Available	WEL	Yes
249	003-123124330074	H000050407	Sealed	Not Available	Va	11808 Magnolia	Coon Rapids	48	3/22/1994	Not Available	WEL	Yes
250	003-163124110071	H000041780	Sealed	Not Available	Foster, William	11562 Xavis St Nw	Coon Rapids	27	4/21/1994	Not Available	WEL	Yes
251	003-133124210103	H000051214	Sealed	Not Available	Mccloud, Lester	11650 Juniper St Nw	Coon Rapids	27	4/21/1994	Not Available	WEL	Yes
252	003-153124240047	H000048256	Sealed	Not Available	Quasbort, Sandy	11400 Partridge	Coon Rapids	21	5/26/1994	Not Available	WEL	Yes
253	003-153124240047	H000048257	Sealed	Not Available	Quasbort, Sandy	11400 Partridge	Coon Rapids	220	5/26/1994	Not Available	WEL	Yes
254	003-153124230076	H000045128	Sealed	Not Available	Niznik, Michael	2318 115th Av Nw	Coon Rapids	22	12/23/1993	Not Available	WEL	Yes
255	003-083124310019	H000045887	Sealed	Not Available	Surma, Jim/Carol	11927 Vintage St Nw	Coon Rapids	30	1/12/1994	Not Available	WEL	Yes
256	003-133124240027	H000045564	Sealed	Not Available	Stanek, Tom	571 Northdale Bl	Coon Rapids	40	1/11/1994	Not Available	WEL	Yes
257	003-133124220043	H000038912	Sealed	Not Available	Norberg, Jeff/Kathy	11640 Magnolia St	Coon Rapids	42	10/25/1993	Not Available	WEL	Yes
258	003-223124320080	H000038920	Sealed	Not Available	Miller, Gilman	10427 Quinn	Coon Rapids	20	11/15/1993	Not Available	WEL	Yes
259	003-123124340009	H000038935	Sealed	Not Available	Lahoud, Arlene	11740 Kumquat	Coon Rapids	52	2/21/1994	Not Available	WEL	Yes
260	003-223124420018	H000044085	Sealed	Not Available	Seman Mortuary	1833 Coon Rapids Bl	Coon Rapids	166	4/19/1994	Not Available	WEL	Approximate
261	003-123124330120	H000039004	Sealed	Not Available	Linde, Mayme E.	11771 Olive Nw	Coon Rapids	37	9/16/1993	Not Available	WEL	Yes
262	003-123124320044	H000038683	Sealed	Not Available	Steinert, George/Lynn	11925 Magnolia St Nw	Coon Rapids	28	7/29/1993	Not Available	WEL	Yes
263	003-253124120004	H000038698	Sealed	Not Available	Cartwright, Evelyn	9905 Foley Bl Nw	Coon Rapids	15	8/2/1993	Not Available	WEL	Approximate
264	003-123124330069	H000039234	Sealed	Not Available	Moon, Leroy	11848 Magnolia St N	Coon Rapids	34	12/28/1993	Not Available	WEL	Yes
265	003-123124330097	H000059272	Sealed	Not Available	Niemczyski, Paul/Mary	11881 Norway St Nw	Coon Rapids	18	6/6/1995	Not Available	WEL	Yes
266	003-123124340013	H000072217	Sealed	Not Available	Norton, Todd/Melanie	11717 Larch St	Coon Rapids	28	8/19/1995	Not Available	WEL	Yes
267	003-133124240055	H000072220	Sealed	Not Available	Anderson, Dan	11521 Juniper St	Coon Rapids	35	8/24/1995	Not Available	WEL	Yes
268	003-133124210091	H000072226	Sealed	Not Available	Sharpe, Roger	11631 Juniper St Nw	Coon Rapids	29	8/30/1995	Not Available	WEL	Yes
269	003-213124220040	H000072453	Sealed	Not Available	Lindbloom, Robert M.	10756 Flora St	Coon Rapids	33	10/11/1995	Not Available	WEL	Yes

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270	003-223124430059	H000066430	Sealed	Not Available	Nbl Financial Corporation	10143 Linnet St Nw	Coon Rapids	125	9/16/2003	Not Available	WEL	Approximate
271	003-183123330018	H000066434	Sealed	Not Available	Rasmussen, Ray	10901 Sixth St	Blaine	30	9/27/2003	Not Available	WEL	Yes
272	003-153124240017	H000066458	Sealed	Not Available	Sommerfeld, Ari/Martha	11356 Osage St Nw	Coon Rapids	120	7/27/1995	Not Available	WEL	Yes
273	003-123124330122	H000066471	Sealed	Not Available	Wrzos, Raymond	11791 Olive St	Coon Rapids	25	7/26/1995	Not Available	WEL	Yes
274	003-083124310018	H000066472	Sealed	Not Available	Berg, Joe	11919 Vintage St	Coon Rapids	130	7/28/1995	Not Available	WEL	Yes
275	053-3312021320034	H000072457	Sealed	Not Available	Kunde, Michael/Debr	6216 111TH Av N	Champlin	57	10/12/1995	Not Available	WEL	Yes
276	003-133124220013	H000066510	Sealed	Not Available	Dahlin, Dennis	11560 Olive St Nw	Coon Rapids	23	9/6/1995	Not Available	WEL	Yes
277	003-223124230025	H000059105	Sealed	Not Available	Nigon, Dave/Carol	10663 Verdin St Nw	Coon Rapids	15	11/7/1994	Not Available	WEL	Yes
278	003-223124220039	H000059315	Sealed	Not Available	Lindstrom, Morris/Joyce	10870 Thrush St	Coon Rapids	120	6/22/1995	Not Available	WEL	Yes
279	003-083124310017	H000059318	Sealed	Not Available	Vanoss, Jill	11911 Vintage St Nw	Coon Rapids	28	6/22/1995	Not Available	WEL	Yes
280	003-133124210043	H000054445	Sealed	Not Available	Va	11580 Kumquat Av	Coon Rapids	31	9/27/1994	Not Available	WEL	Yes
281	003-123124220006	H000059767	Sealed	Not Available	Mueller, Bud/Joanne	731 123rd Av Nw	Coon Rapids	29	11/14/1994	Not Available	WEL	Yes
282	003-083124310014	H000056899	Sealed	Not Available	Hoffer, Kelly	11910 Undercliff St Nw	Coon Rapids	137	9/30/1994	Not Available	WEL	Yes
283	003-133124420070	H000063463	Sealed	Not Available	Nelson, Martha	200 111th La	Coon Rapids	31	5/18/1995	Not Available	WEL	Yes
284	003-223124430036	H000066520	Sealed	Not Available	Gohman, Keith	10243 Hanson Bl	Coon Rapids	70	9/14/1995	Not Available	WEL	Yes
285	003-223124240045	H000063381	Sealed	Not Available	Bailey, Lisa	2030 106th Av Nw	Coon Rapids	105	3/22/1995	Not Available	WEL	Yes
286	003-133124210109	H000064230	Sealed	Not Available	Tucker, Richard	11590 Juniper St Nw	Coon Rapids	37	5/22/1995	Not Available	WEL	Yes
287	053-3312021230091	H000064271	Sealed	Not Available	Schreiber, Rose M.	11306 Douglas Dr N	Champlin	23	6/29/1995	Not Available	WEL	Yes
288	003-133124220029	H000064966	Sealed	Not Available	Reinfeld, Ray	11521 Olive St Nw	Coon Rapids	60	3/23/1995	Not Available	WEL	Yes
289	003-123124330024	H000059235	Sealed	Not Available	Hein, Mike/Melissa	11765 Larch St	Coon Rapids	28	5/3/1995	Not Available	WEL	Yes
290	003-133124130001	H000052719	Sealed	Not Available	Camp, Bill	339 Northdale Bl	Coon Rapids	25	7/25/1994	Not Available	WEL	Yes
291	003-223124240022	H000052744	Sealed	Not Available	Sjolander, Fred	2031 107th Av Nw	Coon Rapids	96	1/31/1995	Not Available	WEL	Yes
292	003-133124240035	H000052747	Sealed	Not Available	Hartfiel, Ben	560 Northdale Bl	Coon Rapids	40	2/17/1995	Not Available	WEL	Yes
293	003-133124220095	H000059343	Sealed	Not Available	Jirsa, Geneale	761 Northdale Bl	Coon Rapids	30	6/20/1995	Not Available	WEL	Yes
294	003-123124330046	H000063470	Sealed	Not Available	Joyce, Kelly	11808 Larch St	Coon Rapids	45	5/30/1995	Not Available	WEL	Yes
295	003-163124230006	H000063484	Sealed	Not Available	Lonkey, Dick	11447 Lily St Nw	Coon Rapids	51		Not Available	WEL	Yes
296	003-113124110125	H000063487	Sealed	Not Available	Lilliencrantz, Don	12426 Redwood St Nw	Coon Rapids	20	8/2/1995	Not Available	WEL	Yes
297	003-133124110002	H000045149	Sealed	Not Available	Miller, James	11626 University Av Nw	Coon Rapids	26	3/17/1994	Not Available	WEL	Yes
298	003-133124230074	H000049022	Sealed	Not Available	Sorteberg School	11400 Magnolia St Nw	Coon Rapids	31	9/2/1994	Not Available	WEL	Yes
299	003-223124230003	H000056847	Sealed	Not Available	Hausmann, William	2241 Coon Rapids Bl	Coon Rapids	50	8/30/1994	Not Available	WEL	Yes
300	003-073123330064	H000054881	Sealed	Not Available	Dropps, Edwin A	15 117th Av Ne	Blaine	27	10/4/1994	Not Available	WEL	Approximate
301	003-223124310003	H000069713	Sealed	Not Available	Coon Rapids United Methodist Church	10506 Hanson Bl Nw	Coon Rapids	184	5/25/1995	Not Available	WEL	Yes
302	003-123124320061	H000081459	Sealed	Not Available	Bliss, Scott	11951 Norway St Nw	Coon Rapids	30	10/23/1992	Not Available	WEL	Yes
303	003-223124220053	H000091730	Sealed	Not Available	Sorenson, Kathy	2351 108th Av Nw	Coon Rapids	32	12/10/1987	Not Available	WEL	Yes
304	003-223124220033	H000091736	Sealed	Not Available	Chandler, Vern	10898 Thrush	Coon Rapids	88	4/25/1988	Not Available	WEL	Yes
305	003-163124220105	H000091740	Sealed	Not Available	Furlong, Bruce	11542 Jonquil St	Coon Rapids	0	5/27/1987	Not Available	WEL	Yes
306	003-253124130018	H000091743	Sealed	Not Available	Jaworski, Mary	305 97th Av Nw	Coon Rapids	34	10/28/1988	Not Available	WEL	Yes
307	003-163124320007	H000091758	Sealed	Not Available	White Castle	3000 Coon Rapids Bl	Coon Rapids	36	10/3/1985	Not Available	WEL	Approximate
308	003-133124220030	H000080639	Sealed	Not Available	Remund, Marie	11541 Olive St	Coon Rapids	39	12/8/1992	Not Available	WEL	Yes
309	003-183123330055	H000091673	Sealed	Not Available	Century 21	10931 Fifth St	Blaine	20	9/28/1988	Not Available	WEL	Yes
310	003-183123330132	H000091697	Sealed	Not Available	Accap Construction	10913 University Av N	Blaine	23	10/24/1986	Not Available	WEL	Yes
311	003-183123330130	H000091713	Sealed	Not Available	Accap Construction	10907 University Av	Blaine	23	10/24/1986	Not Available	WEL	Yes
312	003-183123330134	H000091714	Sealed	Not Available	Accap Construction	10925 University Av	Blaine	15	10/24/1986	Not Available	WEL	Yes
313	003-183123330130	H000091715	Sealed	Not Available	Accap Construction	10917 University Av	Blaine	22	10/24/1986	Not Available	WEL	Approximate
314	003-223124240030	H000091719	Sealed	Not Available	Jewell, Rollie	10640 Hanson Bl	Coon Rapids	102	6/29/1988	Not Available	WEL	Yes
315	003-223124220008	H000091721	Sealed	Not Available	Caouette, Tina	2216 108th Av Nw	Coon Rapids	85	7/20/1988	Not Available	WEL	Yes
316	003-223124210008	H000091722	Sealed	Not Available	Joyce, Dan	10761 Key Ci	Coon Rapids	98	7/21/1988	Not Available	WEL	Yes
317	003-123124330037	H000091724	Sealed	Not Available	Johannsen, Dennis	11873 Larch St Nw	Coon Rapids	45	11/18/1988	Not Available	WEL	Yes
318	003-163124430057	H000091725	Sealed	Not Available	Midwest Auto Mall	2704 Coon Rapids Bl	Coon Rapids	70	9/15/1987	Not Available	WEL	Approximate
319	003-123124340022	H000091769	Sealed	Not Available	Biegler, Brad	11811 Juniper St	Coon Rapids	17	9/22/1987	Not Available	WEL	Yes
320	003-133124210058	H000091770	Sealed	Not Available	Jensen, Roger	11561 Larch Av	Coon Rapids	21	8/31/1987	Not Available	WEL	Yes
321	003-123124340036	H000091771	Sealed	Not Available	Varvelle, Jeffrey	11719 Ilex St Nw	Coon Rapids	50	8/26/1987	Not Available	WEL	Approximate
322	003-133124220084	H000091772	Sealed	Not Available	Delaney, Lyle	11709 Magnolia St	Coon Rapids	21	3/11/1988	Not Available	WEL	Yes
323	003-133124120004	H000091774	Sealed	Not Available	Pennala, Roslyn	11555 Flintwood St	Coon Rapids	25	2/26/1988	Not Available	WEL	Yes
324	003-163124430050	H000091726	Sealed	Not Available	Midwest Auto Mall	2664 Coon Rapids Bl	Coon Rapids	17	9/15/1987	Not Available	WEL	Yes
325	003-123124340022	H000091727	Sealed	Not Available	Biegler, Brad	11811 Juniper St	Coon Rapids	19	9/17/1987	Not Available	WEL	Yes
326	003-123124330029	H000078845	Sealed	Not Available	Handle, Paul	11809 Larch St	Coon Rapids	35	3/15/1993	Not Available	WEL	Yes
327	053-3312021240035	H000080296	Sealed	Not Available	Va	11317 Yates Av N	Champlin	120	12/14/1992	Not Available	WEL	Yes
328	003-123124220108	H000079491	Sealed	Not Available	Amoco Oil Company	Hwy 242 (& Foley Bl)	Coon Rapids	23	2/11/1993	Not Available	WEL	Uncertain
329	003-123124220108	H000079492	Sealed	Not Available	Amoco Oil Company	Hwy 242 (& Foley Bl)	Coon Rapids	22	2/11/1993	Not Available	WEL	Uncertain
330	003-123124220108	H000079496	Sealed	Not Available	Amoco Oil Company	Hwy 242 (& Foley Bl)	Coon Rapids	18	2/11/1993	Not Available	WEL	Uncertain
331	003-123124220108	H000079497	Sealed	Not Available	Amoco Oil Company	Hwy 242 (& Foley Bl)	Coon Rapids	24	2/11/1993	Not Available	WEL	Uncertain
332	003-123124220108	H000079498	Sealed	Not Available	Amoco Oil Company	Hwy 242 (& Foley Bl)	Coon Rapids	21	2/11/1993	Not Available	WEL	Uncertain
333	003-133124240029	H000080306	Sealed	Not Available	Utecht, Jill	551 Northdale Bl	Coon Rapids	32	12/15/1992	Not Available	WEL	Yes
334	053-3312021440071	H000080024	Sealed	Not Available	Kittleson, Gary	11021 River Rd W	Champlin	25	1/5/1993	Not Available	WEL	Yes
335	003-133124210036	H000077362	Sealed	Not Available	Shenkee, Steve	11550 Larch St	Coon Rapids	25	10/31/1989	Not Available	WEL	Yes
336	003-123124320034	H000077364	Sealed	Not Available	Simonson, Betty	11900 Kumquat St	Coon Rapids	30	7/11/1989	Not Available	WEL	Yes

PCSI Results - Sealed Wells in the DWSMAs
City of Coon Rapids Part 2 WHPP Amendment

PCSI ID	PID No.	Unique No.	Status	Use	Well Owner	Well Location	City	Total Sealed Depth (Feet)	Date Completed/Sealed	Aquifer	PCS Code	Location Verified
337	003-133124210116	H000079919	Sealed	Not Available	Paite, Jerry/Janet	11520 Juniper St Nw	Coon Rapids	27	1/19/1993	Not Available	WEL	Yes
338	003-213124210013	H000077485	Sealed	Not Available	Dillenburg, Michael	10900 Dahlia St Nw	Coon Rapids	30	12/31/1988	Not Available	WEL	Yes
339	003-123124340015	H000079375	Sealed	Not Available	Northwestern College	11850 Ilex St Nw	Coon Rapids	55	2/4/1993	Not Available	WEL	Yes
340	003-273124120044	H000078960	Sealed	Not Available	Hanson, Orville K.	1855 99th Av Nw	Coon Rapids	50	2/26/1993	Not Available	WEL	Yes
341	003-123124330027	H000060052	Sealed	Not Available	Corey, Charles	11789 Larch	Coon Rapids	34	11/23/1994	Not Available	WEL	Yes
342	003-123124220072	H000073735	Sealed	Not Available	Hood, Frank S.	744 Main St Nw	Coon Rapids	65	5/23/1996	Not Available	WEL	Yes
343	003-123124220072	H000073736	Sealed	Not Available	Hook, Frank S.	744 Main St Nw	Coon Rapids	68	5/23/1996	Not Available	WEL	Yes
344	003-213124110010	H000080857	Sealed	Not Available	Estenson, Bruce	2405 Coon Rapids Bl	Coon Rapids	63	11/19/1992	Not Available	WEL	Approximate
345	003-123124340069	H000074804	Sealed	Not Available	Hanson, Dennis	11809 Kumquat St	Coon Rapids	24	10/5/1995	Not Available	WEL	Yes
346	003-133124220097	H000074807	Sealed	Not Available	Moen, Tim	741 Northdale Bl	Coon Rapids	31	10/18/1995	Not Available	WEL	Yes
347	003-123124340075	H000074808	Sealed	Not Available	Dunham, Brian	11733 Larch St	Coon Rapids	0	11/24/1995	Not Available	WEL	Yes
348	003-223124240033	H000074810	Sealed	Not Available	Curtis, Jeane	10616 Hanson Bl	Coon Rapids	96	12/15/1995	Not Available	WEL	Yes
349	003-133124220031	H000074811	Sealed	Not Available	Mahr, Sue	11561 Olive St	Coon Rapids	46	12/15/1995	Not Available	WEL	Yes
350	003-223124220030	H000074812	Sealed	Not Available	Meld, Dianne	10809 Thrush St	Coon Rapids	92	1/18/1996	Not Available	WEL	Yes
351	003-123124330073	H000074816	Sealed	Not Available	Larkin, Terry	11816 Magnolia	Coon Rapids	38	4/12/1996	Not Available	WEL	Yes
352	003-133124120002	H000074817	Sealed	Not Available	Cronin, Tom	11613 Flintwood	Coon Rapids	76	4/25/1996	Not Available	WEL	Yes
353	003-213124240013	H000075522	Sealed	Not Available	Porter, Robin	10465 Crocus St	Coon Rapids	117	2/13/1996	Not Available	WEL	Yes
354	003-153124240054	H000078071	Sealed	Not Available	Schultz, Lori	11300 Partridge St	Coon Rapids	131	12/10/1991	Not Available	WEL	Yes
355	003-123124330023	H000078072	Sealed	Not Available	Swanson, Bob	11757 Larch St Nw	Coon Rapids	29	10/23/1991	Not Available	WEL	Yes
356	003-123124330119	H000078073	Sealed	Not Available	Meyer, Steven	11761 Olive St	Coon Rapids	26	10/21/1991	Not Available	WEL	Yes
357	003-133124210114	H000075619	Sealed	Not Available	Bond, Gwen	11540 Juniper	Coon Rapids	40	8/13/1996	Not Available	WEL	Yes
358	003-233124320007	H000077011	Sealed	Not Available	Wingade, Keith R.	1615 Coon Rapids Bl	Coon Rapids	56	8/9/1991	Not Available	WEL	Approximate
359	053-3212021410021	H000073471	Sealed	Not Available	Wawrzyniak, James \	11242 Georgia Av	Champlin	15	10/10/1995	Not Available	WEL	Yes
360	003-233124330015	H000077422	Sealed	Not Available	Peck, Terry	1495 Egret Bl	Coon Rapids	95	8/30/1989	Not Available	WEL	Yes
361	053-3312021320024	H000075482	Sealed	Not Available	Savage, Joe/Darla	5917 113th Av	Champlin	76	11/2/1995	Not Available	WEL	Yes
362	003-163124410030	H000075491	Sealed	Not Available	Classen, Bill	11260 Zion St Nw	Coon Rapids	26	11/6/1995	Not Available	WEL	Yes
363	003-123124330054	H000075911	Sealed	Not Available	Mancl, John	11773 Magnolia St Nw	Coon Rapids	26	10/4/1995	Not Available	WEL	Yes
364	053-3312021330086	H000077239	Sealed	Not Available	Men Rio Construction Co., Inc.	11041 Douglas Dr	Champlin	28	6/6/1990	Not Available	WEL	Approximate
365	003-123124340070	H000077452	Sealed	Not Available	Meyers, Steven	11817 Kumquat St	Coon Rapids	35	3/15/1990	Not Available	WEL	Yes
366	003-213124430002	H000077453	Sealed	Not Available	Moorhouse, Larry	10259 Mississippi Bl Nw	Coon Rapids	39	6/22/1990	Not Available	WEL	Yes
367	003-123124230102	H000067963	Sealed	Not Available	Faulkner, Virgil	702 123rd Av Nw	Coon Rapids	30	4/13/1995	Not Available	WEL	Approximate
368	003-183123330063	H000094825	Sealed	Not Available	No Property Owner On Record	11031 Fifth St	Blaine	21	4/7/1988	Not Available	WEL	Yes
369	003-133124210049	H000094834	Sealed	Not Available	Munbleau, Gloria	11520 Kumquat St Nw	Coon Rapids	28	4/17/1989	Not Available	WEL	Yes
370	003-233124330028	H000102265	Sealed	Not Available	Enmark, John	1578 103rd Av Nw	Coon Rapids	80	5/23/1996	Not Available	WEL	Yes
371	003-223124240075	H000102519	Sealed	Not Available	Lewis, Ralph	2080 Coon Rapids Bl	Coon Rapids	291	5/29/1996	Not Available	WEL	Approximate
372	003-133124240050	H000108556	Sealed	Not Available	Steele, Gladys	11516 Ilex St Nw	Coon Rapids	34	9/10/1996	Not Available	WEL	Yes
373	003-133124120063	H000102733	Sealed	Not Available	Nielsen, Chris/Kumiko	11679 Evergreen St	Coon Rapids	24	4/29/1996	Not Available	WEL	Yes
374	003-123124340018	H000102746	Sealed	Not Available	Brown, Christy	11820 Ilex St Nw	Coon Rapids	38	6/11/1996	Not Available	WEL	Yes
375	003-083124310005	H000107545	Sealed	Not Available	Miskowiec, Steve	11951 Undercliff St Nw	Coon Rapids	85	7/26/1996	Not Available	WEL	Yes
376	003-213124440045	H000102081	Sealed	Not Available	Cech, Rita	10222 Mississippi Bl Nw	Coon Rapids	75	5/21/1996	Not Available	WEL	Yes
377	003-133124240044	H000107524	Sealed	Not Available	Skog, John	11361 Kumquat St	Coon Rapids	40	7/16/1996	Not Available	WEL	Yes
378	003-163124220099	H000102703	Sealed	Not Available	Rainwater, Ben/Cheryl	11525 Jonquil St	Coon Rapids	42	2/28/1996	Not Available	WEL	Yes
379	003-133124210083	H000102704	Sealed	Not Available	Utter, Tom	11551 Juniper St Nw	Coon Rapids	35	3/5/1996	Not Available	WEL	Yes
380	003-133124240043	H000102026	Sealed	Not Available	Klasons, John	11371 Kumquat St Nw	Coon Rapids	30	4/19/1996	Not Available	WEL	Yes
381	003-223124220011	H000079081	Sealed	Not Available	Getting, Jim	10798 Thrush	Coon Rapids	44	9/15/1992	Not Available	WEL	Yes
382	003-093124340012	H000079083	Sealed	Not Available	Larson, Chris	2931 118th La Nw	Coon Rapids	0		Not Available	WEL	Yes
383	003-233124320006	H000094836	Sealed	Not Available	Peifer, John	10321 Flamingo St Nw	Coon Rapids	10	4/5/1989	Not Available	WEL	Yes
384	003-213124110030	H000094840	Sealed	Not Available	Coon Rapids, City Of	10800 Xavis	Coon Rapids	145	10/24/1988	Not Available	WEL	Yes
385	003-223124220038	H000094842	Sealed	Not Available	Eastman, Robert	10874 Thrush St Nw	Coon Rapids	94	12/15/1988	Not Available	WEL	Yes
386	003-133124210088	H000094844	Sealed	Not Available	Lahner, Steve	11601 Juniper	Coon Rapids	29	4/7/1989	Not Available	WEL	Yes
387	003-253124140027	H000101723	Sealed	Not Available	Forest Lake Contracting	181 99th Av	Coon Rapids	25	5/2/1996	Not Available	WEL	Approximate
388	003-123124320057	H000080495	Sealed	Not Available	Madson, Gayle	11917 Norway St Nw	Coon Rapids	25	11/25/1992	Not Available	WEL	Yes
389	053-3212021110050	H000114473	Sealed	Not Available	Jenniges, Myron	11630 Edgewood Av N	Champlin	88	4/15/1997	Not Available	WEL	Yes
390	003-123124340072	H000114591	Sealed	Not Available	Fashant, Betty	11833 Kumquat St	Coon Rapids	35	3/5/1997	Not Available	WEL	Yes
391	003-163124110050	H000114689	Sealed	Not Available	Martin, John	11567 Xavis St Nw	Coon Rapids	25	3/10/1997	Not Available	WEL	Yes
392	003-153124240050	H000114690	Sealed	Not Available	Smith, Doug/Ruth	11332 Partridge St Nw	Coon Rapids	130	3/10/1997	Not Available	WEL	Yes
393	003-163124230072	H000114691	Sealed	Not Available	Kari, Steve	11440 Heather St Nw	Coon Rapids	30	3/14/1997	Not Available	WEL	Yes
394	003-133124210019	H000114692	Sealed	Not Available	Holmquist, Brad	11511 Kumquat St Nw	Coon Rapids	45	3/19/1997	Not Available	WEL	Yes
395	003-083124330017	H000115108	Sealed	Not Available	Al Parent Construction, Inc.	3915 Coon Rapids Bl	Coon Rapids	48	4/18/1997	Not Available	WEL	Yes
396	003-133124230074	H000109557	Sealed	Not Available	Isd 11	11400 Magnolia St Nw	Coon Rapids	23	9/25/1996	Not Available	WEL	Yes
397	Not Available	H000118752	Sealed	Not Available	Not Available	Not Available		24	4/29/1997	Not Available	WEL	Uncertain
398	003-133124210053	H000118838	Sealed	Not Available	Nepstad, Gerhard	11511 Larch St Nw	Coon Rapids	30	6/17/1997	Not Available	WEL	Yes
399	003-123124320047	H000119067	Sealed	Not Available	Duffy, Raymond	11949 Magnolia St Nw	Coon Rapids	33	6/5/1997	Not Available	WEL	Yes
400	003-223124220004	H000115585	Sealed	Not Available	Lott, Bill	10709 Thrush St Nw	Coon Rapids	95	2/25/1998	Not Available	WEL	Yes
401	003-223124210007	H000115725	Sealed	Not Available	Nortorn, Wayne	10760 Key Ci Nw	Coon Rapids	55	4/16/1997	Not Available	WEL	Yes
402	003-183123330041	H000120529	Sealed	Not Available	Moran, Steve	11002 Sixth St Ne	Blaine	24	3/19/1996	Not Available	WEL	Yes
403	003-133124240025	H000112833	Sealed	Not Available	Jenkins, Bob	560 115th Av Nw	Coon Rapids	35	11/21/1996	Not Available	WEL	Yes

PCSI Results - Sealed Wells in the DWSMAs
City of Coon Rapids Part 2 WHPP Amendment

PCSI ID	PID No.	Unique No.	Status	Use	Well Owner	Well Location	City	Total Sealed Depth (Feet)	Date Completed/Sealed	Aquifer	PCS Code	Location Verified
404	003-183123330105	H000112894	Sealed	Not Available	Johnson, John P.	11002 Fourth St Ne	Blaine	25	12/11/1996	Not Available	WEL	Yes
405	003-183123330105	H000112895	Sealed	Not Available	Johnson, John P.	11002 Fourth St Ne	Blaine	20	12/11/1996	Not Available	WEL	Yes
406	003-133124130053	H000116033	Sealed	Not Available	Northdale 76	11404 Foley Bl	Coon Rapids	30	8/1/1997	Not Available	WEL	Yes
407	053-3312021240046	H000108993	Sealed	Not Available	Sawatsky, Alice	11416 Yates Av N	Champlin	94	12/2/1996	Not Available	WEL	Yes
408	053-3312021230017	H000113531	Sealed	Not Available	Va	5933 113TH Av N	Champlin	83	2/17/1997	Not Available	WEL	Yes
409	003-133124240045	H000114657	Sealed	Not Available	Rearson, Tim	11351 Kumquat St Nw	Coon Rapids	30	1/15/1997	Not Available	WEL	Yes
410	003-093124340030	H000107241	Sealed	Not Available	Grant, Steve	2820 119th Av Nw	Coon Rapids	29	8/13/1996	Not Available	WEL	Yes
411	003-123124340005	H000107242	Sealed	Not Available	Rivera, Angel	11721 Kumquat St Nw	Coon Rapids	32	8/13/1996	Not Available	WEL	Yes
412	003-153124240055	H000112845	Sealed	Not Available	Hanson, Larry	11301 Quinn St Nw	Coon Rapids	125	12/11/1996	Not Available	WEL	Yes
413	053-0311921130044	H000104724	Sealed	Not Available	Roach, Robert L.	3501 Sunset rd	Brooklyn Park	79	5/9/1996	Not Available	WEL	Yes
414	003-153124240018	H000106539	Sealed	Not Available	Shields, Kris	11348 Osage St	Coon Rapids	115	7/1/1996	Not Available	WEL	Yes
415	003-153124420005	H000106543	Sealed	Not Available	Faith Lutheran Church	11115 Hanson Bl	Coon Rapids	115	8/12/1996	Not Available	WEL	Yes
416	003-273124120024	H000104432	Sealed	Not Available	Borner, Pat	9960 Linnet St	Coon Rapids	110	8/23/1996	Not Available	WEL	Yes
417	003-093124340021	H000116479	Sealed	Not Available	Bahe, Conrad	2900 118th La Nw	Coon Rapids	80	7/22/1997	Not Available	WEL	Yes
418	003-133124220067	H000103505	Sealed	Not Available	Henthorn, Christine	11711 Norway St Nw	Coon Rapids	25	3/8/1996	Not Available	WEL	Yes
419	003-173124440001	H000109754	Sealed	Not Available	Mn Doa	Not Available	Coon Rapids	26	8/23/1996	Not Available	WEL	Uncertain
420	003-133124220042	H000109650	Sealed	Not Available	Lablanche, Barry	11650 Magnolia St	Coon Rapids	27	1/7/1997	Not Available	WEL	Yes
421	003-263124220007	H000115412	Sealed	Not Available	Coon Rapids, City Of	Coon Rapids (1350-1410) Bl	Coon Rapids	17	2/16/1998	Not Available	WEL	Uncertain
422	003-123124340043	H000111778	Sealed	Not Available	Anderson, Scott	11741 Juniper St	Coon Rapids	54	10/28/1996	Not Available	WEL	Yes
423	003-153124240051	H000108773	Sealed	Not Available	Olson, Marla	11324 Partridge St Nw	Coon Rapids	120	8/12/1996	Not Available	WEL	Yes
424	003-233124330029	H000112015	Sealed	Not Available	Fjerstad, Jerry	1570 103rd Av	Coon Rapids	100	5/6/1997	Not Available	WEL	Yes
425	003-133124210094	H000120247	Sealed	Not Available	Gibbs, Patrick	11661 Juniper St	Coon Rapids	40	2/27/1996	Not Available	WEL	Yes
426	053-3312021240023	H000113047	Sealed	Not Available	Giese, Ted/Kay	11449 Yates Av N	Champlin	110	12/2/1996	Not Available	WEL	Yes
427	003-223124240044	H000104405	Sealed	Not Available	Steinberg, Bill	10540 Hanson Bl	Coon Rapids	55	7/25/1996	Not Available	WEL	Yes
428	003-133124210005	H000104187	Sealed	Not Available	Corbin, Richard	11661 Kumquat St	Coon Rapids	36	5/22/1996	Not Available	WEL	Yes
429	053-2812021330032	H000104193	Sealed	Not Available	Schreiber, Jerry	11836 W River rd	Champlin	90	5/30/1996	Not Available	WEL	Yes
430	053-3212021110062	H000126949	Sealed	Not Available	Meyers, Richard W.	11581 Douglas Dr	Champlin	59	10/24/1997	Not Available	WEL	Yes
431	003-133124240014	H000126213	Sealed	Not Available	Kosloski, Randolph L.	620 115th Av Nw	Coon Rapids	48	8/6/1997	Not Available	WEL	Yes
432	003-133124220093	H000126227	Sealed	Not Available	Gonsales, Eugene	770 115th Av Nw	Coon Rapids	66	9/17/1997	Not Available	WEL	Yes
433	003-133124210112	H000130688	Sealed	Not Available	Wagner, Wayne	11560 Juniper St	Coon Rapids	28	12/3/1997	Not Available	WEL	Yes
434	003-223124220062	H000128240	Sealed	Not Available	Bloodgood, Dawn	2350 108th Av Nw	Coon Rapids	47	1/5/1999	Not Available	WEL	Yes
435	003-253124130072	H000128251	Sealed	Not Available	Mann, John	261 97th Av Nw	Coon Rapids	22	5/21/1993	Not Available	WEL	Yes
436	003-123124420002	H000128996	Sealed	Not Available	Gerads, Earl S.	Not Available	Coon Rapids	20	1/19/2006	Not Available	WEL	Uncertain
437	003-123124420002	H000128997	Sealed	Not Available	Gerads, Earl S.	Not Available	Coon Rapids	20	1/19/2006	Not Available	WEL	Uncertain
438	003-163124420027	H000135449	Sealed	Not Available	Reinhardt, Clarence	11253 Crooked Lake Bl Nw	Coon Rapids	0	6/9/1998	Not Available	WEL	Yes
439	003-223124240051	H000135450	Sealed	Not Available	Mathis, Marcella	2100 106th Av	Coon Rapids	88	6/9/1998	Not Available	WEL	Yes
440	003-183123340107	H000128291	Sealed	Not Available	Stieren, Ronald J.	10931 Washington St Ne	Blaine	20	5/10/1999	Not Available	WEL	Yes
441	003-133124230007	H000128332	Sealed	Not Available	Staffonson, Dale	727 114th Av Nw	Coon Rapids	31	9/29/1989	Not Available	WEL	Yes
442	003-223124420011	H000134933	Sealed	Not Available	Real Estate Masters	1911 103rd Av Nw	Coon Rapids	114	3/11/1998	Not Available	WEL	Yes
443	003-123124130056	H000130740	Sealed	Not Available	Miedtke, Scott	12077 Evergreen St	Coon Rapids	43	4/14/1998	Not Available	WEL	Yes
444	003-133124230008	H000126916	Sealed	Not Available	Hall, Curt	717 114th Av Nw	Coon Rapids	25	8/26/1997	Not Available	WEL	Yes
445	003-133124220007	H000135410	Sealed	Not Available	Mevissen, Tom	11710 Olive St Nw	Coon Rapids	31	4/8/1998	Not Available	WEL	Yes
446	003-233124330008	H000119623	Sealed	Not Available	Larson Mechanical	1509 Coon Rapids Bl	Coon Rapids	20	5/13/1997	Not Available	WEL	Yes
447	003-223124220046	H000126248	Sealed	Not Available	Bisek, Leona	10804 Thrush St	Coon Rapids	28	3/30/1998	Not Available	WEL	Yes
448	003-153124240042	H000123316	Sealed	Not Available	Kampa, Patty	11440 Partridge St	Coon Rapids	100	6/12/1997	Not Available	WEL	Yes
449	003-223124210005	H000125428	Sealed	Not Available	Martig, Marcy	10740 Key Ci Nw	Coon Rapids	102	8/12/1997	Not Available	WEL	Yes
450	003-223124230027	H000123871	Sealed	Not Available	Faulkner, Virgil	10659 Verdin St	Coon Rapids	18	6/24/1997	Not Available	WEL	Yes
451	003-133124210052	H000123882	Sealed	Not Available	Gliddon, Alfred	11501 Larch St	Coon Rapids	29	7/8/1997	Not Available	WEL	Yes
452	003-113124440003	H000117061	Sealed	Not Available	Styles, Tom	11857 Olive St Nw	Coon Rapids	0	9/11/1997	Not Available	WEL	Yes
453	003-233124330018	H000117062	Sealed	Not Available	Fischer, Kalynn	10221 Flamingo St Nw	Coon Rapids	80	9/4/1997	Not Available	WEL	Yes
454	003-223124240031	H000117090	Sealed	Not Available	Corcoran, Don/Teresa	10632 Hanson Bl	Coon Rapids	145	11/21/1997	Not Available	WEL	Yes
455	003-093124330004	H000123890	Sealed	Not Available	Pemble, Steve	3000 119th Av Nw	Coon Rapids	68	7/18/1997	Not Available	WEL	Yes
456	003-153124240058	H000123900	Sealed	Not Available	Olson, Coleen	11325 Quinn St Nw	Coon Rapids	126	7/30/1997	Not Available	WEL	Yes
457	003-133124210096	H000128714	Sealed	Not Available	Behlen, Mark	11681 Juniper St Nw	Coon Rapids	30	7/10/1989	Not Available	WEL	Yes
458	003-123124340017	H000128816	Sealed	Not Available	Willis, Susan	11830 Ilex St Nw	Coon Rapids	31	7/19/1990	Not Available	WEL	Yes
459	003-123124320064	H000128903	Sealed	Not Available	Ellison, M. D.	11940 Norway St Nw	Coon Rapids	23	7/25/1990	Not Available	WEL	Yes
460	003-233124330038	H000117970	Sealed	Not Available	Anoka County Rent All	1531 Coon Rapids Bl	Coon Rapids	26	4/24/1997	Not Available	WEL	Approximate
461	003-123124220023	H000127901	Sealed	Not Available	Hackworthy, Kim	12347 Olive St	Coon Rapids	19	8/27/1997	Not Available	WEL	Yes
462	003-213124430006	H000127908	Sealed	Not Available	Heikel, Gloria	10314 Mississippi Bl	Coon Rapids	85	9/11/1997	Not Available	WEL	Approximate
463	003-183123330079	H000117258	Sealed	Not Available	Thalhuber, John J	10914 Fifth St	Blaine	10	6/10/1997	Not Available	WEL	Yes
464	003-223124410182	H000131187	Sealed	Not Available	Hassan, Ann	10409 Jay St	Coon Rapids	100	12/10/1997	Not Available	WEL	Yes
465	003-223124410064	H000132909	Sealed	Not Available	Tovar, Roseann	10430 Hummingbird St Nw	Coon Rapids	95	1/23/1998	Not Available	WEL	Yes
466	003-223124130061	H000132920	Sealed	Not Available	Anoka County Highway Department	10563 Hanson Bl	Coon Rapids	20	2/6/1998	Not Available	WEL	Yes
467	003-223124130061	H000132923	Sealed	Not Available	Anoka County Highway Department	10563 Hanson Bl	Coon Rapids	85	2/6/1998	Not Available	WEL	Yes
468	053-0311921220006	H000132929	Sealed	Not Available	Stella, Michael/Shir	10832 Noble Av N	Brooklyn Park	80	2/17/1998	Not Available	WEL	Yes
469	003-163124410061	H000132942	Sealed	Not Available	Hammes, Bill	2409 Heights Dr S	Coon Rapids	35	3/6/1998	Not Available	WEL	Yes
470	003-133124210050	H000132947	Sealed	Not Available	Culley, Steve/Wendy	11510 Kumquat St Nw	Coon Rapids	30	3/11/1998	Not Available	WEL	Yes

PCSI Results - Sealed Wells in the DWSMAs
City of Coon Rapids Part 2 WHPP Amendment

PCSI ID	PID No.	Unique No.	Status	Use	Well Owner	Well Location	City	Total Sealed Depth (Feet)	Date Completed/Sealed	Aquifer	PCS Code	Location Verified
471	003-133124220059	H000142696	Sealed	Not Available	Peterson, David L	11541 Norway St	Coon Rapids	22	3/3/1999	Not Available	WEL	Yes
472	003-153124240077	H000142638	Sealed	Not Available	Kent, George	11400 Quinn St Nw	Coon Rapids	55	7/29/1998	Not Available	WEL	Yes
473	003-213124230009	H000142652	Sealed	Not Available	Eggert, Carol	10560 Mississippi Bl	Coon Rapids	80	8/20/1998	Not Available	WEL	Yes
474	003-273124120011	H000139216	Sealed	Not Available	Anderson, Dennis	10033 Hanson Bl	Coon Rapids	135	9/28/1998	Not Available	WEL	Yes
475	003-223124240026	H000137398	Sealed	Not Available	Chambers, Jack	2101 107th Av	Coon Rapids	87	8/3/1998	Not Available	WEL	Yes
476	003-153124240040	H000131204	Sealed	Not Available	Merhiy, Larry	11456 Partridge St Nw	Coon Rapids	116	1/12/1998	Not Available	WEL	Yes
477	003-223124430029	H000141758	Sealed	Not Available	Martin, William	10216 Linnet St Nw	Coon Rapids	99	4/15/1999	Not Available	WEL	Yes
478	003-223124220055	H000131184	Sealed	Not Available	Beaving, George	2420 108th Av Nw	Coon Rapids	88	11/28/1997	Not Available	WEL	Yes
479	003-123124330064	H000128344	Sealed	Not Available	Johnson, Dan/Janice	11865 Magnolia St	Coon Rapids	31	3/16/1990	Not Available	WEL	Yes
480	003-193123210016	H000133913	Sealed	Not Available	Branum, John	10819 President Dr	Blaine	18	3/25/1998	Not Available	WEL	Yes
481	003-163124140026	H000133917	Sealed	Not Available	Richardson, Harold	2510 115th Av	Coon Rapids	21	4/8/1998	Not Available	WEL	Yes
482	003-163124130025	H000135176	Sealed	Not Available	Halverson, John	11324 Bittersweet St Nw	Coon Rapids	35	4/14/1998	Not Available	WEL	Yes
483	003-163124220097	H000135414	Sealed	Not Available	Rebeck, Rita	11543 Jonquil St	Coon Rapids	42	4/16/1998	Not Available	WEL	Yes
484	003-133124220077	H000135415	Sealed	Not Available	Kempenich, Mike	11601 Magnolia St Nw	Coon Rapids	25	4/16/1998	Not Available	WEL	Yes
485	003-123124330056	H000125317	Sealed	Not Available	Zupon, David	11801 Magnolia St Nw	Coon Rapids	35	8/1/1997	Not Available	WEL	Yes
486	003-133124240038	H000133294	Sealed	Not Available	Adams, Greg	11421 Juniper St	Coon Rapids	38	7/22/1998	Not Available	WEL	Approximate
487	003-123124330028	H000134411	Sealed	Not Available	Hostetler, Judy	11801 Larch St	Coon Rapids	30	2/26/1998	Not Available	WEL	Yes
488	003-213124240001	H000134414	Sealed	Not Available	Hartstrom, Larry	10554 Direct River Dr	Coon Rapids	61	3/9/1998	Not Available	WEL	Yes
489	003-183123330037	H000135738	Sealed	Not Available	Bloomgren, Diane	11026 Sixth St Ne	Blaine	20	6/2/1998	Not Available	WEL	Yes
490	003-133124210104	H000134445	Sealed	Not Available	Wiemers, Sandy	11640 Juniper St Nw	Coon Rapids	32	6/5/1998	Not Available	WEL	Yes
491	003-133124210034	H000125326	Sealed	Not Available	Mueller, Elroy A.	11600 Larch St Nw	Coon Rapids	25	8/8/1997	Not Available	WEL	Yes
492	053-3312021240030	H000132318	Sealed	Not Available	Frismanis, Herman	11409 Yates Av	Champlin	60	4/15/1998	Not Available	WEL	Yes
493	003-123124340011	H000129727	Sealed	Not Available	Thompson, Marvel	11720 Kumquat St Nw	Coon Rapids	35	9/29/1997	Not Available	WEL	Yes
494	003-153124240064	H000129755	Sealed	Not Available	Gunter, Sue	11417 Quinn St Nw	Coon Rapids	110	11/11/1997	Not Available	WEL	Yes
495	003-223124240074	H000134910	Sealed	Not Available	Turner, Darrell/Gayl	2110 Coon Rapids Bl	Coon Rapids	92	2/19/1998	Not Available	WEL	Yes
496	053-3312021320015	H000151578	Sealed	Not Available	Neprude, Leigh	6008 113th Av N	Champlin	59	8/19/1999	Not Available	WEL	Yes
497	003-223124120070	H000148449	Sealed	Not Available	Manfred Hage, Estate Of	1925 108th La Ne	Coon Rapids	175	12/29/1998	Not Available	WEL	Yes
498	003-213124110064	H000143731	Sealed	Not Available	Boerger, Paul	10687 Verdin St Nw	Coon Rapids	15	9/28/1998	Not Available	WEL	Yes
499	003-093124430010	H000143746	Sealed	Not Available	Wodarski, Lisa	11835 Crocus St Nw	Coon Rapids	17	10/7/1998	Not Available	WEL	Yes
500	003-133124320028	H000143757	Sealed	Not Available	Henriksen, Marlys	11248 Norway St Nw	Coon Rapids	10	10/21/1998	Not Available	WEL	Yes
501	003-133124320028	H000143759	Sealed	Not Available	Henriksen, Marlys	11248 Norway St Nw	Coon Rapids	10	10/21/1998	Not Available	WEL	Yes
502	003-133124210097	H000148660	Sealed	Not Available	Koeneman, Dale	11691 Juniper St Nw	Coon Rapids	25	12/10/1998	Not Available	WEL	Yes
503	053-2812021330016	H000154962	Sealed	Not Available	Brodeen, Nancy	11842 W River rd	Champlin	107	6/25/1999	Not Available	WEL	Yes
504	003-223124220007	H000143775	Sealed	Not Available	Szaflarski, David	2224 108th Av Nw	Coon Rapids	85	12/2/1998	Not Available	WEL	Yes
505	053-3312021320019	H000161827	Sealed	Not Available	Titus, George	5900 113th Av N	Champlin	54	10/29/1999	Not Available	WEL	Yes
506	003-163124340014	H000155582	Sealed	Not Available	Anderson, Paul/Carolyn	10951 Crooked Lake Bl	Coon Rapids	44	8/26/1999	Not Available	WEL	Yes
507	003-223124230013	H000151035	Sealed	Not Available	Svare, Marcie	2260 Coon Rapids Bl	Coon Rapids	83	5/3/1999	Not Available	WEL	Yes
508	003-093124310008	H000151041	Sealed	Not Available	Vandenburgh, Marsha	2829 119th Av Nw	Coon Rapids	24	5/3/1999	Not Available	WEL	Yes
509	003-163124140097	H000151048	Sealed	Not Available	Olson, Garth	11364 N Heights Dr	Coon Rapids	30	5/20/1999	Not Available	WEL	Yes
510	003-093124310008	H000151049	Sealed	Not Available	Vandenburgh, Marsha	2829 119th Av	Coon Rapids	0	5/17/1999	Not Available	WEL	Yes
511	003-123124330129	H000151019	Sealed	Not Available	Mueller, Leroy	11770 Olive St	Coon Rapids	29	4/7/1999	Not Available	WEL	Yes
512	003-123124330128	H000149830	Sealed	Not Available	Dye, Lorraine	11841 Olive St	Coon Rapids	42	3/3/1999	Not Available	WEL	Yes
513	003-133124220035	H000151387	Sealed	Not Available	Engelking, Duane	11661 Olive St	Coon Rapids	28	6/22/1999	Not Available	WEL	Yes
514	003-223124130101	H000151389	Sealed	Not Available	Sauter & Sons	10625 Hanson Bl	Coon Rapids	113	6/23/1999	Not Available	WEL	Yes
515	003-133124210098	H000151007	Sealed	Not Available	Ramczyk, Henry	11698 Juniper St Nw	Coon Rapids	35	2/22/1999	Not Available	WEL	Yes
516	003-223124240060	H000151010	Sealed	Not Available	Kehn, Glenn	2151 107th Av	Coon Rapids	46	2/22/1999	Not Available	WEL	Yes
517	003-223124210034	H000147512	Sealed	Not Available	Dropps, Roy	10840 Thrush St	Coon Rapids	64	2/9/1999	Not Available	WEL	Yes
518	003-223124220029	H000137545	Sealed	Not Available	Strike, Ronald	10853 Thrush St Nw	Coon Rapids	66	6/19/1998	Not Available	WEL	Yes
519	003-153124240022	H000144853	Sealed	Not Available	Nash, Simone	11316 Osage Nw	Coon Rapids	60	9/11/1998	Not Available	WEL	Yes
520	003-223124220052	H000144857	Sealed	Not Available	Larson, Julie	2341 108th Av	Coon Rapids	66	9/16/1998	Not Available	WEL	Yes
521	003-223124220052	H000144858	Sealed	Not Available	Larson, Julie	2341 108th Av	Coon Rapids	80	9/16/1998	Not Available	WEL	Yes
522	003-153124240023	H000144885	Sealed	Not Available	Cusey, Rodney	11308 Osage St Nw	Coon Rapids	68	11/10/1998	Not Available	WEL	Yes
523	003-133124220049	H000144891	Sealed	Not Available	Rupar, Micah	11550 Magnolia St	Coon Rapids	27	11/12/1998	Not Available	WEL	Yes
524	003-183123220004	H000144897	Sealed	Not Available	Sutton, Dan	140 117th Av Ne	Blaine	28	12/14/1998	Not Available	WEL	Yes
525	053-2912021440002	H000155528	Sealed	Not Available	Coughlan, Colleen	11715 Douglas Dr	Champlin	65	7/7/1999	Not Available	WEL	Yes
526	003-183123330117	H000146763	Sealed	Not Available	Zacharias, Shelly	10943 University Av	Blaine	24	1/14/1999	Not Available	WEL	Yes
527	053-3212021410059	H000140429	Sealed	Not Available	Food & Fuel	11151 Douglas Dr	Champlin	0	7/15/1998	Not Available	WEL	Yes
528	053-3212021110059	H000138988	Sealed	Not Available	Aarhus, Arthur	6401 116th Av N	Champlin	50	8/21/1998	Not Available	WEL	Yes
529	053-3212021110034	H000138989	Sealed	Not Available	Anderson, Tim	11601 Edgewood Av N	Champlin	54	8/21/1998	Not Available	WEL	Yes
530	003-093124340005	H000167155	Sealed	Not Available	Pribyl, Richard	2821 118th La Nw	Coon Rapids	25	4/25/2000	Not Available	WEL	Yes
531	003-133124240020	H000161968	Sealed	Not Available	Dittberner, Melvin	510 115th Av Nw	Coon Rapids	30	11/11/1999	Not Available	WEL	Yes
532	003-163124140015	H000161977	Sealed	Not Available	Foote, Grovner W.	2529 115th Av Nw	Coon Rapids	25	12/1/1999	Not Available	WEL	Yes
533	003-153124240006	H000165620	Sealed	Not Available	Mattson, Erik	11324 Hanson Bl	Coon Rapids	102	4/5/2000	Not Available	WEL	Yes
534	003-213124420001	H000163716	Sealed	Not Available	Camble, Mary	10344 Mississippi Bl	Coon Rapids	75	12/30/1999	Not Available	WEL	Yes
535	003-123124340066	H000156392	Sealed	Not Available	Groth, Colleen	11810 Juniper St Nw	Coon Rapids	34	7/14/1999	Not Available	WEL	Yes
536	003-253124130052	H000163956	Sealed	Not Available	Sime, Gerry	322 98th La	Coon Rapids	62	4/21/2000	Not Available	WEL	Yes
537	003-123124320078	H000163957	Sealed	Not Available	Hilger, Clarence	649 Sand Creek Dr	Coon Rapids	35	4/21/2000	Not Available	WEL	Yes

PCSI Results - Sealed Wells in the DWSMAs
City of Coon Rapids Part 2 WHPP Amendment

PCSI ID	PID No.	Unique No.	Status	Use	Well Owner	Well Location	City	Total Sealed Depth (Feet)	Date Completed/Sealed	Aquifer	PCS Code	Location Verified
538	003-123124330063	H000163975	Sealed	Not Available	Klein, Donna	11857 Magnolia St	Coon Rapids	43	6/21/2000	Not Available	WEL	Yes
539	003-123124330106	H000164658	Sealed	Not Available	Vannurden, Alice	11824 Norway St Nw	Coon Rapids	40	4/18/2000	Not Available	WEL	Yes
540	003-133124130084	H000164661	Sealed	Not Available	Schultz, Ed	11421 Flintwood St Nw	Coon Rapids	150	4/25/2000	Not Available	WEL	Yes
541	003-223124240071	H000164662	Sealed	Not Available	Nelson, Nona	2130 Coon Rapids Bl	Coon Rapids	151	4/26/2000	Not Available	WEL	Yes
542	003-133124210071	H000164663	Sealed	Not Available	Dyrdahl, Linda	11608 Ilex St	Coon Rapids	32	4/27/2000	Not Available	WEL	Yes
543	003-083124310015	H000164664	Sealed	Not Available	Walter Danz, Estate Of	11900 Undercliff St Nw	Coon Rapids	94	4/26/2000	Not Available	WEL	Yes
544	003-093124340032	H000164668	Sealed	Not Available	Russell L. Ridge, Estate Of	2840 119th Av Nw	Coon Rapids	60	5/4/2000	Not Available	WEL	Yes
545	003-133124220037	H000164669	Sealed	Not Available	Jobes, Arlyn	11711 Olive St Nw	Coon Rapids	35	5/9/2000	Not Available	WEL	Yes
546	003-253124240016	H000164670	Sealed	Not Available	Hulstrand, Bert	9822 Foley Bl	Coon Rapids	41	5/11/2000	Not Available	WEL	Yes
547	003-123124320045	H000164674	Sealed	Not Available	Fjerstad, Richard	11933 Magnolia St	Coon Rapids	31	5/17/2000	Not Available	WEL	Yes
548	Not Available	H000164677	Sealed	Not Available	Anoka County Highway Department	Not Available	Coon Rapids	54	5/26/2000	Not Available	WEL	Uncertain
549	003-133124240048	H000164678	Sealed	Not Available	Demars, Mildred R.	11321 Kumquat St	Coon Rapids	35	5/26/2000	Not Available	WEL	Yes
550	003-133124210038	H000163086	Sealed	Not Available	Welshons, Viola	11530 Larch St Nw	Coon Rapids	28	6/14/2000	Not Available	WEL	Yes
551	003-133124220048	H000163087	Sealed	Not Available	Wikstrom, Charles	11560 Magnolia St Nw	Coon Rapids	25	6/16/2000	Not Available	WEL	Yes
552	003-273124120029	H000166263	Sealed	Not Available	Ammann, Jeff	10050 Linnet St Nw	Coon Rapids	115	4/25/2000	Not Available	WEL	Yes
553	003-223124220034	H000164856	Sealed	Not Available	Curtis, Louis	10890 Thrush St Nw	Coon Rapids	105	3/9/2000	Not Available	WEL	Yes
554	003-223124220010	H000164867	Sealed	Not Available	Lehn, Joseph/Dalor	2261 Coon Rapids Bl	Coon Rapids	85	3/16/2000	Not Available	WEL	Yes
555	003-133124210076	H000171719	Sealed	Not Available	Koppy, Evelyn	11564 Ilex St Nw	Coon Rapids	36	10/3/2000	Not Available	WEL	Yes
556	003-123124330091	H000171720	Sealed	Not Available	Pk Properties	11833 Norway St	Coon Rapids	26	10/3/2000	Not Available	WEL	Yes
557	003-213124440056	H000173101	Sealed	Not Available	Epping, Norb W.	10170 Mississippi Bl	Coon Rapids	110	9/12/2000	Not Available	WEL	Yes
558	003-223124240032	H000173105	Sealed	Not Available	Haugen, Roger	10624 Hanson Bl	Coon Rapids	110	9/13/2000	Not Available	WEL	Yes
559	053-3312021320010	H000173117	Sealed	Not Available	Shuma, Ken	6209 112th Av	Champlin	55	9/20/2000	Not Available	WEL	Yes
560	003-203124110003	H000164689	Sealed	Not Available	Paulson, Sheri	10860 Mississippi Bl	Coon Rapids	77	7/11/2000	Not Available	WEL	Yes
561	003-183123330045	H000173148	Sealed	Not Available	Hoel, Nancy	10926 Sixth St	Blaine	36	9/26/2000	Not Available	WEL	Yes
562	053-3312021320061	H000158025	Sealed	Not Available	Olson, Larry	6100 113th Av	Champlin	61	9/9/1999	Not Available	WEL	Yes
563	003-163124440024	H000157753	Sealed	Not Available	Goodshaud, Dick	11050 Wren St	Coon Rapids	15	7/30/1999	Not Available	WEL	Yes
564	003-163124440024	H000157754	Sealed	Not Available	Goodshaud, Dick	11050 Wren St	Coon Rapids	10	7/30/1999	Not Available	WEL	Yes
565	003-093124310074	H000157756	Sealed	Not Available	Francisco, Wendy	11953 Eidelweiss St	Coon Rapids	155	8/12/1999	Not Available	WEL	Yes
566	003-223124330014	H000150237	Sealed	Not Available	Waller, Al	10314 Thrush St Nw	Coon Rapids	30	10/22/1999	Not Available	WEL	Yes
567	003-223124440005	H000158801	Sealed	Not Available	Isd 11	1700 Coon Rapids Bl	Coon Rapids	410	8/23/1999	Not Available	WEL	Yes
568	003-153124240028	H000160019	Sealed	Not Available	Sanborn, Leann	11325 Partridge St Nw	Coon Rapids	121	10/26/1999	Not Available	WEL	Yes
569	003-123124330140	H000160023	Sealed	Not Available	Norman, Betty Jo	11717 Magnolia St Nw	Coon Rapids	0	11/9/1999	Not Available	WEL	Yes
570	003-133124240019	H000160357	Sealed	Not Available	Petro, Kim/Mike	500 115th Av Nw	Coon Rapids	31	9/16/1999	Not Available	WEL	Yes
571	003-203124110004	H000159999	Sealed	Not Available	Brom, Mary	10850 Mississippi Bl	Coon Rapids	130	10/22/1999	Not Available	WEL	Yes
572	003-123124340061	H000155533	Sealed	Not Available	Danelson, Cecil	11860 Juniper St Nw	Coon Rapids	25	7/22/1999	Not Available	WEL	Yes
573	003-123124330113	H000155538	Sealed	Not Available	Besonen, Carl	11754 Norway St	Coon Rapids	40	7/15/1999	Not Available	WEL	Yes
574	003-133124240024	H000155549	Sealed	Not Available	Field, Bernice	550 115th Av Nw	Coon Rapids	30	7/26/1999	Not Available	WEL	Yes
575	003-123124340012	H000155555	Sealed	Not Available	Betty Henifin, Estate Of	11710 Kumquat St Nw	Coon Rapids	35	8/4/1999	Not Available	WEL	Yes
576	053-3312021230008	H000153386	Sealed	Not Available	Maus, Pat	11316 Zane Av N	Champlin	125	6/11/1999	Not Available	WEL	Yes
577	003-223124230024	H000152211	Sealed	Not Available	Bona, Sue	10665 Verdin St	Coon Rapids	25	6/5/1999	Not Available	WEL	Yes
578	003-133124210123	H000165418	Sealed	Not Available	Kruger, Justin	11500 Larch St	Coon Rapids	24	5/6/2000	Not Available	WEL	Yes
579	003-213124230008	H000150168	Sealed	Not Available	Scott, Ronnie L.	10600 Mississippi Bl Nw	Coon Rapids	103	4/10/1999	Not Available	WEL	Yes
580	003-133124220051	H000150178	Sealed	Not Available	Zayonckows, Joseph J.	11530 Magnolia St Nw	Coon Rapids	54	5/14/1999	Not Available	WEL	Yes
581	003-183123330054	H000150182	Sealed	Not Available	Miller, Ronald	10925 Fifth St Ne	Blaine	40	5/19/1999	Not Available	WEL	Yes
582	003-213124110020	H000150196	Sealed	Not Available	Riley, Ron	2422 Coon Rapids Bl	Coon Rapids	21	6/30/1999	Not Available	WEL	Yes
583	003-213124110020	H000150197	Sealed	Not Available	Riley, Ron	2422 Coon Rapids Bl	Coon Rapids	90	6/30/1999	Not Available	WEL	Yes
584	003-133124340064	H000158738	Sealed	Not Available	Sauter & Sons	11118 Foley Bl	Coon Rapids	15	7/8/1999	Not Available	WEL	Approximate
585	003-223124310003	H000159993	Sealed	Not Available	Coon Rapids Methodist Church	10506 Hanson Bl	Coon Rapids	31	10/18/1999	Not Available	WEL	Yes
586	003-223124130101	H000173668	Sealed	Not Available	Sauter & Sons, Inc.	10625 Hanson Bl	Coon Rapids	21	9/7/2000	Not Available	WEL	Yes
587	003-133124210117	H000179350	Sealed	Not Available	Johnson, Keith	11708 Larch St Nw	Coon Rapids	34	7/31/2001	Not Available	WEL	Yes
588	003-133124210107	H000182468	Sealed	Not Available	Bopp, Darrell	11610 Juniper St Nw	Coon Rapids	33	4/16/2002	Not Available	WEL	Yes
589	003-133124210102	H000170789	Sealed	Not Available	Vandenburg, Guy	11660 Juniper St Nw	Coon Rapids	26	1/19/2001	Not Available	WEL	Yes
590	003-133124210027	H000170790	Sealed	Not Available	Ascheman, Lisa	11671 Larch St Nw	Coon Rapids	31	1/19/2001	Not Available	WEL	Yes
591	003-153124130073	H000179301	Sealed	Not Available	Johnson, Lyle	11331 Hanson Bl	Coon Rapids	14	3/21/2001	Not Available	WEL	Approximate
592	003-123124330038	H000176471	Sealed	Not Available	Ringweiski, Kipp	11872 Larch St Nw	Coon Rapids	33	7/23/2001	Not Available	WEL	Yes
593	003-163124220106	H000179308	Sealed	Not Available	Broderick, Kristi	11534 Jonquil St Nw	Coon Rapids	45	4/19/2001	Not Available	WEL	Yes
594	003-223124410033	H000167475	Sealed	Not Available	Salvation Army	10326 Ibis Av	Coon Rapids	111	8/16/2000	Not Available	WEL	Uncertain
595	003-163124140011	H000169473	Sealed	Not Available	Barnett, Dave	2451 115th Av	Coon Rapids	20	7/31/2000	Not Available	WEL	Yes
596	003-183123330006	H000167393	Sealed	Not Available	Johnson, Darrin	11020 Seventh St Ne	Blaine	22	10/2/2000	Not Available	WEL	Yes
597	053-3312021230062	H000170155	Sealed	Not Available	Realty House	11318 Douglas Dr	Champlin	25	9/26/2000	Not Available	WEL	Yes
598	003-133124210025	H000171727	Sealed	Not Available	Nordquist, John	11651 Larch St Nw	Coon Rapids	31	11/28/2000	Not Available	WEL	Yes
599	053-3212021110076	H000184033	Sealed	Not Available	Patton, Dick	11621 Florida Av N	Champlin	48	10/11/2001	Not Available	WEL	Yes
600	003-123124330008	H000164277	Sealed	Not Available	Kammerer, Tom	11897 Kumquat	Coon Rapids	40	5/15/2001	Not Available	WEL	Yes
601	003-163124210050	H000164291	Sealed	Not Available	Mallam, Brett	2850 116th Av Nw	Coon Rapids	35	5/5/2001	Not Available	WEL	Yes
602	003-183123330078	H000164297	Sealed	Not Available	Bisson, Roger	10920 Fifth St Ne	Blaine	35	5/21/2001	Not Available	WEL	Yes
603	003-223124140152	H000170763	Sealed	Not Available	Black, Dave	10531 Jay St Nw	Coon Rapids	86	8/30/2000	Not Available	WEL	Yes
604	003-253124110066	H000170764	Sealed	Not Available	Hatch, Linda	9938 Cottonwood St Nw	Coon Rapids	24	9/12/2000	Not Available	WEL	Yes

PCSI Results - Sealed Wells in the DWSMAs
City of Coon Rapids Part 2 WHPP Amendment

PCSI ID	PID No.	Unique No.	Status	Use	Well Owner	Well Location	City	Total Sealed Depth (Feet)	Date Completed/Sealed	Aquifer	PCS Code	Location Verified
605	003-123124320048	H000180671	Sealed	Not Available	Watson, Bert	11948 Magnolia St Nw	Coon Rapids	78	5/9/2001	Not Available	WEL	Yes
606	053-3212021110010	H000167370	Sealed	Not Available	Richard, Mark	11509 Douglas Dr	Champlin	114	6/29/2000	Not Available	WEL	Yes
607	053-3212021110010	H000167371	Sealed	Not Available	Richards, Mark	11509 Douglas Dr	Champlin	25	6/29/2000	Not Available	WEL	Yes
608	003-123124340010	H000169453	Sealed	Not Available	Miller, Andrew	11730 Kumquat St Nw	Coon Rapids	25	7/12/2000	Not Available	WEL	Yes
609	003-123124330076	H000162513	Sealed	Not Available	Mimback, Dennis	11780 Magnolia St	Coon Rapids	24	12/8/1999	Not Available	WEL	Yes
610	003-173124140003	H000189381	Sealed	Not Available	Marathon Oil	11489 Round Lake Bl	Coon Rapids	35	3/29/2002	Not Available	WEL	Approximate
611	003-093124340244	H000189382	Sealed	Not Available	Oasis Market	11706 Crooked Lake Bl	Coon Rapids	27	3/29/2002	Not Available	WEL	Approximate
612	003-123124320054	H000183622	Sealed	Not Available	Gangelhoff, Karen	11900 Magnolia	Coon Rapids	25	7/31/2001	Not Available	WEL	Yes
613	003-133124220073	H000200614	Sealed	Not Available	Peter, Ray	11531 Magnolia St	Coon Rapids	26	10/18/2002	Not Available	WEL	Yes
614	053-0311921220018	H000190957	Sealed	Not Available	Brooklyn Park, City Of	10841 Kyle Av N	Brooklyn Park	128	11/16/2001	Not Available	WEL	Approximate
615	003-133124220068	H000185077	Sealed	Not Available	Belisle, Dale	11721 Norway St	Coon Rapids	26	9/11/2001	Not Available	WEL	Yes
616	053-2812021340034	H000185082	Sealed	Not Available	Vry, Don	11848 Mississippi Dr	Champlin	67	9/28/2001	Not Available	WEL	Yes
617	003-133124210093	H000192389	Sealed	Not Available	Hjertstedt, Marcy	11651 Juniper St Nw	Coon Rapids	31	10/16/2002	Not Available	WEL	Yes
618	003-213124420007	H000185184	Sealed	Not Available	Collier, Robert	10401 Zion St	Coon Rapids	40	10/29/2001	Not Available	WEL	Yes
619	003-223124240020	H000183792	Sealed	Not Available	Mohs, Dave	10662 Hanson Bl	Coon Rapids	90	9/18/2001	Not Available	WEL	Yes
620	003-233124320010	H000186104	Sealed	Not Available	Stromgren, Wade	1549 103rd Av Nw	Coon Rapids	0	8/24/2001	Not Available	WEL	Yes
621	003-133124120056	H000175507	Sealed	Not Available	Person, Richard	11681 Flintwood St	Coon Rapids	20	11/9/2000	Not Available	WEL	Yes
622	053-2812021320027	H000185985	Sealed	Not Available	Stevens, Fred	11830 Porter Dr	Champlin	55	8/30/2005	Not Available	WEL	Yes
623	003-123124330117	H000181058	Sealed	Not Available	Pauly, Jim	11741 Olive St	Coon Rapids	22	6/14/2001	Not Available	WEL	Yes
624	003-253124130074	H000176977	Sealed	Not Available	Lauria, Mark/Amy	312 98th La	Coon Rapids	48	3/27/2001	Not Available	WEL	Yes
625	003-133124410009	H000177392	Sealed	Not Available	Fairbanks Capital Corporation	11150 University Av Nw	Coon Rapids	75	5/1/2001	Not Available	WEL	Yes
626	003-213124440001	H000182449	Sealed	Not Available	Law, David	10153 Mississippi Bl	Coon Rapids	118	10/29/2001	Not Available	WEL	Yes
627	003-253124130022	H000192361	Sealed	Not Available	Johnson, Vera	321 97th La Nw	Coon Rapids	18	7/16/2002	Not Available	WEL	Yes
628	003-253124130022	H000192363	Sealed	Not Available	Johnson, Vera	321 97th La Nw	Coon Rapids	18	7/16/2002	Not Available	WEL	Yes
629	053-3312021320071	H000192397	Sealed	Not Available	Dhanan, Barakat	6217 112th Av	Champlin	47	10/22/2002	Not Available	WEL	Yes
630	003-123124330115	H000181460	Sealed	Not Available	Wagner, Derrick	11738 Norway St Nw	Coon Rapids	25	7/10/2001	Not Available	WEL	Yes
631	003-163124220001	H000181464	Sealed	Not Available	Huntington, Don	3139 116th La Nw	Coon Rapids	75	7/9/2001	Not Available	WEL	Yes
632	003-213124240003	H000192272	Sealed	Not Available	Church, David	10534 Hollywood Bl	Coon Rapids	92	7/18/2002	Not Available	WEL	Yes
633	003-223124220048	H000181499	Sealed	Not Available	Stromgren, Marvin	10800 Thrush St Nw	Coon Rapids	105	8/13/2001	Not Available	WEL	Yes
634	003-093124340023	H000185100	Sealed	Not Available	Ingeborg Hagen, Estate Of	2840 118th La Nw	Coon Rapids	27	10/18/2001	Not Available	WEL	Yes
635	003-163124110028	H000177334	Sealed	Not Available	Main, Ronald	11563 Wren St Nw	Coon Rapids	20	1/29/2001	Not Available	WEL	Yes
636	003-163124430096	H000200914	Sealed	Not Available	Coon Rapids Chrysler Plymouth	2710 Coon Rapids Bl Nw	Coon Rapids	46	12/12/2002	Not Available	WEL	Approximate
637	003-133124220016	H000198059	Sealed	Not Available	Berglund, Chris	11700 Norway St Nw	Coon Rapids	25	9/11/2002	Not Available	WEL	Yes
638	003-183123330016	H000198072	Sealed	Not Available	Morton, Wayne	10908 Seventh St	Blaine	25	10/28/2002	Not Available	WEL	Yes
639	053-3312021240055	H000211153	Sealed	Not Available	Curtis, Rolff/Mary	11417 Xenia Av N	Champlin	138	6/24/2003	Not Available	WEL	Yes
640	003-153124320026	H000212629	Sealed	Not Available	Ivor Mitchell Estate	11255 Verdin Ci	Coon Rapids	12	9/2/2003	Not Available	WEL	Yes
641	003-143124110014	H000201169	Sealed	Not Available	Anderson, Jim	806 Northdale Bl Nw	Coon Rapids	31	1/23/2003	Not Available	WEL	Yes
642	003-143124110014	H000201173	Sealed	Not Available	Anderson, Jim	806 Northdale Bl Nw	Coon Rapids	30	1/23/2003	Not Available	WEL	Yes
643	003-133124430003	H000212799	Sealed	Not Available	Bauers, John/Susan	353 111th Av Nw	Coon Rapids	22	7/21/2004	Not Available	WEL	Yes
644	003-163124220107	H000200829	Sealed	Not Available	Hedrick, Roger	11524 Jonquil St	Coon Rapids	43	10/29/2002	Not Available	WEL	Yes
645	003-233124320002	H000200399	Sealed	Not Available	Neinstadt, Dan	10341 Flamingo St Nw	Coon Rapids	100	4/15/2003	Not Available	WEL	Yes
646	003-223124220023	H000193678	Sealed	Not Available	Wolford, John	10883 Thrush St Nw	Coon Rapids	134	3/19/2002	Not Available	WEL	Yes
647	003-213124110067	H000193681	Sealed	Not Available	Kaslow, Jerry	10688 Verdin St Nw	Coon Rapids	22	4/10/2002	Not Available	WEL	Yes
648	003-123124340059	H000193685	Sealed	Not Available	Kroll, Ken	11880 Juniper St	Coon Rapids	29	4/17/2002	Not Available	WEL	Yes
649	003-163124230114	H000193693	Sealed	Not Available	Larson, Gerals	11347 Lily St	Coon Rapids	72	5/10/2002	Not Available	WEL	Yes
650	003-133124220098	H000193703	Sealed	Not Available	Ganser, Marty	731 Northdale Bl	Coon Rapids	32	5/23/2002	Not Available	WEL	Yes
651	003-133124240056	H000193723	Sealed	Not Available	Mary Patrick, Estate Of	11510 Juniper St Nw	Coon Rapids	29	7/24/2002	Not Available	WEL	Yes
652	003-093124340033	H000193731	Sealed	Not Available	Bray, Mae	2850 119th Av	Coon Rapids	26	8/12/2002	Not Available	WEL	Yes
653	003-093124340033	H000193732	Sealed	Not Available	Bray, Mae	2850 119th Av	Coon Rapids	62	8/12/2002	Not Available	WEL	Yes
654	003-153124320005	H000193737	Sealed	Not Available	Pierce, Ken	2210 111th La Nw	Coon Rapids	122	8/30/2002	Not Available	WEL	Yes
655	003-223124430002	H000193785	Sealed	Not Available	Krekelberg, Audrey	1801 Mississippi Bl	Coon Rapids	127	6/30/2003	Not Available	WEL	Yes
656	003-273124120033	H000188775	Sealed	Not Available	Soltis, Joey	1850 Mississippi Bl	Coon Rapids	102	12/17/2001	Not Available	WEL	Yes
657	003-153124240031	H000188783	Sealed	Not Available	Lawrence, Michael	11349 Partridge St Nw	Coon Rapids	115	1/16/2002	Not Available	WEL	Yes
658	003-133124240047	H000188754	Sealed	Not Available	Ervin Prickett, Estate Of	11331 Kumquat St Nw	Coon Rapids	27	10/23/2001	Not Available	WEL	Yes
659	003-223124240055	H000198702	Sealed	Not Available	S/L National Corporatioin	2131 Coon Rapids Bl Nw	Coon Rapids	85	4/6/2002	Not Available	WEL	Approximate
660	003-183123330087	H000198703	Sealed	Not Available	Abrahamson, James	10931 Fourth St Ne	Blaine	15	8/2/2002	Not Available	WEL	Yes
661	003-093124310067	H000198723	Sealed	Not Available	Kohl, Allan	12020 Crooked Lake Bl	Coon Rapids	65	9/4/2002	Not Available	WEL	Yes
662	003-263124210008	H000199827	Sealed	Not Available	Coon Rapids, City Of	1350 Coon Rapids (1350-1440) Bl	Coon Rapids	40	3/24/2003	Not Available	WEL	Yes
663	003-273124120027	H000204459	Sealed	Not Available	Loxtercamp, Chad	10026 Linnet St Nw	Coon Rapids	72	2/5/2003	Not Available	WEL	Approximate
664	003-163124230055	H000204473	Sealed	Not Available	Snippen, Bob	11425 Jonquil St Nw	Coon Rapids	98	4/8/2003	Not Available	WEL	Yes
665	003-253124130023	H000199239	Sealed	Not Available	Armstrong, Oliver	329 97th La Nw	Coon Rapids	34	10/3/2002	Not Available	WEL	Yes
666	003-123124320042	H000199240	Sealed	Not Available	Thum, John	11909 Magnolia Av	Coon Rapids	27	10/3/2002	Not Available	WEL	Yes
667	003-183123330106	H000196822	Sealed	Not Available	Carlson, Gary/Rita	10944 Fourth St Ne	Blaine	22	1/22/2003	Not Available	WEL	Yes
668	053-0311921430008	H000196751	Sealed	Not Available	Action Construction	10225 Abbott Av N	Brooklyn Park	61	7/11/2002	Not Available	WEL	Uncertain
669	003-223124240034	H000215894	Sealed	Not Available	Rasmusson, Ann	10608 Hanson Bl	Coon Rapids	90	11/3/2003	Not Available	WEL	Yes
670	003-143124110005	H000213489	Sealed	Not Available	Stoesz, Alice	841 Northdale Bl	Coon Rapids	169	12/9/2003	Not Available	WEL	Yes
671	053-2812021310002	H000208355	Sealed	Not Available	Schneider, Wayne	11900 Mississippi Dr	Champlin	59	4/22/2003	Not Available	WEL	Yes

PCSI Results - Sealed Wells in the DWSMAs
City of Coon Rapids Part 2 WHPP Amendment

PCSI ID	PID No.	Unique No.	Status	Use	Well Owner	Well Location	City	Total Sealed Depth (Feet)	Date Completed/Sealed	Aquifer	PCS Code	Location Verified
672	003-123124330035	H000208599	Sealed	Not Available	Smits, Bill	11857 Larch St Nw	Coon Rapids	25	7/14/2004	Not Available	WEL	Yes
673	003-223124430057	H000222285	Sealed	Not Available	Howe, Leroy	10256 Linnet	Coon Rapids	72	5/26/2004	Not Available	WEL	Yes
674	003-163124230004	H000218087	Sealed	Not Available	Spanjers, Richard	3141 113th Av	Coon Rapids	60	3/10/2005	Not Available	WEL	Yes
675	003-253124130021	H000222547	Sealed	Not Available	Jechorek, Mike	315 97th La Nw	Coon Rapids	25	6/11/2004	Not Available	WEL	Yes
676	003-223124240097	H000218430	Sealed	Not Available	Omega Constrction Company	2017 Coon Rapids Bl Nw	Coon Rapids	90	3/25/2004	Not Available	WEL	Yes
677	003-133124210079	H000218433	Sealed	Not Available	Rudolph, Ruth	11540 Ilex St Nw	Coon Rapids	40	4/2/2004	Not Available	WEL	Yes
678	003-223124410031	H000213472	Sealed	Not Available	Pk Investment Properties	1715 Coon Rapids Bl	Coon Rapids	107	10/27/2003	Not Available	WEL	Yes
679	003-223124410031	H000213473	Sealed	Not Available	Pk Investment Properties	1715 Coon Rapids Bl	Coon Rapids	16	10/27/2003	Not Available	WEL	Yes
680	003-223124210030	H000213114	Sealed	Not Available	Medelberg, Kathryn	10825 Thrush St Nw	Coon Rapids	40	8/8/2003	Not Available	WEL	Yes
681	003-223124220025	H000213115	Sealed	Not Available	Buelow, Dewaine	10875 Thrush St Nw	Coon Rapids	120	8/8/2003	Not Available	WEL	Yes
682	003-163124220091	H000213118	Sealed	Not Available	Hasselius, Robert	3123 116th Av Nw	Coon Rapids	70	8/14/2003	Not Available	WEL	Yes
683	053-3312021240041	H000203905	Sealed	Not Available	Martin, Nick	11456 Yates Av N	Champlin	147	12/4/2002	Not Available	WEL	Yes
684	003-153124240033	H000208060	Sealed	Not Available	Humphrey, Jack	11409 Partridge St	Coon Rapids	123	5/13/2003	Not Available	WEL	Yes
685	003-163124230060	H000208088	Sealed	Not Available	Schmidt, Dell	11436 Ivywood St	Coon Rapids	21	7/16/2003	Not Available	WEL	Yes
686	053-2812021320043	H000207990	Sealed	Not Available	Hopping, John	11908 Colorado Av N	Champlin	97	5/12/2003	Not Available	WEL	Yes
687	053-2812021320036	H000207991	Sealed	Not Available	Hysjulien, Milt	11836 Porter Dr	Champlin	55	5/16/2003	Not Available	WEL	Yes
688	003-133124210003	H000207996	Sealed	Not Available	Fossum, Deloris	11681 Kumquat St Nw	Coon Rapids	35	5/21/2003	Not Available	WEL	Yes
689	053-3312021320021	H000205236	Sealed	Not Available	Benson, Mark	6008 112th Av N	Champlin	55	4/1/2003	Not Available	WEL	Yes
690	053-0311921420096	H000208506	Sealed	Not Available	Donnayu, Paul	10349 France Av N	Brooklyn Park	105	5/28/2003	Not Available	WEL	Approximate
691	003-123124340030	H000208513	Sealed	Not Available	Rihde, Larry	11780 Ilex Av N	Coon Rapids	36	5/6/2003	Not Available	WEL	Yes
692	053-3212021110025	H000213764	Sealed	Not Available	Vanhorrick, Bill	11641 Florida Av N	Champlin	110	8/20/2003	Not Available	WEL	Yes
693	003-213124230011	H000210198	Sealed	Not Available	Belain Excavating	10540 Mississippi Bl	Coon Rapids	55	12/12/2003	Not Available	WEL	Yes
694	003-133124210035	H000211008	Sealed	Not Available	Johnson, Marjorie	11560 Larch St	Coon Rapids	36	6/13/2003	Not Available	WEL	Yes
695	003-183123330017	H000211025	Sealed	Not Available	Engren, Donald	10902 Seventh St Ne	Blaine	21	7/15/2003	Not Available	WEL	Yes
696	003-123124230104	H000201261	Sealed	Not Available	Brackin, Ronald G.	728 123rd Av Nw	Coon Rapids	46	10/23/2002	Not Available	WEL	Yes
697	003-163124130011	H000201266	Sealed	Not Available	Johnson, Richard	2653 S Heights Dr	Coon Rapids	25	11/11/2002	Not Available	WEL	Yes
698	053-3312021240026	H000220537	Sealed	Not Available	Nesser, Mike	11429 Yates Ci N	Champlin	57	4/12/2004	Not Available	WEL	Yes
699	003-253124130031	H000203373	Sealed	Not Available	Cain, Carol	9769 Foley Bl	Coon Rapids	40	12/5/2002	Not Available	WEL	Yes
700	003-223124210019	H000207966	Sealed	Not Available	Ezanov, Jeff	2130 108th Av Nw	Coon Rapids	24	4/12/2003	Not Available	WEL	Yes
701	003-223124210019	H000207969	Sealed	Not Available	Ezanov, Jeff	2130 108th Av Nw	Coon Rapids	94	4/12/2003	Not Available	WEL	Yes
702	003-133124210121	H000205582	Sealed	Not Available	Rosencrantz, Gerald	11520 Larch St Nw	Coon Rapids	25	2/27/2003	Not Available	WEL	Yes
703	003-133124210057	H000203578	Sealed	Not Available	Guy, Shawn	11551 Larch St	Coon Rapids	23	4/14/2003	Not Available	WEL	Yes
704	003-223124440012	H000203584	Sealed	Not Available	Kerssen, Mary	1744 103rd Av	Coon Rapids	75	5/5/2003	Not Available	WEL	Yes
705	003-133124210122	H000203565	Sealed	Not Available	Eisenberg, Ken	11510 Larch St Nw	Coon Rapids	109	3/14/2003	Not Available	WEL	Yes
706	053-3212021140060	H000200375	Sealed	Not Available	Braun, Sandy	11416 Florida Av	Champlin	16	2/5/2003	Not Available	WEL	Yes
707	003-133124430080	H000200383	Sealed	Not Available	Buerkley, Mary	230 110th Av	Coon Rapids	29	3/17/2003	Not Available	WEL	Yes
708	003-163124220100	H000200384	Sealed	Not Available	Collaci, Maria	11519 Jonquil St	Coon Rapids	43	3/17/2003	Not Available	WEL	Yes
709	053-3312021320007	H000231416	Sealed	Not Available	Christoferson, Cliff	6108 112th Av N	Champlin	52	3/9/2005	Not Available	WEL	Yes
710	053-3412021330004	H000233410	Sealed	Not Available	Bills Superette	10967 River rd	Champlin	30	5/25/2005	Not Available	WEL	Approximate
711	003-153124240062	H000223103	Sealed	Not Available	Winterhall, Sherman	11401 Quinn St	Coon Rapids	69	6/13/2005	Not Available	WEL	Yes
712	003-183123330048	H000223104	Sealed	Not Available	Hugh, Beverly	10908 Sixth St Ne	Blaine	24	6/22/2005	Not Available	WEL	Yes
713	003-183123430070	H000223118	Sealed	Not Available	Kroone, Gloria	624 109th Av Ne	Blaine	24	7/29/2005	Not Available	WEL	Yes
714	003-183123330092	H000223132	Sealed	Not Available	Kirkbride, Sonja	11013 Fourth St Ne	Blaine	26	8/8/2005	Not Available	WEL	Yes
715	053-2812021330032	H000234573	Sealed	Not Available	Schreiber, Arleen	11836 W River rd	Champlin	45	6/2/2005	Not Available	WEL	Yes
716	003-133124230052	H000233150	Sealed	Not Available	Counselor Realty	11334 Kumquat St Nw	Coon Rapids	22	7/6/2005	Not Available	WEL	Yes
717	003-183123330020	H000230498	Sealed	Not Available	Redden, Robert	10913 Sixth St Ne	Blaine	23	5/13/2005	Not Available	WEL	Yes
718	053-3412021330020	H000228770	Sealed	Not Available	Omega Development	10964 Mississippi Dr	Champlin	47	12/6/2004	Not Available	WEL	Yes
719	053-3312021440004	H000242253	Sealed	Not Available	Tri Star Homes	4700 109th Av	Champlin	54	11/16/2005	Not Available	WEL	Yes
720	053-3312021440004	H000242254	Sealed	Not Available	Tri Star Homes	4700 109th Av	Champlin	50	4/26/2006	Not Available	WEL	Yes
721	003-183123330013	H000230973	Sealed	Not Available	Lamecker, Doug	10926 Seventh St Ne	Blaine	22	3/25/2005	Not Available	WEL	Yes
722	003-123124330136	H000227837	Sealed	Not Available	Barthl, Les	11748 Larch St Nw	Coon Rapids	30	10/19/2004	Not Available	WEL	Yes
723	003-123124340115	H000233136	Sealed	Not Available	Moore, Robert	408 117th Av Nw	Coon Rapids	25	5/9/2005	Not Available	WEL	Yes
724	003-123124320035	H000231266	Sealed	Not Available	Hermann, Judy	11901 Larch St Nw	Coon Rapids	35	7/21/2005	Not Available	WEL	Yes
725	053-0311921220029	H000210828	Sealed	Not Available	S.R. Weidema, Inc.	10717 Noble Av N	Brooklyn Park	140	7/18/2003	Not Available	WEL	Approximate
726	053-0311921220029	H000210829	Sealed	Not Available	S.R. Weidema, Inc.	Not Available	Brooklyn Park	35	7/18/2003	Not Available	WEL	Uncertain
727	053-2812021320044	H000225679	Sealed	Not Available	Tappe, Jodi	11906 Colorado Av	Champlin	86	4/20/2005	Not Available	WEL	Yes
728	053-0311921140005	H000225690	Sealed	Not Available	Blume, Amy	10541 W River rd	Brooklyn Park	78	5/16/2005	Not Available	WEL	Yes
729	003-123124330040	H000225613	Sealed	Not Available	Layne, Melisa	11856 Larch St	Coon Rapids	44	8/4/2004	Not Available	WEL	Yes
730	053-3212021110057	H000226030	Sealed	Not Available	Huemann, Adry/Linda	6409 116th Av N	Champlin	91	10/5/2004	Not Available	WEL	Yes
731	003-223124230006	H000226038	Sealed	Not Available	Henrikson, Barry P.	2231 Coon Rapids Bl	Coon Rapids	88	10/25/2004	Not Available	WEL	Yes
732	003-133124210026	H000217029	Sealed	Not Available	Price, Kathy	11661 Larch St	Coon Rapids	21	6/2/2004	Not Available	WEL	Yes
733	003-223124310038	H000217064	Sealed	Not Available	Richardson, Doug	10521 Partridge Ci	Coon Rapids	28	8/8/2004	Not Available	WEL	Yes
734	003-153124340198	H000217112	Sealed	Not Available	Larson, Phylis	10986 Hanson Bl Nw	Coon Rapids	84	12/3/2004	Not Available	WEL	Approximate
735	003-253124110070	H000217113	Sealed	Not Available	Anderson, Dale	10012 Cottonwood St Nw	Coon Rapids	17	12/8/2004	Not Available	WEL	Yes
736	053-3312021240027	H000217119	Sealed	Not Available	Ertl, Sue	11425 Yates Ci N	Champlin	69	12/21/2004	Not Available	WEL	Yes
737	053-3312021240025	H000217135	Sealed	Not Available	Morle, James	11433 Yates Ci N	Champlin	102	3/7/2005	Not Available	WEL	Yes
738	053-3412021330022	H000221260	Sealed	Not Available	Washburn, John L.	10920 W River rd	Champlin	120	6/30/2004	Not Available	WEL	Approximate

PCSI Results - Sealed Wells in the DWSMAs
City of Coon Rapids Part 2 WHPP Amendment

PCSI ID	PID No.	Unique No.	Status	Use	Well Owner	Well Location	City	Total Sealed Depth (Feet)	Date Completed/Sealed	Aquifer	PCS Code	Location Verified
739	003-123124340039	H000221074	Sealed	Not Available	Novak, Eugene/June	11701 Juniper St Nw	Coon Rapids	33	7/7/2004	Not Available	WEL	Yes
740	003-213124140072	H000216983	Sealed	Not Available	Allen, Sue	10672 Wren St Nw	Coon Rapids	14	3/17/2004	Not Available	WEL	Yes
741	003-153124230090	H000216819	Sealed	Not Available	Frantz, Darla	2321 113th Av Nw	Coon Rapids	18	6/2/2004	Not Available	WEL	Yes
742	003-133124120077	H000216820	Sealed	Not Available	Edina Realty	244 116th Av Nw	Coon Rapids	16	6/3/2004	Not Available	WEL	Yes
743	003-123124340042	H000216823	Sealed	Not Available	Larrabee, Mickey/Dave	11731 Juniper St	Coon Rapids	32	7/1/2004	Not Available	WEL	Yes
744	003-173124220036	H000225072	Sealed	Not Available	Ruzynski, Mike	11556 Zea St	Coon Rapids	114	6/29/2004	Not Available	WEL	Yes
745	003-223124310016	H000226119	Sealed	Not Available	M, Curtis	2137 105th La Nw	Coon Rapids	24	9/1/2004	Not Available	WEL	Yes
746	003-253124120015	H000221282	Sealed	Not Available	Cross Of Christ Church	9931 Foley Bl Nw	Coon Rapids	25	4/13/2005	Not Available	WEL	Yes
747	003-183123330012	H000221285	Sealed	Not Available	Koester, Robert	10932 Seventh St	Blaine	23	6/22/2005	Not Available	WEL	Yes
748	003-093124340031	H000210856	Sealed	Not Available	Kaldahl, Larry	2830 119th Av	Coon Rapids	23	7/7/2003	Not Available	WEL	Yes
749	003-153124240046	H000216647	Sealed	Not Available	Weyscheid, Eldon	11408 Partridge St Nw	Coon Rapids	132	4/3/2006	Not Available	WEL	Yes
750	053-2912021440011	H000224517	Sealed	Not Available	Foster, Mark	11732 Edgewood Av N	Champlin	112	7/28/2004	Not Available	WEL	Yes
751	003-223124440014	H000134223	Sealed	Not Available	Estate Of Marguerite Port	10228 Ibis St Nw	Coon Rapids	17	8/15/2006	Not Available	WEL	Yes
752	003-213124230029	H000238623	Sealed	Not Available	Gordon, Tom	10555 Mississippi Bl Nw	Coon Rapids	96	8/15/2005	Not Available	WEL	Yes
753	003-133124240025	H000241143	Sealed	Not Available	Seddon, Timothy/Ange	560 115th Av Nw	Coon Rapids	39	12/6/2005	Not Available	WEL	Yes
754	003-153124310018	H000245093	Sealed	Not Available	Foley, Jerry	2160 111th La Nw	Coon Rapids	85	5/9/2006	Not Available	WEL	Yes
755	003-133124240038	H000242289	Sealed	Not Available	Provast, Jan	561 114th Av	Coon Rapids	30	4/24/2006	Not Available	WEL	Yes
756	053-2812021320013	H000235606	Sealed	Not Available	Parent Custom Homes	11920 Mississippi Dr	Champlin	85	4/28/2005	Not Available	WEL	Yes
757	053-3312021240028	H000243716	Sealed	Not Available	Girgis, Laila	11421 Yates Ci	Champlin	90	2/27/2006	Not Available	WEL	Yes
758	003-223124220036	H000245505	Sealed	Not Available	Miller, Tim	10882 Thrush St Nw	Coon Rapids	58	2/10/2006	Not Available	WEL	Yes
759	003-123124330014	H000235918	Sealed	Not Available	Fredricks, Ron	11856 Kumquat St Nw	Coon Rapids	38	5/25/2005	Not Available	WEL	Yes
760	053-3212021110029	H000250171	Sealed	Not Available	Hagberg, Paul	6401 117th Av N	Champlin	85	9/5/2006	Not Available	WEL	Yes
761	003-223124410213	H000232075	Sealed	Not Available	Salvation Army	10347 Ibis St Nw	Coon Rapids	120	1/4/2005	Not Available	WEL	Yes
762	053-3412021330022	H000234412	Sealed	Not Available	Zahl Petroleum, Contractor	10917 W River rd	Champlin	58	4/29/2005	Not Available	WEL	Yes
763	003-123124330099	H000234419	Sealed	Not Available	Homolka, Dennis	11880 Norway St	Coon Rapids	30	5/9/2005	Not Available	WEL	Yes
764	003-133124210077	H000234430	Sealed	Not Available	Carter, Joan	11556 Ilex St Nw	Coon Rapids	36	5/26/2005	Not Available	WEL	Yes
765	003-223124240044	H000236659	Sealed	Not Available	Campbell, Anthony	10550 Hanson Bl Nw	Coon Rapids	100	6/23/2005	Not Available	WEL	Approximate
766	003-123124330068	H000236664	Sealed	Not Available	Zigan, James	11856 Magnolia St Nw	Coon Rapids	30	6/27/2005	Not Available	WEL	Yes
767	003-273124120042	H000236665	Sealed	Not Available	Reefer, Jack	9919 Linnet St Nw	Coon Rapids	95	7/1/2005	Not Available	WEL	Yes
768	003-123124220092	H000231799	Sealed	Not Available	Slavin, Jeff/Beverly	608 Main St Nw	Coon Rapids	34	4/22/2005	Not Available	WEL	Yes
769	003-123124220092	H000231800	Sealed	Not Available	Slavin, Jeff/Beverly	608 Main St Nw	Coon Rapids	25	4/22/2005	Not Available	WEL	Yes
770	003-123124340024	H000237135	Sealed	Not Available	Herman Capital	11831 Juniper St Ne	Coon Rapids	38	6/20/2005	Not Available	WEL	Yes
771	003-133124220066	H000238035	Sealed	Not Available	Krueger, Lori	11701 Norway St Nw	Coon Rapids	45	10/4/2005	Not Available	WEL	Yes
772	053-0411921110049	H000230478	Sealed	Not Available	Gonyea Homes	10756 Noble Av N	Brooklyn Park	24	4/4/2005	Not Available	WEL	Approximate
773	053-0411921110049	H000230479	Sealed	Not Available	Gonyea Homes	10756 Noble Av N	Brooklyn Park	38	4/14/2005	Not Available	WEL	Approximate
774	003-223124220054	H000230482	Sealed	Not Available	Dahlman, Harold	2361 108th Av	Coon Rapids	40	4/18/2005	Not Available	WEL	Yes
775	003-223124210033	H000230483	Sealed	Not Available	Ruhl, Franklin	10848 Thrush St	Coon Rapids	22	4/17/2005	Not Available	WEL	Yes
776	003-223124210026	H000230484	Sealed	Not Available	Kroll, Lillian	10841 Thrush St	Coon Rapids	21	4/17/2005	Not Available	WEL	Yes
777	053-3312021240024	H000230571	Sealed	Not Available	Westerveit, Tom	11441 Yates Av N	Champlin	98	11/11/2004	Not Available	WEL	Yes
778	053-2812021320006	H000239497	Sealed	Not Available	Gerber, Larry	12012 Mississippi Dr	Champlin	56	9/14/2005	Not Available	WEL	Yes
779	003-123124330033	H000259639	Sealed	Not Available	Hanken, Tanya	11841 Larch St	Coon Rapids	38	9/10/2007	Not Available	WEL	Yes
780	003-123124330002	H000248594	Sealed	Not Available	Tom Hilden Construction	11849 Kumquat St	Coon Rapids	32	1/24/2007	Not Available	WEL	Yes
781	003-153124320050	H000253252	Sealed	Not Available	Smith, Dan	11221 Swallow St Nw	Coon Rapids	26	11/2/2006	Not Available	WEL	Yes
782	003-183123330006	H000237017	Sealed	Not Available	Novis, Jaime	11020 Seventh St Ne	Blaine	13	9/27/2007	Not Available	WEL	Yes
783	Not Available	H000252915	Sealed	Not Available	Ward, Mary	Not Available	Coon Rapids	180	3/20/2007	Not Available	WEL	Uncertain
784	003-223124220032	H000254907	Sealed	Not Available	Hefty, Tom	10801 Thrush St	Coon Rapids	102	11/6/2006	Not Available	WEL	Yes
785	003-133124220021	H000265307	Sealed	Not Available	Olson, Anita	11600 Norway St Nw	Coon Rapids	30	9/24/2007	Not Available	WEL	Yes
786	003-133124210064	H000253254	Sealed	Not Available	Barsness, Mark	11664 Ilex St Nw	Coon Rapids	38	11/21/2006	Not Available	WEL	Yes
787	003-133124210069	H000245947	Sealed	Not Available	Vincent, Nicole	11624 Ilex St Nw	Coon Rapids	25	1/12/2007	Not Available	WEL	Yes
788	003-253124120012	056563	Sealed	Not Available	Mn Dot	Not Available	Coon Rapids	51	9/12/1995	Not Available	WEL	Uncertain
789	003-133124440088	H000245579	Sealed	Not Available	Peace Lutheran Church	20 Northdale Bl	Coon Rapids	110	8/2/2006	Not Available	WEL	Yes
790	003-133124320023	H000246729	Sealed	Not Available	Paul, Carol	748 112th Av Nw	Coon Rapids	14	6/19/2006	Not Available	WEL	Yes
791	003-263124210008	629339	Sealed	Not Available	Coon Rapids, City Of	1350 Coon Rapids Bl	Coon Rapids	17	4/6/2007	Not Available	WEL	Yes
792	003-263124210008	629340	Sealed	Not Available	Coon Rapids, City Of	1350 Coon Rapids Bl	Coon Rapids	17	4/6/2007	Not Available	WEL	Yes
793	003-263124210008	629341	Sealed	Not Available	Coon Rapids, City Of	1350 Coon Rapids Bl	Coon Rapids	17	4/6/2007	Not Available	WEL	Yes
794	003-263124210008	629342	Sealed	Not Available	Coon Rapids, City Of	1350 Coon Rapids Bl	Coon Rapids	16	4/6/2007	Not Available	WEL	Yes
795	003-263124210008	635407	Sealed	Not Available	Coon Rapids, City Of	1350 Coon Rapids Bl	Coon Rapids	17	4/6/2007	Not Available	WEL	Yes
796	003-263124210008	629343	Sealed	Not Available	Coon Rapids, City Of	1350 Coon Rapids Bl	Coon Rapids	18	4/6/2007	Not Available	WEL	Yes
797	003-123124320066	H000253271	Sealed	Not Available	Pavlenko, Dan	11924 Norway St	Coon Rapids	30	4/5/2007	Not Available	WEL	Yes
798	Not Available	056564	Sealed	Not Available	Mn Dot	Not Available	Coon Rapids	51	9/13/1995	Not Available	WEL	Uncertain
799	Not Available	056565	Sealed	Not Available	Mn Dot	Not Available	Coon Rapids	51	9/14/1995	Not Available	WEL	Uncertain
800	003-223124210024	H000245593	Sealed	Not Available	Weber, Lenard	10849 Thrush St Nw	Coon Rapids	47	9/6/2006	Not Available	WEL	Yes
801	003-223124240063	H000247525	Sealed	Not Available	Sheldon, Gwen	2181 107th Av Nw	Coon Rapids	89	5/24/2006	Not Available	WEL	Yes
802	003-123124330108	H000245573	Sealed	Not Available	Oconner, Shawn	11808 Norway St	Coon Rapids	42	7/18/2006	Not Available	WEL	Yes
803	003-173124220041	H000245564	Sealed	Not Available	Ryman, Tim	3849 116th Av	Coon Rapids	120	6/22/2006	Not Available	WEL	Yes
804	003-163124130010	H000247117	Sealed	Not Available	Borden, Jim	2661 S Heights Dr	Coon Rapids	25	7/19/2006	Not Available	WEL	Yes
805	003-173124220079	H000256122	Sealed	Not Available	Lloyds Construction	3815 Coon Rapids Bl	Coon Rapids	101	3/7/2007	Not Available	WEL	Approximate

PCSI Results - Sealed Wells in the DWSMAs
City of Coon Rapids Part 2 WHPP Amendment

PCSI ID	PID No.	Unique No.	Status	Use	Well Owner	Well Location	City	Total Sealed Depth (Feet)	Date Completed/Sealed	Aquifer	PCS Code	Location Verified
806	003-133124210008	H000245696	Sealed	Not Available	Ramundt, Craig	11631 Kumquat St Nw	Coon Rapids	31	1/16/2007	Not Available	WEL	Yes
807	053-3312021240021	H000265333	Sealed	Not Available	Rekstad, Dennis	11457 Yates Av N	Champlin	108	10/8/2007	Not Available	WEL	Yes
808	003-223124240046	H000248873	Sealed	Not Available	Preuss, Dave	2040 106th Av Nw	Coon Rapids	102	11/7/2007	Not Available	WEL	Yes
809	003-133124230003	H000257796	Sealed	Not Available	Roberts, Jon	671 Northdale Bl	Coon Rapids	29	1/15/2008	Not Available	WEL	Yes
810	003-133124210061	H000266238	Sealed	Not Available	Geidl, Sandra	11621 Larch St Nw	Coon Rapids	28	1/3/2008	Not Available	WEL	Yes
811	053-2812021330019	H000248883	Sealed	Not Available	Oleary, Ryan	11806 Porter Dr N	Champlin	55	3/11/2008	Not Available	WEL	Yes
812	053-2812021320004	H000265706	Sealed	Not Available	Plewacki, Gale	12036 Mississippi Dr	Champlin	44	10/9/2007	Not Available	WEL	Yes
813	053-2812021330004	H000266469	Sealed	Not Available	Kallstrom, Joe	11835 W River rd	Champlin	64	12/27/2007	Not Available	WEL	Yes
814	003-123124330031	H000266823	Sealed	Not Available	Alben, Brian	11825 Larch St Nw	Coon Rapids	38	11/12/2007	Not Available	WEL	Yes
815	053-2812021330013	H000263267	Sealed	Not Available	Dahl, Jim	11817 Porter Dr	Champlin	97	4/22/2008	Not Available	WEL	Yes
816	003-273124110051	H000263558	Sealed	Not Available	Gay, Kimberly	10010 Ibis St	Coon Rapids	50	8/14/2007	Not Available	WEL	Yes
817	003-223124240047	H000255398	Sealed	Not Available	Folk, Larry	2050 106th Av Nw	Coon Rapids	96	5/16/2007	Not Available	WEL	Yes
818	003-133124220085	H000253668	Sealed	Not Available	Spires, Bonnie	670 115th Av Nw	Coon Rapids	25	4/16/2008	Not Available	WEL	Yes
819	003-123124330032	H000262069	Sealed	Not Available	Krieger, Alan	11833 Larch St Nw	Coon Rapids	22	7/24/2007	Not Available	WEL	Yes
820	003-123124330141	H000259619	Sealed	Not Available	Anderson, Judy	11725 Magnolia St Nw	Coon Rapids	41	7/12/2007	Not Available	WEL	Yes
821	003-263124210008	629338	Sealed	Not Available	Coon Rapids, City Of	1350 Coon Rapids Bl	Coon Rapids	17	4/6/2007	Not Available	WEL	Yes
822	003-223124240028	H000237010	Sealed	Not Available	Wincek, Don	2121 107th Av Nw	Coon Rapids	95	7/11/2007	Not Available	WEL	Yes
823	003-173124220079	H000258784	Sealed	Not Available	Kami, Inc.	3815 Coon Rapids Bl Nw	Coon Rapids	24	5/24/2007	Not Available	WEL	Approximate
824	003-123124320050	H000263580	Sealed	Not Available	Johnson, Dorothy	11932 Magnolia St	Coon Rapids	32	9/7/2007	Not Available	WEL	Yes
825	053-2812021330012	H000263268	Sealed	Not Available	Wheeler, Everett	11815 Porter Dr	Champlin	92	4/22/2008	Not Available	WEL	Yes
826	003-153124240010	H000266247	Sealed	Not Available	Coon Rapids, City Of	11301 Osage St	Coon Rapids	110	2/14/2008	Not Available	WEL	Yes
827	003-093124310074	H000255607	Sealed	Not Available	Lilke, John	11953 Eidelweiss St Nw	Coon Rapids	123	5/12/2007	Not Available	WEL	Yes
828	053-2812021330042	H000264266	Sealed	Not Available	Strunge, Jerome	11715 Adair Av N	Champlin	78	8/27/2007	Not Available	WEL	Yes
829	003-123124340045	H000259602	Sealed	Not Available	Sack, Steven	11761 Juniper St Nw	Coon Rapids	37	6/6/2007	Not Available	WEL	Yes
830	003-123124340045	H000259601	Sealed	Not Available	Sack, Steven	11761 Juniper St Nw	Coon Rapids	13	6/6/2007	Not Available	WEL	Yes
831	003-123124330116	H000258974	Sealed	Not Available	Barbara Williams Estate	11731 Olive St	Coon Rapids	30	6/27/2007	Not Available	WEL	Yes
832	003-123124340038	H000272443	Sealed	Not Available	Leblanc, Melanie	11700 Ilex St Nw	Coon Rapids	52	8/20/2008	Not Available	WEL	Yes
833	003-153124240046	H000275776	Sealed	Not Available	Wholesale Home Improvements	11408 Partridge St Nw	Coon Rapids	132	5/22/2009	Not Available	WEL	Yes
834	053-3312021240051	H000279202	Sealed	Not Available	Whaley, Doug L.	11301 Yates Av N	Champlin	56	4/29/2009	Not Available	WEL	Approximate
835	003-133124220009	H000250987	Sealed	Not Available	Knight, Jean	11670 Olive St	Coon Rapids	56	6/6/2009	Not Available	WEL	Yes
836	003-123124340046	H000262096	Sealed	Not Available	Kraft, Steve	11771 Juniper St	Coon Rapids	31	6/10/2008	Not Available	WEL	Yes
837	053-3212021110048	H000259743	Sealed	Not Available	Ziegler, Nancy	11610 Edgewood Av	Champlin	69	3/24/2009	Not Available	WEL	Yes
838	003-123124340006	H000274826	Sealed	Not Available	Reimer, Cheri	11711 Kumquat St	Coon Rapids	30	7/28/2009	Not Available	WEL	Yes
839	003-273124110054	H000278223	Sealed	Not Available	Nierengarten, David	9940 Ibis St Nw	Coon Rapids	91	7/2/2009	Not Available	WEL	Yes
840	003-133124240013	H000268789	Sealed	Not Available	Bautch, Josh	610 115th Av	Coon Rapids	20	7/8/2008	Not Available	WEL	Yes
841	003-133124230072	H000274393	Sealed	Not Available	Dennis, Steve	719 113th Av Nw	Coon Rapids	22	9/23/2008	Not Available	WEL	Yes
842	003-213124310017	H000263282	Sealed	Not Available	Nist, F. Marcine	10346 Mississippi Bl	Coon Rapids	48	7/16/2008	Not Available	WEL	Yes
843	003-133124240016	H000237037	Sealed	Not Available	Weispfenning, Rich	621 Northdale Bl Nw	Coon Rapids	31	8/27/2008	Not Available	WEL	Yes
844	003-133124220033	H000271701	Sealed	Not Available	Ebert, Ewald	11621 Olive St Nw	Coon Rapids	38	6/17/2008	Not Available	WEL	Yes
845	003-153124230100	H000097662	Sealed	Not Available	Schultz, David	2315 114th La Nw	Coon Rapids	21	9/15/1989	Not Available	WEL	Yes
846	003-253124130035	H000128235	Sealed	Not Available	Smith, Harold W.	231 99th Av Nw	Coon Rapids	20	12/23/1992	Not Available	WEL	Approximate
847	Not Available	H000277043	Sealed	Not Available	Central Bank	Not Available	Not Available	50	7/7/2010	Not Available	WEL	Uncertain
848	003-223124130106	H000292479	Sealed	Not Available	Moore, Janet	1941 105th La Nw	Coon Rapids	155	1/4/2011	Not Available	WEL	Yes
849	003-163124440062	H000269577	Sealed	Not Available	Hartfiel, Mark	11040 Yukon St Nw	Coon Rapids	22	5/14/2010	Not Available	WEL	Yes
850	003-153124240073	H000293540	Sealed	Not Available	Amborn, Cheryl	11432 Quinn St Nw	Coon Rapids	85	3/4/2011	Not Available	WEL	Yes
851	003-093124310075	H000290233	Sealed	Not Available	Elliott, Kathy	11952 Crooked Lake Bl	Coon Rapids	68	3/24/2011	Not Available	WEL	Yes
852	053-3312021240042	H000288981	Sealed	Not Available	Nelson, Tim	11448 Yates Av N	Champlin	135	7/23/2010	Not Available	WEL	Yes
853	053-3312021320039	H000289699	Sealed	Not Available	Schnitzler, Brad	6016 111TH Av N	Champlin	55	4/21/2011	Not Available	WEL	Yes
854	Not Available	H000289760	Sealed	Not Available	Coon Rapids, City Of	Not Available	Not Available	85	10/21/2010	Not Available	WEL	Uncertain
855	003-133124220061	H000286244	Sealed	Not Available	Schwantz, Rob	11601 Norway St	Coon Rapids	30	3/18/2011	Not Available	WEL	Yes
856	003-133124210051	H000290237	Sealed	Not Available	Wandzel, Nancy	11500 Kumquat St Nw	Coon Rapids	39	4/8/2011	Not Available	WEL	Yes
857	003-113124440018	H000289757	Sealed	Not Available	Kapler, Ken	11816 Olive St	Coon Rapids	26	11/29/2010	Not Available	WEL	Yes
858	003-233124330032	H000278264	Sealed	Not Available	Kinseth, Judy	1520 103rd Av Nw	Coon Rapids	102	10/22/2009	Not Available	WEL	Yes
859	003-133124220054	H000278276	Sealed	Not Available	Jost, Evelyn	11500 Magnolia St Nw	Coon Rapids	27	12/8/2009	Not Available	WEL	Yes
860	003-223124220056	H000274834	Sealed	Not Available	Faroane, Dale	2410 108th Av Nw	Coon Rapids	123	10/23/2009	Not Available	WEL	Yes
861	003-213124220005	H000275657	Sealed	Not Available	Marilyn Carnell Trust	10760 Mississippi Bl Nw	Coon Rapids	88	6/11/2009	Not Available	WEL	Yes
862	003-223124220041	H000278274	Sealed	Not Available	Lubbers, Brian	10860 Thrush St	Coon Rapids	115	11/16/2009	Not Available	WEL	Yes
863	003-223124440036	H000280908	Sealed	Not Available	Rapid Properties, Llc	1620 103rd Av Nw	Coon Rapids	115	11/16/2009	Not Available	WEL	Yes
864	003-123124330085	H000284454	Sealed	Not Available	Cerny, Elaine	11771 Norway St Nw	Coon Rapids	40	10/7/2009	Not Available	WEL	Yes
865	053-1011921210017	H000269567	Sealed	Not Available	Brooklyn Park, City Of	10047 Fall Gold Parkway	Brooklyn Park	18	8/18/2009	Not Available	WEL	Yes
866	053-2912021440004	H000278129	Sealed	Not Available	Purlieus Properties, Inc.	11707 Douglas Dr N	Champlin	45	9/1/2009	Not Available	WEL	Yes
867	003-123124330025	H000280815	Sealed	Not Available	Michaelson, Keith	11773 Larch St	Coon Rapids	28	9/4/2009	Not Available	WEL	Yes
868	003-123124320059	H000297865	Sealed	Not Available	Johnson, Kurtis	11933 Norway St Nw	Coon Rapids	25	1/17/2012	Not Available	WEL	Yes
869	003-123124330143	H000294550	Sealed	Not Available	Montgomery, Anna	11741 Magnolia St	Coon Rapids	145	12/6/2011	Not Available	WEL	Yes
870	003-133124330009	H000300484	Sealed	Not Available	Watje, Wendy	11004 Magnolia St	Coon Rapids	20	11/23/2011	Not Available	WEL	Yes
871	003-223124420015	H000301056	Sealed	Not Available	Scheunemann, Roger	1911 Coon Rapids Bl	Coon Rapids	140	11/30/2011	Not Available	WEL	Yes
872	003-253124130005	H000297860	Sealed	Not Available	Le, Hu	9858 Foley Bl Nw	Coon Rapids	40	12/28/2011	Not Available	WEL	Yes

PCSI Results - Sealed Wells in the DWSMAs
City of Coon Rapids Part 2 WHPP Amendment

PCSI ID	PID No.	Unique No.	Status	Use	Well Owner	Well Location	City	Total Sealed Depth (Feet)	Date Completed/Sealed	Aquifer	PCS Code	Location Verified
873	003-223124310057	H000301054	Sealed	Not Available	Deutsche Bank National Trust Co.	10465 Partridge St Nw	Coon Rapids	21	11/19/2011	Not Available	WEL	Yes
874	003-163124330044	H000303034	Sealed	Not Available	Coon Rapids, City Of	2996 111th Av Nw	Coon Rapids	40	3/28/2012	Not Available	WEL	Approximate
875	003-163124330044	H000303033	Sealed	Not Available	Coon Rapids, City Of	2966 111th Av Nw	Coon Rapids	40	3/28/2012	Not Available	WEL	Approximate
876	003-173124210045	H000303032	Sealed	Not Available	Coon Rapids, City Of	3789 Coon Rapids Bl	Coon Rapids	24	3/27/2012	Not Available	WEL	Approximate
877	003-183123330044	H000097595	Sealed	Not Available	Lamb, Daniel	10932 Sixth St Ne	Blaine	18	5/11/1990	Not Available	WEL	Yes
878	003-133124210085	H000292486	Sealed	Not Available	Bornes, Dean	11571 Juniper St	Coon Rapids	48	3/30/2011	Not Available	WEL	Yes
879	Not Available	H000289994	Sealed	Not Available	Us Bank Na Nd	Not Available	Not Available	21	10/26/2010	Not Available	WEL	Uncertain
880	Not Available	H000291359	Sealed	Not Available	Humbert, Ronald	Not Available	Not Available	159	9/27/2010	Not Available	WEL	Uncertain
881	Not Available	H000291358	Sealed	Not Available	Johnson, Robert	Not Available	Not Available	89	10/10/2010	Not Available	WEL	Uncertain
882	003-183123330071	H000097593	Sealed	Not Available	Moorhouse, Larry	11014 Fifth St Ne	Blaine	20	5/22/1990	Not Available	WEL	Yes
883	003-183123330074	H000097594	Sealed	Not Available	Hud	10944 Fifth St Ne	Blaine	20	5/22/1990	Not Available	WEL	Yes
884	003-093124340010	H000097635	Sealed	Not Available	Morehouse, James	2911 118th La	Coon Rapids	27	7/20/1990	Not Available	WEL	Yes
885	003-223124430038	H000097636	Sealed	Not Available	Youakim, Maurice	10227 Hanson Bl	Coon Rapids	65	7/19/1990	Not Available	WEL	Yes
886	003-223124430038	H000097637	Sealed	Not Available	Youakim, Maurice	10227 Hanson Bl	Coon Rapids	30	7/19/1990	Not Available	WEL	Yes
887	003-133124220047	H000097640	Sealed	Not Available	Kocur, Bill	11600 Magnolia St Nw	Coon Rapids	30	7/30/1990	Not Available	WEL	Yes
888	Not Available	H000279393	Sealed	Not Available	Midgely, Orville	Not Available	Not Available	87	10/22/2010	Not Available	WEL	Uncertain
889	003-223124220065	H000286227	Sealed	Not Available	Galebach, Troy	2320 108th Av	Coon Rapids	106	9/21/2010	Not Available	WEL	Yes
890	003-133124240053	H000097643	Sealed	Not Available	Friton, David	11501 Juniper St Nw	Coon Rapids	55	5/16/1990	Not Available	WEL	Yes
891	003-223124230002	H000097645	Sealed	Not Available	Coon Rapids, City Of	2301 105th Av Nw	Coon Rapids	25	5/11/1990	Not Available	WEL	Approximate
892	003-163124220016	H000097648	Sealed	Not Available	Century 21 Realty	3011 115th Av	Coon Rapids	25	4/27/1990	Not Available	WEL	Yes
893	003-093124340020	H000097653	Sealed	Not Available	Anderson, Kevin D.	2910 118th La	Coon Rapids	23	2/4/1990	Not Available	WEL	Yes
894	003-153124240012	H000097654	Sealed	Not Available	Peterson, Carl	11333 Partridge St	Coon Rapids	136	2/16/1990	Not Available	WEL	Yes
895	003-133124220032	H000289769	Sealed	Not Available	Storkan, Doug	11601 Olive St	Coon Rapids	15	11/29/2010	Not Available	WEL	Yes
896	003-143124440015	H000292491	Sealed	Not Available	Henseth, Debbie	11022 Norway St	Coon Rapids	22	4/23/2011	Not Available	WEL	Yes
897	053-3212021110041	H000290442	Sealed	Not Available	Hennepin County	11651 Douglas Dr	Champlin	89	9/21/2010	Not Available	WEL	Yes
898	053-3212021140126	H000290440	Sealed	Not Available	Hennepin County	11311 Douglas Dr	Champlin	24	9/21/2010	Not Available	WEL	Yes
899	003-133124430004	H000286313	Sealed	Not Available	Murry, Tom	343 111th Av	Coon Rapids	23	5/10/2010	Not Available	WEL	Yes
900	003-223124430025	H000277044	Sealed	Not Available	Central Bank	Not Available	Not Available	90	7/7/2010	Not Available	WEL	Uncertain
901	003-163124340015	H000294501	Sealed	Not Available	Songstad, Vern	10941 Crooked Lake Bl	Coon Rapids	47	6/28/2011	Not Available	WEL	Yes
902	003-183123240075	H000306882	Sealed	Not Available	Durkot, Alan	11311 Seventh St	Blaine	33	9/7/2012	Not Available	WEL	Yes
903	003-163124140071	H000301250	Sealed	Not Available	Petersdorph Co.	11414 Xavis St	Coon Rapids	24	8/16/2012	Not Available	WEL	Yes
904	003-093124340040	H000306275	Sealed	Not Available	Schirmers, Bruce	2960 119th La Nw	Coon Rapids	74	9/20/2012	Not Available	WEL	Yes
905	003-153124240067	H000305492	Sealed	Not Available	Schmidt, Ruth E.	11441 Quinn St Nw	Coon Rapids	107	7/23/2012	Not Available	WEL	Yes
906	003-163124330044	H000292422	Sealed	Not Available	Coon Rapids, City Of	2980 Coon Rapids Bl	Coon Rapids	35	7/8/2011	Not Available	WEL	Approximate
907	003-163124330044	H000292421	Sealed	Not Available	Coon Rapids, City Of	3026 111th Av Nw	Coon Rapids	35	7/8/2011	Not Available	WEL	Approximate
908	003-163124330044	H000292423	Sealed	Not Available	Coon Rapids, City Of	2900 Coon Rapids Bl	Coon Rapids	35	7/8/2011	Not Available	WEL	Approximate
909	003-163124340003	H000301188	Sealed	Not Available	Peoples Bank Of Commerce	2810 Coon Rapids Bl	Coon Rapids	37	12/21/2011	Not Available	WEL	Yes
910	003-213124310015	H000300315	Sealed	Not Available	Walsh, Paul	10360 Mississippi Bl	Coon Rapids	131	12/28/2011	Not Available	WEL	Yes
911	003-223124220061	H000298941	Sealed	Not Available	Hanson, Marlene	2360 108th Av Nw	Coon Rapids	88	3/20/2012	Not Available	WEL	Yes
912	003-163124340003	H000270822	Sealed	Not Available	Nova Consulting Group	2810 Coon Rapids Bl	Coon Rapids	39	2/10/2012	Not Available	WEL	Yes
913	003-133124210022	H000299726	Sealed	Not Available	Wolf, Alvin	11670 Kumquat St Nw	Coon Rapids	31	9/27/2011	Not Available	WEL	Yes
914	003-093124340008	H000299740	Sealed	Not Available	Jadwin, Sandra K.	2851 118th La Nw	Coon Rapids	30	10/26/2011	Not Available	WEL	Yes
915	003-223124240023	H000294210	Sealed	Not Available	Easthouse, Larry	2041 107th Av	Coon Rapids	92	10/13/2011	Not Available	WEL	Yes
916	003-163124110027	H000297130	Sealed	Not Available	Getchell, Randy	11571 Wren St Nw	Coon Rapids	23	5/23/2012	Not Available	WEL	Yes
917	003-133124210013	H000299068	Sealed	Not Available	Youngman, Leona	11571 Kumquat St	Coon Rapids	70	10/5/2011	Not Available	WEL	Yes
918	003-133124210039	H000305484	Sealed	Not Available	Maurstad, Matt	11630 Kumquat St Nw	Coon Rapids	32	7/2/2012	Not Available	WEL	Yes
919	003-183123330093	H000306284	Sealed	Not Available	Jacquemart, Anita	11019 Fourth St Ne	Blaine	20	11/5/2012	Not Available	WEL	Yes
920	003-133124210023	H000307330	Sealed	Not Available	Ulferts, Gary	11660 Kumquat St	Coon Rapids	28	10/30/2012	Not Available	WEL	Yes
921	053-2812021320011	H000304506	Sealed	Not Available	Orr, Richard	11936 Mississippi Dr	Champlin	36	8/8/2012	Not Available	WEL	Yes

Approximate - Parcel not found but location is approximately where that address would exist
Uncertain - Not enough address information to verify location

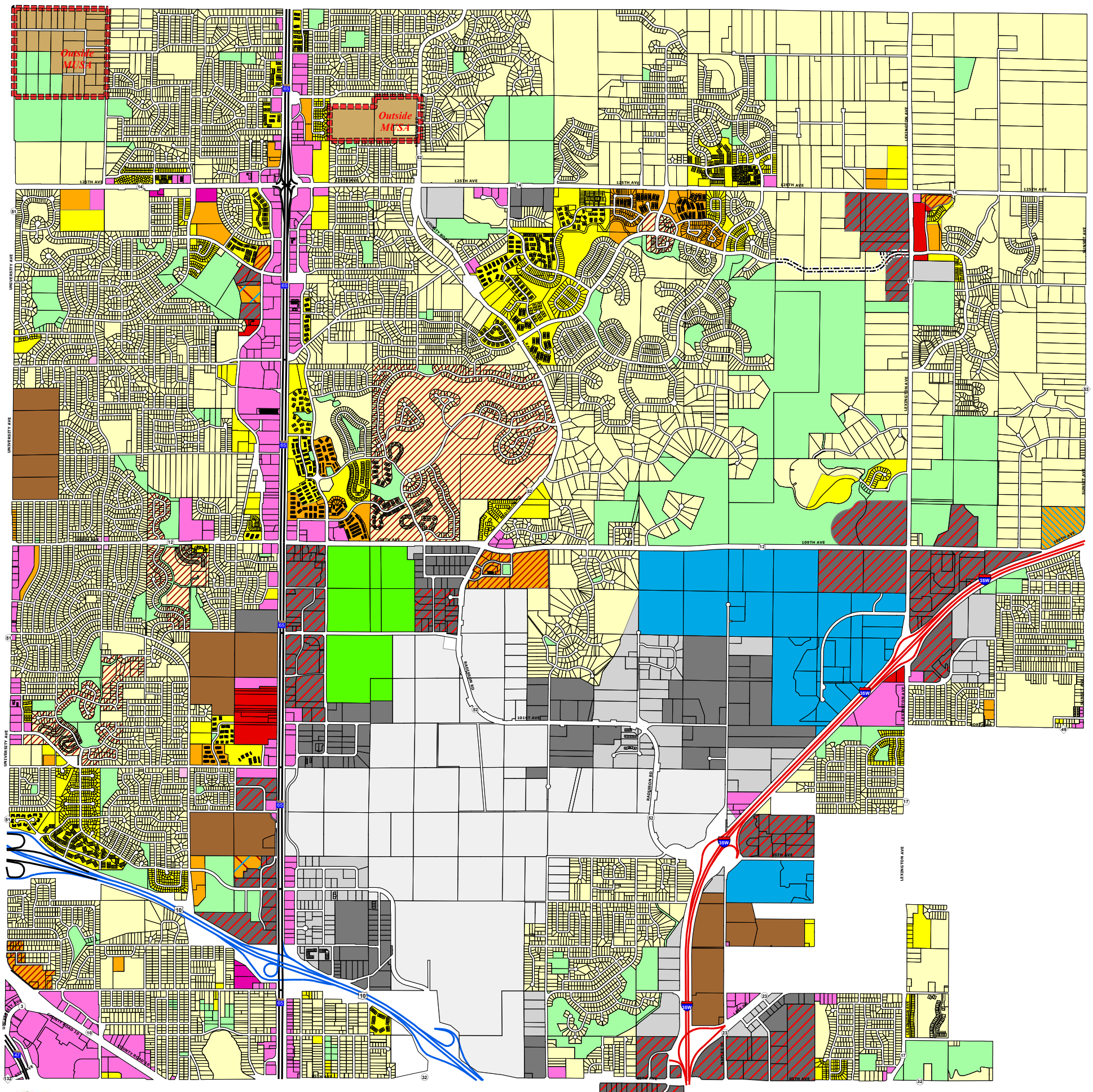
Attachment C-4

Maps for other Jurisdictions

DRAFT

Comprehensive Land Use Plan

City of Blaine, MN



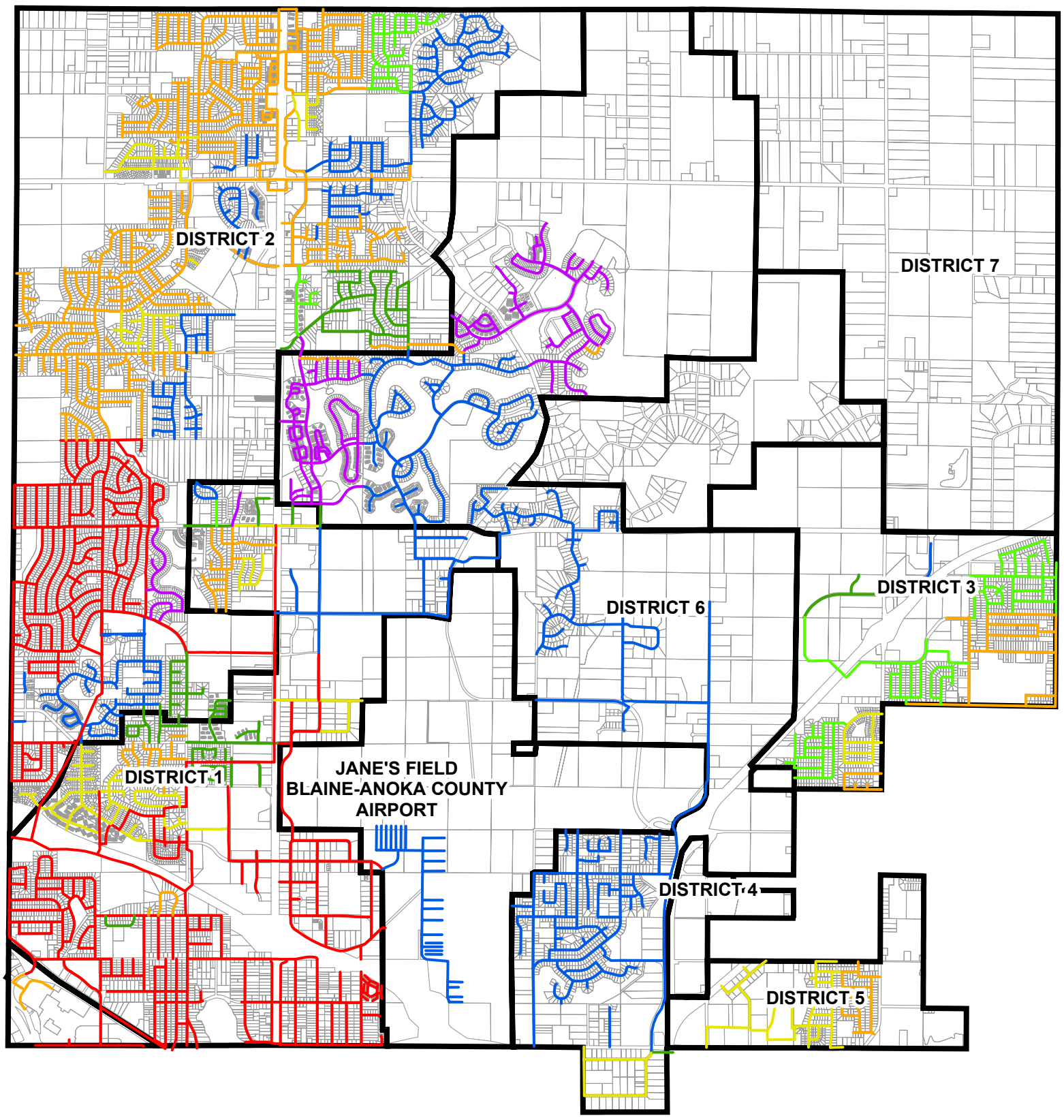
Disclaimer: This document has been compiled using information gathered from various governmental offices and other sources and is to be used for reference purposes only. Every effort has been made to make sure the completeness and accuracy on this document. The City of Blaine does not represent that the data can be used for exact measurement of distance or direction or precision in the depiction of geographic features. If errors or discrepancies are found, please contact (763) 717-2639.

This map is in draft form and should not be looked upon as a legal document.
Map Created By City of Blaine GIS
Data provided by City of Blaine Planning Department
Map Date: November 2016

Legend

- Interstate Highway
- US Highway
- State Highway
- LDR - Low Density Residential
- L-MDR - Low/Medium Density Res.
- MDR - Medium Density Residential
- MDR/PC
- HDR - High Density Residential
- HDR/PC
- HDR/PI
- HDR/PI/PC
- MHR - Mobile Home Residential
- LI - Light Industrial
- HI - Heavy Industrial
- PI - Planned Industrial
- NC - Neighborhood Commercial
- CC - Community Commercial
- PC - Planned Commercial
- PI/PC - Planned Ind./Comm.
- O - Office
- R - Rural Residential
- P/OS - Park / Open Space
- RR - Regional Recreation
- AP - Airport

Planning\Projects\Land Use Map Small.mxd



LEGEND

PARCELS

SANITARY SEWER DISTRICTS

YEAR BUILT

- 1965 to 1969
- 1970 to 1979
- 1980 to 1984
- 1985 to 1989
- 1990 to 1994
- 1995 to 1999
- 2000 to 2004

This map shows preliminary data of the year built on the City if Blaine sanitary sewer system. Dates and locations have not been checked against as-built drawings.

Map Document: (X:\AE\Blain\040200\GIS\Fig_2_PipeAge_SanitarySewer_Blaine_11x17.mxd)
8/17/2005 -- 11:27:21 AM

0 2,000 4,000 8,000 Feet

SEH

3535 VADNAIS CENTER DR.
ST. PAUL, MN 55110
PHONE: (651) 490-2000
FAX: (651) 490-2150
WATTS: 800-325-2055
www.sehinc.com

FILE NO.
ABLAIN0402.00

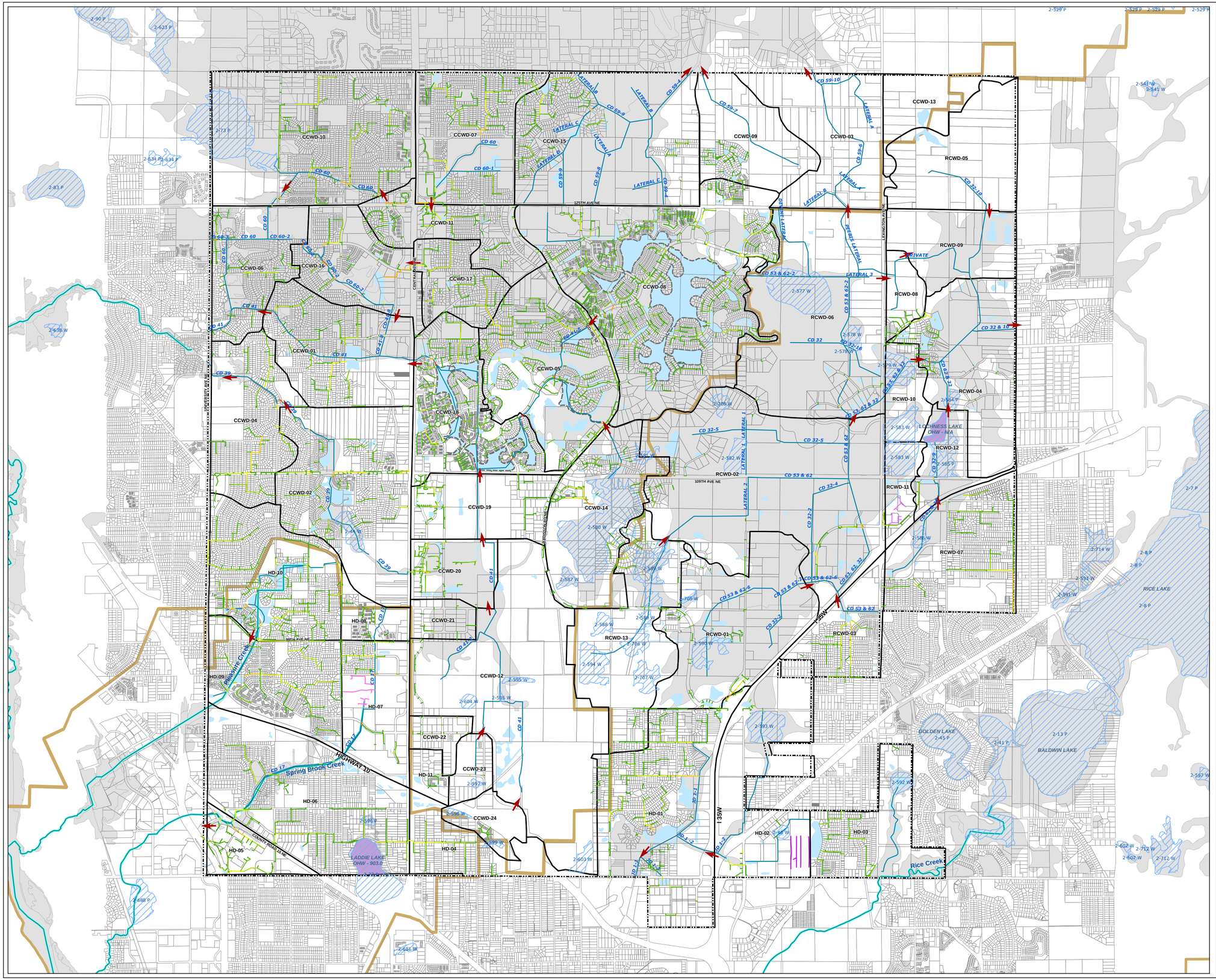
March 1, 2005

CITY OF BLAINE
SANITARY SEWER SYSTEM
ESTIMATED CONSTRUCTION DATES

Figure
2

Existing Storm Sewer Map

Storm Water Management Plan
City of Blaine, Minnesota
Map 1



Storm Pipes
- <= 12"
- 15"
- 18"
- 20"
- 21"
- 22"
- 24"
- 27"
- 28"
- 29"
- 30"
- 31"
- 33"
- 36"
- 40"
- 42"
- 43"
- 44"
- 45"
- 48"
- 54"
- 58"
- 60"
- 62"
- 65"
- 72"
- 78"
- 88"
- 114"
- 120"
- CFT
- PRV
- SPB

- Ponds
- PWI
- Public Water
- Ditches
- Impaired Waters
- Flow Arrows
- Man-Made Basins
- FEMA
- Drainage Area Boundary
- WMO
- City Boundary

N

1,800 0 1,800 Feet

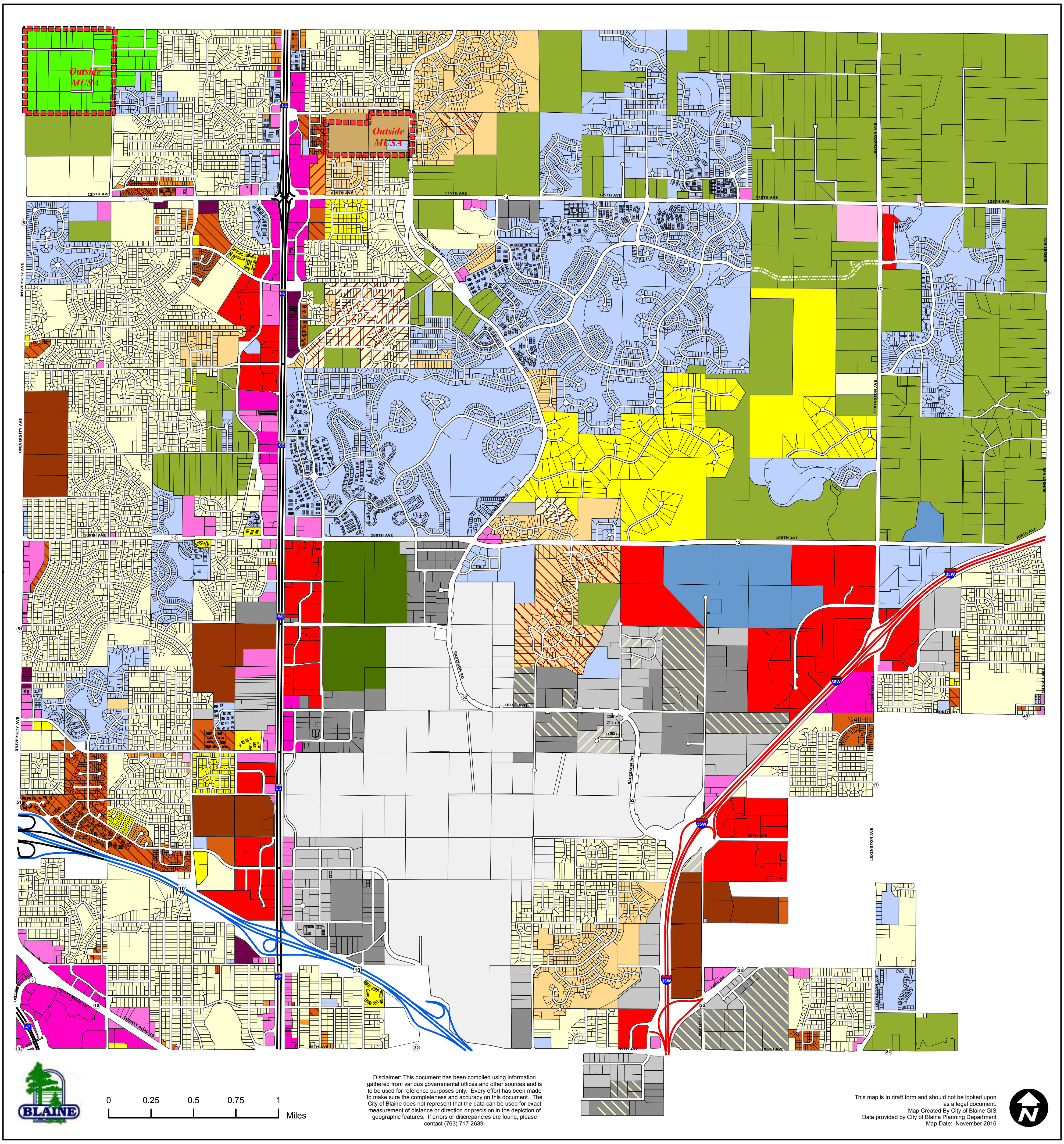
October 2008

Bonestroo

I:/654/65407002/GIS/Projects/Map1_storn sewer.mxd

Zoning Map

City of Blaine, MN

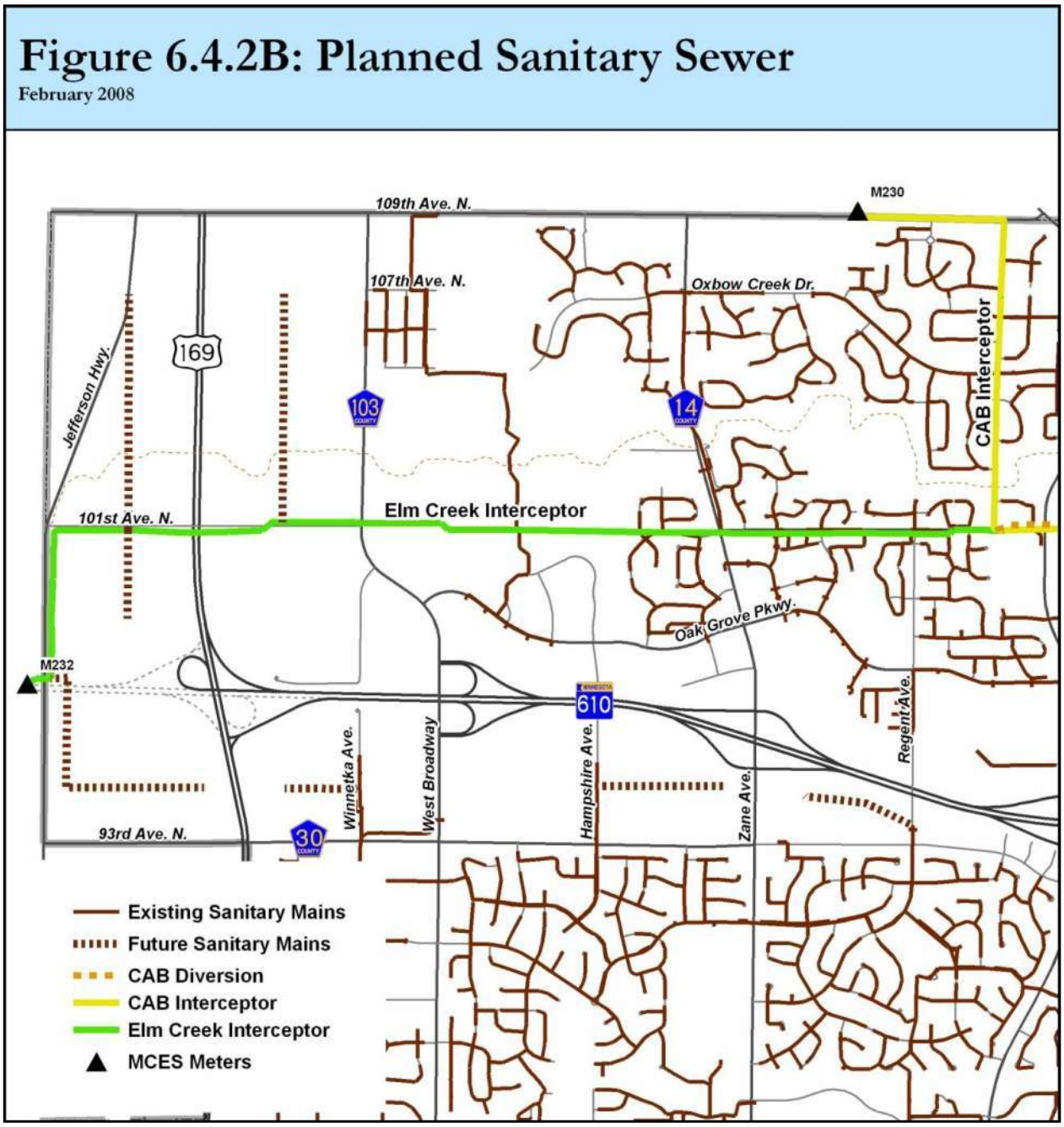


Legend

- Interstate Highway
- US Highway
- State Highway
- B-1 - Neighborhood Business
- B-2 - Community Commercial
- B-3 - Regional Commercial
- B-4 - Office Research Park
- DF - Development Flex
- Airport
- I-1 - Light Industrial
- I-1A - Light Industrial
- I-2 - Heavy Industrial
- I-2A - Heavy Industrial
- PBD - Planned Business District
- POD - Planned Office District
- R-1 - Single Family
- R-1A - Single Family
- R-1AA - Single Family
- R-1B - Single Family
- R-2 - Two Family
- R-3A - Low Density Multi-Family
- R-3B - Medium Density Multi-Family
- R-3C - High Density Multi-Family
- R-4 - Mobile Homes
- RE - Residential Estate
- RF - Residential Flex
- RR - Regional Recreation
- AG - Agriculture
- FR - Farm Residence

Planning\Projects\Zoning Map Small.mxd

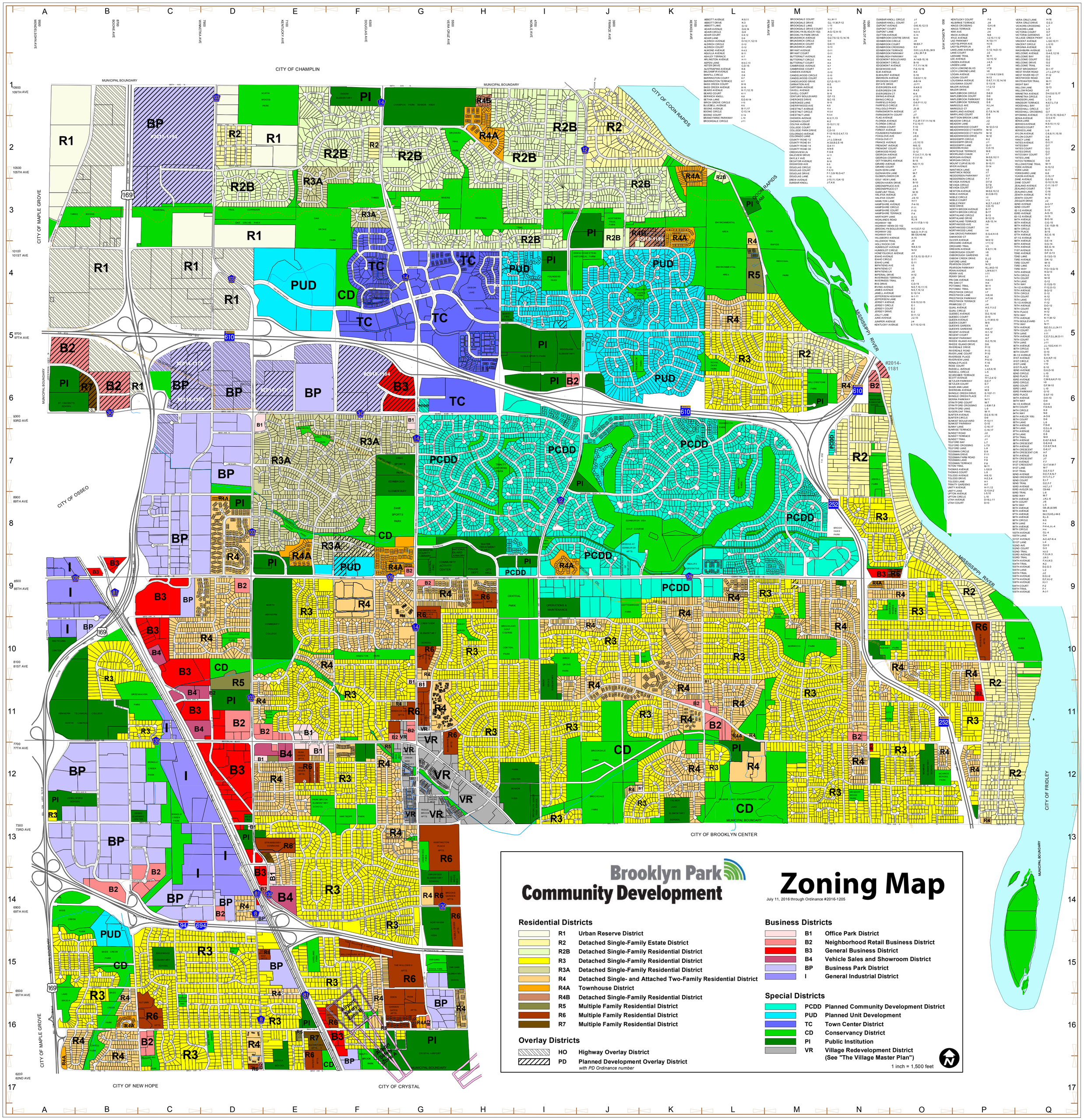
- The City of Maple Grove serves two religious buildings in the northwest part of Brooklyn Park.



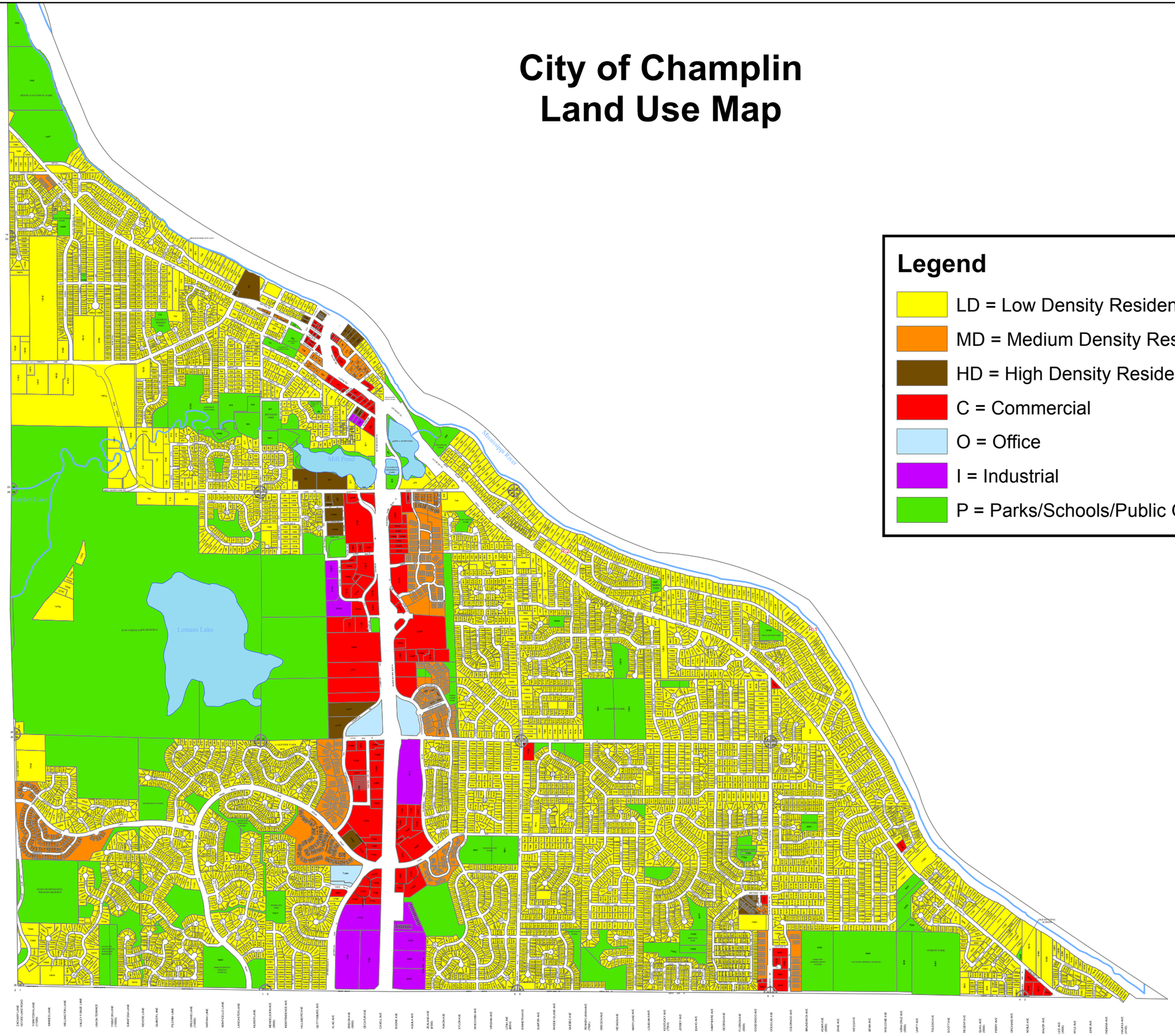
Maintenance

The City of Brooklyn Park Operations and Maintenance Department is responsible for all maintenance activities associated with the City's sanitary sewer system. There are no major outstanding maintenance issues with the sanitary sewer system at this time. Preventive maintenance is conducted by the department on a regular basis, including:

- Replacement of clay pipe house services within the right of way during street reconstruction projects
- Rehabilitation and replacement of clay pipe mains


Brooklyn Park
Community Development
Zoning Map
July 11, 2016 through Ordinance #2016-1205
Residential Districts
R1 Urban Reserve District
R2 Detached Single-Family Estate District
R2B Detached Single-Family Residential District
R3 Detached Single-Family Residential District
R3A Detached Single-Family Residential District
R4 Detached Single- and Attached Two-Family Residential District
R4A Townhouse District
R4B Detached Single-Family Residential District
R5 Multiple Family Residential District
R6 Multiple Family Residential District
R7 Multiple Family Residential District
Overlay Districts
HO Highway Overlay District
PD Planned Development Overlay District
with PD Ordinance number
Business Districts
B1 Office Park District
B2 Neighborhood Retail Business District
B3 General Business District
B4 Vehicle Sales and Showroom District
BP Business Park District
I General Industrial District
Special Districts
PCDD Planned Community Development District
PUD Planned Unit Development
TC Town Center District
CD Conservancy District
PI Public Institution
VR Village Redevelopment District
(See "The Village Master Plan")
1 inch = 1,500 feet
CITY OF CHAMPLIN
CITY OF COON RAPIDS
CITY OF MAPLE GROVE
CITY OF OSSEO
CITY OF BROOKLYN CENTER
CITY OF FRIDLEY
CITY OF NEW HOPE
CITY OF CRYSTAL
MUNICIPAL BOUNDARY
MISSISSIPPI RIVER
#2014-1181
#2015-194
#2016-1195

City of Champlin
Land Use Map



N
W E
S

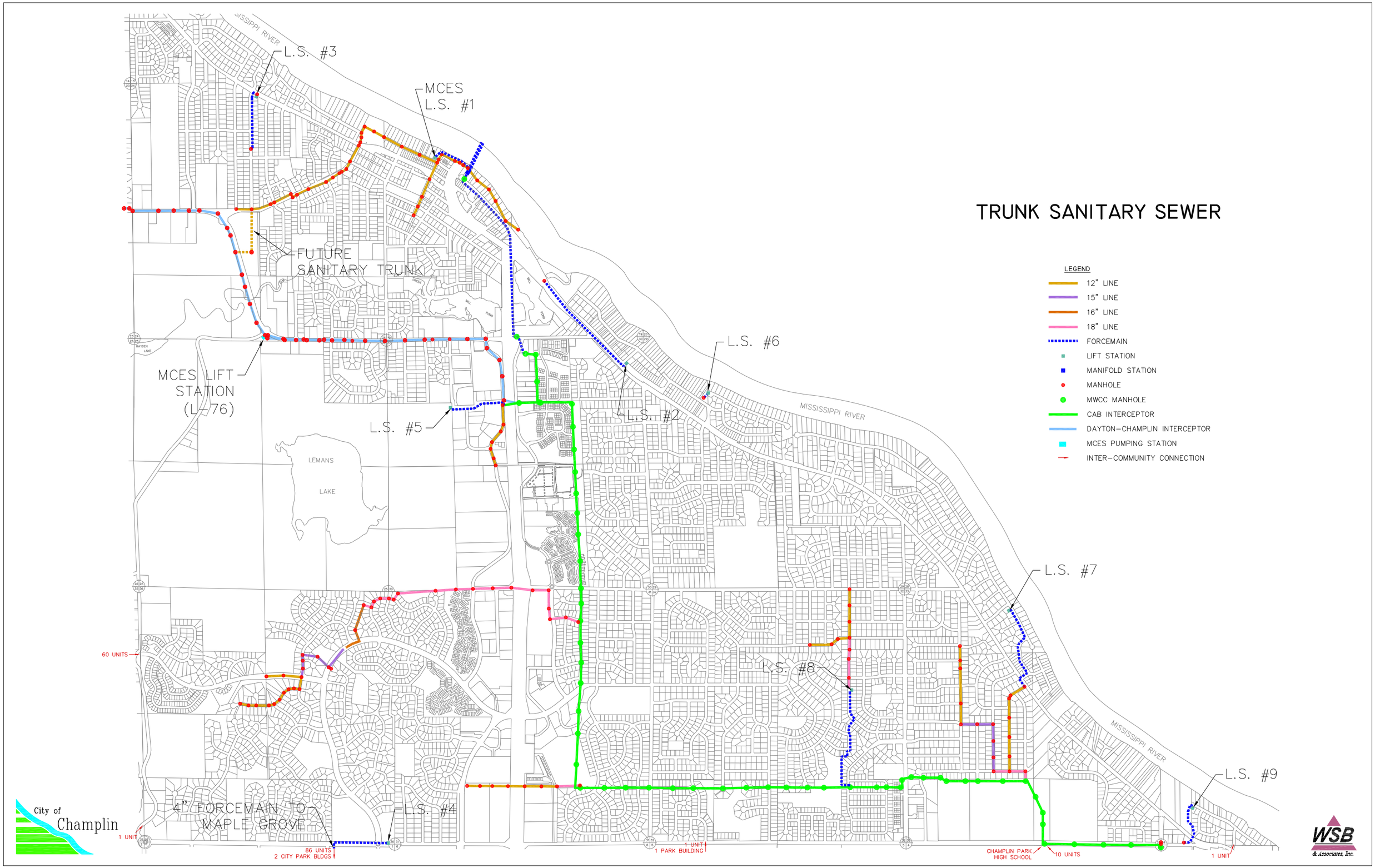
0 2,000 Feet

Legend

- LD = Low Density Residential - This Land Use
- MD = Medium Density Residential
- HD = High Density Residential
- C = Commercial
- O = Office
- I = Industrial
- P = Parks/Schools/Public Open Space

* Created by City of Champlin GIS
September 2011

TRUNK SANITARY SEWER



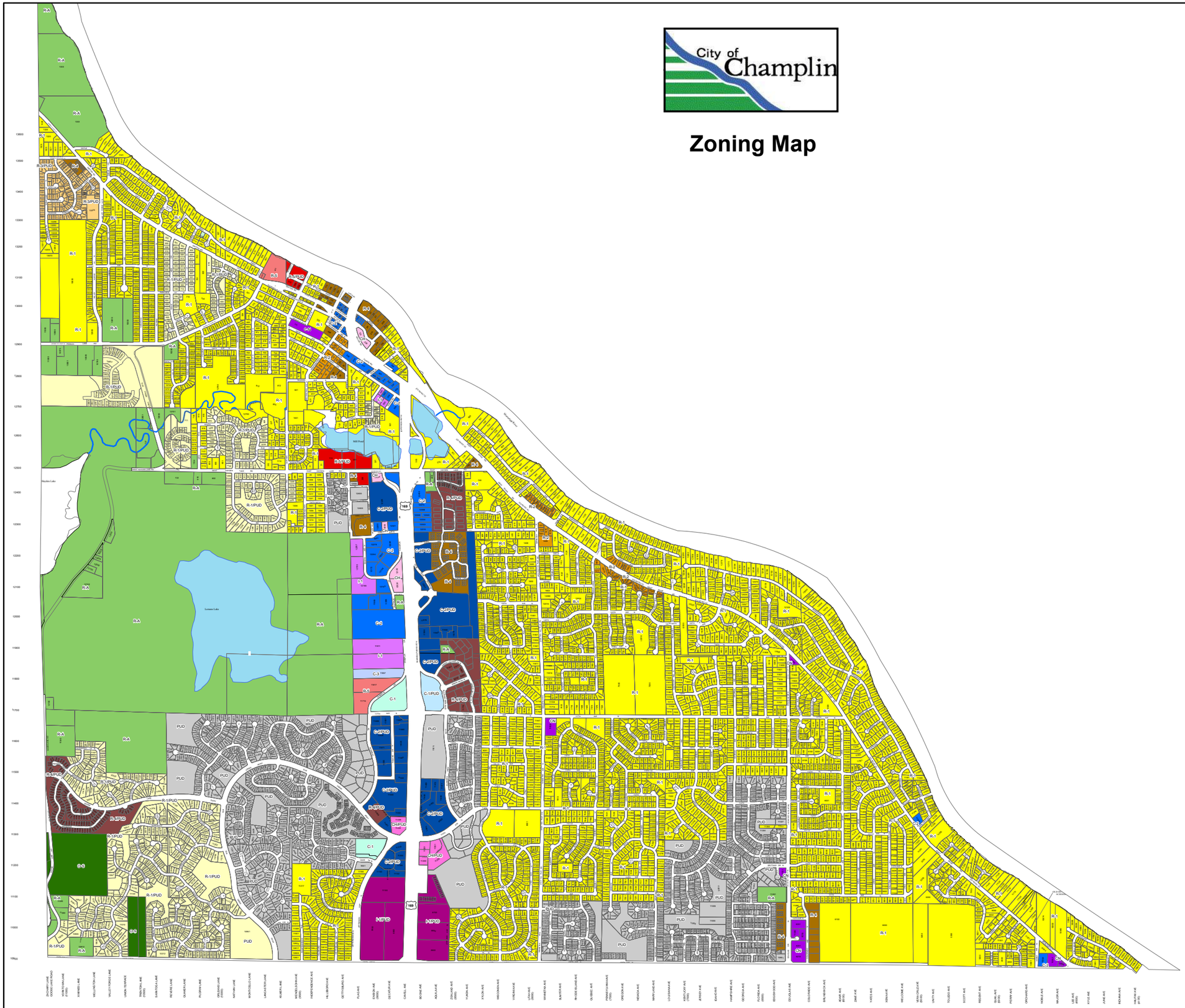
K:\01684-32\Cad\Plan\Champlin Sanitary Map.dwg, 12/1/2008 3:34:19 PM

City of Champlin

Zoning Map

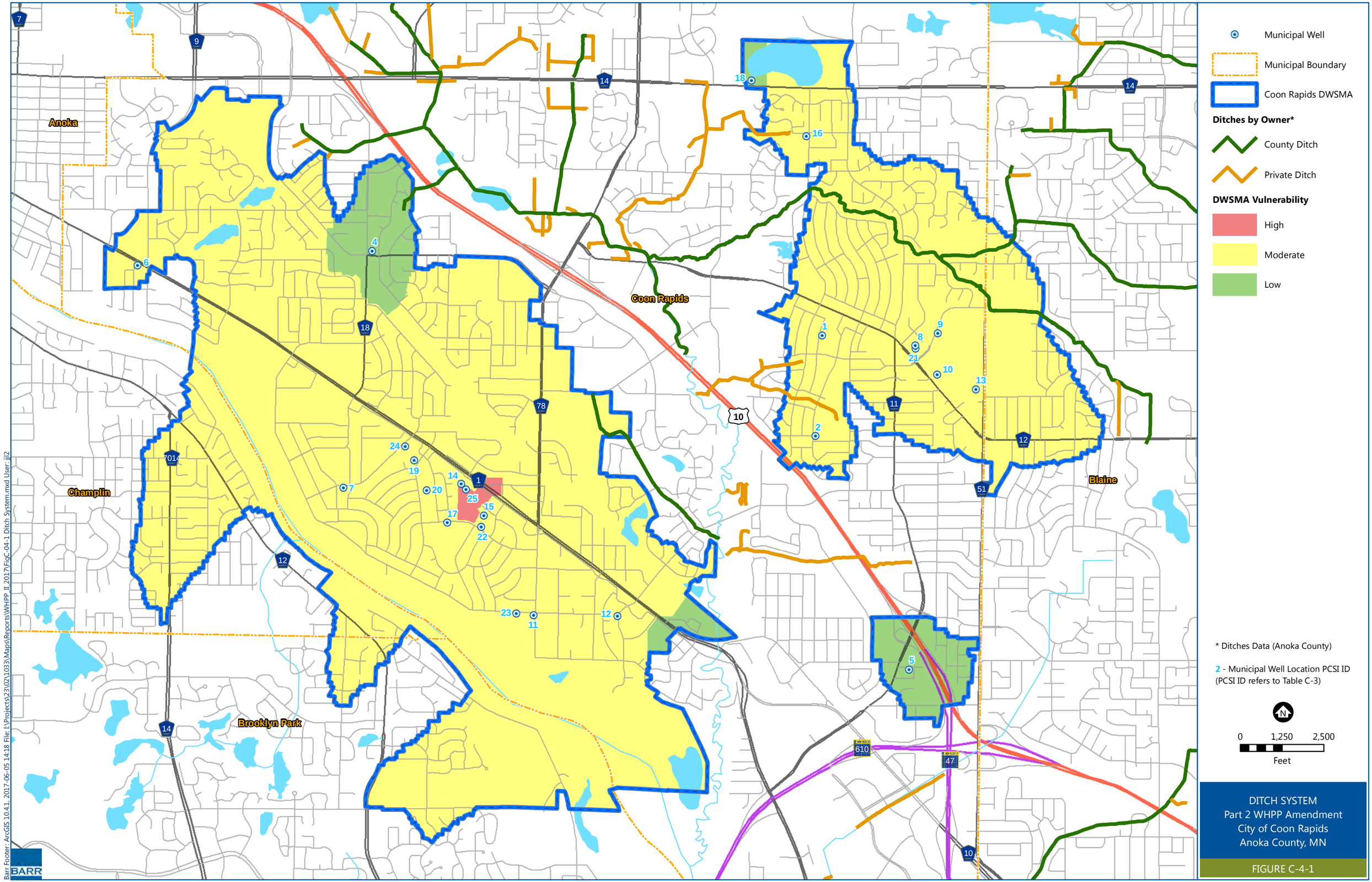
0 750 1,500 3,000 Feet

N



Legend

- C-1 Commercial Office
- C-1/PUD
- C-2 Commercial General Business
- C-2/PUD
- C-3 Commercial Mini-Storage
- CH Commercial Highway
- CH/PUD
- CN Commercial Neighborhood
- I-1 Industrial
- I-1/PUD
- O-S Open Space
- PARK
- PUD Planned Unit Development
- R-1 Single Family Residential
- R-1/PUD
- R-2 Two-Family Residential
- R-3/PUD
- R-4 Medium Density Residential
- R-4/PUD
- R-5 High Density Residential
- R-5/PUD
- R-A Residential Agricultural


Municipal Well
Municipal Boundary
Coon Rapids DWSMA
Ditches by Owner*
County Ditch
Private Ditch
DWSMA Vulnerability
High
Moderate
Low
Anoka
Coon Rapids
Champlin
Brooklyn Park
Blaine
* Ditches Data (Anoka County)
2 - Municipal Well Location PCSI ID
(PCSI ID refers to Table C-3)
0
1,250
2,500
Feet
DITCH SYSTEM
Part 2 WHPP Amendment
City of Coon Rapids
Anoka County, MN
FIGURE C-4-1
BARR
Barr Footer: ArcGIS 10.4.1, 2017-06-05 14:18 File: I:\Projects\23\02\103\Maps\Reports\WHPP_II_2017\FigC-04-1 Ditch System.mxd User: jjl2

Appendix D

Water Quality Information

PWSID: 1020017

City of Coon Rapids
2016 Drinking Water Report

The City of Coon Rapids is issuing the results of monitoring done on its drinking water for the period from January 1 to December 31, 2016. The purpose of this report is to advance consumers' understanding of drinking water and heighten awareness of the need to protect precious water resources.

Source of Water

The City of Coon Rapids provides drinking water to its residents from a groundwater source: 24 wells ranging from 105 to 700 feet deep, that draw water from the Multiple, Tunnel City-Mt.Simon, Tunnel City-Wonewoc, Wonewoc-Mt.Simon, Quaternary Buried Artesian, Mt. Simon, Tunnel City Group, and Tunnel City-Eau Claire aquifers.

The Minnesota Department of Health has made a determination as to how vulnerable our systems' source(s) of water may be to future contamination incidents. If you wish to obtain the entire source water assessment regarding your drinking water, please call 651-201-4700 or 1-800-818-9318 (and press 5) during normal business hours. Also, you can view it on line at www.health.state.mn.us/divs/eh/water/swp/swa.

Call 763-767-6576 if you have questions about the City of Coon Rapids drinking water or would like information about opportunities for public participation in decisions that may affect the quality of the water.

Results of Monitoring

No contaminants were detected at levels that violated federal drinking water standards. However, some contaminants were detected in trace amounts that were below legal limits. The table that follows shows the contaminants that were detected in trace amounts last year. (Some contaminants are sampled less frequently than once a year; as a result, not all contaminants were sampled for in 2016. If any of these contaminants were detected the last time they were sampled for, they are included in the table along with the date that the detection occurred.)

Key to abbreviations:
MCLG—Maximum Contaminant Level Goal: The level of a contaminant in drinking water below which there is no known or expected risk to health. MCLGs allow for a margin of safety.

MCL—Maximum Contaminant Level: The highest level of a contaminant that is allowed in drinking water. MCLs are set as close to the MCLGs as feasible using the best available treatment technology.

MRDL—Maximum Residual Disinfectant Level.

MRDLG—Maximum Residual Disinfectant Level Goal.

AL—Action Level: The concentration of a contaminant which, if exceeded, triggers treatment or other requirement which a water system must follow.

90th Percentile Level—This is the value obtained after disregarding 10 percent of the samples taken that had the

highest levels. (For example, in a situation in which 10 samples were taken, the 90th percentile level is determined by disregarding the highest result, which represents 10 percent of the samples.) Note: In situations in which only 5 samples are taken, the average of the two with the highest levels is taken to determine the 90th percentile level.

pCi/l—PicoCuries per liter (a measure of radioactivity).

ppm—Parts per million, which can also be expressed as milligrams per liter (mg/l).

ppb—Parts per billion, which can also be expressed as micrograms per liter (μg/l).

nd—No Detection.

N/A—Not Applicable (does not apply).

Contaminant (units)	MCLG	MCL	Level Found		Typical Source of Contaminant
			Range (2016)	Average /Result*	
Alpha Emitters (pCi/l)	0	15.4	nd-16	15♦	Erosion of natural deposits.
Arsenic (ppb)	0	10	N/A	5.25	Erosion of natural deposits; Runoff from orchards; Runoff from glass and electronics production wastes.
Barium (ppm) (08/10/2015)	2	2	N/A	.05	Discharge of drilling wastes; Discharge from metal refineries; Erosion of natural deposits.
Combined Radium (pCi/l)	0	5.4	nd-7.8	7.7♦	Erosion of natural deposits.
Di(2-Ethylhexyl) Adipate (ppb)	400	400	nd-45	22.5	Discharge from chemical factories.
Fluoride (ppm)	4	4	.52-.68	.72	State of Minnesota requires all municipal water systems to add fluoride to the drinking water to promote strong teeth; Erosion of natural deposits; Discharge from fertilizer and aluminum factories.
Haloacetic Acids (HAA5) (ppb)	0	60	nd-30.5	22.73	By-product of drinking water disinfection.
Nitrate (as Nitrogen) (ppm)	10.4	10.4	nd-.07	.07	Runoff from fertilizer use; Leaching from septic tanks, sewage; Erosion of natural deposits.
TTHM (Total trihalomethanes) (ppb)	0	80	13.1-53.5	45.35	By-product of drinking water disinfection.

*This is the value used to determine compliance with federal standards. It sometimes is the highest value detected and sometimes is an average of all the detected values. If it is an average, it may contain sampling results from the previous year.

PWSID: 1020017

♦Our system has taken the initiative to limit the amount of water being pumped from the source(s) with higher levels of Alpha Emitters and Combined Radium. We have a compliance agreement with the MDH to ensure drinking water consumed by residents contain levels less than the MCL(s) on an annual basis.

Contaminant (units)	MRDLG	MRDL	****	*****	Typical Source of Contaminant
Chlorine (ppm)	4	4	.4-.6	.61	Water additive used to control microbes.

****Highest and Lowest Monthly Average.
*****Highest Quarterly Average.

Contaminant (units)	MCLG	AL	90% Level	# sites over AL	Typical Source of Contaminant
Copper (ppm) (07/29/2014)	1.3	1.3	.78	0 out of 30	Corrosion of household plumbing systems; Erosion of natural deposits.
Lead (ppb) (07/29/2014)	0	15	1.8	0 out of 30	Corrosion of household plumbing systems; Erosion of natural deposits.

If present, elevated levels of lead can cause serious health problems, especially for pregnant women and young children. Lead in drinking water is primarily from materials and components associated with service lines and home plumbing. City of Coon Rapids is responsible for providing high quality drinking water, but cannot control the variety of materials used in plumbing components. When your water has been sitting for several hours, you can minimize the potential for lead exposure by flushing your tap for 30 seconds to 2 minutes before using water for drinking or cooking. If you are concerned about lead in your water, you may wish to have your water tested. Information on lead in drinking water, testing methods, and steps you can take to minimize exposure is available from the Safe Drinking Water Hotline or at http://www.epa.gov/safewater/lead.

Monitoring may have been done for additional contaminants that do not have MCLs established for them and are not required to be monitored under the Safe Drinking Water Act. Results may be available by calling 651-201-4700 or 1-800-818-9318 during normal business hours.

Compliance with National Primary Drinking Water Regulations

The sources of drinking water (both tap water and bottled water) include rivers, lakes, streams, ponds, reservoirs, springs, and wells. As water travels over the surface of the land or through the ground, it dissolves naturally-occurring minerals and, in some cases, radioactive material, and can pick up substances resulting from the presence of animals or from human activity.

Contaminants that may be present in source water include:

Microbial contaminants, such as viruses and bacteria, which may come from sewage treatment plants, septic systems, agricultural livestock operations, and wildlife.

Inorganic contaminants, such as salts and metals, which can be naturally-occurring or result from urban stormwater runoff, industrial or domestic wastewater discharges, oil and gas production, mining, or farming.

Pesticides and herbicides, which may come from a variety of sources such as agriculture, urban stormwater runoff, and residential uses.

Organic chemical contaminants, including synthetic and volatile organic chemicals, which are by-products of industrial processes and petroleum production, and can also come from gas stations, urban

stormwater runoff, and septic systems.

Radioactive contaminants, which can be naturally-occurring or be the result of oil and gas production and mining activities.

In order to ensure that tap water is safe to drink, the U. S. Environmental Protection Agency (EPA) prescribes regulations which limit the amount of certain contaminants in water provided by public water systems. Food and Drug Administration regulations establish limits for contaminants in bottled water which must provide the same protection for public health.

Drinking water, including bottled water, may reasonably be expected to contain at least small amounts of some contaminants. The presence of contaminants does not necessarily indicate that water poses a health risk. More information about contaminants and potential health effects can be obtained by calling the Environmental Protection Agency's Safe Drinking Water Hotline at 1-800-426-4791.

Some people may be more vulnerable to contaminants in drinking water than the general population. Immuno-compromised persons such as persons with cancer undergoing chemotherapy, persons who have undergone organ transplants, people with HIV/AIDS or other immune system disorders, some elderly, and infants can be particularly at risk from infections. These people should seek advice about drinking water from their health care providers. EPA/CDC guidelines on appropriate means to lessen the risk of infection by Cryptosporidium and other microbial contaminants are available from the Safe Drinking Water Hotline at 1-800-426-4791.

For Non-English Speaking Customers:

English:

This report contains very important information. Translate or ask someone who understands it.

Spanish:

Información importante. Si no la entiende, haga que alguien se la traduzca ahora.

Hmong:

Nov yog ntaub ntawv tseem ceeb. Yog koy tsi to taub, nrhiav neeg pab txhais rau koh kom sai sai.

Appendix E

Wellhead Protection Program Evaluation Template

CITY OF COON RAPIDS, MINNESOTA

Wellhead Protection Program Evaluation

Evaluation Completed By
(Wellhead Protection Manager): _____

Date Evaluation Completed: _____

Plan Evaluation Frequency (according to wellhead protection plan):

- ☐ **1 year**
- ☐ **2.5 years**

Copies of Evaluation Presented or Sent to:

☐ Minnesota Department of Health
Environmental Health Division
Source Water Protection Unit
P.O. Box 64975
St. Paul, MN 55164-0975

☐ Coon Rapids City Council
(Date Presented)

☐ City's Wellhead Protection File

I. Changes to Water System, Delineations, or Contaminant Sources

A. List the unique number and locations of new wells installed since the last plan evaluation:

Unique Well Number	Date Online	Delineation Completed?
.		

B. List any new facilities or changes in current facilities in the drinking water supply management area(s) that may be of concern with regard to groundwater quality (list the facility name and nature of concern):

Facility Name	Change	Distance to Well	Well Number	Date Change Made

C. Was any component of the contingency plan implemented by your system at any time since the last program evaluation?

- ☐ **Yes (What was the reason?_____)**
- ☐ **No**

List changes that are needed in the contingency plan and <u>update the plan accordingly</u>:

1.

2.

3.

II. Wellhead Protection Plan Evaluation Approaches

In letters A-D below, complete the sections that apply to the evaluation approaches that were specified in your wellhead protection plan (Chapter 6).

A. Sampling the quality of groundwater throughout the drinking water supply management area. ***(Summarize efforts or attach report of sampling results and conclusions.)***

B. Documenting inventory control of potential contaminants. ***(Summarize efforts.)***

C. Documentation of the implementation of wellhead protection measures. ***(Summarize efforts.)***

D. Using monitoring data that are required by existing laws and rules in effect at the time of plan adoption. ***(List data used and summarize conclusions made from data.)***

III. New Wellhead Protection Data

List any new data that relates to wellhead protection delineations or source management (i.e., groundwater study results, water quality monitoring data, well construction logs, etc.) that may be used during the next update of the wellhead protection plan:

Nature of Data	Source of Data

IV. Plan Implementation Administrative and Financial Concerns

A. Estimate the annual expense of plan implementation for each plan year including staff time and actual dollar amount spent.

Year	Annual Expense	Year	Annual Expense
1	$	6	$
2	$	7	$
3	$	8	$
4	$	9	$
5	$	10	$

B. Estimate full-time equivalency (FTE) spent on wellhead protection implementation in terms of percentage of FTE.

FTE = _____%

C. Has the wellhead protection budget been adequate to conduct wellhead protection implementation activities during the last evaluation period?

☐ **Yes** ☐ **No**

If no, where could it improve?

D. Itemize difficulties incurred during your plan implementation.

1.

2.

3.

4.

Appendix F

Water Supply Plan

Note to reviewers: If approval of the new Water Supply Plan is received from the Dept. of Natural Resources before this Part 2 WHPP amendment is submitted to the Dept. of Health for approval, the new Water Supply Plan will be inserted here. Otherwise, the current Coon Rapids Water Supply Plan will be inserted.

DRAFT