Minnesota River Greenway, Eagan Segment Feasibility Study Report

Final – July 2014

Dakota COUNTY

BOLTON & MENK, INC.
Consulting Engineers & Surveyors

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PROJECT STAKEHOLDERS

REPRESENTATIVE	AGENCY	TITLE
Chris Hartzell	Dakota County	Project Manager
John Mertens	Dakota County	Senior Planner
Kurt Chatfield	Dakota County	Planning Supervisor
Dave Felleson	Minnesota DNR	Fort Snelling State Park Supervisor
Cindy Wheeler	Minnesota DNR	Central Region Project Manager
Jan Shaw Wolff	Minnesota DNR	Central Region Strategic Program Mgr
Larry Peterson	Minnesota DNR	Park Development & Real Estate Mgr
Anton Benson	Minnesota DNR	Regional Resource Specialist
Brooke Haworth	Minnesota DNR	Regional EA Biologist
Jennie Skancke	Minnesota DNR	South Metro Area Hydrologist
Jeff Berg	Minnesota DNR	Hydrologist
Dennis Rodacker	Minnesota Board of Water & Soil Resources	Metro Senior Wetland Specialist
Sarah Wingert	US Army Corps of Engineers	Project Manager
David Holmen	Dakota Soil & Water Conservation District	Resource Conservationist
Linda Loomis	Lower Minnesota River Watershed District	Administrator
Eric Macbeth	Eagan/Gun Club Lake Watershed	Administrator
Juli Johnson	City of Eagan	Parks Director
Tim Plath	City of Eagan	Transportation Engineer
Mike Ridley	City of Eagan	City Planner
Eric Johnson	Bolton & Menk, Inc.	Project Manager
Angie Bersaw	Bolton & Menk, Inc.	Transportation Planner

EXECUTIVE SUMMARY

BACKGROUND

The Minnesota River Greenway is part of Dakota County's planned county-wide 200 mile greenway network. The Minnesota River Greenway travels 17 miles following the south side of the Minnesota River valley through five municipalities between Burnsville and St. Paul, Fort Snelling State Park and the Minnesota Wildlife Refuge. This greenway provides access to natural areas and views of the river valley from its location in one of the largest continuous natural areas in the Twin Cities. This corridor is also part of the larger Minnesota Valley State Trail planned by the Minnesota Department of Natural Resources that will travel from Le Sueur to St. Paul.

In order to further the planning for this greenway, Dakota County developed the Minnesota River Greenway Master Plan in 2011. The greenway master plan identified issues, challenges and potential trail alignments for the entire length of the Minnesota River Greenway. Master plan alignments were based on general feasibility and were not detailed enough to provide a definitive alignment in many sections of the overall greenway. Additional feasibility study was recommended to determine a more precise alignment of the greenway.

One segment of the greenway requiring further study was the Eagan segment, located primarily in the Fort Snelling State Park area between I-494 and Highway 77/Cedar Avenue. This segment is of high importance to Dakota County due to the nature of the connections and access this four-mile section of trail would provide. The Eagan segment of this greenway would link the well developed local trail systems and regional parks in Burnsville/Eagan/Mendota Heights with those in Bloomington, St. Paul and Minneapolis.

PURPOSE OF STUDY

The purpose of the Minnesota River Greenway, Eagan Segment Feasibility Study was to refine the 2011 master plan alignment concepts, complete an environmental screening and agency coordination process, and identify a feasible alignment(s) for the County's use in moving forward to solicit funding for the trail construction. The goal of the study was to develop a feasible and supported trail alignment(s).

Locating a trail between I-494 and Highway 77/Cedar Ave has many challenges including a highly sensitive wetland and fen complex, flooding issues, high water table, poor soils, contaminated properties and proximity of the Union Pacific Railroad. Due to the challenges within the project area, achieving the study goal included considering:

- Access to Fort Snelling State Park
- Exposure to the natural areas along the Minnesota River
- Engineering feasibility (terrain, soils, constructability)
- Union Pacific Railroad support
- Fort Snelling State Park support
- Impacts to wetlands
- Impacts to fens
- Flooding impacts to the trail and designing it accordingly
- Environmental concerns (contamination, cultural resources, etc.)

CONCEPTS CONSIDERED

The study considered a broad range of trail alignments in conjunction with a comprehensive environmental screening and resource/permitting agency and railroad coordination effort to better understand what alignments were feasible for the Minnesota River Greenway, Eagan segment. **Appendix C** contains graphics that illustrate the original range of alignment alternatives considered in this feasibility study as well as others showing the evolution of the alternatives.

A Project Stakeholders Group met several times over the course of the study to consider and refine alignment alternatives and discuss environmental and regulatory issues. Project Stakeholders included staff from Dakota County, the City of Eagan, the Minnesota DNR and Fort Snelling State Park, Minnesota Board of Water and Soil Resources, U.S. Army Corps of Engineers, and area watershed districts. In addition, coordination with Union Pacific Railroad representatives was also conducted to identify feasible railroad crossing options for the proposed greenway.

Several of the initial range of alignment options was dismissed due to the identification of fatal flaws such as inconsistency with the greenway vision, environmental impacts, and/or safety concerns. The concept refinement and evaluation process continued with a field walk in June 2013 and again after wetlands and fens were delineated within the study area. Following these efforts, a recommended alignment with two alternate options at both the northern and southern ends of the study area was identified.

RECCOMENDATIONS

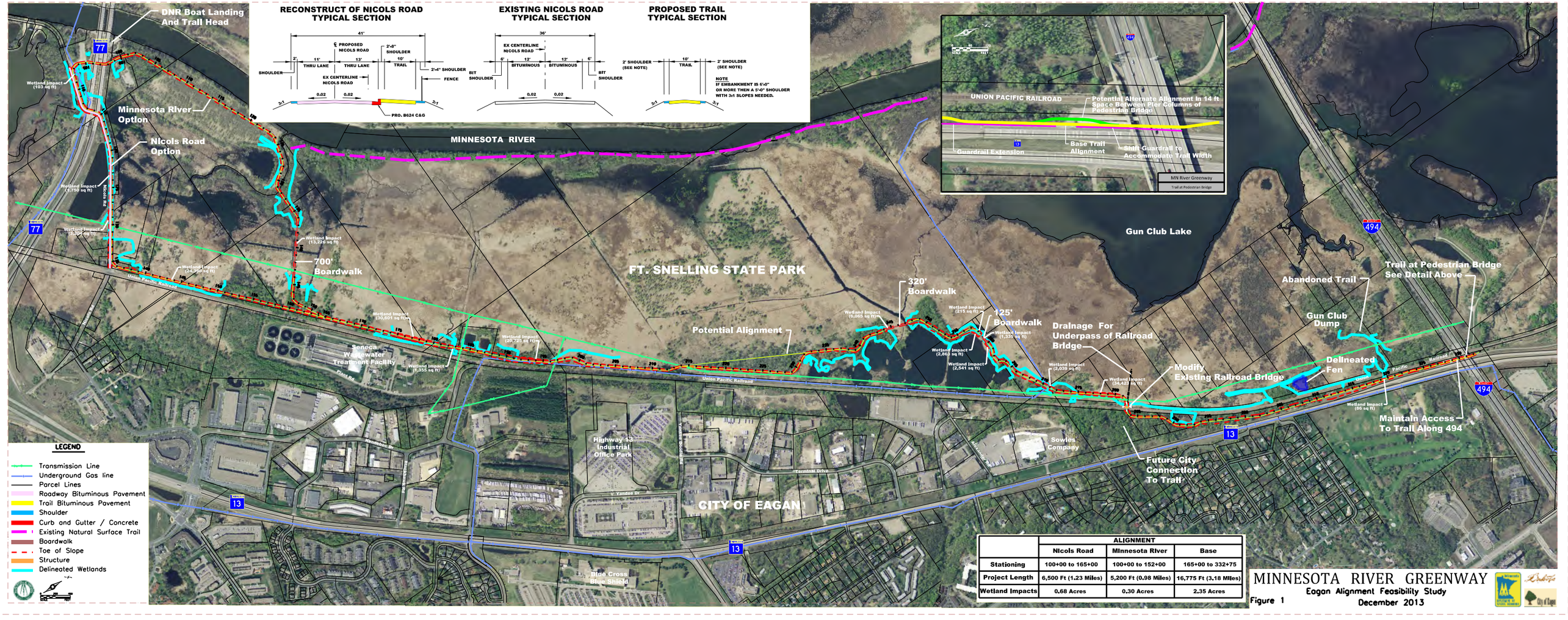
Figure 1 illustrates the recommended alignment(s) which begins with a connection to the existing Highway 77/Cedar Avenue pedestrian bridge at the southern end of the study corridor near the Minnesota River boat launch and parking lot. The study provided two feasible alignment options to connect the existing trail in this area to an alignment that parallels the west side of the railroad.

- **Nicols Road Option**- This option includes reconstructing Nicols Road to provide room for the trail adjacent to the existing road alignment. Nicols Road would be narrowed but maintained as a park access road. See **Figure 1** for this alignment, as well as a typical section showing the proposed changes. Approximately five additional feet of width would be necessary to accommodate the two-lane access road and the trail. Nicols Road would be widened to the south toward the MnDOT pond to minimize impacts to the natural wetland area to the north. The trail would then turn north at the railroad. The City of Eagan could potentially connect a local trail system into the greenway trail at the at-grade railroad crossing of Nicols Road.

  Moving to the north, the proposed trail alignment follows the west edge of the railroad right-of-way past the Seneca Wastewater Treatment Facility and former treatment ponds. It is understood that the former treatment ponds have been remediated upon cessation of use for wastewater treatment and therefore could be suitable for trail development.

- **Minnesota River Option** - An alternate alignment would follow an existing Fort Snelling State Park trail adjacent to the Minnesota River and then cross the floodplain/wetland area on a 700’ boardwalk to connect in with an alignment that parallels the west side of the railroad across from the Seneca Wastewater Treatment Facility.

The proposed trail alignment would continue north along the west side of the railroad right-of-way. There are two options shown on the layout approaching the quarry lake and former sand mine.



	ALIGNMENT		
	Nicols Road	Minnesota River	Base
Stationing	100+00 to 165+00	100+00 to 152+00	165+00 to 332+75
Project Length	6,500 Ft (1.23 Miles)	5,200 Ft (0.98 Miles)	16,775 Ft (3,18 Miles)
Wetland Impacts	0.68 Acres	0.30 Acres	2.35 Acres

MINNESOTA RIVER GREENWAY

Eagan Alignment Feasibility Study

December 2013

Figure 1

The potential options were developed after the delineation was completed to provide both an option adjacent to the railroad and a more scenic alignment away from the railroad. Both of these options are likely out of the wetlands however, this will need to be verified as the project is further developed. The trail travels along the backside of the quarry lake, utilizing upland area resulting from past spoils disposal. Two boardwalks of 320' and 125' are recommended through low areas near the lake. The trail would provide public access to the lake where there is already public use for fishing and swimming. Current access to this area is gained by trespassing across the railroad tracks.

North of the quarry lake the trail would utilize an existing railroad bridge to cross under the tracks and then continue on the east side of the railroad right-of-way. The railroad right-of-way and Highway 13 road use converge near I-494, narrowing the available space for the trail. Two options remain for connecting the proposed trail into the I-494 trail as shown on **Figure 1**. Either the trail needs to squeeze between the pedestrian bridge columns and the TH 13 guardrail or between the columns of the pedestrian bridge (see photo to the right). If the first option is selected, some guardrail modification will be needed along with shoulder narrowing of TH 13 from 11' to 10'.

COST ESTIMATES

Planning level cost estimates were prepared for the trail alignment concepts. The cost estimates (in 2013 dollars) include trail construction, railroad ballast shield, fireproof boardwalk, contingency, amenities, and wetland mitigation. Generally the improvements are estimated to cost between $5.3 million and $6.1 million depending upon the alignments. These cost estimates do not include project development and delivery costs which are estimated to range between $900,000 and $1.1 million depending upon the alignments. See **Appendix E** for the preliminary cost estimating documentation.

The costs could be reduced by $1,250,000 in the Minnesota River Option and $490,000 in the Nicols Road Option if a wood boardwalk were to be constructed rather than the fireproof boardwalk. This would bring the cost range of all options down to $4.8 million.

NEXT STEPS

It was concluded there is a feasible trail alignment that includes two options for the southern connection to Highway 77/Cedar Ave and two options for connection to I-494. All of these options are feasible but need further design and agency coordination to fully flush out the option that best meets the needs of the greenway, minimizes impacts and is cost-effective.

The following next steps for the Minnesota River Greenway, Eagan segment trail development include:

- Explore wetland mitigation/restoration opportunities and fen delineation findings – Continued coordination with regulatory agencies is necessary, working towards receiving an approved wetland permit application and identification of mitigation needs. The fen delineation findings should be discussed with the various regulatory authorities including the Minnesota DNR, the US Army Corps, the Bureau of Water and Soil Resources, Minnesota Pollution Control Agency, and the representative Local Government Unit.

- Address items needing further study and coordination – Additional coordination with environmental resource and regulatory agencies is necessary to discuss topics including cultural resource survey needs, soil testing, hydraulic modeling to discern floodplain impacts, and highway easements/shoulder modifications once a final alignment is selected. Further coordination with the UP Railroad is needed to determine the feasibility of the railroad crossing location identified. UP has indicated a hydraulics analysis will be required. Additional design and preliminary engineering is also needed to determine if the existing bridge structure can be excavated and overhead protection installed with proper clearances to meet the railroad's requirements. If an agreement to utilize the existing structure cannot be reached with UP, a new railroad crossing structure should be planned.

- Identify and seek funding sources for trail construction – Dakota County will continue to seek funding for this greenway project from various sources which could include the Transportation Alternatives Program, Minnesota DNR programs, Minnesota Pollution Control Agency, Clean Water, Land and Legacy Amendment, National Park Service and Environment and Natural Resources Trust Fund, among others.

Appendix F documents Project Stakeholder coordination and support for this greenway project as evidence of their general concurrence with the recommended alignment(s) and in support of Dakota County's efforts to seek funding for this greenway's development and construction.

I. INTRODUCTION

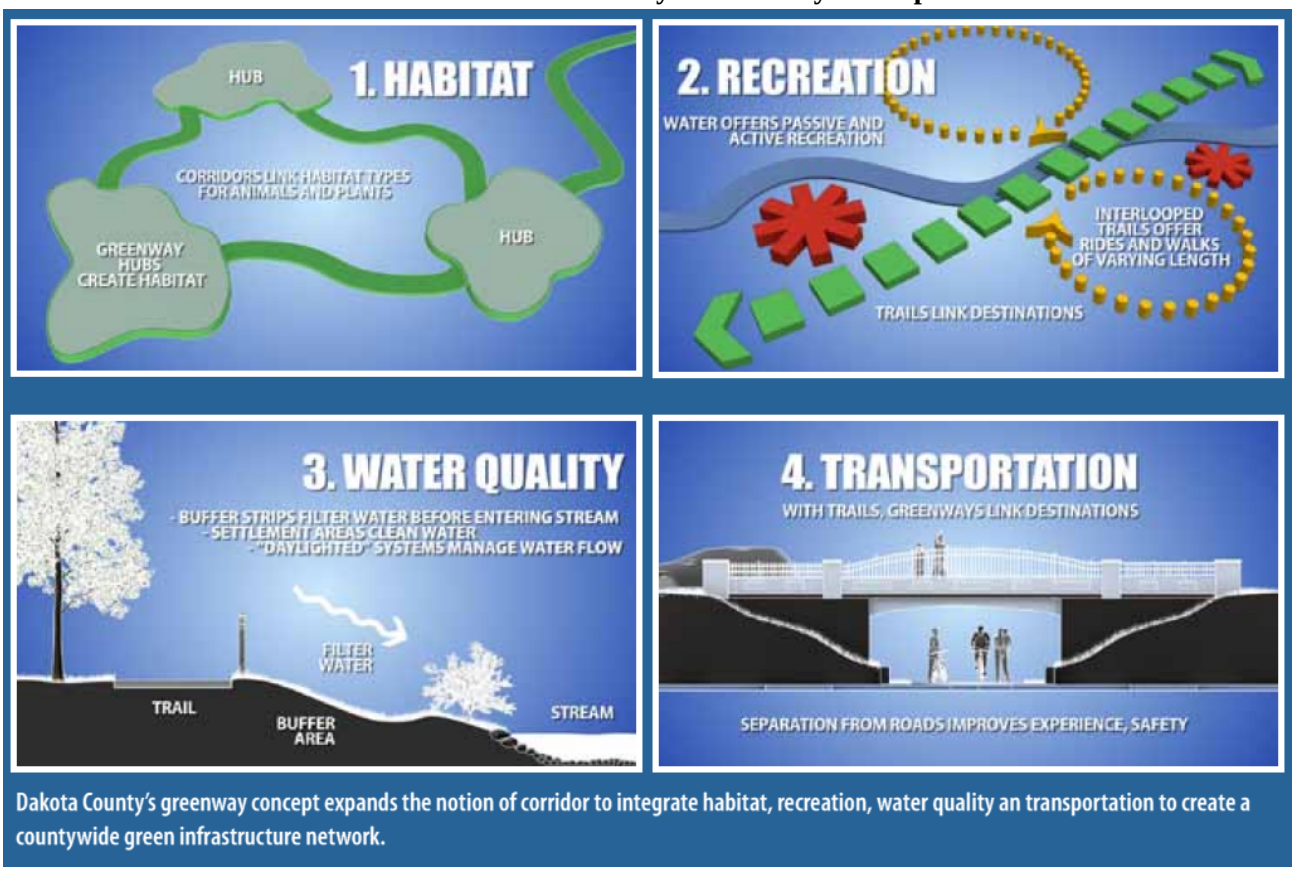
A. DAKOTA COUNTY GREENWAY VISION

The 2008 Dakota County Park System Plan and the 2010 Dakota County Greenway Collaborative Guidebook established the foundation for a countywide greenway network by envisioning a system of regional greenways that interconnect parks, schools, local trail and libraries through the non-rural portions of the county. **Figure 2** illustrates Dakota County's greenway vision which suggests 200 miles of regional greenways, 2/3 of which is on land currently in public or semipublic ownership.

FIGURE 2 – 2030 Dakota County Greenway Vision

The Dakota County Greenway vision proposes more than just a trail system. Dakota County's greenway concept expands the notion of corridor to integrate habitat, recreation, water quality and transportation to create a countywide green infrastructure network as shown in **Figure 3** below.

FIGURE 3 – Dakota County's Greenway Concept



Source: Minnesota River Greenway Master Plan (2011)

The 2010 Dakota County Greenway Collaborative Guidebook outlines the following performance goals for urban greenways:

- Away from streets 80% of the time
- Ideal corridor width of 100 feet
- Natural design signature with native gardensque landscaping and boulevard trees
- Grade-separated crossing of arterial roads and controlled intersections at collector roads (or grade-separated crossing)
- Special crossing markings at local roads and driveways
- Stormwater infiltration
- Pedestrian scale lighting
- Interpretive elements, wayfinding signage, and benches

B. MINNESOTA RIVER GREENWAY

One of Dakota County's greenways identified by the 2008 Park System Plan is the Minnesota River Greenway. The Minnesota River Greenway travels 17 miles following the south side of the Minnesota River valley through five municipalities between Burnsville and St. Paul, Fort Snelling State Park and the Minnesota Wildlife Refuge. This greenway provides access to natural areas and views of the river valley from its location in one of the largest continuous natural areas in the Twin Cities. This corridor is also part of the larger Minnesota Valley State Trail planned by the Minnesota Department of Natural Resources that will travel from Le Sueur to St. Paul.

In order to further the planning for this greenway, Dakota County developed the Minnesota River Greenway Master Plan in 2011. This plan was the first greenway master plan to be prepared since Dakota County solidified its greenway vision in the 2008 Park System Plan. The greenway master plan identifies issues, challenges and potential trail alignments for the entire length of the Minnesota River Greenway. Master plan alignments were based on general feasibility and were not detailed enough to provide a definitive alignment in many sections of the overall greenway. Therefore, additional feasibility study was recommended to determine a more precise alignment of the greenway. Below is a summary of the master plan findings for each segment of the Minnesota River Greenway:

- *Segment 1: Lilydale Regional Park to I-494 (5 miles)* – The regional trail in the Minnesota River Greenway begins at the boundary of Lilydale Regional Park and follows the existing Big Rivers Regional Trail. With the exception of a trail gap between Lilydale Park and the Big Rivers Regional Trail, this section of the trail is complete. The master plan identifies a proposed alignment to close this gap. Dakota County and the City of St. Paul continue to coordinate efforts to fund and construct this segment.

- *Segment 2: I-494 to Cedar Ave/Highway 77 (4 miles)* – The master plan identified several potential alignments for this segment; however, due to the complexity of issues in this area a more detailed feasibility study was recommended to recommend a preferred alignment. This segment is the subject of the study and is referred to as the "Eagan Segment".

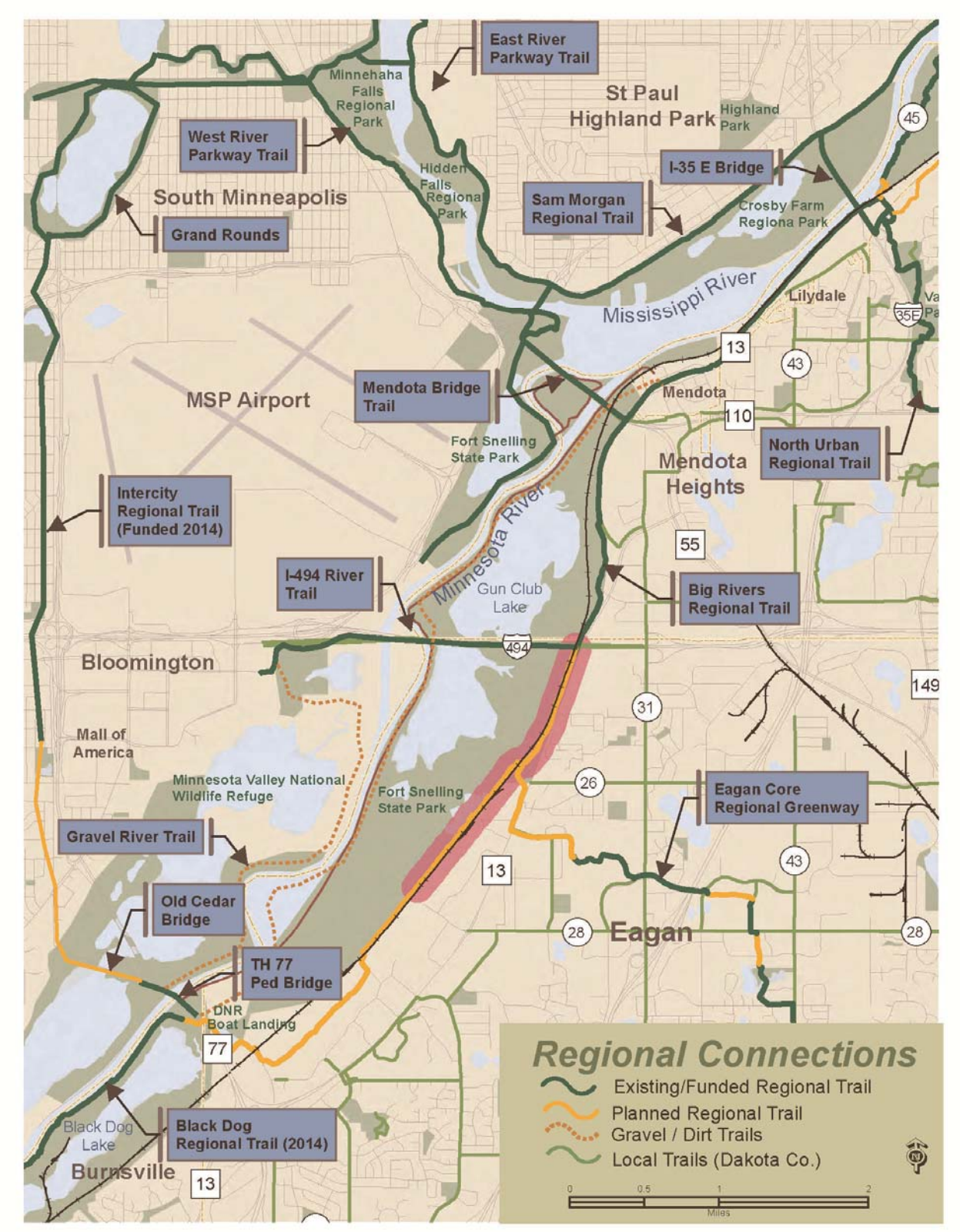
- *Segment 3: Cedar Avenue/Highway 77 to I-35W (3.5 miles)* - The greenway trail will closely follow the Minnesota River through the Minnesota Valley National Wildlife Refuge, roughly following the Black Dog Road alignment. The City of Burnsville received a federal Transportation Enhancement grant to partially fund this portion of the regional trail in 2014.

- *Segment 4: I-35W to Scott County (4 miles)* – Southeast of I-35W, the trail will continue along the Minnesota River to Scott County to connect with future regional trails. The master plan identified two options for making this connection.

C. PURPOSE AND IMPORTANCE OF EAGAN SEGMENT

The purpose of the Minnesota River Greenway, Eagan segment is to develop a multi-use recreational trail located on the south side of the Minnesota River valley between I-494 and Highway 77 in the City of Eagan. Developing the Minnesota River Greenway, Eagan segment is of high importance due to the nature of the connections and access this four-mile segment of trail would provide. As **Figure 4** illustrates, the Minnesota River Greenway, Eagan Segment, will serve as a non-motorized transportation route that links the well-developed local trail systems and regional parks in Burnsville/Eagan/Mendota Heights with those in Bloomington, St. Paul and Minneapolis. On the north end of the project the trail will connect to the existing Big Rivers Regional Trail and the I-494 bridge trail connecting west to

FIGURE 4 – Regional Trail Connections



Bloomington and east to Eagan/Pilot Knob Road. On the south end of the project, the trail will connect to the existing pedestrian river crossing at Highway 77/Cedar Ave and the funded/planned Minnesota River, Black Dog Trail which connects further to I-35W through the Minnesota Valley National Wildlife Refuge/Xcel Energy Black Dog Power Plant area. Once the Minnesota River Greenway, Eagan Segment is complete, a paved trail will run from the I-35W Minnesota River Bridge to downtown St. Paul and beyond using the many regional connections to the Minnesota and Mississippi rivers. The trails will include interpretive opportunities of the natural and cultural resources of the area.

The Minnesota River Greenway, Eagan Segment, is an important element of the larger trail system in the Minnesota River Valley. The Minnesota Valley National Wildlife Refuge and Fort Snelling State Park create one of the largest open spaces in any major American metropolitan area. This system of trails will extend from the confluence at Mendota to Le Sueur, connecting Belle Plaine, Jordan, Shakopee, Chaska, Savage, Eden Prairie, Burnsville, Bloomington, Eagan and Mendota. Eventually, the state trail will extend west across the state to Ortonville on the South Dakota border.

D. STUDY PURPOSE AND GOAL

The Minnesota River Greenway, Eagan Segment Feasibility Study was the next step in the project development process for this trail building upon the efforts of the 2011 Dakota County Minnesota River Greenway Master Plan. The study considered the feasibility of potential trail alignments through the four mile section of the Minnesota River Greenway between I-494 and Highway 77 in Eagan. This segment represents a gap in the Dakota County section of the regional trail and will also provide a connection to the inner city trail in Bloomington via the old Cedar Avenue Bridge. The Eagan segment is of the highest priority for the County and will be considered for upcoming bonding and grant opportunities. The feasibility study refined the master plan alignment concepts and concluded with the identification of feasible alignment(s) and environmental screening for the County's use in moving forward to solicit funding for the trail construction.

The goal for the study was to develop a feasible and supported trail alignment(s). Due to the challenges within the project area, achieving this goal included considering:

- Access to Fort Snelling State Park
- Exposure to the natural areas along the Minnesota River
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- Union Pacific Railroad support
- Fort Snelling State Park support
- Impacts to wetlands
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- Flooding impacts to the trail and designing it accordingly
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II. ENVIRONMENTAL SCREENING

Locating a trail between I-494 and Highway 77/Cedar Ave has many challenges including a highly sensitive wetland and fen complex, flooding issues, high water table, poor soils, contaminated properties and proximity of the Union Pacific Railroad through the study corridor. **Figure 5** illustrates some of these key issues within the study area. A social, environmental and economic (SEE) scan of the study area was conducted to more clearly identify these existing built and natural resources. The National Environmental Policy Act (NEPA) and Minnesota Environmental Policy Act (MEPA) require governmental agencies to examine the environmental impacts of their proposed projects. The SEE scan documented in this section is meant to identify issues at a screening level and to document big picture fatal-flaw constraints that would prevent trail development in the future. As trail development progresses, SEE topics will need further investigation as part of a future environmental documentation process.

There are many potential SEE impacts that need to be considered in the early scoping process. The identification of the affected SEE issues and constraints included GIS research, field review/observations and in some cases, such as wetlands and fens, field delineations. The study area reviewed in the SEE analysis included the area between Highway 77/Cedar Ave and I-494, from the Minnesota River to Highway 13.

Based on a preliminary review of the study area, a trail within the study corridor will potentially impact social, economic, and/or environmental resources as summarized below and depicted in **Appendix A.**

WATER RESOURCES

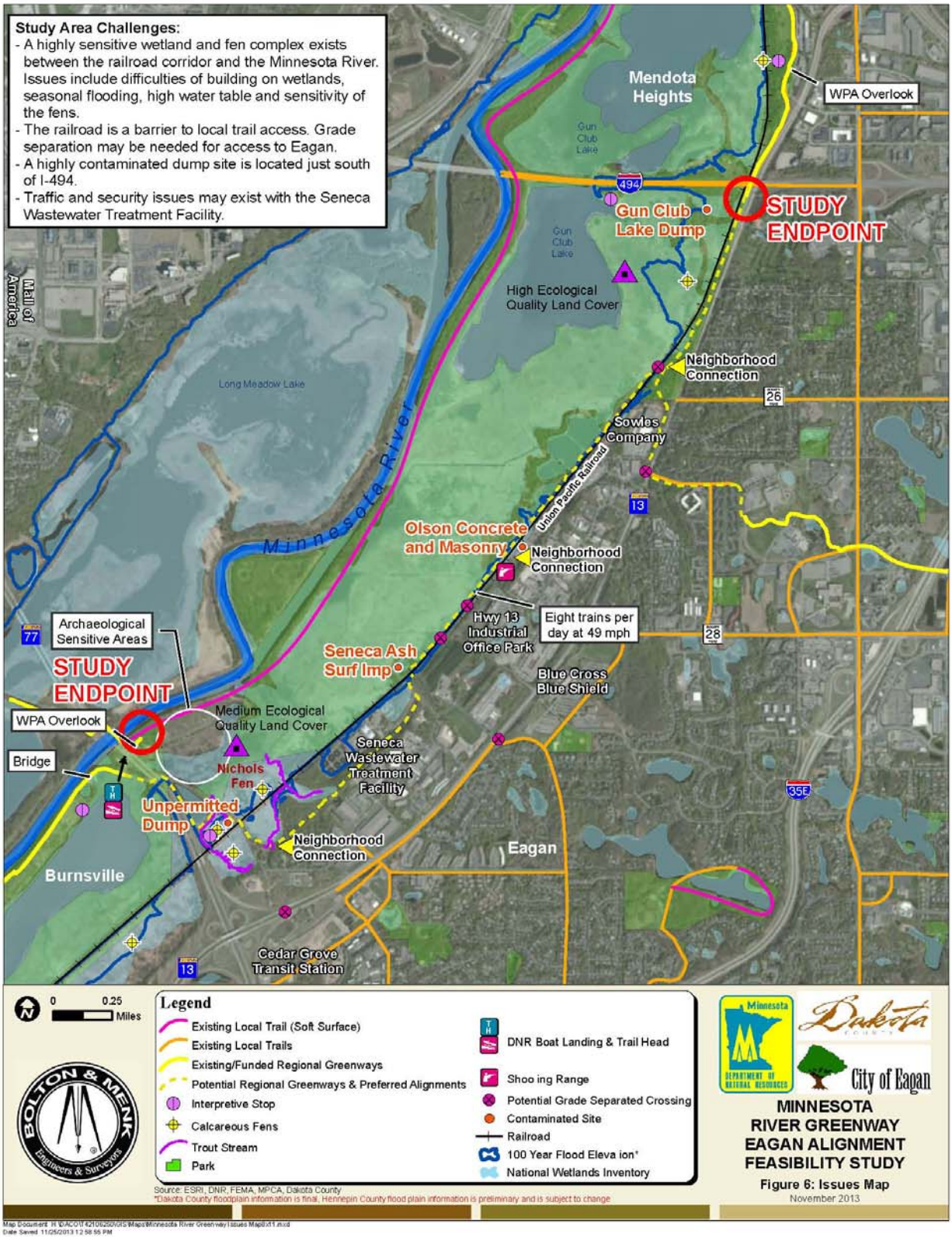
The Minnesota River is the dominant water system of the greenway, providing periodic floods to the valley wetlands systems. Floods can be key to wetland functions but the high sediment load of the Minnesota River can lead to sedimentation and filling of the floodplain wetlands. Land use in the watershed has changed which has resulted in stormwater arriving in the Minnesota River more rapidly. Recent years have seen an increase in flood duration and frequency. Flooding and sediment loading will continue to have a significant impact on habitat and recreation in the Minnesota River Valley.

The MPCA includes the Minnesota River in its inventory of impaired waters. High levels of dissolved oxygen, mercury, polychlorinated biphenyl (PCB) and turbidity are noted as stressors and pollutants within this section of the river. Stormwater management must be responsive to the river's impaired status.

FLOODPLAINS/FLOODWAY

Nearly the entire study area is located in a floodplain. The reach of the Minnesota River is a FEMA designated Zone AE with an established floodway. The Zone AE floodway extends east to the railroad. Any fill in the floodway will require compensatory flood storage to offset the storage removed from trail construction. The existing flood elevations must be maintained to no change (to hundredth of foot). To accomplish this the general recommended level of protection is the 50-year flooding event. Designing the trail to a 50-year base flood elevation will result in a 2 percent probability of flooding in any given year.

FIGURE 5 – Issues Map



VEGETATION

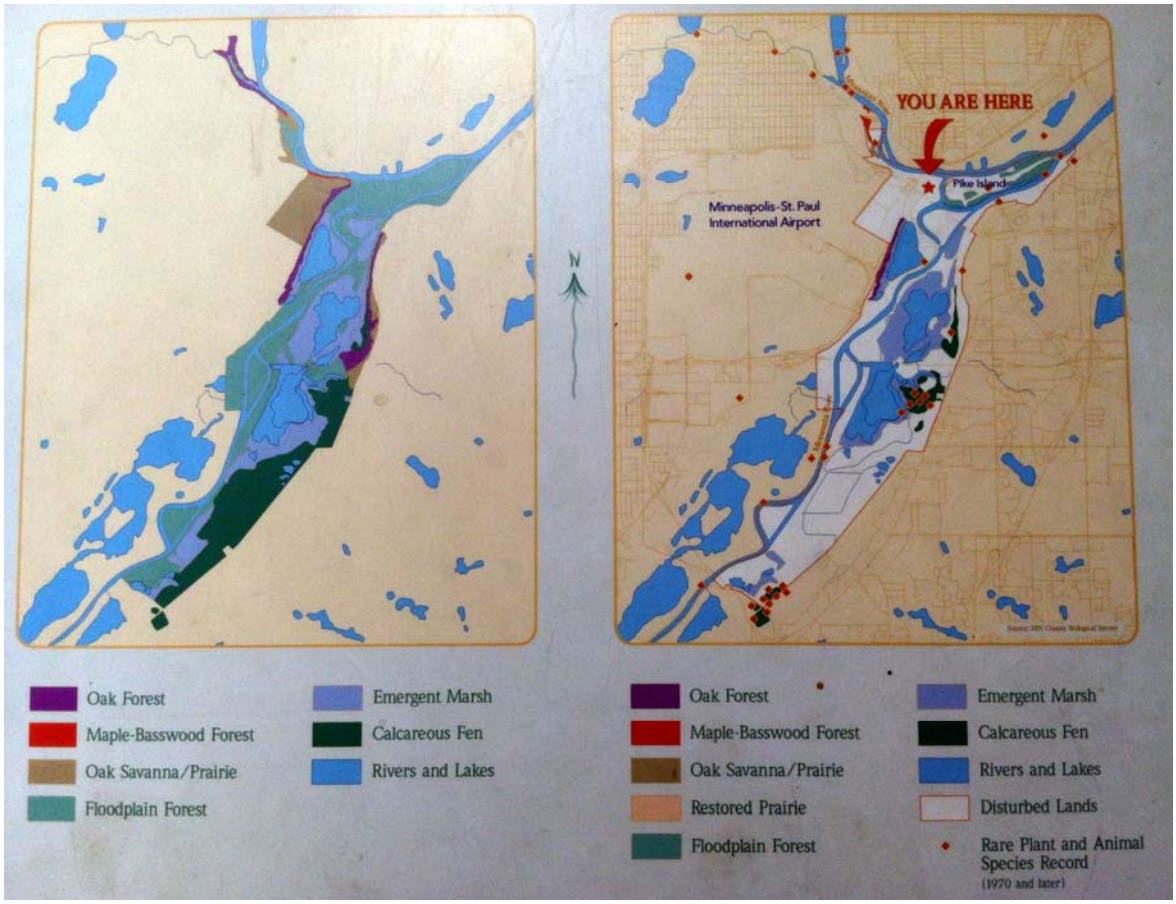
According to the Minnesota Land Cover Classification System and field verification during wetland and fen delineations, the Minnesota River Greenway vegetation is primary open water, shrub-carr and emergent wetlands the length of the river valley and the Fort Snelling and Nicols Meadow calcareous fens. Many areas in the river valley have been identified by the Minnesota DNR's Minnesota County Biological Survey as some of the highest quality habitat in the county. In addition, the river valley is habitat for numerous state and federal endangered plant species. The ecological quality of the Minnesota River Greenway, Eagan Segment is high to moderate for most of the natural plant communities within the floodplain.

The primary ecological impact to the valley wetland systems has been due to hydrologic changes from stormwater inputs and reed canary grass invasion in wetlands. The ecological impacts of urbanization to the valley bluff areas have led to lower ecological quality than within the valley. This loss of ecological quality is due to interruption of disturbance regimes (fire), invasive species colonization and habitat fragmentation from urban roads and development. **Figure 6** illustrates these dramatic changes in natural plant communities, wetlands/fens and rare species that have occurred in the study area as a result of these influences.

FIGURE 6 – Changes in Natural Plant Communities and Wetlands/Fens

Natural communities of Fort Snelling State Park prior to disturbance.

Natural plant communities, rare species and disturbed areas of Fort Snelling State Park, 1997.



Source: Fort Snelling State Park Visitors Center Display

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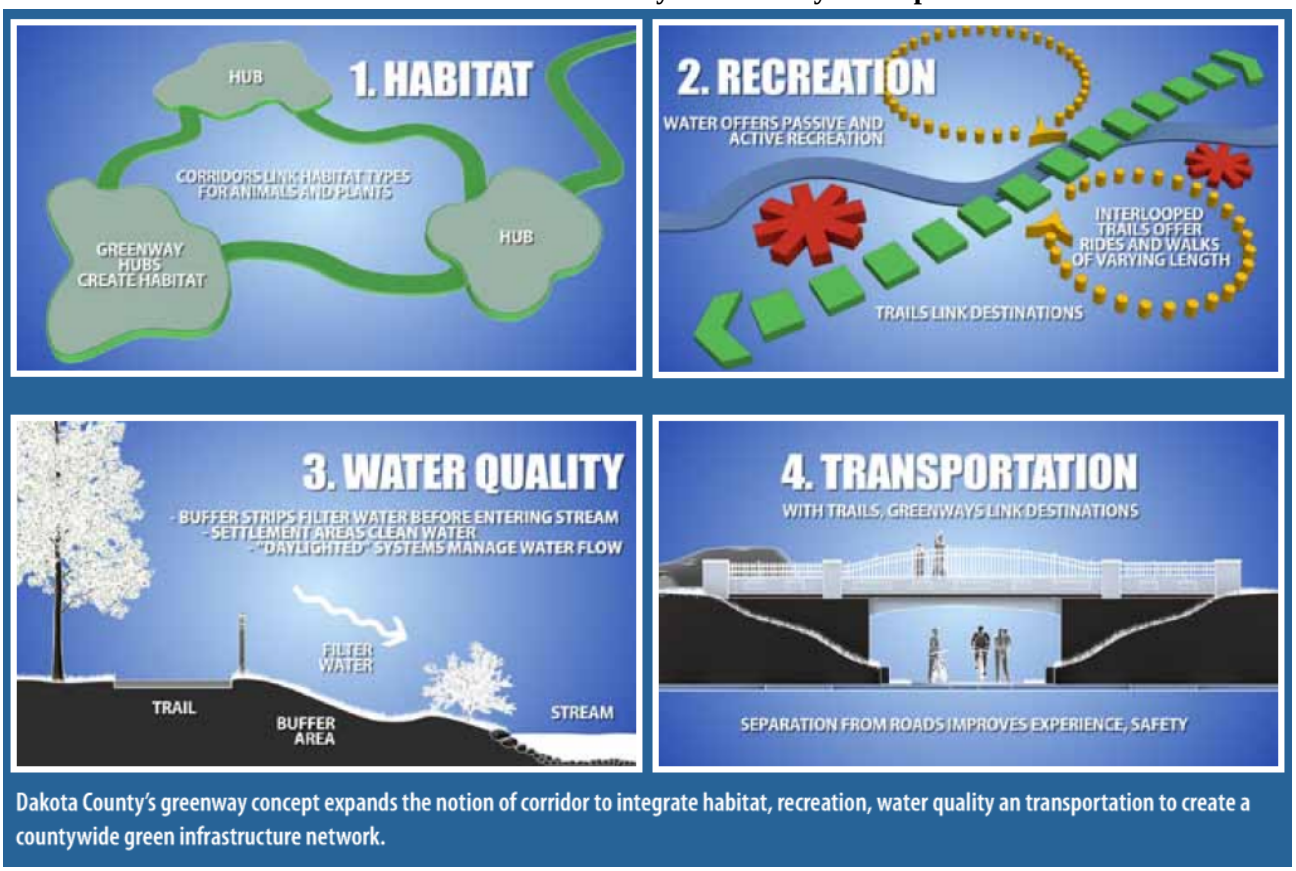

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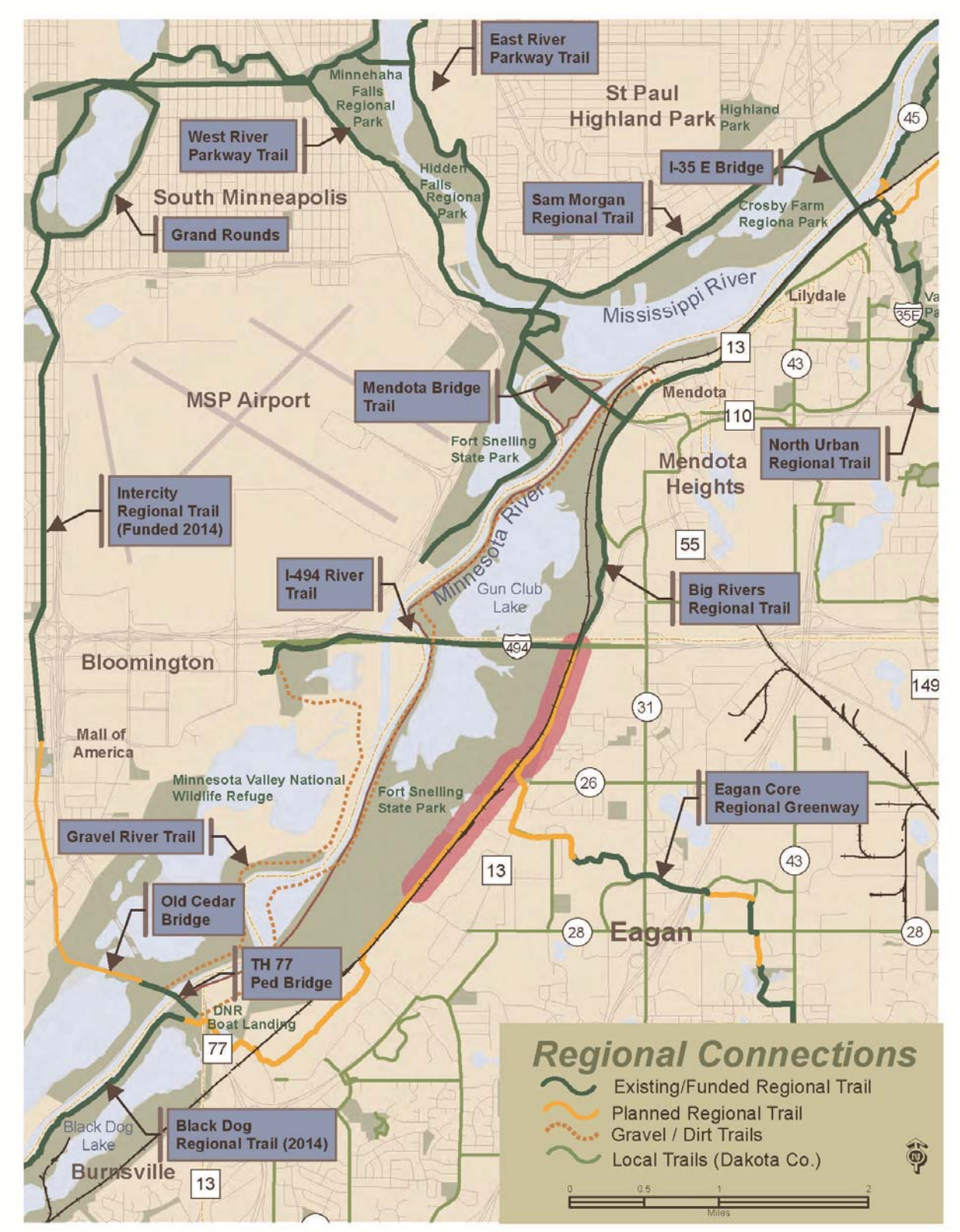

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- Environmental concerns (contamination, cultural resources, etc.)

II. ENVIRONMENTAL SCREENING

Locating a trail between I-494 and Highway 77/Cedar Ave has many challenges including a highly sensitive wetland and fen complex, flooding issues, high water table, poor soils, contaminated properties and proximity of the Union Pacific Railroad through the study corridor. **Figure 5** illustrates some of these key issues within the study area. A social, environmental and economic (SEE) scan of the study area was conducted to more clearly identify these existing built and natural resources. The National Environmental Policy Act (NEPA) and Minnesota Environmental Policy Act (MEPA) require governmental agencies to examine the environmental impacts of their proposed projects. The SEE scan documented in this section is meant to identify issues at a screening level and to document big picture fatal-flaw constraints that would prevent trail development in the future. As trail development progresses, SEE topics will need further investigation as part of a future environmental documentation process.

There are many potential SEE impacts that need to be considered in the early scoping process. The identification of the affected SEE issues and constraints included GIS research, field review/observations and in some cases, such as wetlands and fens, field delineations. The study area reviewed in the SEE analysis included the area between Highway 77/Cedar Ave and I-494, from the Minnesota River to Highway 13.

Based on a preliminary review of the study area, a trail within the study corridor will potentially impact social, economic, and/or environmental resources as summarized below and depicted in **Appendix A.**

WATER RESOURCES

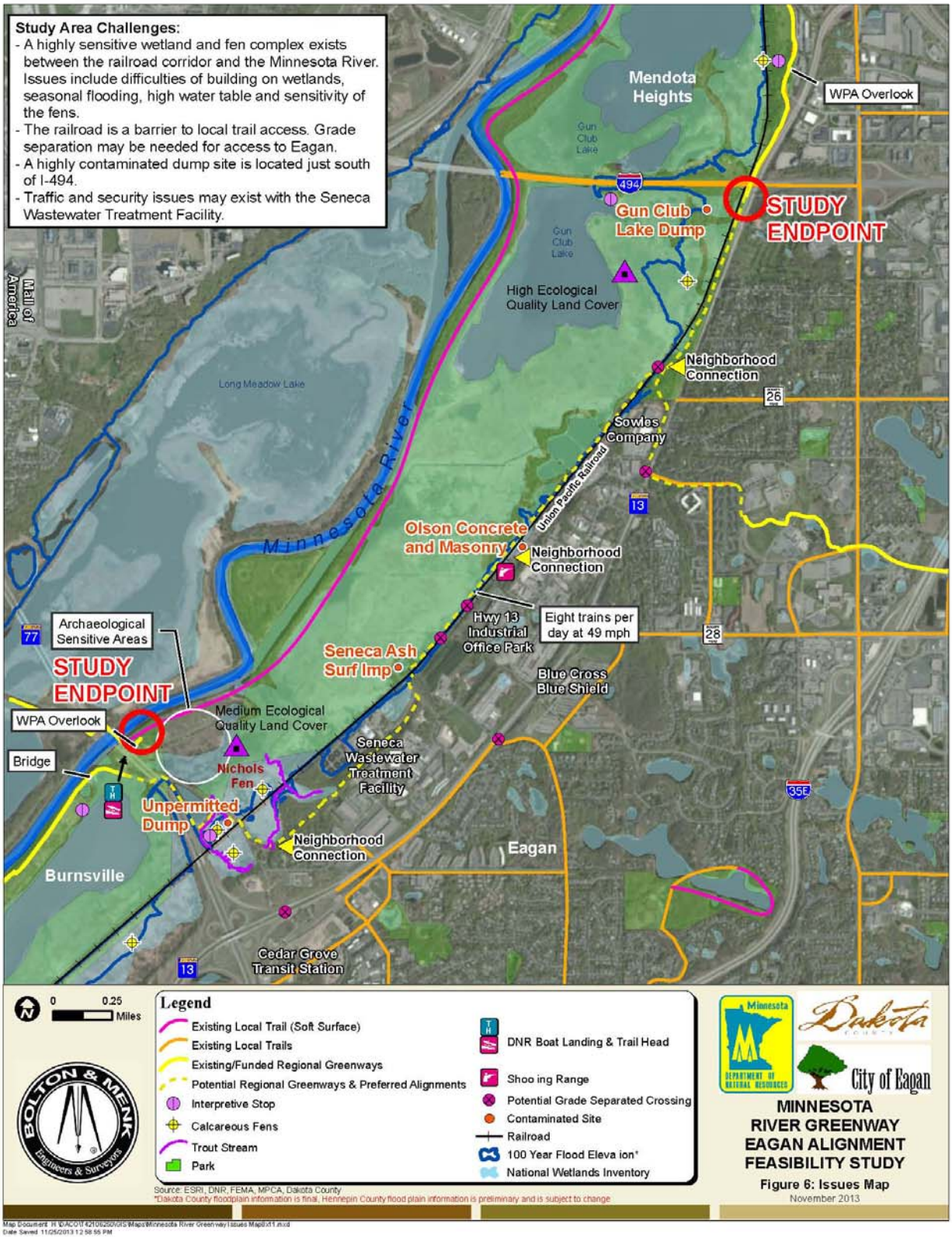
The Minnesota River is the dominant water system of the greenway, providing periodic floods to the valley wetlands systems. Floods can be key to wetland functions but the high sediment load of the Minnesota River can lead to sedimentation and filling of the floodplain wetlands. Land use in the watershed has changed which has resulted in stormwater arriving in the Minnesota River more rapidly. Recent years have seen an increase in flood duration and frequency. Flooding and sediment loading will continue to have a significant impact on habitat and recreation in the Minnesota River Valley.

The MPCA includes the Minnesota River in its inventory of impaired waters. High levels of dissolved oxygen, mercury, polychlorinated biphenyl (PCB) and turbidity are noted as stressors and pollutants within this section of the river. Stormwater management must be responsive to the river's impaired status.

FLOODPLAINS/FLOODWAY

Nearly the entire study area is located in a floodplain. The reach of the Minnesota River is a FEMA designated Zone AE with an established floodway. The Zone AE floodway extends east to the railroad. Any fill in the floodway will require compensatory flood storage to offset the storage removed from trail construction. The existing flood elevations must be maintained to no change (to hundredth of foot). To accomplish this the general recommended level of protection is the 50-year flooding event. Designing the trail to a 50-year base flood elevation will result in a 2 percent probability of flooding in any given year.

FIGURE 5 – Issues Map



VEGETATION

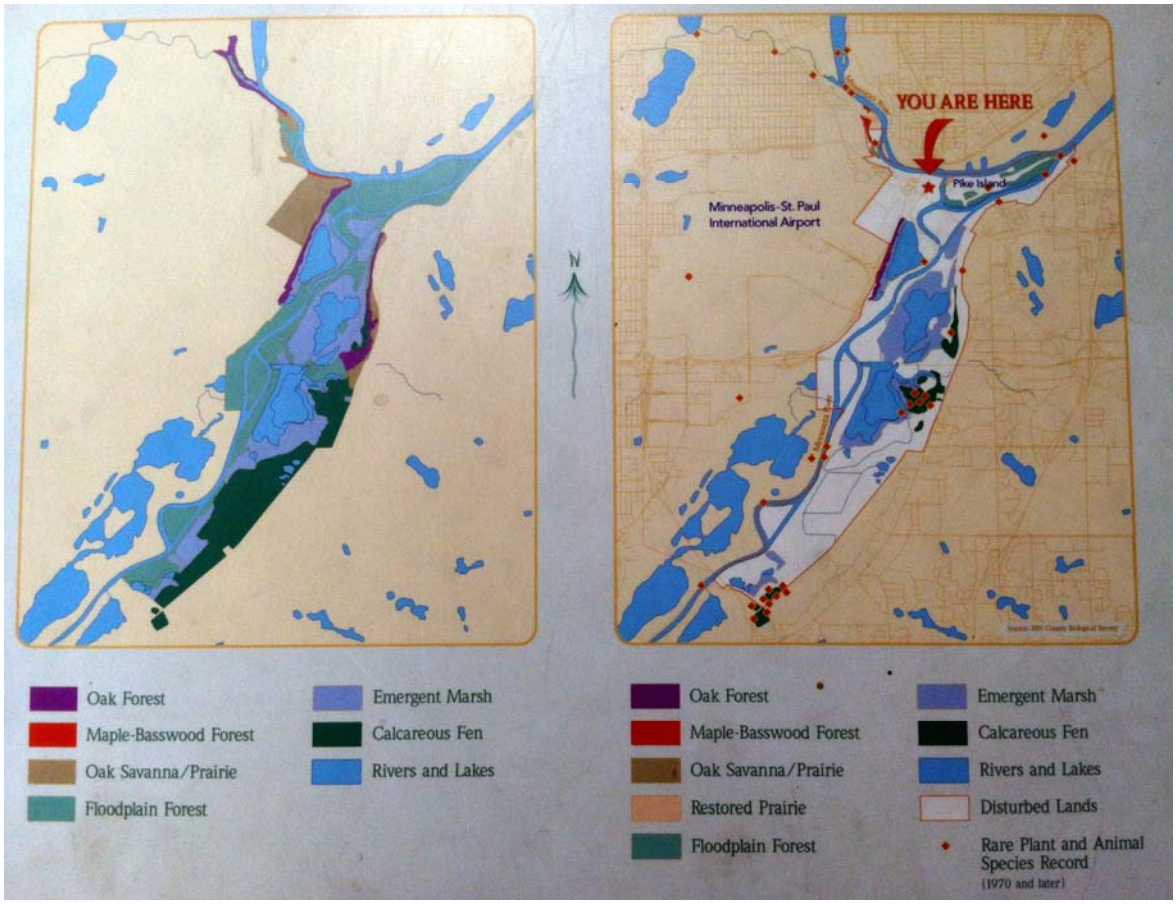
According to the Minnesota Land Cover Classification System and field verification during wetland and fen delineations, the Minnesota River Greenway vegetation is primary open water, shrub-carr and emergent wetlands the length of the river valley and the Fort Snelling and Nicols Meadow calcareous fens. Many areas in the river valley have been identified by the Minnesota DNR's Minnesota County Biological Survey as some of the highest quality habitat in the county. In addition, the river valley is habitat for numerous state and federal endangered plant species. The ecological quality of the Minnesota River Greenway, Eagan Segment is high to moderate for most of the natural plant communities within the floodplain.

The primary ecological impact to the valley wetland systems has been due to hydrologic changes from stormwater inputs and reed canary grass invasion in wetlands. The ecological impacts of urbanization to the valley bluff areas have led to lower ecological quality than within the valley. This loss of ecological quality is due to interruption of disturbance regimes (fire), invasive species colonization and habitat fragmentation from urban roads and development. **Figure 6** illustrates these dramatic changes in natural plant communities, wetlands/fens and rare species that have occurred in the study area as a result of these influences.

FIGURE 6 – Changes in Natural Plant Communities and Wetlands/Fens

Natural communities of Fort Snelling State Park prior to disturbance.

Natural plant communities, rare species and disturbed areas of Fort Snelling State Park, 1997.



Source: Fort Snelling State Park Visitors Center Display

WETLANDS/CALCAREOUS FENS

At the onset of the study it was believed large, highly-sensitive wetland complexes including calcareous fens existed throughout the study area. Wetland and fen delineation was conducted as part of this study to identify and verify the boundaries of wetlands and fens within the study corridor. Below is a summary of these findings.

WETLANDS

A wetland has mostly wet soil, is saturated with water either above or just below the surface and is covered with plants that have adapted to wet conditions. Wetlands are important because they reduce flooding by slowing excess water runoff during times of heavy rainfall. Wetlands improve water quality by filtering sediments, nutrients and toxic substances out of water before it washes into rivers and lakes. They also provide habitat for many fish, wildlife and plants, some of which can only survive in wetlands.

In most cases, draining or filling a wetland will require a permit or some other authorization in Minnesota; applicants will often need to show efforts to avoid wetlands and may be required to replace drained or filled wetland areas.

The Minnesota River Greenway, Eagan Segment study area includes a major wetland complex associated with the Minnesota River. A wetland delineation was conducted in August and September of 2013 which identified a total of 10 wetlands in the study corridor, all associated with the main wetland complex **(**see **Figure 1** and further detail in **Appendix A**). Some of these wetland complexes also support rare wetland plant communities, called calcareous fens, which are given special protection in Minnesota. A delineation of calcareous fens within the study area was conducted and is described in more detail in the section below.

Outside of the areas classified as calcareous fens, wetlands in the study area are not of high quality, being dominated by invasive and weedy species, such as reed canary grass, thistle and buckthorn. The wetlands range in types depending on their topographic location and vegetation. Regardless of type or quality, the proposed impacts to these wetlands will have to be mitigated for under the Wetland Conservation Act (WCA) and Section 404 of the Clean Water Act. Alternative trail construction methods such as boardwalks should be considered to minimize impacts to wetlands in areas where avoidance may not be possible.

CALCAREOUS FENS

Fen Overview

Fen is a term used to describe wetlands that are generally dominated by herbaceous species, primarily sedges, and fed by ground water discharge. The soils in these systems are typically saturated year-round, resulting in the accumulation of organic matter. The organic matter is typically graminoid or Sphagnum based depending on nutrient availability. Those fens with limited nutrient availability are referred to as poor fens whereas fen systems with abundant nutrient availability are referred to as rich fens. There are several different rich fen communities including calcareous fens. This particular fen community is distinguishable from other fens in that the ground water discharge is rich in calcium carbonate. The chemistry of these systems ultimately influences the species composition, often dominated by a suite of species referred to as calciphiles. Typical calciphiles include sterile sedge (*Carex sterilis*), beaked spikerush (*Eleocharis rostellata*), hair-like beak-rush (*Rhynchospora capillacea*), marsh arrowgrass (*Triglochin palustris*), and whorled nutrush (*Scleria verticillata*). Calcareous fens are uncommon

in Minnesota and therefore the strict calciphiles are also rare and thus protected under the Minnesota Endangered Species Statute.

In Minnesota, native plant communities are classified according to the Minnesota Native Plant Community Classification (NPC) system (Version 2.0). This classification system was developed by the Minnesota DNR and allows for the classification of communities in a standardized format. These communities are differentiated based on vegetative structure and composition, landscape setting, hydrology, and soils. There are two different calcareous fen communities in Minnesota under this classification system, the Prairie Extremely Rich Fen (OPp93) and Northern Extremely Rich Fen (OPn93). Calcareous fens can also be determined according to the *Test of the Technical Criteria for Identifying and Delineating Calcareous Fens in Minnesota* document. The criteria must meet the individual technical criterion for hydrology, soils, water chemistry, and vegetation as described in the document. The vegetative technical criterion includes the 50 Percent Cover Method and the Calciphile Species Occurrence Method. Both methods rely on a designated list of 27 statewide calciphiles indicative of calcareous fens. Each of these species has been assigned a calciphile indicator class (strong (25), moderate (5), and weak (1)). Under the Calciphile Species Occurrence Method, an area must have a cumulative natural community index value of 50 points or greater to meet the vegetative criterion.

Due to the rarity of these systems, calcareous fens are protected and regulated under State Statute 103G.223, which prohibits any activity that directly or indirectly impacts these systems by means of filling, draining, or other action that results in the degradation of the system, except when approved by the Commissioner of the Minnesota DNR. Approval to impact a fen is unusual and there are very few instances of this occurring. In those cases, the Commissioner must deem the action necessary and this requires the preparation of a Fen Management Plan. These plans are required by the Minnesota DNR when a proposed activity has the potential to affect a calcareous fen. The documents describe the resource in great detail as well as the proposed action or potential project alternatives. The plan also includes information pertaining to proposed monitoring efforts if the action is allowed. The monitoring typically involves a long-term evaluation of the hydrology and vegetation in order to determine trends following the action. This could involve the installation of monitoring wells to measure the water table throughout the growing season of the course of many years and the establishment of permanent vegetation monitoring plots. The project proposers also have to collect detailed base-line data prior to any action in order to evaluate trends. The plans also includes safeguards in the event that there are impacts as determined during monitoring efforts. This could vary between corrective action or monetary compensation.

The statute also states that the calcareous fen must be acknowledged in the Minnesota State Register, which is the official publication of the state's Executive Branch. These features are additionally regulated by the Minnesota Pollution Control Agency (MPCA) under Minnesota Administrative Rules 7050.0180, the Nondegradation for Outstanding Resource Value Waters. This statute prohibits the discharge of "sewage, industrial waste, or other waste to waters" in a number of high quality natural resources including designated calcareous fens.

As with all "fen" communities, calcareous fens are hydrologically fed by groundwater discharge and are peat-forming. The distinction with calcareous fens is that the groundwater is mineral rich as a result of the discharge flowing through calcium carbonate substrate. The ultimate source of this groundwater discharge may be several miles away in what is termed the recharge zone. These zones are reliant on surface waters and impacts to these areas may lead to the degradation of these fen communities. The fen systems are also affected by alterations nearby which could result in

direct inputs of surface water, thus altering the chemistry or causing some other negative affect. The discharge through calcium carbonate in calcareous fens results in a basic pH and the alkalinic nature of these systems limits the type of vegetation that can survive or thrive. The species that inhabit this type of community are referred to as calciphiles. A number of these calciphiles are rare and are protected through the Minnesota's Endangered Species Statute, thus adding to the significance of these communities. Fens are also dominated by graminoid species, the general term for grasses, rushes, and sedges. The two calcareous fen communities differ in species composition as well as geographic setting and overall hydrology. The OPn93 community is generally restricted to the Northern Minnesota and Ontario Peatlands section of the state and associated with large peatland formations, particularly the Patterned Peatlands near Upper Red Lake. The majority of the calcareous fens in Minnesota are classified as the OPp93 community type. This community is found in the prairie region of the state associated with several geographic features including the Minnesota River Valley, Mississippi River Valley, and Glacial Lake Agassiz.

Project Area History

The prevalence of fens in the Twin Cities region was greater prior to European settlement. According to data available from the Minnesota DNR, there are twenty-seven calcareous fen units in the seven county metropolitan region that remain. This is based on survey work conducted by the Minnesota Biological Survey (formerly the Minnesota County Biological Survey) in the early to mid-1990s. Often times, these areas were evaluated in the field and the approximate locations of natural features or rare plants were noted on physical maps and eventually digitized using GIS software. This effort in the metropolitan area was prior to the regular use of GPS technology and methods have since been modified to incorporate this. However, these features can tend to be over and under delineated when the data is not directly derived from field delineation efforts and therefore the data from this period is not necessarily precise.

The decline of calcareous fen units over the years can often be attributed to land conversion (agriculture to commercial/residential development), municipal water use and transportation infrastructure. Anthropogenic pressures ultimately affect the availability of water due to increased water use and subsequent drawdown of local watertables. There is also the issue of impacts to the recharge areas. A reduction in the amount of water filtering through these recharge areas eventually results in a decrease of discharge in the associated fen. Another threat is transportation infrastructure, predominantly roads. The road surfaces are impervious and this alters surface flow either diverting water or resulting in the concentration of too much water leading to a hydrologic bounce within a system. Calcareous fens are extremely sensitive to surface water inputs and they are vulnerable to degradation when this occurs. The area around Fort Snelling State Park has a considerable amount of open space for a metropolitan area. However, the overall area including the recharge zone is highly developed with road and rail infrastructure and dense residential/commercial development. The surrounding development appears to be altering the hydrology, leading to hydrologic bounce (as evident with the monoculture of invasive cattails) and the reduction in groundwater discharge. Another issue is the suppression of natural disturbance regimes such as fire which has allowed for the encroachment of woody species and as well as the introduction of invasive species including reed canary grass (*Phalaris arundinacea*).

Resources in Project Area

According to the Minnesota Biological Survey, there are five fen features located at Fort Snelling State Park. Three of these features were recently evaluated as part of this feasibility study since they are within the proposed project footprint. Meander surveys were conducted throughout the project corridor where these three features had been mapped by the Minnesota Biological Survey

(see **Appendix B**). This survey resulted in the confirmation of only one location of calcareous fen and this was a small component of what had been previously identified. This finding conflicts with the existing spatial data resulting from the efforts of the Minnesota Biological Survey and there may be several reasons for this. Much of what had been mapped as fen appears degraded in terms of species composition and altered hydrologic regime. This could be both in the form of reduced discharge and increased input via surface waters in the past two decades. It is also quite possible that these areas had been initially over delineated and the actual fens in the entire area (including outside of the project area) are much smaller and part of a native plant community mosaic that includes the Southern Seepage Meadow/Carr (WMs83) and the Bulrush Marsh (MRn93a). A second survey of two areas was conducted in June 2014 to verify the original survey findings since the original survey was conducted late in the growing season. It becomes more difficult to accurately identify many of the key species used to distinguish between community types, predominantly sedges later in the growing season.

Overall four areas were investigated within the project corridor and are identified in **Figure 7**. The first area evaluated, Area 1, Nicols Meadow Fen is a degraded wet meadow complex primarily dominated by *Phalaris arundinacea*. There was one particular area of interest with a significant population of *Berula erecta (*MN Threatened) and this was one of only two calciphile species observed during survey efforts in that area. There is obvious groundwater discharge associated with the *B. erecta*, but this was not considered a calcareous fen feature. Based on current conditions, this area does not appear to be a calcareous fen community.

The majority of Area 2 is dominated by non-native cattail (indicative of hydrologic bounce); This particular area is most similar to the Southern Seepage Meadow/Carr (WMs83) native plant community and is primarily dominated by *Carex stricta*. The overall wetland complex around this location appears to be a mosaic of WMs83 and degraded marsh.

Area 3 was the only area where calcareous fen was confirmed. This particular area would not satisfy the numerical point threshold used to identify fens based on our species inventory. The calciphiles observed were *Betula pumila*, *Bromus ciliatus*, *Carex hystericina*, *Carex sterilis*, *Eriophorum angustifolium*, and *Oxypolis rigidior*. This area was fairly small and surrounded by encroaching shrubs. Most of this portion of the wetland complex appears degraded with exception of the calcareous fen. The June 2014 re-survey of Area 3 yielded no additional observations of sterile sedge (*Carex sterilis*) within the area delineated as calcareous fen (OPp93) (see **Appendix B**).

Area 4 appears to be a wet meadow WMs83 community with dense shrub cover to the south, but fairly open to the north as the shrub cover dissipates. The open component of the complex is dominated by graminoid cover (primarily *Carex lacustris*) with *Bidens trichosperma, Equisetum fluviatile*, and *Impatiens capensis*. Much of this portion of the native plant community appears intact and generally free of invasive species. Area 4 was also re-evaluated in 2014 by means of releve sampling. The 2014 field review of Area 4 confirmed the original survey's findings (see **Appendix B**).

FIGURE 7 – Fens

Impacts to Fens

Potential impacts to fens, both direct (such as the trail in the fen) and indirect (alteration of the hydrology from nearby earthwork) should be avoided due to the ecological value of these systems as well as the additional regulatory steps. Permitting becomes much more difficult, costly, and time consuming in preparing further documents including a Fen Management Plan. Avoidance of fen impacts from trail development should be pursued, thus reducing impacts to these resources and reducing the overall complexity of the permitting process. There is also the issue of rare plant location. Efforts should be made to avoid impacts, with consideration of moving the proposed trail further away from any area of sensitivity. If unable to avoid impacts, a takings permit will need to be obtained from the Minnesota DNR. The takings permit would likely require some type of compensatory mitigation and that would need to be discussed with the Minnesota DNR Endangered Species Coordinator.

WILDLIFE, THREATENED AND ENDANGERED SPECIES

A review of the Minnesota DNR's National Heritage Information System (NHIS) was conducted to identify any wildlife, threatened and endangered species (see **Appendix A**). The following threatened and endangered species have been observed within and immediately adjacent to the study area:

- Mucket (Actinonaias ligamentina)
- Kitten-tails (Besseya bullii)
- Sterile Sedge (Carex sterilis)
- Butterfly (Ellipsaria lineolata)
- Washboard (Megalonaias nervosa)
- Paddlefish (Polyodon spathula)
- Valerian (Valeriana edulis var. ciliate)
- Yellow Sandshell (Lampsilis teres)
- Rock Pocketbook (Arcidens confragosus)

Several species of concern have also been observed here. A biological survey and coordination with the DNR may be necessary in response to the high ecological value and the presence of threatened and endangered species.

FISHERIES

Two streams are classified as trout streams in the study corridor and are identified in **Figure 5**. The following information on these trout streams is reported by the Minnesota DNR:

- Kennealy Creek – This stream is a tributary to the Minnesota River located north and east of Nicols Road. This is a very small stream (less than 2 feet wide) with low flows as a result of the de-watering at the adjacent sewage treatment facility. A few small brook trout may be present, but the population is not significant enough to warrant fishing. No trout were sampled in the last assessment.
- Unnamed Stream #1 (Harnack Creek) – This stream is a tributary to the Minnesota River in Eagan. The stream crosses Nicols Road between the railroad tracks and the entrance to the Minnesota River boat ramp under the Highway 77/Cedar Ave Bridge. This is a very small stream which contains a few, small brook trout. The portion of the stream which lies downstream of Nicols Road travels through the floodplain of the Minnesota River, and the creek bed changes its course often. Beaver dams have been present in the past. This creek has little potential for anglers. It may yield an occasional small brook trout, but little else should be expected. No trout were sampled in the last assessment.

Due to the proximity to these trout streams, trail development in the study corridor should avoid increases in surface temperature and control erosion and sedimentation to avoid impacts.

UTILITIES

OVERHEAD AND UNDERGROUND UTILITIES

Existing utilities within the study corridor are illustrated on **Figure 1** and include an overhead transmission line, sanitary sewer and a gas pipeline. Xcel Energy owns the overhead transmission line that is located just west of the railroad and generally parallels the railroad corridor for the entire study area. Met Council has a sanitary line that runs east of the railroad tracks. Magellan owns an 8" gas pipeline that services the Minneapolis-St. Paul Airport. This gas pipeline enters the study area to the west of Comanche Rd where it crosses under the railroad tracks and then travels north on the west side of the railroad, generally paralleling the tracks towards the former sand mine. On the north side of the former sand mine the gas pipeline heads west towards the Minnesota River around the west side of Gun Club Lake towards its crossing under I-494. Due to the location of these overhead and underground utilities within the study area corridor, it is anticipated that impacts related to trail development in these areas can be avoided and/or designed around.

WASTEWATER TREATMENT FACILITY

Seneca Wastewater Treatment Facility is located on the southern end of the study corridor on the east side of the railroad tracks. The Seneca Plant is the Metropolitan Council Environmental Services' (MCES's) third largest facility and the fourth largest in the state. The plant's capacity includes 34 million gallons per day and provides primary and secondary treatment to wastewater before discharging it to the Minnesota River. Dewatering and incineration are the methods used for disposal of the sludge generated during wastewater treatment. The resulting ash is now landfilled in Rosemount, Minnesota. For security purposes, impacts to Seneca Wastewater Treatment Facility property should be avoided.

RAILROAD

Union Pacific owns and operates the railroad through the study corridor. Approximately 8 trains per day use the line, running at speeds up to 49 mph. The railroad right-of-way corridor is generally 100' wide through the study area built on an embankment. There are numerous existing railroad bridges for drainage purposes throughout the study corridor. The bridges are generally old wooden structures that are open to the ground below. This type of construction is generally not practiced today.

Occasional fires as a result of the active rail operations occur in the Minnesota River floodplains. Currently, it is very difficult for Eagan fire and police to access areas west of the Union Pacific rail line. Ongoing coordination with the railroad will be necessary to implement any improvements that impact the railroad.

FARMLAND AND SOILS

The study area is primarily dedicated to recreational/preserve land use with no active farmland. According to the Natural Resources Conservation Service (NRCS) prime farmland is present within the study area. A farmland evaluation and site assessment, coordinated with the NRCS, is not anticipated. Further, an AD-1006 rating would likely be low due to surrounding land use and the small area of prime farmland soils that may be converted.

The study area is located in the Minnesota River floodplain. Generally the soils in the project area are peat, which is not well suited to support a trail structure. Peat is spongy, water-saturated soil that fens flourish in. The ground is too wet and cold for plant materials to decay properly. Layers accumulate and form dome-shaped peat deposits. The water on peat soils seeps down through limestone bluffs and bedrock, dissolving calcium and magnesium bicarbonates. It then wells up from under the ground to feed the fens. Organics and peats are the most unreliable subsoils for construction and the most expensive to build a trail across. Additional precautions will be required to create a firm enough base for construction.

CONTAMINATED PROPERTIES

According to the What's In My Neighborhood dataset maintained by the MPCA, there are three potentially contaminated areas within the study area that may be impacted by trail construction; these are shown on **Figure 5** and identified below:

- **Gun Club Lake Dump** – Southwest of I-494/TH13 contains lead/battery acid and other refuse. Estimated clean-up costs for this site exceed $50 million.
- **Promiscuous Dump** – Eagan – West of Nichols Road/Union Pacific Railroad. This site contains unknown waste type and quantity.
- **Seneca Ash Surface Impoundment** – Former impoundment of ash from wastewater treatment facility. The site has been cleaned up.

CULTURAL RESOURCES

The Minnesota River Valley contains rich cultural resources associated with pre-European settlement, early European settlement and more recent significance. Multiple archaeology sites are within and adjacent to the study area; these including burial mounds, and Native American habitation sites (**See Appendix A**).

Trail development should make every effort to avoid known archaeological sites; avoidance of burial grounds is required by law. Due to the high occurrence within the study area of precontact burial mounds and earthworks, as well as other archaeological sites, it is likely that an archaeological survey will be necessary in previously un-surveyed areas that would be affected by trail development. Additional evaluation of any known sites that cannot be avoided by the trail may also be necessary. The State Historic Preservation Office, and possibly the Office of the State Archaeologist, should be consulted regarding potential archaeological impacts.

Very few standing structures are in the SHPO inventory within ½ mile of the study area **(See Appendix A)**. The possible trail alignments are not within the viewshed of known standing structures. It is highly unlikely that trail construction would adversely affect inventoried structures that are eligible for listing on the National Register of Historic Places, however consultation with SHPO may be necessary to determine whether a survey to identify historic standing structures will be required.

PARK AND RECREATION AREAS (SECTION 4(F)/SECTION 6(F) RESOURCES)

Section 4(f) legislation, as established under the Department of Transportation Act of 1966 (49 USC 303, 23 USC 138), provides protection for publicly owned parks, recreation areas, public and privately owned historic sites, wildlife, and/or waterfowl refuges from conversion to a transportation use. Additional protection is provided for outdoor recreational lands under Section 6(f) legislation (16 USC 4602-8(f) (3)) where Land and Water Conservation funds were used for the planning, acquisition, or development of the property.

The entire study area west of the railroad is part of Fort Snelling State Park, operated by the Minnesota DNR. Fort Snelling State Park is both a Section 4(f)/6(f) property. This park was funded by the Land and Water Conservation Fund (LAWCON) Act and Minnesota Local Grants Programs. Section 6(f) of this Act requires all funded lands be retained and used solely for outdoor recreation in perpetuity. A trail is consistent with the requirement to keep the land within Fort Snelling State Park in use for outdoor recreation. Section 4(f) impacts will need to be evaluated in a future environmental document. It is likely a *Programmatic Section 4(f) Evaluation for Independent Bikeway or Walkway Construction Projects* will be sufficient to evaluate Fort Snelling State Park impacts from the proposed trail alignment. This will require concurrence for trail development from the Minnesota DNR.

Fort Snelling State Park natural resource management plans include periodic burning through the area of the project footprint. Boardwalk and trail materials that will withstand this process will be necessary.

SOCIAL AND COMMUNITY FACILITIES

The entire study area is located within and/or adjacent to Fort Snelling State Park. The Highway 77 to I-494 section of the state park can be accessed by a parking lot/boat landing off of Nicols Road/Black Dog Road. This side of the Minnesota River and associated section of the Fort Snelling State Park are currently underutilized. A permit to enter the state park property is required; however, park users must travel to the park entrance off Post Road (north of I-494) to get a permit. People often trespass across the railroad into the state park property to gain access to and fish around the quarry lake. An existing natural surface trail is located within the park area adjacent to the Minnesota River. Although scenic, this trail floods often and as a result is difficult to maintain and closes for periods of time until maintenance can be conducted. The addition of the Minnesota River Greenway, Eagan segment has the potential to enhance the state park and open it up to many more users and address the trespassing issue by providing proper means to access the park property and its features.

PEDESTRIAN/BICYCLE FACILITIES

On the north end of the study area, an existing trail with connections to the west into Bloomington parallels I-494 and bridges both the railroad and Highway 13. The I-494 trail bridge over the railroad and Highway 13 includes a connection to a ramp just west of Highway 13 for trail users. The trail ramp circles around before touching down under I-494, parallel to Highway 13 where the Big Rivers Regional Trail starts and continues north connecting Eagan to Lilydale, a distance of over four miles. Dakota County desires to connect the Minnesota River Greenway, Eagan segment into the I-494 trail and Big Rivers Regional Trail near I-494. The proximity of the I-494 bridge piers, railroad and TH 13 to the existing elevated ramp structure will need to be considered carefully in determining how best to tie these regional trail links together.

On the south end of the study area an existing trail connection is provided along the east side of northbound Highway 77 across the Minnesota River connecting Bloomington to Eagan. The Highway 77 trail currently ends at the Minnesota River boat launch in Fort Snelling State Park.

The City of Eagan also has several local trails near the study area. The majority of these trails are located east of Highway 13 with the exception of a short segment of trail on Silver Bell Road (west of Highway 13).

III. AGENCY COORDINATION

Due to the sensitivity of resources and other facilities, such as Fort Snelling State Park, within the study area, multiple environmental resource and regulatory agencies were involved throughout the feasibility study process. Agency coordination and input was critical to better understand trail options and fatal flaws. The following provides a summary of the agency coordination conducted as part of this study.

A. PROJECT STAKEHOLDERS

A Project Stakeholders group was established to lead the study, discuss study progress and consider technical analysis/evaluation of alignment options. Stakeholders included staff from Dakota County, the City of Eagan, the Minnesota DNR and Fort Snelling State Park, Minnesota Board of Water and Soil Resources, U.S. Army Corps of Engineers, and area watershed districts (see full list at beginning of report). The project stakeholders met as a group three times over the course of the study. In addition, several members of this group also participated in a field walk of the study area early in the study process. Below is a summary of each of the project stakeholder meetings and field walk.

- **Project Stakeholders Meeting #1** - Stakeholders met in April 2013 to review the study process, discuss the overall purpose of the feasibility study, to suggest other stakeholder participants and to share information on known resources and issues of concern within the study area.

- **Field Walk** – A field walk was conducted in June 2013 to map and photograph constraints and opportunities, discuss and understand engineering impacts and feasibility, natural environment impacts and regulatory feasibility for trail development within the study area. Field walk participants included representatives from Dakota County, Minnesota DNR, City of Eagan and Bolton & Menk, Inc. Key items that were reviewed and discussed during the field walk included:
    - Connection to the I-494 trail system
    - Gun Club Lake options
    - Railroad issues (underpass locations, overpass opportunities, trespassing issues)
    - Potential neighborhood connection points
    - Seneca Treatment Facility options
    - Boardwalk options
    - Nicols Road options
    - Connection to the south end of the study area
    - Trail elevation
    - Fen impacts
    - Wetland impacts

  Information collected during the field walk was then mapped and shared with project stakeholders at their next meeting for discussion and further consideration of feasible alignment options.

- **Project Stakeholders Meeting #2** – This meeting was held in June 2013 to introduce new stakeholders to the project, discuss the project history/background, and begin discussing the range of alignment options under consideration and potential regulatory issues. Stakeholders at this meeting felt wetland/fen delineations and calculations of impacts were needed to better

understand and provide opinions on the feasibility of the potential trail alignments.

- **Project Stakeholders Meeting #3** – The final Project Stakeholders Meeting was held in December 2013 to review the delineation information and refined trail alignment options. Stakeholders also reviewed and commented on the draft study report and discussed the County's request for agency letters of support evidencing general concurrence with the feasibility study findings.

B. UNION PACIFIC RAILROAD

Consultation and coordination with Union Pacific Railroad representatives was critical to this feasibility study to understand what type of trail crossing locations (i.e., at-grade or grade separated overpass or underpass) the railroad would be willing to consider and where. Railroads are reluctant to grant approval of alignments that introduce new at-grade crossings that are not aligned with an existing roadway crossing since there are no state or federal standards to address liability and safety concerns. New crossings introduce multiple conflicts, including the obvious trail users conflicting with the trains at the crossing. Other considerations include the potential for the trains to idle on the tracks. Today, there is a long corridor where trains can idle and not impede vehicular traffic. If new trail crossings were introduced and trains were to stop, the train would essentially block trail users. This would introduce a significant safety concerns as users may find ways to get by that could lead to poor choices.

The project team reviewed the Union Pacific Railroad's guidance on trail crossings over or under their railroad. The following is a summary of the key points in this guidance that were also reinforced through discussions with Mike Blackley, Union Pacific Manger of Special Projects, Omaha, Nebraska office:

- The railroad does not allow new at-grade trail crossings.
- At-grade crossings immediately adjacent to an existing public roadway crossing with existing Highway Railroad warning devices may be considered.
- The railroad does not allow trails parallel to the track on railroad right-of-way.
- Fences or barriers such as vegetation, ditches and/or berms shall separate trails that are outside the railroad right-of-way and running parallel to the track to stop trespassers from entering the railroad right-of-way.
- Consider the use of existing structures to cross the railroad tracks.
- A crossing under an existing structure may be considered; however, open deck structure shall be modified to a ballast deck or solid deck structure to maintain a safe crossing under the railroad structure. If modifying an existing open deck structure is not practical, a protective cover over the trail will need to be provided.
- Drainage patterns of the site before and after construction will need to be analyzed. Adequate drainage provisions shall be incorporated into the plans and specifications.

Coordination with the railroad continued throughout the feasibility study. Correspondence from railroad representatives is summarized in **Section V**.

C. PUBLIC INVOLVEMENT

The 2011 Minnesota River Greenway Master Plan included a robust public involvement process to identify and evaluate greenway alignment options. The master planning process included a technical advisory group with representatives from various Dakota County departments; the cities of Lilydale, Mendota, Mendota Heights, Eagan and Burnsville; U.S. Fish and Wildlife Service, MnDNR, Lower MN River Watershed District, Fort Snelling State Park, and the Minnesota Historical Society. In addition, the County held stakeholder meetings with communities, the MnDNR and Xcel Energy, established a project

website and notified over 2,000 residents within a quarter-mile of the greenway inviting them to two public open house meetings and an interpretive workshop.

Because of the extensive public involvement process recently conducted for the master plan, it was decided additional public open house meetings were not necessary for the feasibility study. Instead, Dakota County developed a project website to inform the public of the purpose of the feasibility study and to provide updates as the study progressed. A presentation was also prepared outlining the feasibility study findings and recommendations for next steps. This presentation was shared with project stakeholders for their use in updating their respective commissions and elected officials and was also made available on the County's project website.

IV. ALIGNMENT OPTIONS

A. MASTER PLAN ALIGNMENT RECOMMENDATIONS

The 2011 Minnesota River Greenway Master Plan considered several alternatives for the Eagan segment between I-494 and Highway 77. The master plan concluded that from the perspective of trail users, an alignment on the river side of the railroad was desirable, but due to the constraints (railroad, wetlands, fens, seasonal flooding, high water table, contaminated sites, etc.), some or all of the trail might have to be east of the railroad. **Figure 8** illustrates the preferred and alternate alignments identified by the master plan.

The master plan preferred alignment generally followed the southeast side of the railroad, avoiding wetlands, fens and dump sites and allowing for connection to Eagan and Lebanon Hills Regional Park. The trail jogs to the northwest of the tracks near the quarry lake, providing recreation opportunities and views of the river valley. Southwest of the lake, the trail would return to the east side of the tracks along the edge of the Metropolitan Council's Seneca Wastewater Treatment Facility. Three grade separated crossings were recommended: one at an existing culvert north of the quarry lake, one at Comanche Road and a tunnel south of the lake.

The master plan concluded that alternatives exist on the opposite side of the railroad corridor from the preferred alignment in this section. The alternatives included:

- Northeast portion – use the existing I-494 bridge to cross to the west side of the railroad, dropping around the Gun Club dump site and generally following a former Fort Snelling State Park trail.
- Middle portion – weave through the industrial development southeast of the railroad to a new railroad underpass south of the quarry lake.
- Southwest portion –travel on the river side of the railroad tracks, following the 710 flood elevation through Nicols Meadow Fen to Silver Bell Road.

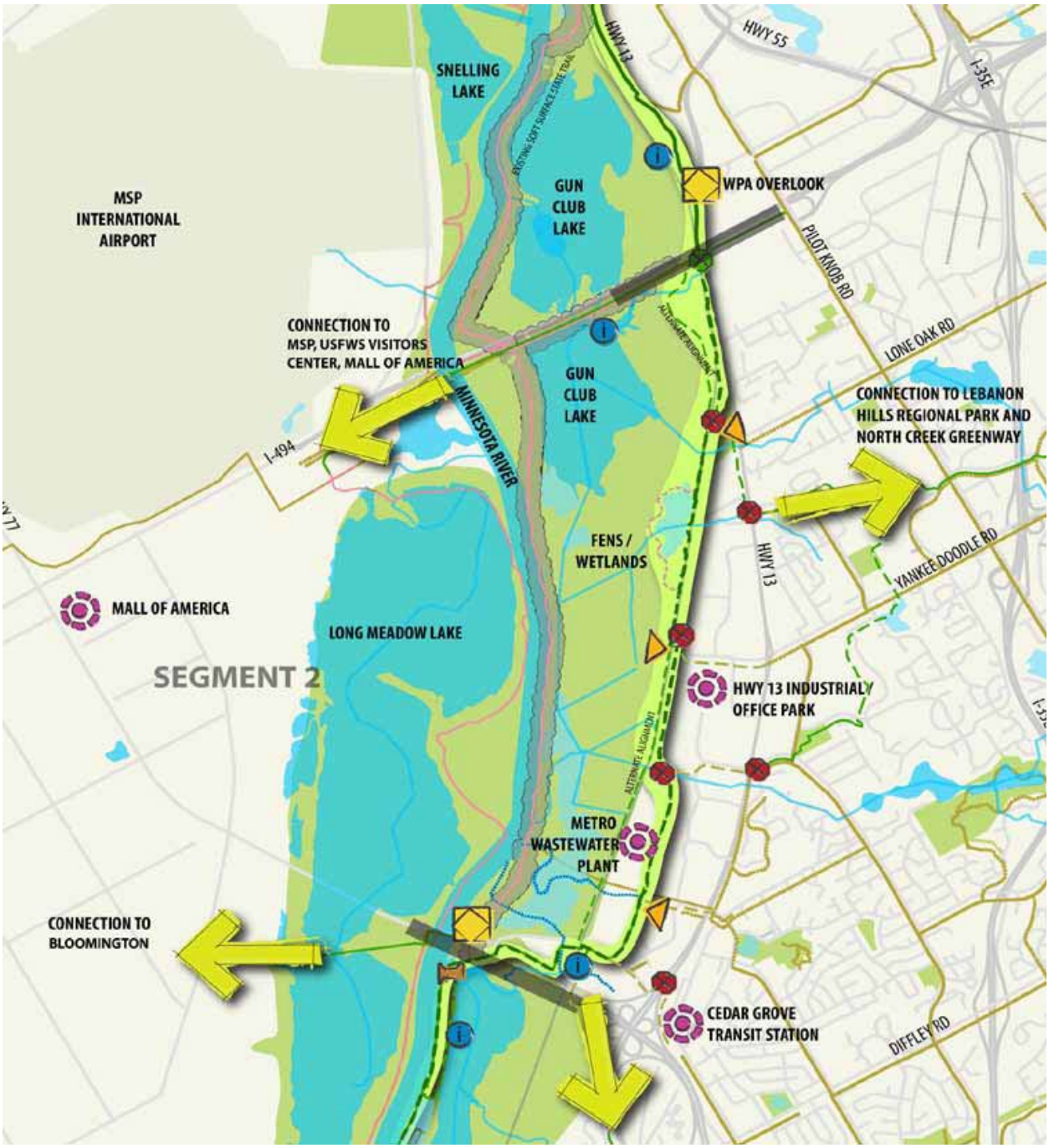
B. FEASIBILITY STUDY ALIGNMENTS CONSIDERED

A wide range of alternatives, including the master plan preferred alignments, were reviewed and considered. **Appendix C** contains graphics that illustrate the original range of alignment alternatives considered in this feasibility study as well as others showing the evolution of the alternatives.

Several of the alignment options were dismissed due to the identification of fatal flaws such as inconsistency with the greenway vision, environmental impacts, and/or safety concerns. The following provides a brief review of those general alignments that were dismissed early in the feasibility study.

- Alignment utilizing an existing Fort Snelling State Park trail directly adjacent to the Minnesota River – This was dismissed due to its proximity to the river and high potential for flooding making it difficult and costly to maintain.
- Alignment using lands east of the railroad, around the Seneca Wastewater Treatment Facility and through the adjacent industrial park areas – This was dismissed due to safety concerns with proximity to the Seneca facility and overall lack of consistency with greenway objectives due to its location within an industrial area.

FIGURE 8 – Master Plan Recommendations on Eagan Segment



Source: Minnesota River Greenway Master Plan (2011)

The following refinements were made to the concepts under consideration following the June 2013 field walk:

- Alignment on the east side of the quarry lake was dismissed due to safety concerns related to its proximity to the shooting range and railroad right-of-way corridor.
- A detailed analysis including field review, railroad coordination, along with consideration of grades and drainage, led to the recommendation of providing the grade separated railroad crossing at the location shown in **Figure 1**. The study then focused on this crossing location.
- It was determined that the alignment option southeast of Seneca Wastewater Treatment Facility would be much less desirable to trail users and that the study should seek to keep the trail on the river side of the tracks through this section.
- Reconstruction of Nicols Road could occur to narrow the roadway and also accommodate a trail.

The project partners met again to discuss project status in late June 2013. They determined the wetlands and fens should be delineated to aid in the refinement of concepts and to better understand potential impacts. The following alignments were dismissed or modified following the wetland and fen delineations:

- Alignment on the west side of the railroad tracks, north of the quarry lake –This alignment was dismissed since it crossed through the delineated fen in Area 3 (see **Figure 7**).
- All remaining trail alignments were refined to minimize impacts to wetlands.
- Boardwalks through some of the larger wetland areas were added to minimize impacts.

Two feasible options at the southern and northern ends of the project remained following the refinements noted above.

C. RECOMMENDED ALIGNMENT

Figure 1 illustrates the recommended trail alignment(s). These alignments begins with a connection to the existing Highway 77/Cedar Avenue pedestrian bridge at the southern end of the study corridor near the Minnesota River boat launch and parking lot. The study provides two feasible alignment options to connect the existing trail in this area to an alignment that parallels the west side of the railroad.

- **Nicols Road Option**- This option includes reconstructing Nicols Road to provide room for the trail adjacent to the existing road alignment. Nicols Road would be narrowed but maintained as a park access road. See **Figure 1** for this alignment, as well as a typical section showing the proposed changes. Approximately five additional feet of width would be necessary to accommodate the two-lane access road and the trail. Nicols Road would be widened to the south toward the MnDOT pond to minimize impacts to the natural wetland area to the north. The trail would then turn north at the railroad. The City of Eagan could potentially connect a local trail system into the greenway trail at the at-grade railroad crossing of Nicols Road. Moving to the north, the proposed trail alignment follows the west edge of the railroad right-of-way past the Seneca Wastewater Treatment Facility and former treatment ponds. It is understood that the former treatment ponds have been remediated upon cessation of use for wastewater treatment and therefore could be suitable for trail development.

- **Minnesota River Option** - An alternate alignment would follow an existing Fort Snelling State Park trail adjacent to the Minnesota River and then cross the floodplain/wetland area on a 700' boardwalk to connect in with an alignment that parallels the west side of the railroad across from the Seneca Wastewater Treatment Facility.

The proposed trail alignment would continue north along the west side of the railroad right-of-way. Approaching the quarry lake and former sand mine there are two options shown on the layout. The potential options were developed after the delineation was completed to provide an option adjacent to the railroad and a more scenic alignment away from the railroad. Both of these options are likely out of the wetlands however, this will need to be verified as the project is further developed. The trail travels along the backside of the quarry lake, utilizing upland area resulting from past spoils disposal. Two boardwalks of 320' and 125' are recommended through low areas near the lake. The trail would provide public access to the lake where there is already public use for fishing and swimming. Current access to this area is gained by trespassing across the railroad tracks.

North of the quarry lake the trail would utilize an existing railroad bridge to cross under the tracks and then continue on the east side of the railroad right-of-way. The railroad right-of-way and Highway 13 road use converge near I-494, narrowing the available space for the trail. Two options remain for connecting the proposed trail into the I-494 trail as shown on **Figure 1**. Either the trail needs to squeeze between the pedestrian bridge columns and the TH 13 guardrail or between the columns of the pedestrian bridge (see photo to the right). If the first option is selected, some guardrail modification will be needed along with shoulder narrowing of TH 13 from 11' to 10'.

V. EVALUATION AND DETAILS OF RECOMMENDED ALIGNMENT

A key distinction between the master planning effort and this feasibility study is the need to evaluate the proposed trail alignment options in more detail to better understand the implications of building the trail in one location versus another and the type of construction methods that could be considered in constrained locations. The project team relied heavily upon information gathered during the master planning process and through coordination with the project stakeholders group and other resource and permitting agencies to evaluate alignments. The following section summarizes the information collected on the proposed alignments organized by benefits each would provide and/or impacts that would occur from trail development.

GREENWAY VISION

Dakota County's greenway vision is to integrate multiple public values into all of its greenway projects. These values include providing recreation, habitat restoration, improvement of water quality and non-motorized transportation. The proposed trail alignment and alternative alignment options provide improved access to views of the protected Minnesota River Valley, Fort Snelling State Park and Minnesota Valley National Wildlife Refuge. Each of the alignment options being considered is consistent with the County's greenway vision. The majority of the alignments under consideration are away from roads except for the Nicols Road option which is located adjacent to a roadway for a portion of the alignment.

FLOODPLAIN / TRAIL ELEVATION

It is recommended that the trail be designed at the 50-year flood elevation in order to offset required fill for trail construction, required compensatory flood storage and wetland impacts. The 50-year flood elevation indicates a 2% probability of flooding in any given year. The 50-year flood elevation at the north end of the study area (I-494) is 711.66'. The 50-year flood elevation at the south end of the study area (Highway 77/Cedar Ave) is 712.04'.

On the west side of the railroad, from the tracks to the Minnesota DNR Boat launch, the trail is located closer to existing grades which is well below 50-year flood elevation. As a result, either option from the DNR Boat launch to the railroad will be below the 50-year elevation. The low point of the proposed railroad underpass is located at the 10-year flood elevation. **Appendix D** contains a profile of the trail that shows the 1%, 2%, and 10% flooding event elevations along with existing ground and proposed trail elevations.

Once the final trail alignment is established, the current FEMA hydraulic model will be augmented to calculate the change in flood stage on proposed fill and anticipated compensatory flood storage, with no change being the target. It is likely an elevated trail through the study area will have negligible effects on overall flood storage based on known discharge rates in the Minnesota River for large flood events and available floodplain storage.

DESIGN DETAILS

TRAIL SECTION

The majority of the greenway alignment is located within a floodplain along the river and wetlands are present in many areas. Soils are expected to be hydric and highly organic. Geotechnical investigation should be completed in future design phases to identify soil types and suitability for trail construction. The geotechnical report should discuss an appropriate trail typical section and other special construction considerations specific to actual site conditions.

With the expectation of organic soils, this study has anticipated that the bituminous trail will be constructed on at least two feet of granular borrow import material to support long-term trail traffic and construction equipment during grading and paving operations. Site preparation would include stripping of the vegetation layer and subsequent installation of a geotextile fabric to add stability and prevent mixing of virgin organic soils with granular trail base materials. Below are highlights of the trail section, which is consistent with Dakota County Greenway standards. A typical trail section can be found on **Figure 1**.

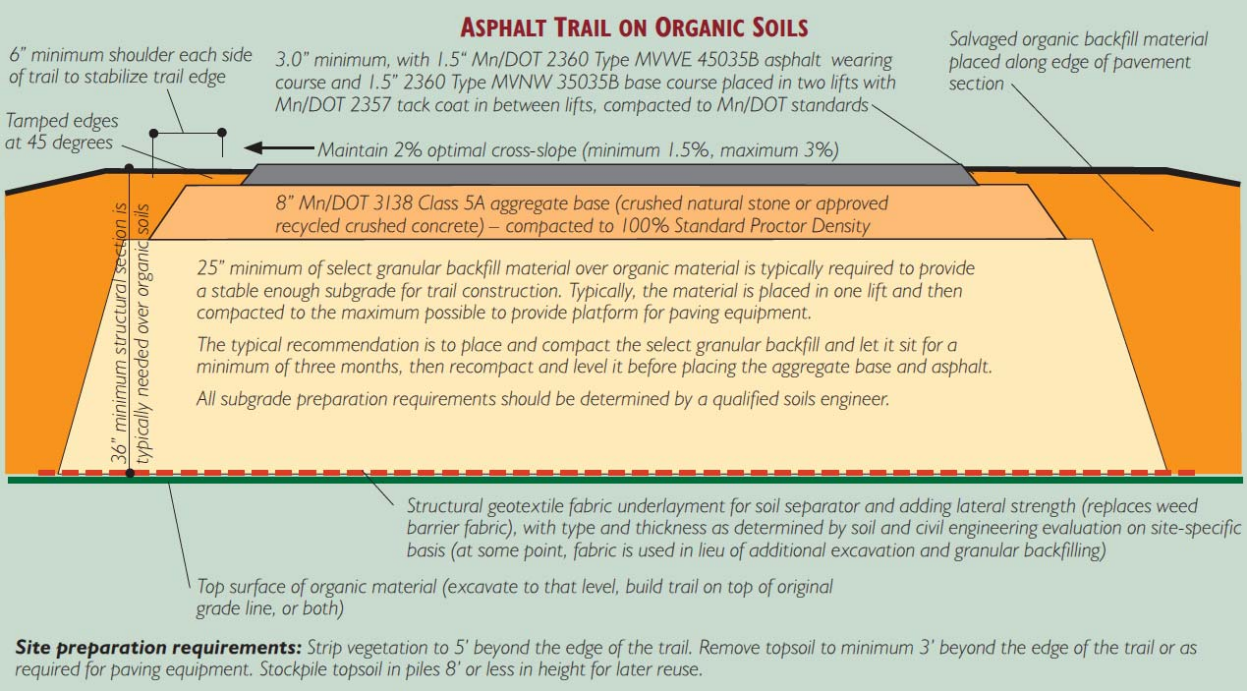
Soils throughout the study corridor are organics and peats and are generally poor for trail construction. Organics and peats are the most unreliable subsoils for construction and the most expensive to build a trail across. Additional precautions will be required to create a firm enough base for construction. **Figure 9** illustrates a general pavement design for organic soils from the Minnesota DNR Trails manual.

The presence of water during trail construction is of concern due to the project site being located within a river floodplain and wetland. Late summer, fall, or winter construction should be considered to avoid spring flooding and times of high rainfall potential.

The proposed section for the trail includes:

- 10’ paved trail
- 2’ grass shoulders
- 3:1 slope to tie into existing ground
- 20 mph design speed
- Pavement Section
    - 3” bituminous pavement
    - 8” class 5
    - 24” select granular borrow
    - Type IV geotextile fabric
    - 6” vegetation stripping.

FIGURE 9 – DNR Trails Manual Typical Section on Organic Soils



NICOLS ROAD

Below are highlights of the Nicols Road section, which is consistent with State Aid standards. A typical trail section can be found on **Figure 1**.

The proposed section for the trail includes:

- 11' thru lanes
- 2' paved shoulder
- 2' curb reaction
- B624 on north side of road
- 14' trail (counting paved 2' clear zone on both sides)
- Fence on north side
- 3:1 slope to tie into existing ground
- 30 mph design speed
- Roadway Pavement Section
    - 4" bituminous pavement
    - 8" class 5
    - Reclaimed existing bituminous used as class 5
    - Type IV geotextile fabric
    - 6" vegetation stripping.

WETLAND IMPACTS

Wetland impacts were calculated for each of the alignment options. Toe of slope was calculated based on the proposed profile. Impact areas were then increased by 10% to account for construction activities. Areas that are in boardwalk segments are included in the totals below. Depending on construction methods, the totals below could be less.

TABLE 1 – Estimated Wetland Impacts

Alignment Description	Wetland Impacts (Acres)
Nicols Road Option	0.68
Minnesota River Option	0.30
Base (Seneca Facility to I-494)	2.35
TOTAL (Range)	**2.65-3.03**

Impacts to wetlands will be subject to the Wetland Conservation Act (WCA) process and reviewed on a site-by-site basis. The Minnesota River Option would cross a native plant community type (NPC) identified by the Minnesota Biological Survey as Bulrush Marsh, which has the conservation status rank of S3 (vulnerable to extinction). NPCs with status rank of S1 to S3 are protected under WCA regulations 8420.0548 supb.3. If this option is selected, close coordination with DNR wetland staff will be required to assess the wetland condition and to determine if mitigation is appropriate.

BOARDWALK

Boardwalks were considered to reduce wetland impacts and enhance the greenway. Boardwalks are recommended in multiple locations illustrated in **Figure 1** and include:

- 700’ of boardwalk on the Minnesota River option that utilizes a portion of the existing State Park trail and then heads east through the wetland complex.
- 320’ of boardwalk and 125’ of boardwalk on the alignment section north of the quarry lake

The Corps of Engineers may consider reduced wetland mitigation requirements with a boardwalk. It is likely only the footprint of the boardwalk would be considered an impact under the Wetland Conservation Act.

BOARDWALK TYPES AND RECOMMENDATIONS

The Project Stakeholders noted concern for the use of boardwalks in the study area due to the frequency of fires and potential for vandalism. To address these concerns, three alternative foundation types and two surface treatments were analyzed to provide options for a durable, low maintenance boardwalk that could withstand damage from an occasional grass fire or vandalism. The construction process, environmental impact and cost for the proposed 14’ wide boardwalk are site specific concerns that must be discussed with the various options. The following breaks down the various boardwalk alternatives and provides recommendations based on the identified issues and concerns.

The three basic boardwalk foundation alternatives include: reinforced concrete spread footing, reinforced concrete caisson, and helical piers. It is anticipated the surface treatment (structural support, decking and railing) can accommodate any one of these foundation types. Environmental impacts will vary with location and type of foundation. If environmental impact is a major concern, helical piers would be the most desirable of the three alternatives. Installation of the helical piers typically requires less mobilization and could be completed in the winter months, reducing environmental impacts. Reinforced deep concrete footings require excavation, steel reinforcement and formwork to a depth determined by the existing soil structure. Reinforced concrete spread footings also require excavation, steel reinforcement and formwork. Spread footings are at a shallower depth than a deep caisson footing but usually require a wider concrete base to spread the boardwalk loading. Providing access for concrete trucks to pour deep or spread footings along with the excavation and forming requires more site disruption and impact than a

steel helical foundation. There are precast concrete spread footing piers available as a slightly more environmentally friendly alternative to poured in place but this option would still require excavation of the footing area.

Two alternatives for the boardwalk beams, joists, decking and railing, referred to as the surface treatment, have been explored. The first option is a traditional wood structure. The alternative to the wood structure is concrete. The wood alternative is more cost effective up front and would provide more design flexibility but could anticipate higher long term maintenance costs versus a concrete structure. The wooden elements would also be more susceptible to damage by fire. A concrete deck alternative would include a metal rail and structural steel/concrete support. The concrete deck alternative can be designed to incorporate techniques designed to simulate a wood deck. This can be accomplished through integrally colored concrete, wood imprinted forms and concrete staining to provide a more natural look and feel to a concrete deck. There are also precast concrete decking systems that could be used vs. a poured concrete deck. These boardwalk items and alternatives are outlined in **Appendix E**.

Based strongly on construction techniques, environmental impacts and overall cost, it is recommended that helical piers be used for the boardwalk foundation. Potential damage from grass fire is minimal due to the piers being steel and typically surrounded by a wet environment. Mobilization and winter constructability are also advantages of using helical piers for a boardwalk foundation. Based strongly on long term maintenance and potential fire damage, it is recommended that the boardwalk be constructed with a poured concrete deck with a painted aluminum railing. This type of concrete deck could also be colored and/or stamped.

CALCAREOUS FEN IMPACTS

The Nicols Meadow Fen, Area 1, lies within the alignment of the Nicols Road Option. According to the MnDNR , this fen is currently protected by Minnesota statute (Section 103G.223) regardless of the results of the fen delineation conducted in late summer 2013 and confirmed by the 2014 field survey. The exemptions under part 8420.0420 and the sequencing provisions under part 8420.0520 do not apply to calcareous fens. If the Nicols Road Option were selected, the project proposers would be required to work with DNR wetlands staff to determine if potential impacts could be avoided. The DNR's recommendation is to avoid impacts to the fen area.

Direct impacts to other fens in Areas 3 and 4 were avoided using the boundary information developed as part of the late summer 2013 fen delineation. All alignments west of the railroad near Area 4 were eliminated from further consideration due to fen impacts. The proposed alignment on the east side of the railroad near Area 4 was adjusted to avoid direct impacts to the fen as well.

TROUT STREAMS

The Minnesota River Option on the southern end of the corridor crosses a state-designated trout stream. This option would will require coordination with DNR hydrology staff if selected. Coordination would occur during the public water permitting process to ensure a stream crossing design that limits impacts to instream trout habitat.

CULTURAL RESOURCES

The Minnesota River Option on the southern end of the corridor is located in or near three known archaeological sites, including Black Dog Village. The Minnesota River Valley is known to be an archaeologically significant geographic feature and it is likely that other sites remain unidentified within the study area. Trail development within areas that have not been intensively disturbed would likely

require consultation with the SHPO, OSA and the sponsoring agency. Consultation may determine that a cultural resources survey, which may also include standing structures, is necessary. Sites that cannot be avoided may require additional study which may add costs and extend the project timeline.

RAILROAD

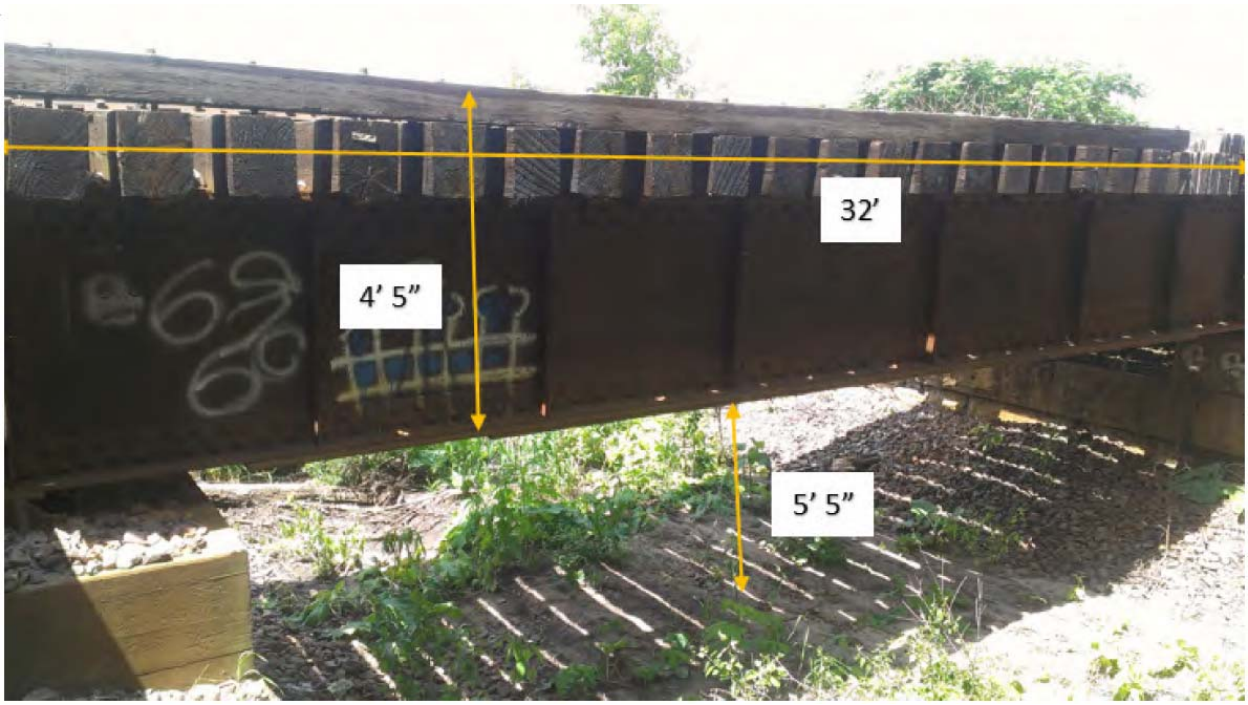
The proposed trail alignment does not impact any railroad right-of-way other than where a perpendicular grade separated crossing is proposed. At some point, the City of Eagan may wish to connect their city trail system into the greenway trail at the existing at-grade railroad crossing with Nicols Road. This is a public crossing with flashing lights and gates. Union Pacific representatives stated that utilizing an existing grade separated railroad crossing would be more desirable that adding a trail to an existing at-grade road crossing. Additional study is needed to determine if Nicols Road crossing meets the railroad's requirements for Highway Railroad warning devices or if some additional improvements are needed to make a city trail connection at this location.

Figure 10 illustrates the eight Union Pacific railroad crossing options that were considered and evaluated for either the future greenway to travel through or to provide for a future city connection to the greenway. The feasibility of potential crossing locations was reviewed in the field before beginning discussions with Union Pacific representatives.

FIGURE 10 – Railroad Bridge Crossing Locations Considered

After review of the potential trail crossings, all but one of the railroad bridge structures were dismissed from further consideration due mainly to their location, inadequate size, poor condition or inability to meet Union Pacific standards for trails under a track. The remaining feasible option recommended by the project stakeholders group was bridge crossing #6 which is illustrated in more detail in **Figure 11**.

FIGURE 11 – Recommended Railroad Bridge Crossing Location



The feasibility of utilizing bridge crossing #6 was considered and explored with Union Pacific Railroad representatives. This crossing is not anticipated to require work on the railroad structure but would require excavation under the bridge to clean out the silt that has built up. This bridge crossing would be modified to maintain flow conveyance from the upstream watershed and provide safe pedestrian passage as detailed on **Figure 1,** conveying drainage towards the river to elevation 703.00’. Based on anticipated trail elevations, flow through the structures will likely need to be at-grade open channel conveyance as opposed to culverts. This will allow for the conveyance to tie into existing grade near the trail as opposed to lengthy culvert extensions which would have additional impacts. The trail will depart from the 50 year flood elevation down to the 10 year flood elevation at the underpass (elevation of 707.08’) to provide 10’ of clearance.

Further study and coordination needs to occur at this crossing. The footing elevation needs to be determined. Then abutment protection will need to be evaluated. Lighting at this crossing should also be considered.

Figure 12 illustrates the typical section for the trail underpass crossing utilizing the existing railroad structure. This also illustrates how the drainage could be accommodated. **Figure 13** illustrates examples of a ballast shield structure under a Union Pacific bridge in Inver Grove Heights, MN. A similar structure will likely be required for the greenway trail underpass since the railroad bridge is an open deck structure. The Union Pacific trail crossing guidance suggests this open deck structure be modified to a ballast deck or solid deck structure, or add a protective shield cover over the trail to maintain a safe crossing for trail users under the tracks.

FIGURE 12 – Railroad Bridge Underpass Typical Section

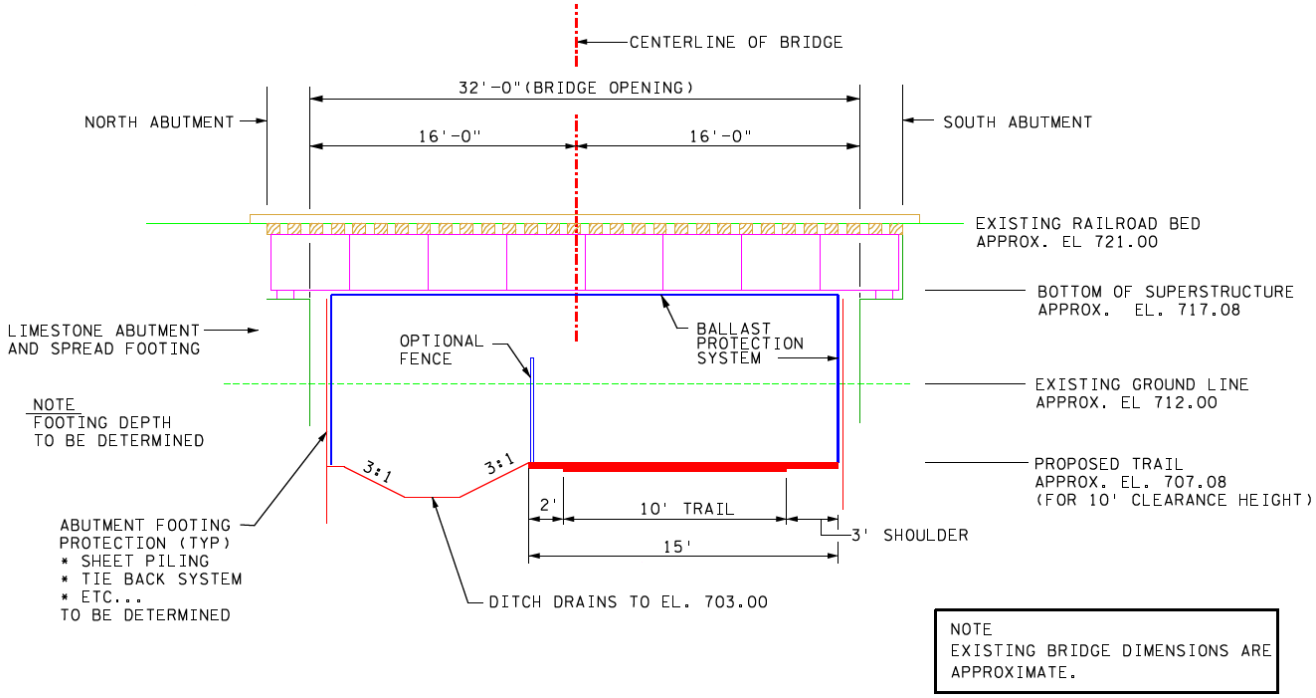


FIGURE 13 – Examples of Ballast Shield Structures

Coordination with Union Pacific (UP) about this particular bridge crossing location indicated:

- The proposed use of the UP railroad bridge (crossing #6) does not fit into their normal grade separation project process because it uses an existing structure.
- Union Pacific does not feel there is enough information at this stage to approve the concept level design discussed in the sections above and illustrated in **Figures 12 and 13**.
- Union Pacific's concerns are:
    - The trail will impact drainage under the bridge. A hydraulic drainage analysis will need to be completed before they will approve the use of an existing structure as a crossing point.
    - The trail, ballast fall protection and fencing will create a hazard that will catch debris causing drainage issues with the UP facilities.
    - The proposed trail with ballast fall protection does not allow sufficient space for normal bridge inspection even with inspection doors added.

If an agreement with UP cannot be reached to utilize the existing structure, the County will need to consider constructing a new railroad bridge either at this location or at a new location. The cost estimates in **Appendix E** include the provision for construction of a new railroad bridge if required.

DRAINAGE

Since nearly the entire study area lies within the Minnesota River Floodway, equalization culverts will have to be installed to allow flooding to occur between the trail and railroad tracks. With the projects high level evaluation, it is recommended that 24" corrugated steel pipe with aprons be installed along the trail corridor at 500' intervals. Evaluation considered concrete pipe but this was considered too heavy and may cause long term maintenance issues with settling. Plastic pipe (light weight) was also considered but with known fire concerns was not recommended as an option to a steel pipe. Final recommendations for equalization should be considered in conjunction with the hydraulic modeling that will be needed in future steps of project development.

COST

Planning level cost estimates were prepared for the concepts. These are very high-level estimates that need to be revisited as an alternative is further developed. Below is a summary of the estimated construction cost in 2013 dollars. See **Appendix E** for the preliminary cost estimating documentation.

TABLE 2 – Estimated Project Costs

MN River Option	Cost
Base Segment (sta 165+00 to 332+75)	$2,040,000
River Segment (sta 100+00 to 152+00)	$420,000
Railroad Bridge Ballast Shield (Safety Canopy)	$80,000
Concrete Boardwalk / Helical Piers / Aluminum Railing (1145 ft by 14 ft)	$1,580,000
Subtotal 1	***$4,120,000***
Contingency (15% of subtotal 1)	$620,000
Greenway Amenities (15% of subtotal 1)	$620,000
Wetland Mitigation (2.65 acres x 2 at $80,000/acre)	$420,000
Subtotal 2	***$1,660,000***
Total	***$5,780,000***
Conservative Total *(with new RR bridge)*	***$6,060,000***

Nicols Road Option	Cost
Base Segment (sta 165+00 to 332+75)	$2,040,000
Nicols Road Segment (sta 100+00 to 165+00)	$760,000
Railroad Bridge Ballast Shield (Safety Canopy)	$80,000
Concrete Boardwalk / Helical Piers / Aluminum Railing (445 ft by 14 ft)	$610,000
Subtotal 1	***$3,490,000***
Contingency (15% of subtotal 1)	$520,000
Greenway Amenities (15% of subtotal 1)	$520,000
Wetland Mitigation (3.03 acres x 2 at $80,000/acre)	$480,000
Subtotal 2	***$1,520,000***
Total	***$5,010,000***
Conservative Total *(with new RR bridge)*	***$5,290,000***

The table above shows the range of costs to complete this four-plus mile section of trail. The estimates include trail construction, railroad ballast shield, fireproof boardwalk, contingency, amenities, and wetland mitigation. Generally the improvements are estimated to cost between $5.3 million and $6.1 million depending upon alignments as shown above and detailed in **Appendix E.** These cost estimates do not include project development and delivery costs which are estimated to range between $900,000 and $1.1 million depending upon the alignments.

The costs could be reduced by $1,250,000 in the Minnesota River Option and $490,000 in the Nicols Road Option if a wood boardwalk were to be constructed rather than the fireproof boardwalk. This would bring the cost range of all options down to $4.8 million.

Maintenance costs for the various options were also considered. Concrete decking will last much longer, requires less maintenance, and is less prone to fire damage when compared to wood. Concrete is more

expensive to construct and the savings on deck replacement will not be realized when only considering construction costs and maintenance costs. User experience, wild fires, flood damage, desire for controlled burns, etc. must also be considered.

Multiple decking, railing and boardwalk foundation types were reviewed. A poured concrete boardwalk was recommended since it will serve the trail demands appropriately and is less costly than a prefabricated fireproof decking. There are options to color and/or stamp poured concrete decking for additional costs. Below is a summary of the standard wood boardwalk compared to the poured concrete decking (without stamping/coloring) and aluminum railings.

- Piers and foundation support is not significantly affected by the type of decking
- Wood decking is $50/SF (including railings)
- Concrete decking is $80/SF plus aluminum railing at $130/ft
- Wood Option Overview:
    - Total Costs of Minnesota River Option with wood decking = $801,500
    - Estimated Yearly Maintenance Costs = $4,000
- Concrete Option Overview:
    - Total Costs of Minnesota River Option with concrete decking = $1,580,000
    - Estimated Yearly Maintenance Costs = $1,600

VI. SUMMARY

This study considered a broad range of trail alignments in conjunction with a comprehensive environmental screening and resource/permitting agency and railroad coordination effort to better understand what alignments are feasible for the Minnesota River Greenway, Eagan segment. It is concluded that there is a feasible trail alignment that includes two options for the southern connection to Highway 77/Cedar Ave and two options for connection to I-494. All of these options are feasible but need further design and agency coordination to fully flush out the option that best meets the needs of the greenway, minimizes impacts and is cost-effective.

VII. NEXT STEPS

This section of the report outlines the required next steps for trail development, working towards actual construction of the Minnesota River Greenway, Eagan segment.

A. ENVIRONMENTAL DOCUMENT

An environmental document will need to be prepared prior to trail construction. At the writing of this feasibility study report, it appears a project memorandum would be the appropriate NEPA document for this project if the County uses federal funding. However, due to the complexity and nature of potential issues, it is possible a combined Environmental Assessment/Environmental Assessment Worksheet (EA/EAW) could be required. Dakota County should coordinate with MnDOT State Aid to determine the appropriate environmental document based on the funding source for this project.

If non-federal sources of funding are used, it is likely a state Environmental Assessment Worksheet (EAW) would be mandatory based on Minnesota Statutes 4410.4300, subpart 27 and potentially subpart 26. Subpart 27 requires a state EAW for projects that change or diminish the course, current or cross-section of one acre or more of any public water or public waters wetland.

- **Subp. 26. Stream diversion.** For a diversion, realignment, or channelization of any designated trout stream, or affecting greater than 500 feet of natural watercourse with a total drainage area of ten or more square miles unless exempted by part 4410.4600, subpart 14, item E, or 17, the local government unit shall be the RGU.

- **Subp. 27. Wetlands and public waters.** Items A and B designate the RGU for the type of project listed:

  A. For projects that will change or diminish the course, current, or cross-section of one acre or more of any public water or public waters wetland except for those to be drained without a permit pursuant to Minnesota Statutes, chapter 103G, the local government unit shall be the RGU.

  B. For projects that will change or diminish the course, current, or cross-section of 40 percent or more or five or more acres of types 3 through 8 wetland of 2.5 acres or more, excluding public waters wetlands, if any part of the wetland is within a shoreland area, delineated flood plain, a state or federally designated wild and scenic rivers district, the Minnesota River Project Riverbend area, or the Mississippi headwaters area, the local government unit shall be the RGU.

In addition to the environmental documentation, a public waters permit will be required for work in a

public water wetlands and for public water crossings. The successful completion of an EA/EAW does not guarantee the granting of a public water permit. Some considerations that will need to be met include culvert and underpass construction designs that meet water and wildlife specifications and evidence that water flow will not be disrupted.

B. WETLANDS

DELINEATION

A Notice of Decision approving the wetland delineation conducted as part of this feasibility study was received by the County on November 4, 2013. This notice indicates the County can move forward with the design of the trail using the wetland limits identified in the delineation. An approved delineation under the Wetland Conservation Act is valid for 3 years, but would not necessarily require substantial work to update if trail construction was delayed beyond that timeframe.

Once the County has a trail design and a concept plan, it should be presented at a pre-application TEP meeting. This will provide a better chance of the permit application being approved later in the process since TEP input will have been incorporated into the design.

Coordination with the Corps of Engineers noted in future documents for this project they will continue to analyze wetland impact minimization to ensure impacts are minimized to the maximum practicable extent. Some additional potential minimization efforts may include locating the trail closer to the railroad at Stations 275-281 and considering constructing on frozen soils as much as possible. Also, the optional alignment just south of Quarry Lakes, along the railroad tracks or through a wooded area may exist. It is unknown at this time whether or not these options would have wetland impacts. This area should be delineated to determine which option is preferable.

MITIGATION

In accordance with the Wetland Conservation Act (WCA) and Section 404 of the Clean Waters Act, wetlands will have to be mitigated either through banking or by on-site mitigation. On site mitigation requires a five year monitoring period. Within the five years, vegetation and hydrology are monitored to ensure that the wetland mitigation site is viable. A native, noninvasive plant community must be established in order to receive wetland credit for the mitigation. This can be accomplished through vegetative maintenance, which could include but is not limited to, herbicide treatments, regular mowing, reseeding and controlled burns. With these parameters set by WCA and the possibility of the Technical Evaluation Panel (TEP) setting performance standards to measure the quality of the plant community, the only viable on-site mitigation that can be performed would be to restore one of the calcareous fens (see discussion below). The mitigation ratio for restoring a calcareous fen would have to be negotiated with the TEP in hopes of receiving a higher ratio. The remaining credits would be purchased from a wetland bank, within the same bank service area at a 2:1 ratio.

C. FENS

DELINEATION

The fen delineation findings should be discussed with the various regulatory authorities including the Minnesota DNR, the US Army Corps, the Bureau of Water and Soil Resources, Minnesota Pollution Control Agency, and the representative Local Government Unit. Ideally, most of the verification would be between those involved with the recent field efforts and the Regional Ecologist for the Minnesota DNR.

If the Nicols Road Option is selected, Dakota County should work with DNR wetlands staff to determine if potential impacts to the Nicols Meadow Fen (Area 1) could be avoided. As state-designated calcareous fens are specially protected, more information about the status of these areas as state-designated fens may be needed.

RESTORATION

There is the potential opportunity to restore at least one of the areas initially classified as calcareous fen (Area 1). The hydrology appears to have been altered and drier than expected with much of the wetland now dominated by *P. arundinacea*. The key to restoring this location would be to evaluate the hydrology and determine whether hydrologic restoration is possible. This would have to be via groundwater discharge as opposed to surface water input. Ideally, restorable discharge rates should be comparable to other calcareous fen systems associated with the Minnesota River Valley.

Restoration will also require vegetative management to eliminate non-native species including *P. arundinacea*. This would likely be done through scraping and then removing the sod from the site. This would create challenges in terms of removing too much or too little sod, soil compaction, and overall ability to do the earthwork in this setting. The goal at this point would be allow for the native seed bank to germinate and to see what establishes. This provides for a unique opportunity, allowing for the restoration of an extremely rare resource.

Another consideration to this process is the potential for wetland replacement credit by means of the Exceptional Natural Resource Value process under Minnesota Rule 8420.0526, Subpart 8.If successful, this restoration would qualify as such and the wetland replacement credit ratios would need to be determined. Rather than have an all or nothing approach, wetland replacement credit ratios could vary based on meeting certain performance criteria. The performance criteria would be evaluated via monitoring efforts examining both hydrology and vegetation and this may require greater than five years to ensure standards have been both met and maintained. Restoring such a community is likely unprecedented and therefore this would allow for potentially greater wetland replacement credits.

D. ITEMS NEEDING FURTHER STUDY AND COORDINATION

As the ultimate trail alignment is selected and further design details are developed, additional coordination with environmental resource and regulatory agencies is necessary to discuss topics including cultural resource survey needs, soil testing, hydraulic modeling to discern floodplain impacts, railroad crossing permitting and highway easements/shoulder modifications.

Further coordination with the UP Railroad is needed to determine the feasibility of the railroad crossing location identified. UP has indicated a hydraulics analysis will be required. Additional design and preliminary engineering is also needed to determine if the existing bridge structure can be excavated and overhead protection installed with proper clearances to meet the railroad's requirements. If an agreement to utilize the existing structure cannot be reached with UP, a new railroad crossing structure should be planned.

Additional coordination with the Minnesota DNR, the Corps of Engineers and other project stakeholders will be necessary to evaluate the trade-offs between the Nicols Road and Minnesota River Options on the south end of the corridor. The Nicols Road Option will have greater wetland fill impacts than the Minnesota River Option which utilizes a portion of the existing Fort Snelling State Park Trail in uplands and includes a boardwalk. Despite this, more information will be needed to determine the least environmentally damaging alternative. The Nicols Road Options keeps close to existing infrastructure

(road and railroad) while the Minnesota River option fragments the wetland, possibly having more impact on habitat. Also, the Nicols Road Option passes through a state-designated calcareous fen (Area 1).

E. POTENTIAL FUNDING SOURCES

The following highlights several sources of funding Dakota County may consider for the Minnesota River Greenway, Eagan segment.

TRANSPORTATION ALTERNATIVES PROGRAM (TAP)

The Metropolitan Council administers the solicitation for the federal Transportation Alternatives Program (TAP) for projects such as trails, safe routes to school, environmental, historical/archaeological and streetscape. Funding requires that the projects relate to surface transportation and be identified in an approved plan or study. A 20% local match (non-federal funds) is required.

NATIONAL PARK SERVICE RIVERS, TRAILS AND CONSERVATION ASSISTANCE PROGRAM

The National Parks Service's Rivers, Trails and Conservation Assistance Program provides technical assistance to conserve rivers, preserve open space and develop trails and greenways. The program implements the conservation and recreation mission of the National Park Service.

MINNESOTA DEPARTMENT OF NATURAL RESOURCES

The Minnesota DNR is one of the most comprehensive resources when it comes to funding for natural resources, parks and trails. Current programs provide assistance to protect and preserve open space and natural habitats. Each of the programs described below varies in funding and timing. The DNR should be consulted to clarify funding availability and qualifications.

- Metro Conservation Corridors – Accelerate protection and restoration of key natural lands in the metro area.
- Natural and Scenic Area – To increase, protect and enhance natural and scenic areas.
- Federal Recreational Trail Program – To encourage the maintenance and development of motorized, non-motorized, and diversified trails by providing funding assistance.
- Restoration Grants – Restoration activities that establish or support native plant and animal communities.
- Protection Grants – Protection of high quality sites with native plants.
- Local Trail Connections Program – To provide grants to local units of government to promote relatively short trail connections between where people live and desirable locations, not to develop significant new trails.
- Outdoor Recreation Grants- Provides matching grants to local units of government for up to 50% of the cost of acquisition, development and/or redevelopment costs of local parks and recreation areas.
- Lessard-Sams Conservation Partners Legacy Grants – Restoration and enhancement projects will consist of activities that restore or enhance habitat for fish, game or wildlife on lands permanently protected by conservation easement or public ownership. Protection projects maintain the ability of habitat and related natural systems to sustain fish, game or wildlife through acquisition of fee title or conservation easements. Land acquired in fee must be open to public hunting and fishing during open seasons. Land protection also includes preserving ecological systems and preventing future degradation of those systems.
- Parks and Trails Legacy Grant Program – To support trails of regional or statewide significance.

MINNESOTA POLLUTION CONTROL AGENCY

The MPCA provides grants that address environmental issues. Programs relevant to greenway initiatives include those that address water quality. The MPCA should be consulted to clarify funding availability and qualifications.

THE ENVIRONMENT AND NATURAL RESOURCES TRUST FUND (LCCMR)

The Environment and Natural Resources Trust Fund is funded through state lottery proceeds. This program has helped acquire land to preserve Dakota County greenways, natural areas, water bodies and open space.

CLEAN WATER, LAND AND LEGACY AMENDMENT

On Nov. 4, 2008, Minnesota voters approved the Clean Water, Land and Legacy Amendment to the Minnesota Constitution, which increased the general sales and use tax rate by three-eighths of one percentage point to 6.875 percent and dedicated the additional proceeds as follows:

- 1/3 to new Outdoor Heritage Fund to restore, protect and enhance wetland, prairie, forest and habitat for game, fish and wildlife.
- 1/3 to new Clean Water Fund to be spent to protect, enhance and restore water quality in lakes, rivers, streams and groundwater with at least 5 percent of the fund spent to protect drinking water.
- 14.25 percent to a new Parks and Trails Fund to support parks and trails of regional or statewide significance.
- 19.75 percent to a new Arts and Cultural Heritage Fund for arts, arts education and arts access and to preserve history and heritage.

WATERSHED MANAGEMENT ORGANIZATIONS

Local watershed management organizations provide funding to improve water quality and manage runoff.

FOUNDATIONS AND NONPROFITS

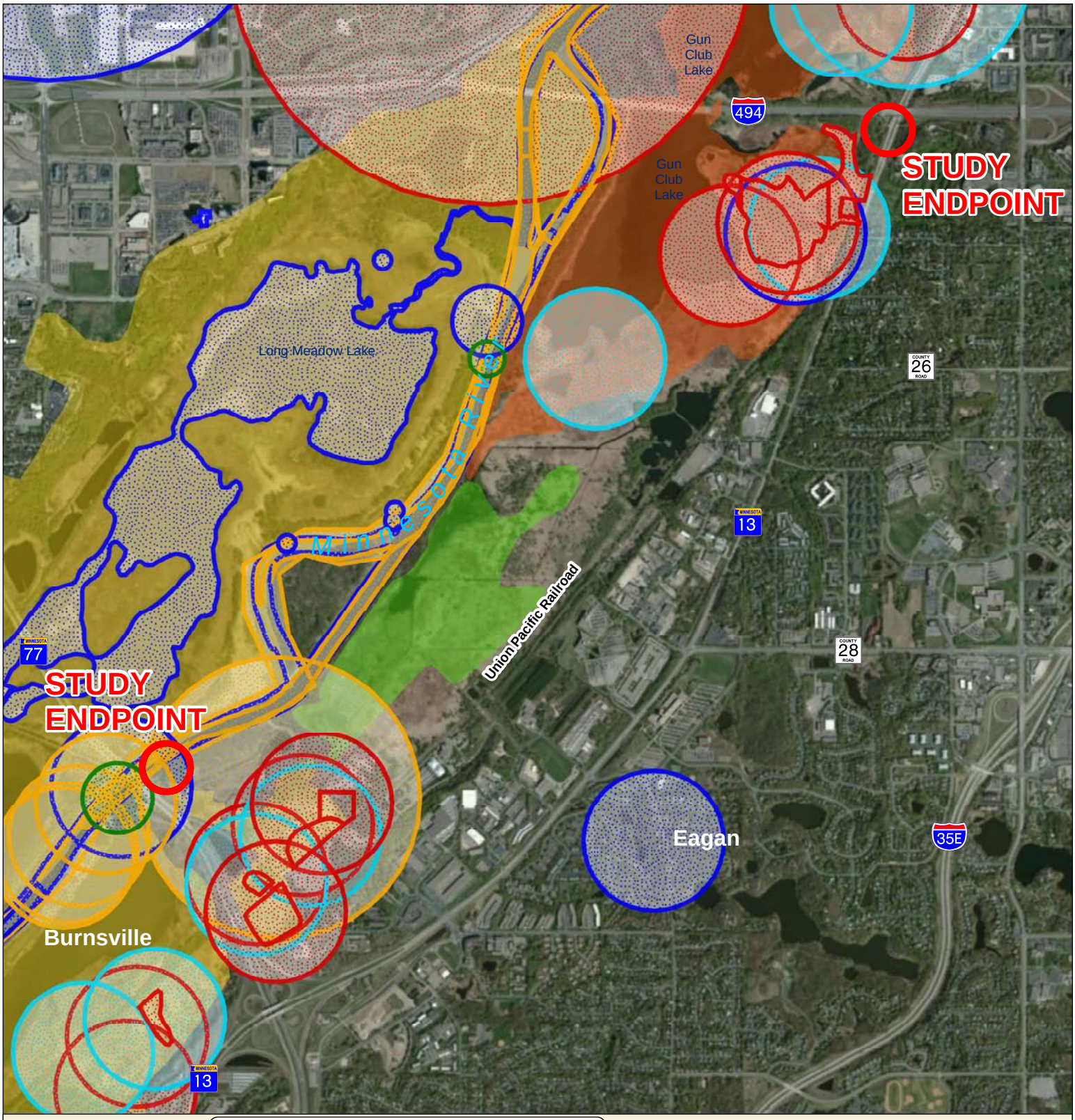
Foundations and nonprofits throughout the country and state are willing to fulfill their mission by supporting local projects. The Minnesota Council on Foundations is a great starting point for identifying local foundations. Before pursuing a foundation, it is important to recognize that each operates differently and toward its own mission. It is also important to contact a foundation early to clarify whether a project would be considered.

F. PROJECT STAKEHOLDER COORDINATION

Regulatory agency concurrence on the feasibility study findings is critical for Dakota County's efforts to seek funding for the development of this trail. Grant awards are often tied directly to a project location, limiting the ability to consider alignment alternatives thus, making agency concurrence on the trail alignment prior to project funding a priority. As part of this feasibility study, Dakota County requested letters of concurrence on general project support from the agency and regulatory project stakeholders. Discussion and coordination with each of these stakeholders is documented in the meeting summaries included in **Appendix F**. Also included are letters from the Minnesota DNR and Corps of Engineers documenting a continued desire to coordinate on the development of this trail.

Appendix A

ENVIRONMENTAL SCREENING GRAPHICS



0 2,500 Feet

Legend

Rare Natural Features

- Vertebrate Animal
- Community
- Invertebrate Animal
- Vascular Plant
- Animal Assemblage

Areas of Biodiversity Significance

- Below Minimum Standard
- Moderate Significance
- High Significance

Source: ESRI, DNR

Note: Threatened and Endangered Species Data Copyright 2012, State of Minnesota, Department of Natural Resources. Rare features data included here were provided by the Division of Ecological Resources, Minnesota Department of Natural Resources (DNR), and were current as of (12/12/2012). These data are not based on an exhaustive inventory of the state. The lack of data for any geographic area shall not be construed to mean that no significant features are present.

Bolton & Menk Engineers & Surveyors

Minnesota Department of Natural Resources

Dakota County

City of Eagan

MINNESOTA RIVER GREENWAY EAGAN ALIGNMENT FEASIBILITY STUDY

Threatened and Endangered Species and Biodiversity Significance

November 2013

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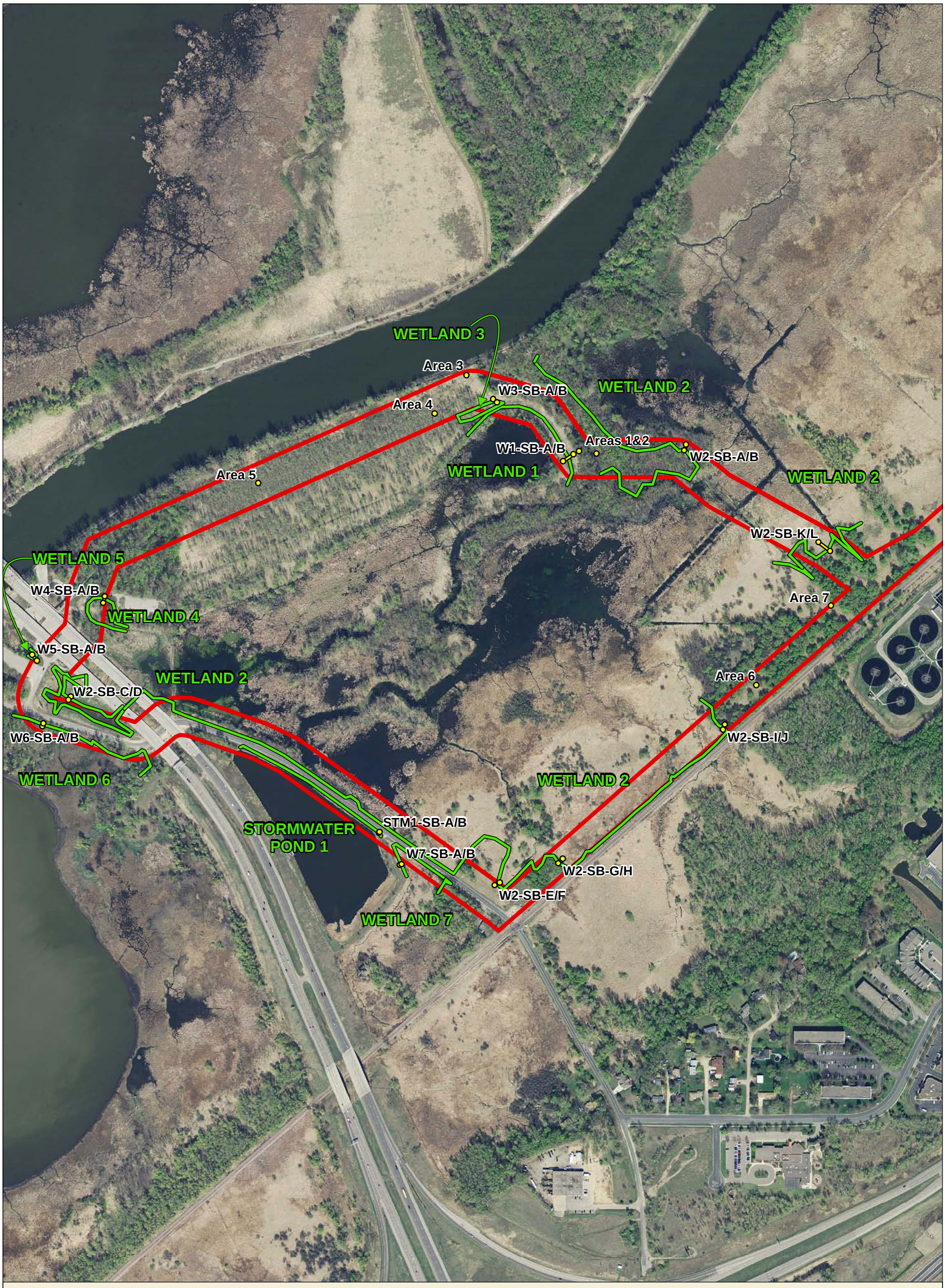

0 500 Feet

Legend

- Soil Borings
- Transects
- Delineated Wetlands
- Study Corridor

Source: 2012 USGS Imagery

MINNESOTA RIVER GREENWAY
EAGAN ALIGNMENT FEASIBILITY STUDY

Delineated Wetland Boundaries

Exhibit F-1

September, 2013

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W2-SB-W/X
W2-SB-U/V
WETLAND 9
W9-SB-C/D
Area 9
W9-SB-A/B
W8-SB-A/B
WETLAND 8
W2-SB-S/T
WETLAND 2
W2-SB-Q/R
Stormwater Ponds 3/4
STM3-SB-A/B
Area 8
STM2-SB-A/B
WETLAND 2
W2-SB-O/P
W2-SB-M/N

0 500 Feet

Legend

- Soil Borings
- Transects
- Delineated Wetlands
- Study Corridor

Source: 2012 USGS Imagery

MINNESOTA RIVER GREENWAY
EAGAN ALIGNMENT FEASIBILITY STUDY

Delineated Wetland Boundaries

Exhibit F-2

September, 2013

Map Document: \\Arcserver1\GIS\DACO\T42106250\ESRI\Maps\Delineation\106250Delineation_2_11x17.mxd
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WETLAND 2
W2-SB-KK/LL
W2-SB-II/JJ
WETLAND 2
W2-SB-GG/HH
W2-SB-EE/FF
WETLAND 2
WETLAND 10
W10-SB-A/B
Area 10
W2-SB-CC/DD
W2-SB-AA/BB
W2-SB-Y/Z
WETLAND 9

0 500 Feet

Legend

- Soil Borings
- Transects
- Delineated Wetlands
- Study Corridor

Source: 2012 USGS Imagery

MINNESOTA RIVER GREENWAY
EAGAN ALIGNMENT FEASIBILITY STUDY

Delineated Wetland Boundaries

Exhibit F-3

September, 2013

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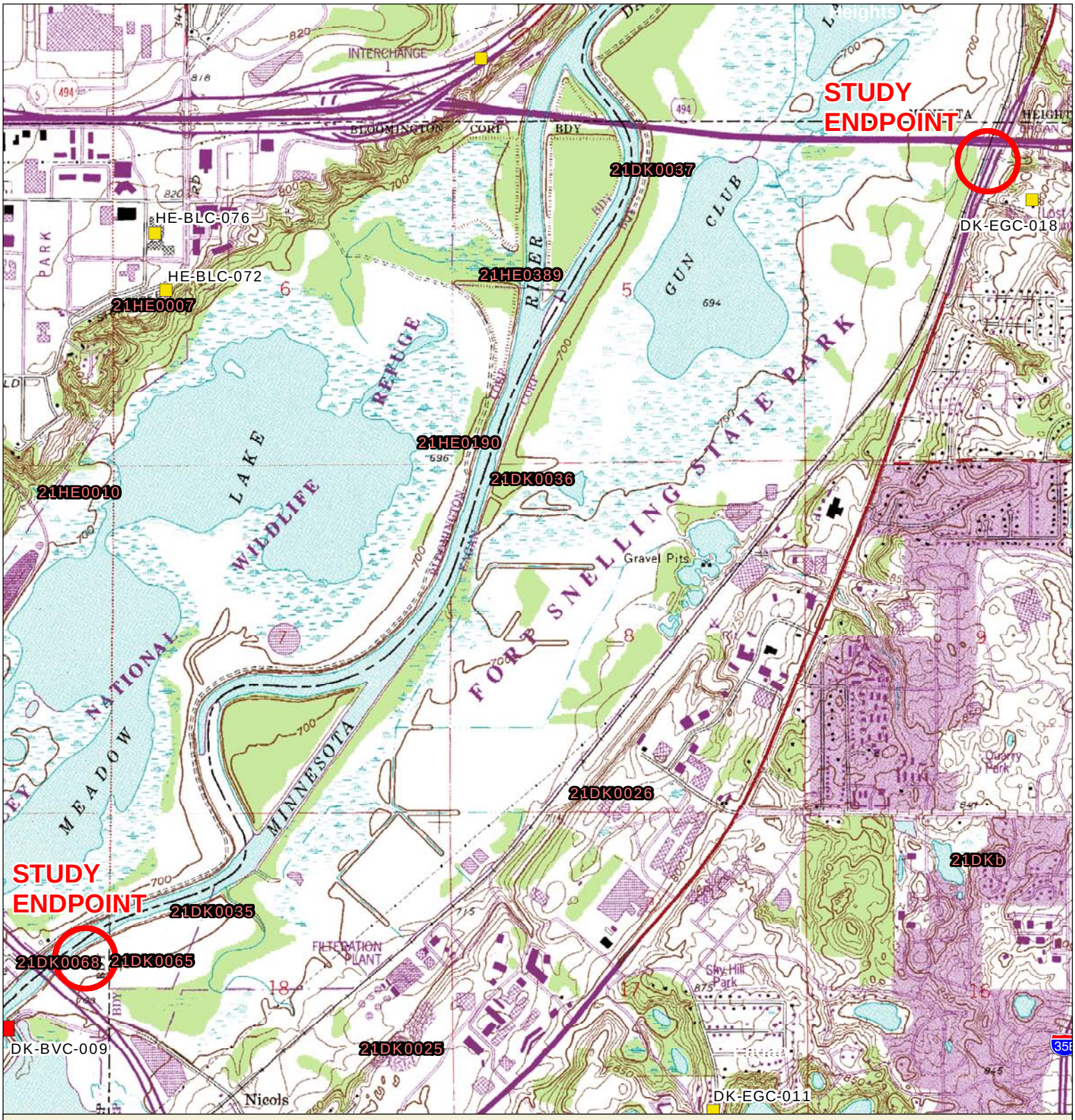

0 2,500 Feet

Legend

- Structure, Inventoried
- Structure, NRHP-Listed or Eligible
- 21DK## Archaeology Site

Source: MnGEO, SHPO

MINNESOTA RIVER GREENWAY EAGAN ALIGNMENT FEASIBILITY STUDY

Known Cultural Resources

November 2013

Map Document H:\DACO\T42106250\GIS\Maps\Known Cultural Resources.mxd
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Appendix B

FEN DELINEATION REPORT and ADDENDUM

Mr. Dan Donayre
Wetland Specialist
Bolton & Menk, Inc.
Consulting Engineers & Surveyors
1960 Premier Drive
Mankato, MN 56001

September 15, 2013

Mr. Donayre,

Midwest Natural Resources, Inc. (MNR) is pleased to provide the following report regarding our findings associated with the calcareous fen evaluation for the Dakota County Greenway Eagan Project.

Background Data

The project site is associated with the Minnesota River and Fort Snelling State Park in Eagan (**Figure 1**). This area had been evaluated originally in 1993 by the Minnesota Biological Survey (formerly the Minnesota County Biological Survey). These past survey efforts resulted in the mapping of several calcareous fen features within the proposed Greenway project area (**Figure 2**). The fen boundaries are based on relevé data which is typically collected for purposes of site documentation and the classification of native plant communities. These data in turn are used to guide digitizing efforts of native plant community boundaries based on vegetative signatures.

Methodology

Meander surveys were conducted throughout the project corridor in areas that had been mapped as calcareous fen (OPp93) by the Minnesota Biological Survey. Additionally, the survey limits for our field review involved evaluating outside of the survey corridor in the area near the northernmost MBS mapped fen. MNR survey efforts involved conducting targeted meander searches for calciphiles as well as categorizing the native plant communities within areas that had been mapped as calcareous fen by the MN DNR. These recent surveys were conducted by Otto Gockman and Scott Milburn on August 28, 2013.

The "Calciphile Species Occurrence Method" was used to calculate the points associated with the flora of potential fen areas based on this methodology's species list. These points are based on the "Test of the Technical Criteria for Identifying and Delineating Calcareous Fens in Minnesota" document (Leete and Smith 2005). The typical numerical threshold under this system is a calciphile score of 50. A species list was compiled for each individual survey location and a calciphile score was generated for each of these areas (**Appendix A**).

Results and Discussion

Two rare plant occurences were observed during the August survey. A population of *Berula erectua* (MN Threatened) was located at the southern end of the study corridor as well as a population of *Carex sterilis* (MN Threatened) at the northern end (**Figure 3**). The locations and extent of each species were recorded using GPS with sub-meter accuracy.

Only one location appeared representative of the calcareous fen community (Area 3) during our evaluation this past August (**Figures 4/5**). This particular area would not satisfy the 50 point numerical threshold based on our species inventory, having only a score of 46. However, it is assumed that there are likely other calciphiles present but undetected that would add to the total calciphile score given spring surveys. The calciphiles observed were *Betula pumila*, *Bromus ciliatus*, *Carex hystericina*, *Carex sterilis*, *Eriophorum angustifolium*, and *Oxypolis rigidior*. This area was fairly small and surrounded by encroaching shrubs. It is very likely that *C. sterilis* is more abundant than reported here, but most of the various Carices were lacking fruiting/flowering structures which aid in the accurate identification of individual plants.

Area 1 is a degraded wet meadow complex primarily dominated by *Phalaris arundinacea*. There was one particular area of interest with a significant population of *Berula erecta* (MN Threatened) and this was the one of only two calciphile species observed during recent survey efforts. There is obvious groundwater discharge associated with the *B. erecta*, but this was not considered a calcareous fen feature.

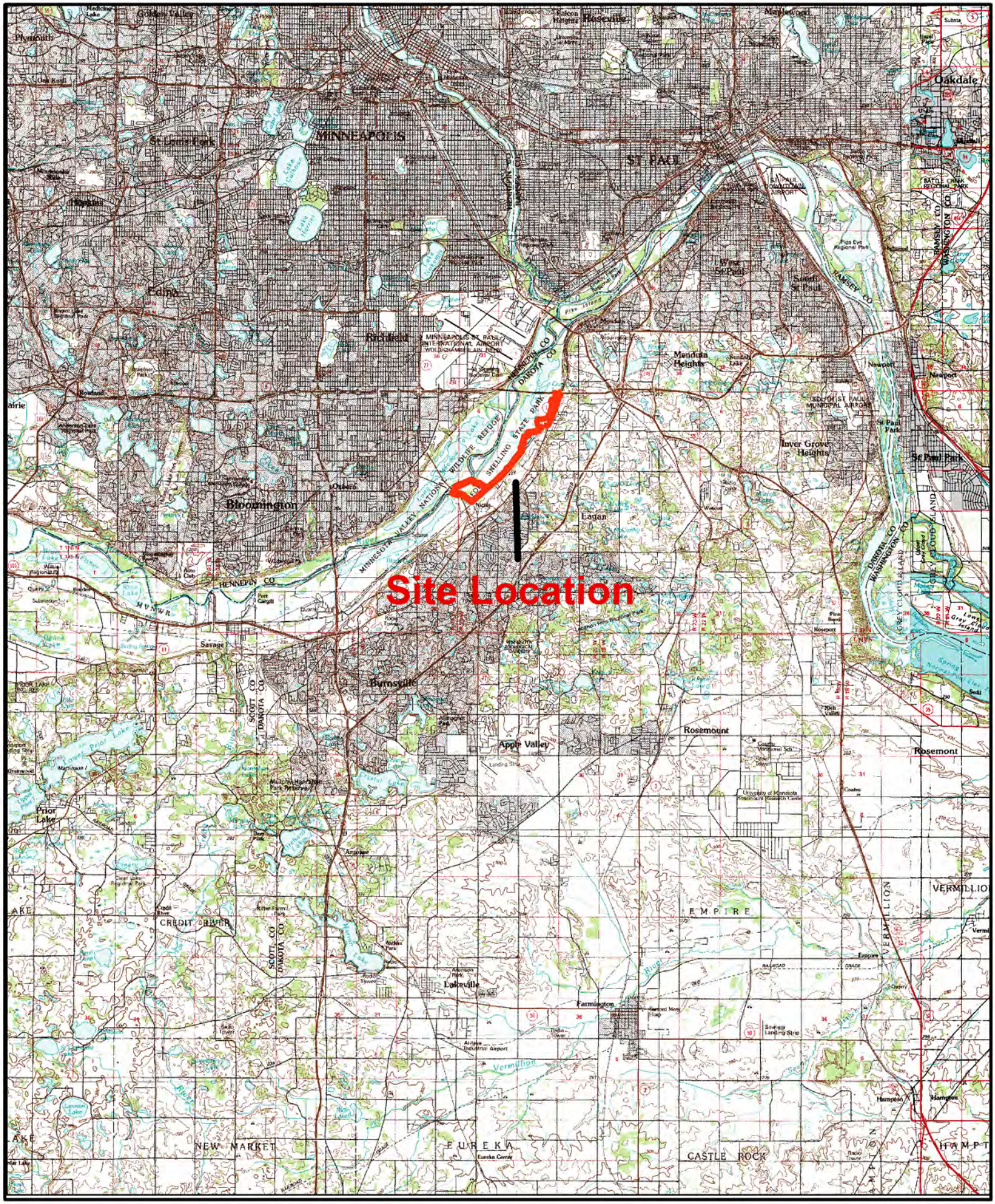
The majority of Area 2 is dominated by non-native cattail (indicative of hydrologic bounce); the photo included in **Appendix B** (Representative photos) depicts a small component of the wetland that remains comprised of native vegetation. This particular area is most similar to the Southern Seepage Meadow/Carr (WMs83) native plant community and is primarily dominated by *Carex stricta*.

Area 4 appears to be a WMs83 community with dense shrub cover to the south, but fairly open to the north as the shrub cover dissipates. The open component of the complex is dominated by graminoid cover (primarily *Carex lacustris*) with *Bidens trichosperma*, *Equisetum fluviatile*, and *Impatiens capensis*.

At this point in time, MNR staff only delineated one area as a calcareous fen community which contradicts the work conducted by the MBS. The timing of our survey efforts made it difficult to identify key calciphiles, particularly Carices that are typically associated with calcareous fen features in the Minnesota River Valley. Ideally the wetland features on the northern end of the study corridor should be revisited during the late spring in order to more accurately map such species as *Carex sterilis* as well as allow a more detailed assessment of the various native plant communities. However, it is possible that the results will not change with future field efforts with issues such as municipal water use, transporation infrastructure, and commercial/residential development in the surrounding area. Calcareous fen features are extremely sensitive to hydrologic alterations directly tied to the recharge zone, and this particular system is likely to be affected by all three issues. This then brings major concern to the persistence of calcareous fens in this region of Minnesota.

Respectfully submitted,

Scott A. Milburn, M.S., PWS
Sr. Botanist/President
Midwest Natural Resources, Inc.



Project Location
Dakota County Greenway Eagan Project
Dakota County, Minnesota

Figure 01

Midwest Natural Resources

MBS Mapped Calcareous Fens
Dakota County Greenway Eagan Project
Dakota County, Minnesota

0 0.2 0.4 0.8 Miles

Figure 02

Midwest Natural Resources

Rare Plant Locations
Dakota County Greenway Eagan Project
Dakota County, Minnesota

0 0.2 0.4 0.8 Miles

Figure 03

Midwest Natural Resources

August 28, 2013 Field Results
Dakota County Greenway Eagan Project
Dakota County, Minnesota

0 0.175 0.35 0.7 Miles

Figure 04

Midwest Natural Resources

August 28, 2013 Field Results
Dakota County Greenway Eagan Project
Dakota County, Minnesota

0 0.05 0.1 0.2 Miles

Figure 05

Midwest Natural Resources

August 28, 2013 Field Results
Dakota County Greenway Eagan Project
Dakota County, Minnesota

0 0.05 0.1 0.2 Miles

Figure 05

Appendix A

Species List

Wetland ID	Plant Species 8-28-2013	Fen Points
Area 1	*Acorus americanus*	
Area 1	*Arctium minus*	
Area 1	*Artemisia serrata*	
Area 1	*Berula erecta*	5
Area 1	*Bolboschoenus fluviatilis*	
Area 1	*Bromus ciliatus*	
Area 1	*Calamagrostis canadensis*	
Area 1	*Calystegia sepium*	
Area 1	*Carex lacustris*	
Area 1	*Carex stricta*	
Area 1	*Carex utriculata*	
Area 1	*Cicuta maculata var. maculata*	
Area 1	*Cirsium muticum*	
Area 1	*Cornus sericea*	
Area 1	*Doellingeria umbellata*	
Area 1	*Epilobium leptophyllum*	
Area 1	*Equisetum arvense*	
Area 1	*Equisetum fluviatile*	
Area 1	*Eutrochium maculatum*	
Area 1	*Fragaria virginiana*	
Area 1	*Frangula alnus*	
Area 1	*Helianthus giganteus*	
Area 1	*Impatiens capensis*	
Area 1	*Lathyrus palustris*	
Area 1	*Lycopus americanus*	
Area 1	*Lycopus asper*	
Area 1	*Oxypolis rigidior*	5
Area 1	*Phalaris arundinacea*	
Area 1	*Phragmites australis subsp. americanus*	
Area 1	*Pilea pumila*	
Area 1	*Poa pratensis*	
Area 1	*Populus deltoides subsp. monilifera*	
Area 1	*Rhamnus cathartica*	
Area 1	*Rorippa sp.*	
Area 1	*Rubus pubescens*	
Area 1	*Rumex britannica*	
Area 1	*Salix bebbiana*	
Area 1	*Salix discolor*	
Area 1	*Salix petiolaris*	
Area 1	*Saxifraga pensylvanica*	
Area 1	*Silphium perfoliatum*	
Area 1	*Solanum dulcamara*	
Area 1	*Solidago canadensis var. canadensis*	
Area 1	*Solidago gigantea*	
Area 1	*Spartina pectinata*	
Area 1	*Taraxacum officinale*	
Area 1	*Thalictrum dasycarpum*	
Area 1	*Typha sp.*	
Area 1	*Viola nephrophylla*	
Area 2	*Ambrosia artemisiifolia*	
Area 2	*Amphicarpaea bracteata*	
Area 2	*Andropogon gerardii*	
Area 2	*Apocynum sibiricum*	
Area 2	*Asclepias syriaca*	
Area 2	*Bidens connata*	
Area 2	*Boehmeria cylindrica*	
Area 2	*Bolboschoenus fluviatilis*	
Area 2	*Bromus ciliatus*	5
Area 2	*Calamagrostis canadensis*	
Area 2	*Caltha palustris*	
Area 2	*Campanula aparinoides*	
Area 2	*Carex hystericina*	5

Area 2	*Carex lacustris*	
Area 2	*Carex sartwellii*	
Area 2	*Carex stricta*	
Area 2	*Chelone glabra*	
Area 2	*Cicuta bulbifera*	
Area 2	*Cicuta maculata var. maculata*	
Area 2	*Cirsium discolor*	
Area 2	*Cirsium muticum*	
Area 2	*Cornus sericea*	
Area 2	*Cuscuta sp.*	
Area 2	*Doellingeria umbellata*	
Area 2	*Eleocharis erythropoda*	
Area 2	*Epilobium sp.*	
Area 2	*Equisetum fluviatile*	
Area 2	*Eupatorium perfoliatum*	
Area 2	*Eutrochium maculatum*	
Area 2	*Frangula alnus*	
Area 2	*Helianthus giganteus*	
Area 2	*Helianthus tuberosus*	
Area 2	*Impatiens capensis*	
Area 2	*Impatiens pallida*	
Area 2	*Juncus torreyi*	
Area 2	*Lathyrus palustris*	
Area 2	*Leersia oryzoides*	
Area 2	*Lemna sp.*	
Area 2	*Lycopus americanus*	
Area 2	*Lycopus uniflorus*	
Area 2	*Lythrum salicaria*	
Area 2	*Mentha arvensis var. canadensis*	
Area 2	*Muhlenbergia sp.*	
Area 2	*Onoclea sensibilis*	
Area 2	*Oxypolis rigidior*	5
Area 2	*Phalaris arundinacea*	
Area 2	*Pilea fontana*	
Area 2	*Poa compressa*	
Area 2	*Poa palustris*	
Area 2	*Populus alba*	
Area 2	*Prenanthes alba*	
Area 2	*Salix amygdaloides*	
Area 2	*Salix discolor*	
Area 2	*Salix interior*	
Area 2	*Schoenoplectus tabernaemontani*	
Area 2	*Scirpus atrovirens*	
Area 2	*Scutellaria lateriflora*	
Area 2	*Solidago gigantea*	
Area 2	*Symphyotrichum lanceolatum*	
Area 2	*Thelypteris palustris var. pubescens*	
Area 2	*Urtica dioica subsp. gracilis*	
Area 2	*Verbena urticifolia*	
Area 3	*Agrostis gigantea*	
Area 3	*Andropogon gerardii*	
Area 3	*Asclepias incarnata var. incarnata*	
Area 3	*Betula pumila*	5
Area 3	*Bidens frondosa*	
Area 3	*Bromus ciliatus*	5
Area 3	*Campanula aparinoides*	
Area 3	*Carex hystericina*	5
Area 3	*Carex sartwellii*	
Area 3	*Carex sterilis*	25
Area 3	*Carex stricta*	
Area 3	*Cirsium arvense*	
Area 3	*Cirsium muticum*	
Area 3	*Comandra umbellata*	

Area 3	*Conyza canadensis*	
Area 3	*Cornus sericea*	
Area 3	*Doellingeria umbellata*	
Area 3	*Equisetum arvense*	
Area 3	*Erechtites hieraciifolius var. hieraciifolius*	
Area 3	*Eriophorum angustifolium subsp. angustifolium*	1
Area 3	*Eupatorium perfoliatum*	
Area 3	*Eutrochium maculatum*	
Area 3	*Glyceria striata*	
Area 3	*Helianthus giganteus*	
Area 3	*Impatiens capensis*	
Area 3	*Lobelia siphilitica*	
Area 3	*Lycopus americanus*	
Area 3	*Lycopus uniflorus*	
Area 3	*Lysimachia quadriflora*	
Area 3	*Maianthemum stellatum*	
Area 3	*Muhlenbergia richardsonis*	
Area 3	*Muhlenbergia sp.*	
Area 3	*Oxypolis rigidior*	5
Area 3	*Pedicularis canadensis*	
Area 3	*Phragmites australis subsp. americanus*	
Area 3	*Poa palustris*	
Area 3	*Prenanthes alba*	
Area 3	*Pycnanthemum virginianum*	
Area 3	*Salix discolor*	
Area 3	*Schoenoplectus tabernaemontani*	
Area 3	*Solidago canadensis var. canadensis*	
Area 3	*Solidago gigantea*	
Area 3	*Solidago riddellii*	
Area 3	*Sonchus arvensis subsp. arvensis*	
Area 3	*Spartina pectinata*	
Area 3	*Symphyotrichum novae-angliae*	
Area 3	*Thelypteris palustris var. pubescens*	
Area 3	*Typha sp.*	
Area 3	*Viola nephrophylla*	
Area 4	*Angelica atropurpurea*	
Area 4	*Bidens connata*	
Area 4	*Bidens trichosperma*	5
Area 4	*Bolboschoenus fluviatilis*	
Area 4	*Calamagrostis canadensis*	
Area 4	*Carex lacustris*	
Area 4	*Cornus sericea*	
Area 4	*Cuscuta sp.*	
Area 4	*Cyperus strigosus*	
Area 4	*Epilobium leptophyllum*	
Area 4	*Equisetum fluviatile*	
Area 4	*Eutrochium maculatum*	
Area 4	*Galium trifidum var. trifidum*	
Area 4	*Helianthus giganteus*	
Area 4	*Impatiens capensis*	
Area 4	*Lycopus asper*	
Area 4	*Mentha arvensis var. canadensis*	
Area 4	*Phalaris arundinacea*	
Area 4	*Phragmites australis subsp. americanus*	
Area 4	*Physostegia virginiana var. virginiana*	
Area 4	*Rumex britannica*	
Area 4	*Salix petiolaris*	
Area 4	*Scutellaria lateriflora*	
Area 4	*Sparganium eurycarpum*	
Area 4	*Symphyotrichum lanceolatum*	
Area 4	*Typha sp.*	
Area 4	*Ulmus americana*	
Area 4	*Verbena hastata*	

Appendix B

Photos

Photo 01 – Site 1

Photo 02 – Site 2

Photo 03 – Site 3

Photo 04 – Site 4

Midwest Natural Resources

Mr. Erick Johnson
Senior Transportation Engineer
Bolton & Menk, Inc.
Consulting Engineers & Surveyors
12224 Nicollet Avenue
Burnsville, MN 55337

June 30, 2014

Report Addendum

Mr. Johnson,

Midwest Natural Resources, Inc. (MNR) completed follow-up surveys of the two areas associated with the Dakota County Greenway Eagan Project. The purpose of these efforts was to further document *Carex sterilis* in the calcareous fen (Area 3) that had been delineated during 2013 survey efforts along with additional data collection in Area 4. This involved the collection of relevé data, which is a vegetative sampling technique that evaluates diversity and cover.

Field Results and Discussion

The 2014 field review of Area 3 yielded no additional observations of sterile sedge (*Carex sterilis*) within the area delineated as calcareous fen (OPp93) by MNR. Area 4 was also re-evaluated in 2014 by means of relevé sampling. Due to signicant rates of precipitation this spring, much of the area identified as Area 4 had been inundated for an extended period of time. Based on field observations, water levels were as high as 2 meters based on observation of debris displacement and shrub stress. Portions of shrubs below the high water mark were entirely defoliated (**Photo 1**). The findings last year for Area 4 concluded that this area was a wet meadow community (WMs83) and the 2014 field review further confirmed this. Only one location within Area 4 was evaluated by means of sampling via the relevé method (**Appendix A**) and the sampling location is illustrated in **Figure 1**. This particular area was dominated by lake sedge (*Carex lacustris*) with greater than 75% cover, with few other species observed (**Photo 2**). Species diversity does appear to be slightly reduced this year, most likely the result of the flooding associated with the Minnesota River. The entire dark signature associated with the relevé location is similar in terms of vegetative cover throughout this entire area with a monotype of reed canary grass (*Phalaris arundinacea*) on the northend of the MBS polygon.

Survey efforts in 2014 confirm our findings as issued in our 2013 report with only one area respresentative of the calcareous fen community type. This concludes our survey efforts. Please let us know if you have any questions.

Respectfully submitted,

Scott A. Milburn, M.S., PWS
Sr. Botanist/President
Midwest Natural Resources, Inc.

Photo 1.

Photo 2.

Relevé Locations
Dakota County Greenway Eagan Project
Dakota County, Minnesota

Midwest Natural Resources

Figure 01

Appendix A

MINNESOTA DEPARTMENT OF NATURAL RESOURCES RELEVE FORM
MNDNR, Division of Ecological & Water Resources, 500 Lafayette Road, Box 25, St. Paul, MN 55155

Initial Scan _____
Entered _____
QC'd _____
Edited _____
Final Scan _____

DNR RELEVE # __ __ __ __

SITE DATA SHEET

GENERAL INFORMATION

DNR RELEVE # __ __ __ __

Surveyor(s): Scott Milburn
Surveyor's Releve #: SAM14-001 **Surveyor's Place Name:**Fort Snelling State Park
Institution: (O)ther Midwess Natural Resources
Purpose of Releve: (C)lassification
Revisit: (N)o
Month: JUN **Year**: 2014 (e.g. 09 JUL 2004)
MBS Site #: __ __ __ **Ownership:** State of Minnesota

VEGETATION INFORMATION

Vegetation Group: (OW) open wetland
NPC Code (Name): WMs83 (Southern Seepage Meadow/Carr)
NPC Ranking in Releve: __ __
Stand Typical of NPC: (N)o
If No, identify appropriate modifier: (N)atural disturbance and (H)uman disturbance
Releve Typical of Stand: (Y)es
If No, identify appropriate modifier: (L)ower Quality
Plot Location in NPC: (M)oderately far from boundary

LOCATION INFORMATION

UTM: 485451 __ __ __ __ E
4966458 __ __ __ __ N
(record in NAD83, Zone 15)

Permanent Marker: (N)o
Marker Type / Placement: 4966458

UTM Accuracy: _____1___ meter
Location Source: (G)PS (A)ir photo (T)opo map (L)iDAR (O)ther _____
County: Dakota County **Township:** 27 N **Range:** 23 **Section:** 4 **QQRT:** SW of **QRT:** SW

PLOT INFORMATION

Plot Size: 10 m x 10m = 100m^2
Elevation: __ __ __ __ ft. **Slope:** 0(%) **Aspect:** LV (e.g., N, NE, etc.; LV for level)
Topographic Context: (D)epression

SOIL INFORMATION

Litter Thickness: ____ cm
Litter Type: (L)eaves (N)eedles (G)rass (O)ther _____
Humus Thickness: ____ cm
HumusType: (M)or (M)oder (P)rairie mull (W)ormed mull
Earthworms Present: (Y)es (N)o
Earthworm Rapid Assessment Rank (low → heavy)**:** (1) (2) (3) (4) (5)
Depth to Semi-Permeable Layer: __ __ __ cm
Depth to Gray Colors or Redox Features: __ __ __ cm
Drainage Class: (E)xcessively/Somewhat excessively (W)ell (M)oderately well
(S)omewhat poorly (P)oorly (V)ery poorly drained
Height of Moss Hummocks: __ __ __ cm
Sphagnum Cover: __ __ __ %
Depth of Standing Water: (>) __ __ __ cm
pH of Surface Water: ____ ± ____
Average Depth to Bedrock: __ __ __ cm
Exposed Rock: __ __ __ %
Rock Group: (F)elsic (M)afic (C)alcareous (S)andstone (S)ioux quartzite (O)ther
Rock Type: _____
General Soil Texture: (C)lay (L)oam (S)and (S)ilt (R)ock (M)uck (P)eat

Soil Layers	Depth of Layer: Top	Depth of Layer: Bottom	Texture[A]	Coarse Fragments: Type[B]	Coarse Fragments: Volume[C]
1:	0 cm	(>) ____ cm			
2:	____ cm	(>) ____ cm			
3:	____ cm	(>) ____ cm			
4:	____ cm	(>) ____ cm			
5:	____ cm	(>) ____ cm			
6:	____ cm	(>) ____ cm			
7:	____ cm	(>) ____ cm			
8:	____ cm	(>) ____ cm			

[A] S = sand, LS = loamy sand, SL = sandy loam, L = loam, SIL = silt loam, SCL = sandy clay loam, CL = clay loam, SICL = silty clay loam, SC = sandy clay, SIC = silty clay, C = clay, RO = rock, PE = peat, MP = mucky peat, MU = muck
If origin of peat or mucky peat is known, add suffix to two-letter code: -m = moss, -s = sedge

[B] Gr = gravel, Co = cobbles, St = stones, Bo = boulders

[C] 0 = <15%, 1 = 15-35%, 2 = 35-60%, 3 = 60-90%, 4 = >90%, ? = unknown

Remarks: Wet meadow system dominated by Carex lacustris with very little diversity. Recently flooded with waterlevels nearing two meters in depth. Species diversity impacted by recent flooding event. Soils assumed organic.

Basal Area & Tree Diameters **DBH List:** (C)omplete (P)artial

Species	L/D	BA-1	BA-2	Ave.	DBH (cm)

Releve-Wide DBH Statistics
Min: ____ Max: ____ Median:____

Prism Factor: ____

Notes:

Photos Taken: (Y)es

DNR RELEVE #:

VEGETATION DATA SHEET

Surveyor(s): Scott Milburn **Surveyor's Releve #:** sam14-001 **Date:** June 2014

County: Dakota **Surveyor's Place Name:** Fort Snelling State Park

ID	C.S	SPECIES NAME	REMARKS	ID	C.S	SPECIES NAME	REMARKS	ID	C.S	SPECIES NAME	REMARKS
	.	*D1-3b*			.	*G1-3c*			.	*H1-3b*	
	+	*Salix petiolaris*			5	*Carex lacustris*			1	*Rumex britannica*	
	+	*Cornus sericea*			1	*Calamagrostis canadensis*			+	*Lysimachia thyrsiflora*	
	.				.				.	*Bidens trichosperma*	Dead
	.				.				1	*Equisetum fluviatile*	
	.				.				1	*Typha cf. glauca*	
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Life Form
B = broadleaf evergreen
D = broadleaf deciduous
E = needleleaf evergreen
G = graminoids
H = forbs
L = lichens
M = mosses & liverworts
C = climbers
K = stem succulents
F = floating-leaved
S = submerged
X = epiphytes

Height
8 >35m
7 = 20-35m
6 = 10-20m
5 = 5-10m
4 = 2-5m
3 = 0.5-2m
2 = 0.1- 0.5m
1 = 0-0.1m

Cover

Group	*Species*	
c	**5**	75-100%
i	**4**	50-75%
p	**3**	25-50%
r	**2**	5-25%
b		1-5%
a		<1%

Abundance
1 <5% cover, many individuals
+ <5% cover, few (2-20) individuals
r <5% cover, single

Sociability
5 = extensive mat
4 = small colonies, broken mat
3 = large group, many plants
2 = small dense clumps
1 = growing singly

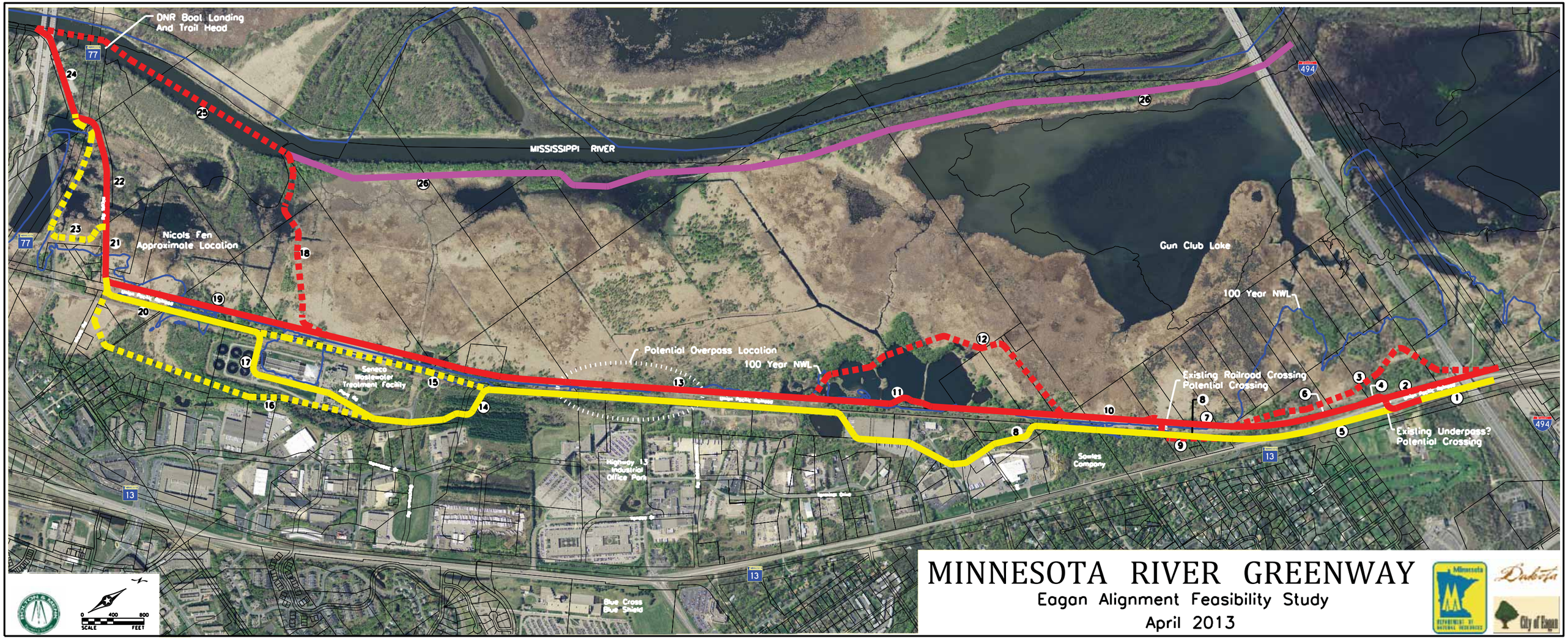
Reliability Code
0 = variety certain
1 = cf. var./subsp.
2 = species certain
3 = species complex
4 = cf. species
5 = genus certain
6 = cf. genus
7 = unknown

Selected Remark Codes
DD = dead
DY = dying
GE = germinating
SD = seedling
SP = sprout (coppice)
FR = fruiting
OP = outside plot (<2m)
= specimen collection

Note: indicate tree canopy by recording "Ca" to right of canopy layer life form/height code (ex: *"D6 - 9p, Ca"*)

Appendix C

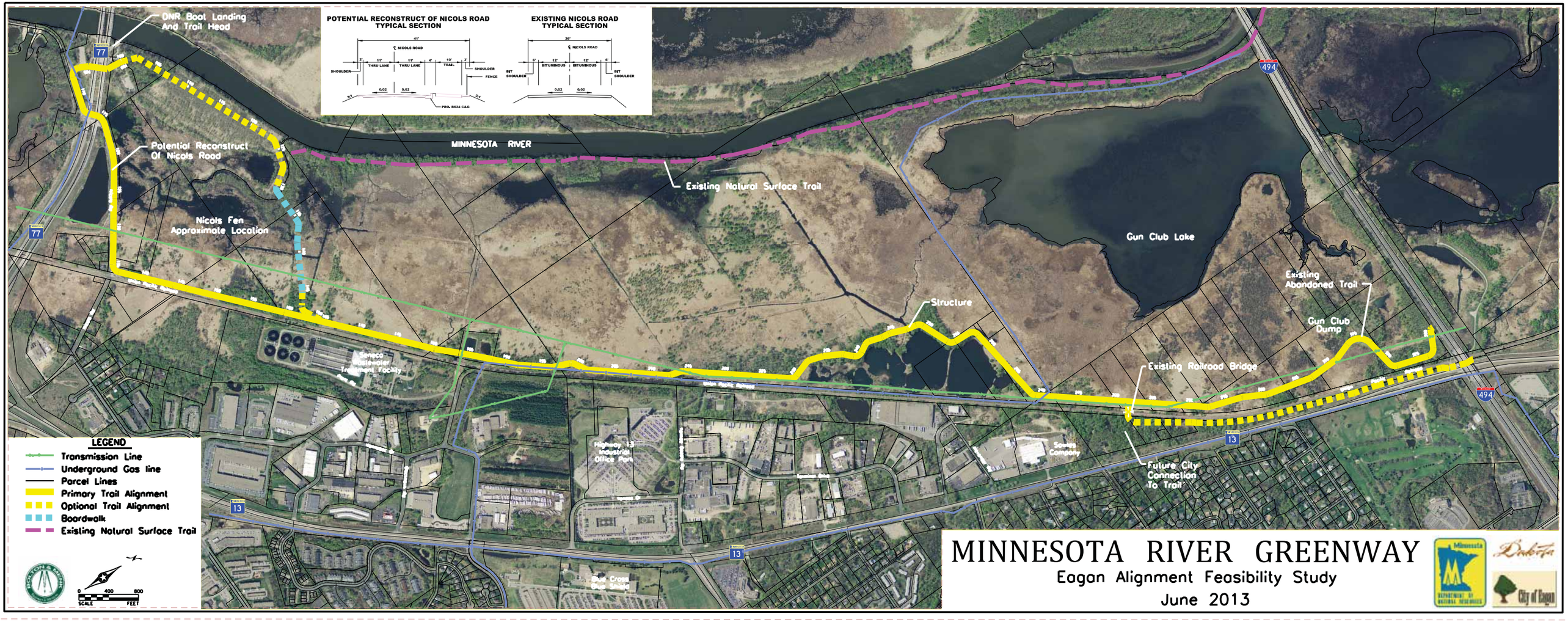
CONCEPT DEVELOPMENT



MINNESOTA RIVER GREENWAY

Eagan Alignment Feasibility Study

April 2013



MINNESOTA RIVER GREENWAY

Eagan Alignment Feasibility Study

June 2013

DNR Boat Landing
And Trail Head

MINNESOTA RIVER

Approximate Location of
Existing Natural Surface Trail

Nicols Fen
Approximate Location

Gun Club Lake

1% Flood Event Elevation

Existing
Abandoned Trail

Potential Overpass Location

1% Flood Event Elevation

Existing Structure Crossing

Existing Railroad Bridge
Potential Under Crossing

Seneca
Wastewater
Treatment Facility

Highway 13
Industrial
Office Park

Sperry
Company

Blue Cross
Blue Shield

LEGEND

- 1% Flood Event Elevation
- Parcel Lines
- Primary Trail Alignment
- Optional Trail Alignment
- (2) Trail Segment Identification
- Existing Natural Surface Trail

0 400 800
SCALE FEET

MINNESOTA RIVER GREENWAY

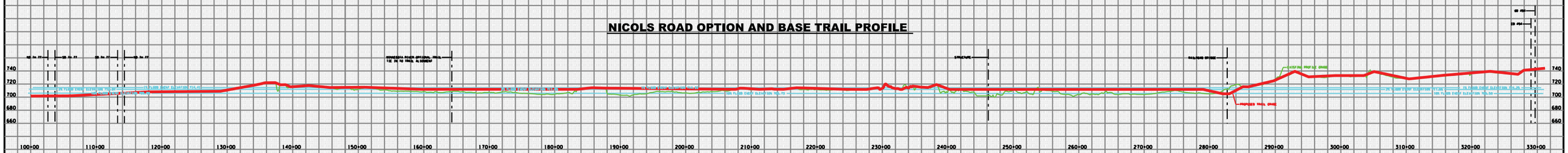
Eagan Alignment Feasibility Study

June 2013

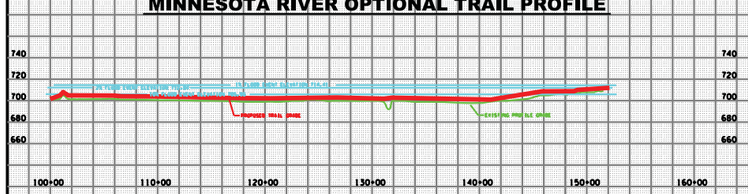
Appendix D

TRAIL PROFILE

NICOLS ROAD OPTION AND BASE TRAIL PROFILE



MINNESOTA RIVER OPTIONAL TRAIL PROFILE



MINNESOTA RIVER GREENWAY

Eagan Alignment Feasibility Study

December 2013

Appendix E

COST ESTIMATES

Minnesota River Greenway

Eagan Segment Feasibility Study

MN River Option	Cost
Base Segment (sta 165+00 to 332+75)	$2,040,000
River Segment (sta 100+00 to 152+00)	$420,000
Railroad Bridge Ballast Shield (Safety Canopy)	$80,000
Concrete Boardwalk / Helical Piers / Aluminum Railing (1145 ft by 14 ft)	$1,580,000
Subtotal 1	***$4,120,000***
Contingency (15% of subtotal 1)	$620,000
Greenway Amenities (15% of subtotal 1)	$620,000
Wetland Mitigation (2.65 acres x 2 at $80,000/acre)	$420,000
Subtotal 2	***$1,660,000***
Total	***$5,780,000***
Conservative Total *(with new RR bridge)*	***$6,060,000***

Nicols Road Option	Cost
Base Segment (sta 165+00 to 332+75)	$2,040,000
Nicols Road Segment (sta 100+00 to 165+00)	$760,000
Railroad Bridge Ballast Shield (Safety Canopy)	$80,000
Concrete Boardwalk / Helical Piers / Aluminum Railing (445 ft by 14 ft)	$610,000
Subtotal 1	***$3,490,000***
Contingency (15% of subtotal 1)	$520,000
Greenway Amenities (15% of subtotal 1)	$520,000
Wetland Mitigation (3.03 acres x 2 at $80,000/acre)	$480,000
Subtotal 2	***$1,520,000***
Total	***$5,010,000***
Conservative Total *(with new RR bridge)*	***$5,290,000***

CONSTRUCTION COST ESTIMATE - BASE ALIGNMENT (STA 165+00 to 332+75)
Minnesota River Greenway
Eagan Segment Feasibility Study
November 25, 2013

Item No.	Description	Unit	Qty.	Unit Cost	Total Cost
2021.501	Mobilization	L.S.	1	$0.00	$0.00
2031.501	Field Office	Each	1	$10,000.00	$10,000.00
2101.501	Clearing	Acre	16	$500.00	$8,000.00
2010.506	Grubbing	Acre	16	$600.00	$9,600.00
2103.607	Haul & Disposal of Non-Hazardous Waste	C.Y.	150	$100.00	$15,000.00
2104.513	Sawing Bituminous Pavement	L.F.	14	$5.00	$70.00
2105.501	Common Excavation (6" vegetation clearing)	C.Y.	11,870	$4.00	$47,480.00
2105.523	Common Borrow (CV)	C.Y.	55,650	$14.00	$779,100.00
2105.604	Geotextile FabricType IV	S.Y.	71,220	$2.00	$142,440.00
2106.607	Select Granular Embankment (CV)	C.Y.	17,400	$18.00	$313,200.00
2211.502	Aggregate Base, Class 5 or Class 7	C.Y.	5,800	$20.00	$116,000.00
2360.501	Bituminous Wearing Course Mix	Ton	3,360	$80.00	$268,800.00
2501.511	C.S Pipe Culvert	L.F.	1,600	$30.00	$48,000.00
2501.569	C.S Safety Apron	Each	64	$300.00	$19,200.00
2511.501	Random RipRap	C.Y.	416	$100.00	$41,600.00
2554.603	Install Guardrail	L.F.	800	$45.00	$36,000.00
2563.601	Traffic Control	L.S.	1	$2,000.00	$2,000.00
2573.502	Silt Fence	L.F.	32,900	$2.00	$65,800.00
2575.505	Turf Establishment (w/Seed, 4" Topsoil,Mulch and Fertilizer)	S.Y.	74,560	$1.50	$111,840.00
2575.601	Temporary Erosion Control	L.S.	1	$5,000.00	$5,000.00
	Base Trail Segment Total				**$2,039,130.00**

CONSTRUCTION COST ESTIMATE - MINNESOTA RIVER ALIGNMENT (STA 100+00 to 152+00)
Minnesota River Greenway
Eagan Segment Feasibility Study
November 25, 2013

Item No.	Description	Unit	Qty.	Unit Cost	Total Cost
2021.501	Mobilization	L.S.	1	$0.00	$0.00
2101.501	Clearing	Acre	8	$500.00	$4,000.00
2010.506	Grubbing	Acre	8	$600.00	$4,800.00
2103.607	Haul & Disposal of Non-Hazardous Waste	C.Y.	50	$100.00	$5,000.00
2105.501	Common Excavation (6" vegetation clearing)	C.Y.	2,350	$4.00	$9,400.00
2105.523	Common Borrow (CV)	C.Y.	7,190	$14.00	$100,660.00
2105.604	Geotextile FabricType IV	S.Y.	14,050	$2.00	$28,100.00
2106.607	Select Granular Embankment (CV)	C.Y.	4,670	$18.00	$84,060.00
2211.502	Aggregate Base, Class 5 or Class 7	C.Y.	1,560	$20.00	$31,200.00
2360.501	Bituminous Wearing Course Mix	Ton	900	$80.00	$72,000.00
2501.511	C.S Pipe Culvert	L.F.	450	$30.00	$13,500.00
2501.569	C.S Safety Apron	Each	18	$300.00	$5,400.00
2511.501	Random RipRap	C.Y.	117	$100.00	$11,700.00
2563.601	Traffic Control	L.S.	1	$500.00	$500.00
2573.502	Silt Fence	L.F.	9,970	$2.00	$19,940.00
2575.505	Turf Establishment (w/Seed, 4" Topsoil,Mulch and Fertilizer)	S.Y.	19,900	$1.50	$29,850.00
2575.601	Temporary Erosion Control	L.S.	1	$2,000.00	$2,000.00
	Minnesota River Trail Segment Total				**$422,110.00**

CONSTRUCTION COST ESTIMATE - NICOLS ROAD ALIGNMENT (STA 100+00 to 165+00)
Minnesota River Greenway
Eagan Segment Feasibility Study
November 25, 2013

Item No.	Description	Unit	Qty.	Unit Cost	Total Cost
2021.501	Mobilization	L.S.	1	$0.00	$0.00
2101.501	Clearing	Acre	5	$500.00	$2,500.00
2010.506	Grubbing	Acre	5	$600.00	$3,000.00
2103.607	Haul & Disposal of Non-Hazardous Waste	C.Y.	30	$100.00	$3,000.00
2104.505	Salvage/Install Bituminous Surfacing (Reuse as Bottom half of Cl 5)	C.Y.	880	$6.00	$5,280.00
2104.513	Sawing Bituminous Pavement	L.F.	225	$5.00	$1,125.00
2105.501	Common Excavation (6" vegetation clearing)	C.Y.	2,920	$4.00	$11,680.00
2105.523	Common Borrow (CV)	C.Y.	6,580	$14.00	$92,120.00
2105.604	Geotextile FabricType IV	S.Y.	27,130	$2.00	$54,260.00
2106.607	Select Granular Embankment (CV)	C.Y.	4,670	$18.00	$84,060.00
2211.502	Aggregate Base, Class 5 or Class 7 (8" thick roadway, 8" thick trail)	C.Y.	2,550	$20.00	$51,000.00
2360.501	Bituminous Wearing Course Mix (4" thick Roadway, 3" thick trail)	Ton	3,390	$80.00	$271,200.00
2501.511	C.S Pipe Culvert	L.F.	350	$30.00	$10,500.00
2501.569	C.S Safety Apron	Each	14	$300.00	$4,200.00
2503.601	Connect and Extend Existing Culvert	L.F.	30	$200.00	$6,000.00
2511.501	Random RipRap	C.Y.	121	$100.00	$12,100.00
2531.501	Concrete Curb & Gutter Design B624	L.F.	2,100	$18.00	$37,800.00
2531.618	Truncated Domes	S.F.	40	$40.00	$1,600.00
2554.603	Install Guardrail (along west side near pond)	L.F.	1,000	$45.00	$45,000.00
2557.501	Wire Fence (along trail on east side)	L.F.	1,000	$15.00	$15,000.00
2563.601	Traffic Control	L.S.	1	$2,000.00	$2,000.00
2573.502	Silt Fence	L.F.	13,320	$2.00	$26,640.00
2575.505	Turf Establishment (w/Seed, 4" Topsoil,Mulch and Fertilizer)	S.Y.	12,500	$1.50	$18,750.00
2575.601	Temporary Erosion Control	L.S.	1	$2,000.00	$2,000.00
2582.502	Striping	L.F.	11,800	$0.30	$3,540.00
	Nicols Road Trail Segment Total				**$764,355.00**

Opinion of Probable Cost (OPC) for Boardwalk Alternatives

01-06-14

The Opinion of Probable Cost (OPC) for the Boardwalk Alternatives includes construction costs associated with maintenance vehicle loading. This load is reflected in all of the decking and foundation costs.

The life cycle costs and considerations:

Traditional wood decking= lifespan of approximately 20 years (5% replacement @ $5 SF) = $0.25 per SF of Decking/YR

Concrete decking= lifespan of approximately 100 years (1% of decking @ $10 SF) = $0.10 per SF of Decking/YR

The foundation design and costs will not be greatly affected by the type of decking that is selected. The foundation will be designed to support the loading requirements regardless of the surface material.

It is anticipated that a 14' wide boardwalk will have three (3) vertical helicals and one (1) lateral support helical for every twelve foot (12') of boardwalk length. It is estimated that an average helical depth of twenty-five feet (25') will be required to achieve the necessary torque and stability required.

1. **Traditional wood decking with helical piers (deep footing)**

   Total OPC Cost per SF (furnished and installed)= $50 SF (includes wood railing)

   Cost breakdown:

   Helical piers= $800 EA (12' O.C. spacing)

   Wood boardwalk (this includes framing, decking and railing)= $30 SF

2. **Traditional wood decking with reinforced concrete caissons (deep footing)**

   Total OPC Cost per SF (furnished and installed)= $60 SF (includes wood railing)

   Cost breakdown:

   Concrete piers= $1400 EA (12' O.C. spacing)

   Wood boardwalk (this includes framing, decking and railing)= $30 SF

3. **Concrete decking with helical piers (deep footing)**

   Total OPC Cost per SF (furnished and installed)= $80 SF (does not include rail)

   Cost breakdown:

Helical piers= $800 EA (12’ O.C. spacing)

Structural steel/concrete= $ 50 SF (verify)

Concrete decking= $10 SF (if stamped and integrally colored add $2 SF)

4. **Fire proof decking with precast concrete piers (Perma Trak)(spread footing)**

Total OPC Cost per SF (furnished and installed)= $63 SF (does not include railing)

Cost breakdown:

The SF number includes boardwalk engineering and design support, material (foundation system, beams and treads) delivered to the site and labor to install the product.

Piers spaced 10’ O.C.

5. **Fire proof decking with cast-in-place concrete piers (spread footing)**

Total OPC Cost per SF (furnished and installed)= $89 SF (does not include railing)

Cost breakdown:

The SF number includes boardwalk engineering and design support, material (foundation system, beams and treads) delivered to the site and labor to install the product.

Piers spaced 10’ O.C.

6. **Fire proof decking with reinforced concrete caissons (deep footing)**

Total OPC Cost per SF (furnished and installed)= $99 SF (does not include railing)

Cost breakdown:

The SF number includes boardwalk engineering and design support, material (foundation system, beams and treads) delivered to the site and labor to install the product.

Piers spaced 10’ O.C.

7. **Fire proof decking with helical piers (deep footing)**

Total OPC Cost per SF (furnished and installed)= $115 SF (does not include railing)

Cost breakdown:

The SF number includes boardwalk engineering and design support, material (foundation system, beams and treads) delivered to the site and labor to install the product.

Piers spaced 10’ O.C.

Approximate Railing costs (furnished and installed):

Wood= $75 LF

Standard Painted Aluminum = $130 LF

Stainless Steel= $300 LF

Appendix F

PROJECT STAKEHOLDER COORDINATION

Minnesota Department of Natural Resources
Division of Ecological and Water Resources
1200 Warner Road
Saint Paul, MN 55106-6793

February 5, 2014 Transmitted via email

Angie Bersaw, AICP
Transportation Planner
Bolton & Menk, Inc.
1960 Premier Drive
Mankato, MN 56001

Dear Ms. Bersaw,

The Minnesota Department of Natural Resources (DNR) has reviewed the Minnesota River Greenway, Eagan Segment Feasibility Study Report draft of December 4, 2013. We commend Dakota County for a thorough planning process and appreciate being included in the feasibility study process. This letter acknowledges our commitment to work with Dakota County on this project to minimize impacts to natural resources, and presents the following comments for your consideration.

Impacts to Calcareous Fens

We appreciate the selection of alternative routes that avoid impacts to calcareous wetlands in the north end of this project. However, Nicols Meadow Fen lies within one of the alternative pathways at the southern end of the project. This fen is currently protected by Minnesota statute (Section 103G.223), regardless of the results of plant surveys conducted in late summer 2013. The exemptions under part 8420.0420 and the sequencing provisions under part 8420.0520 do not apply to calcareous fens. If the Nicols Road alternative were selected, the project proposers would be required to work with DNR wetlands staff to determine if potential impacts could be avoided. We appreciate the discussion of potential restoration activities associated with mitigation (page 42), and encourage you to coordinate with DNR wetlands staff regarding those possibilities. Our recommendation remains to design the trail to avoid the fen area, as you have done elsewhere in the planning process.

However, please see the following discussion regarding wetland impacts from the Mississippi River alternative, which also raises concerns for impacts to rare wetland type and trout streams.

Impacts to Wetlands and Trout Stream

Impacts to wetlands are expected to be incurred on a number of trail sections, as noted in the report. These will be subject to the WCA process and reviewed on a site by site basis. Further, the Mississippi River trail alternatives at the southern end of the project

would cross a native plant community type (NPC) identified by the Minnesota Biological Survey as Bulrush Marsh, which has the conservation status rank of S3 (vulnerable to extinction). NPCs with status rank of S1 to S3 are protected under WCA regulations 8420.0548 subp.3. If the Mississippi River alternative trail is selected, close coordination with DNR wetland staff will be required to assess the wetland condition and to determine if mitigation is appropriate.

In addition, the Mississippi River alternative crosses a state-designated trout stream, which will require coordination with DNR hydrology staff during the public water permitting process, to ensure a stream crossing design that limits impacts to instream trout habitat.

Regulatory Processes

On page 41 of the document, you correctly identify the potential for a state Environmental Assessment Worksheet (EAW) to be triggered if certain thresholds are met (specifically Subp. 26. Stream diversion and Subp. 27. Wetlands and public waters). You also address the potential requirement for an Environmental Assessment (EA) if federal funding is accessed. The requirement for an EA does not replace the requirement for an EAW. If you were to perform a combined EA/EAW, all requirements of the EAW must be addressed in the document. In addition, a public waters permit will be required for work in public water wetlands and for public water crossings. The successful completion of an EA/EAW does not guarantee the granting of a public water permit. Some considerations that will need to be met include culvert and underpass construction designs that meet water and wildlife specifications, and evidence that water flow will not be disrupted.

Natural Heritage Database Review

As this project moves forward, we request that a Natural Heritage Information System (NHIS) review be conducted to identify any records of rare species or rare natural resource features that are known to be located within the project footprint. The NHIS is continually updated as new information becomes available and would include current records and surveys. An NHIS review is considered valid if performed within one year of project implementation. The NHIS Data Request form and rate information can be accessed on the DNR website at http://www.dnr.state.mn.us/eco/nhnrp/nhis.html. Once the project footprint is determined, further rare species surveys will be required. Please contact Lisa Joyal, Endangered Species Review Coordinator (phone: 651-259-5109 lisa.joyal@state.mn.us), regarding procedures and protocols for survey requirements.

Management Concerns

Fort Snelling State Park natural resource management plans include periodic burning through the area of the project footprint. Boardwalk and trail materials that will withstand this process are recommended.

Due to the location of this trail in wetland and floodplain areas, increased mortality to reptiles and amphibians should be expected. Trail design is encouraged that recognizes potential impacts to herpetofauna. Examples include wildlife crossing signs and larger culvert crossings with roadside fencing to encourage crossing in specific areas. During erosion-control activities, the DNR encourages the use of wildlife-friendly erosion control mesh (non-plastic, non-welded).
Traditional erosion control mesh is known to cause injury and may be fatal to wildlife, particularly reptiles and amphibians.

Operational Order 113 (Invasive Species) requires DNR policy and procedures to prevent or limit the introduction, establishment and spread of invasive species. Construction protocols that address the potential spread of invasive plants by large equipment and foot traffic are encouraged.

Thank you for the opportunity to review this document. We look forward to ongoing coordination with you on this project. Please contact me with any questions you may have.

Sincerely,

Brooke Haworth

Brooke Haworth
Environmental Assessment Ecologist, Central Region
MnDNR Division of Ecological and Water Resources
1200 Warner Road, St. Paul, MN 55106
Phone: 651-259-5755
Email: Brooke.haworth@state.mn.us

DEPARTMENT OF THE ARMY
ST. PAUL DISTRICT, CORPS OF ENGINEERS
180 FIFTH STREET EAST, SUITE 700
ST. PAUL MINNESOTA 55101-1678

REPLY TO
ATTENTION

MAR 2 5 2014

Operations
Regulatory (2013-02391-SEW)

Mr. Chris Hartzell
Dakota County Western Service Center
14955 Galaxie Avenue
Apple Valley, Minnesota 55124

Dear Mr. Hartzell:

We have received the document entitled *Draft Minnesota River Greenway, Eagan Segment - Feasibility Study Report* dated December 4, 2013 (Feasibility Report). As requested, this letter contains comments on this document for your consideration. The project site is in the City of Eagan in Section 13, Township 17N., Range 24W., and Sections 4, 5, 8, 9, 17, and 18, Township 27N., Range 23W., Dakota County, Minnesota.

Our preliminary determination is that this project would involve a discharge of fill material into waters of the United States, and thus would be subject to the Corps of Engineers' jurisdiction under Section 404 of the Clean Water Act (CWA Section 404). Waters of the United States include navigable waters, their tributaries, and adjacent wetlands (33 CFR § 328.3). CWA Section 301(a) prohibits discharges of dredged or fill material into waters of the United States, unless the work has been authorized by a Department of the Army permit under Section 404. Information about the Corps permitting process can be obtained online at http://www.mvp.usace.army.mil/Missions/Regulatory.aspx.

The Corps' evaluation of a Section 404 permit application involves multiple analyses, including (1) evaluating the proposal's impacts in accordance with the National Environmental Policy Act (NEPA) (33 CFR part 325), (2) determining whether the proposal is contrary to the public interest (33 CFR § 320.4), and (3) in the case of a Section 404 permit, determining whether the proposal complies with the Section 404(b)(1) Guidelines (40 CFR part 230). The Guidelines specifically require that "no discharge of dredged or fill material shall be permitted if there is a practicable alternative to the proposed discharge which would have less adverse impact on the aquatic ecosystem, so long as the alternative does not have other significant adverse environmental consequences" (40 CFR § 230.10(a)). Time and money spent on the proposal prior to applying for a Section 404 permit cannot be factored into the Corps' decision whether there is a less damaging practicable alternative to the proposal.

The Feasibility Report discusses the status of Dakota County's review of alternatives for the Eagan segment of the Minnesota River Greenway. The Minnesota River Greenway is a partially-constructed multi-use recreational trail that would be approximately 17 miles long when complete, and would connect St. Paul to Burnsville by following the south side of the Minnesota River Valley. The trail would also be part of the larger Minnesota Valley State Trail that is being planned by Minnesota Department of Natural Resources (MnDNR) between Le Sueur and St. Paul. The Eagan

segment would be located in Fort Snelling State Park between I-494 and Highway 77 (Cedar Avenue). The north end of the Eagan segment would connect to the existing Big Rivers Regional Trail leading to St. Paul, and the I-494 bridge trail, which connects west to Bloomington and east to Eagan. The south end of the Eagan segment would connect to an existing MnDNR boat landing, trails in Bloomington via an existing pedestrian river crossing at the old Cedar Avenue bridge, and another planned segment of the Minnesota River Greenway (Black Dog trail).

For our permit review, the Corps is responsible for defining the overall project purpose. The overall project purpose is used for evaluating practicable alternatives under the Section 404(b)(1) Guidelines. The overall project purpose must be specific enough to define the applicant's needs, but not so restrictive as to preclude all discussion of alternatives. Per the Section 404(b)(1) Guidelines, a practicable alternative is defined as available and capable of being done after taking into consideration cost, existing technology, and logistics in light of the overall project purpose. While the Feasibility Report does not define a specific overall purpose for the Eagan segment, it would seem the overall purpose would be to construct a segment of a greenway multi-use recreational trail located on the south side of the Minnesota River Valley between I-494 and Highway 77 in the City of Eagan.

The Feasibility Report discusses preliminary alternative alignments between I-494 and Highway 77 that were eliminated due to inconsistency with Dakota County's greenway vision, expected environmental impacts, and anticipated safety issues. The dismissed alternatives include using the existing Fort Snelling State Park Trail alignment that runs parallel and adjacent to the Minnesota River bank, routing east of the railroad tracks through an industrial area and around the Seneca Wastewater Treatment Facility, routing east side of the railroad tracks opposite the Quarry Lake area, and routing west away from the railroad tracks and around the Gun Club Dump on the north side of the project. Based on the information provided, the Corps believes that the elimination of these alternatives from the analysis for the reasons provided on Pages 29 and 30 of the Feasibility Report would be consistent with future Corp permitting.

The Feasibility Report presents two feasible alternative options on the south end of the trail alignment and the north end of the trail alignment, as well as wetland impact minimization considerations on the trail alignment. The feasible alternatives considered likely wetland impacts based on a wetland delineation of the project corridor that occurred in 2013, as well as the results of an on-going calcareous fen identification and native plant survey effort. The two feasible northern alignment options do not appear to have wetland impacts, while the two south alignment options differ in estimated impacts; the Nichols Road option would have greater wetland fill impacts, while the Minnesota River option, which utilizes a portion of the existing Fort Snelling State Park trail in uplands, and includes a 700-foot boardwalk through a wetland, would have less wetland fill impacts. Despite this, more information will be needed to determine the least environmentally damaging alternative. For instance, the Nichols Road option keeps close to existing infrastructure, such as Nichols Road and the railroad, while the Minnesota River option fragments the wetland, possibly having more impact on habitat. Also, the Nichols Road option would pass through a state-designated calcareous fen (designated as "Area1" in the Feasibility Report). The Feasibility Report indicates Area 1 does not meet calcareous fen criteria, and that calcareous fen investigation Areas 3 and 4 will be studied again this spring. The Corps would recommend also surveying Area 1 again this spring, since this location yielded a population of *Berula erectua* and would be crossed by the Nichols Road alignment. As state-designated calcareous fens are specially protected, more information about the status of these areas as state-designated fens may be needed.

The Minnesota River option reduces wetland fill impacts by partially utilizing an existing trail alignment, using existing uplands, and using a 700-foot boardwalk to cross a wetland area. The Minnesota River alignment would avoid the Nichols fen area, provide public access in the Fort Snelling State Park, provide viewing of the Minnesota River, accommodate bicyclists, be fire-resistant, and use helical piers to reduce ground disturbance. However, the Minnesota River option fragments the wetland, and also crosses through an area of three known archaeological resources in the location of the Fort Snelling State Park trail, including Black Dog Village. Depending on the nature of these resources, including but not limited to their potential eligibility for the National Register of Historic Places and the interest of tribal communities, it may come to light that it is prudent to avoid this area.

Depending on the funding of this project, the Corps may be the lead federal agency responsible for the review of impacts to historic properties under Section 106 of the National Historic Preservation Act. In the future, if it seems likely the Corps would be the lead federal agency involved with this project, please contact us early so we can appropriately review this project under Section 106, which could involve requiring archaeological surveys and coordination with the SHPO and tribes, as indicated on Page 36 of the Feasibility Report.

The Corps appreciates the information you provided that describes the measures that were taken into account at this stage in the planning to reduce wetland impacts in the feasible alternatives. These measures included things like using minimum state standards for proposed trail and road cross-sections, utilizing boardwalks in two low areas around quarry lake, utilizing a boardwalk in the Minnesota River option, installing equalizer culverts at appropriate intervals along the trail length to convey floodwaters, utilizing an existing railroad bridge crossing to cross east of the railroad tracks, construction of boardwalks using helical piers, the utilization of delineated upland areas to avoid wetland impacts when possible, and keeping the trail close to the existing railroad to reduce wetland and floodplain fragmentation. In future documents for this project, the Corps will continue to analyze wetland impact minimization to ensure impacts are minimized to the maximum practicable extent. Some additional potential minimization efforts may include locating the trail closer to the railroad at Stations 275-281, and constructing on frozen soils as much as possible. Also, the Feasibility Report indicates the trail may have an optional alignment just south of Quarry Lakes, along the railroad tracks or through a wooded area. The report indicates it is not known if these two options would have wetland impacts. This area should be delineated to determine which option is preferable. The Section 404(b)(1) Guidelines specifically require that "no discharge of dredged or fill material shall be permitted if there is a practicable alternative to the proposed discharge which would have less adverse impact on the aquatic ecosystem, so long as the alternative does not have other significant adverse environmental consequences" (40 CFR § 230.10(a)).

In addition to these comments, we have a few specific comments on the text on Page 42 of the Feasibility Report:

- The Corps is reviewing the September 2013 wetland delineation report for concurrence, as requested. If more information or a site visit is needed, we will let you know.

- The report recommends a pre-application meeting with the TEP in the future. The Corps would also like to be a part of this meeting.

- The report indicates wetlands would have to be mitigated under WCA; the report should also indicate wetland impacts would also be mitigated under Section 404 CWA.

- We note that the applicant is considering options for compensatory mitigation, including on-site project-specific compensation (i.e. restoration, enhancement, etc.) and the purchase of wetland bank credits. Based on the Mitigation Rule (33 CFR 332), the Corps preferential sequence for compensatory mitigation is 1) wetland banking credits, 2) project-specific compensation based on a watershed approach, 3) project-specific compensation that is on-site and in-kind, and 4) project-specific compensation that is off-site or out-of-kind. If wetland banking credits would be purchased, the bank should be located within the same major watershed as the impacts, if possible. We cannot supply specific comments at this time since a permit application and compensatory mitigation proposal has not been submitted. If on-site mitigation was proposed, the Corps would require performance standards per the Mitigation Rule.

As you know, the project proposer may request a pre-application consultation meeting with the Corps to obtain information regarding the data, studies or other information that will be necessary for the permit evaluation process. A pre-application consultation meeting is strongly recommended if the proposal has substantial impacts to waters of the United States, or if it is a large or controversial project.

Thank you for allowing us the opportunity to comment on the Feasibility Study for the Eagan segment of the Minnesota River Greenway. We look forward to continuing to work with you on this project. For further information or to request a pre-application consultation meeting, please contact Sarah Wingert at 651-290-5358, the Corps' project manager for Dakota County.

Sincerely,

for Tamara E. Cameron
Chief, Regulatory Branch

Copy furnished:
Angie Bersaw – Bolton & Menk, Inc.

MINNESOTA RIVER GREENWAY
EAGAN ALIGNMENT FEASIBILITY STUDY

PROJECT MANAGEMENT TEAM MEETING #1

Wednesday, April 3, 2013
9:30 – 11:30 AM

Meeting Location: Dakota County Western Service Center

MEETING MINUTES

Attendees:

Chris Hartzell, Dakota County	Dave Felleson, DNR
John Mertens, Dakota County	Juli Johnson, City of Eagan
Kurt Chatfield, Dakota County	Mike Ridley, City of Eagan
Bruce Blair, Dakota County	Eric Johnson, Bolton & Menk
Cindy Wheeler, DNR	Angie Bersaw, Bolton & Menk

1. Introductions/Project History

Eric provided a brief overview of the study purpose and history. He noted the current study is building upon the efforts of the 2011 Dakota County Minnesota River Greenway Master Plan. The master plan identified general regional trail alignments and design and greenway standards for the Minnesota River Greenway between Burnsville and downtown St. Paul.

The current study will consider the feasibility of a potential trail alignment through the four mile section of the Minnesota River Greenway between I-494 and TH 77 in Eagan. The study will refine the master plan alignment concepts for this area to address issues unresolved during the master planning process. The study will conclude with the identification of a preferred alignment and preliminary environmental documentation for the County's use in moving forward to solicit funding for the trail construction.

2. Review Scope, Project and Schedule

Eric reviewed the study tasks and schedule. He noted the overall study is anticipated to be completed in a 5-6 month timeframe. John said there is no immediate deadline for the study since the metro area federal funding solicitations have been pushed back this year.

Eric noted the PMT will guide the overall study process and recommendations. Kurt noted the importance of having the right people at the table from the start of the study. He suggested the County's survey staff get involved to clarify the location of the railroad right-of-way as it relates to the floodplain elevations. He noted there are very tight constraints with some of the alignment options and their proximity to the floodplain, wetlands and the railroad. He felt survey accurate data will be necessary to identify fatal flaws in alignment alternatives early on. Cindy suggested a DNR hydrologist be invited to participate on the PMT. She will provide follow up with contact information for a DNR Hydrologist.

Angie stated the overall study will conclude with a study report to document the process, public and agency input and recommendations. Bolton & Menk will also prepare a draft Project Memorandum to ensure the County is prepared to solicit funding for this segment of the Minnesota River Greenway.

3. Public Agency Coordination

Eric reviewed the proposed public and agency coordination efforts as outlined on the study schedule. He stated meetings are planned with the Union Pacific Railroad, agencies and key property owners/stakeholders in the study area. He noted there was still some uncertainty whether or not a public open house would be an effective means for public involvement with this study since the master plan effort was recently completed and the current study area is largely industrial in nature. Kurt felt some type of public process was important to demonstrate transparency in the process. Juli suggested the County host a project meeting or provide a presentation to the City's Parks Commission as a means to engage the public. She said these meetings are televised and could therefore, reach a larger audience. PMT members agreed this was a good suggestion for consideration as the study progresses.

Eric reviewed the agency coordination and Union Pacific Railroad coordination anticipated. John suggested Bolton & Menk wait 3-4 weeks to engage the railroad since the County is close to an agreement with them on another project and does not want to jeopardize that process. John also suggested the study engage Dakota County's environmental services department, specifically as it relates to the Gun Club Lake contamination. He stated they have been very involved in studying the contamination in this area and would provide good input on what may or may not be feasible in this area.

4. Data Collection/Key Issues Identification

Eric reviewed the preliminary issues Bolton & Menk had uncovered through research of previous plans and GIS datasets. The following issues were discussed by the PMT:

- Floodplain – need to locate trail above 1% flooding event?
    - Black dog Road Trail (anticipated to be constructed in 2014/15) is within 100 year flood plain

- Need to better understand implications of locating trail in floodplain (how often would flooding be anticipated? how long would closures likely be?) and compare to the cost/feasibility of elevating the trail out of the floodplain.
- Kurt suggested researching the elevations of the trails along Black Dog Road and the Lilydale area, which are located on either side of this study area. He noted both of these trails flood periodically and understanding their elevations may provide some insight into what type of flooding could be expected in the study area.
- Dave noted the existing natural surface trail along the river bank in the state park is difficult to maintain and often floods. He felt a bituminous trail in this area would be too costly to maintain. Kurt stated the existing natural trail would be a nice complement to the regional trail, offering a loop system through this scenic area.
- Dave noted beaver activity within the park and wetland areas are becoming more problematic. The beavers are plugging up the channels which help drain the floodplain after high water events.
- Impacts to wetland areas will be a significant challenge within the study area. A DNR hydrologist will be able to provide good insight into what types of wetlands are in the study area and whether or not mitigation opportunities may exist. Boardwalks may need to be considered. Also need to coordinate with the appropriate watershed management organization for this area.
- Eric noted the existing trout streams and Fens within the study area. PMT members noted the trout have been largely depleted from these streams. Coordination with the appropriate resource agencies will be necessary to understand potential constraints and opportunities within these areas.

- Controlled Burns
  - Dave said there are no controlled burns within the state park area. However, sparks from the rail cars have caused fires in the park in the past.
- Railroad/Utilities
  - Eric reported there are currently 8 trains per day running at an average speed of 49 mph through the study area.
  - Trail is not anticipated to encroach upon the railroad right-of-way except for the crossing locations.
  - Railroad crossings are needed to connect trail to Eagan. Without these connections, illegal trespassing across the railroad will be likely and will create safety issues.

  - Need to communicate the safety benefits to the railroad, such as removing trespassing issues and providing dedicated grade separated trail crossings.
  - The provision of some access across the railroad to connect to Eagan is necessary. The location of the specific access is not as important as the provision for access somewhere.
  - Need to evaluate existing underpass locations. Are they large enough to accommodate groomers and emergency vehicles? Can they be expanded to meet the required standards?
  - Some utilities exist within the railroad right-of-way. Need to verify all utility locations including sewer, gas and overhead power.

- Contaminated Sites
  - Gun Club Lake Dump is contaminated with lead/battery acid and is estimated to cost $50 million to clean up.
  - Trail project could be impetus to organize a clean-up of the Gun Club site with outside funding sources.
  - Additional discussion is needed with County's environmental services department to better understand the constraints/opportunities with this site.
- I-494 connection
  - Eric asked for thoughts on how the proposed trail could connect into the existing I-494 trail. The PMT discussed options for connecting to the I-494 trail depending upon which side of the railroad tracks the proposed trail would be. Further discussion on this item will be needed.
- Parking Areas/Greenway Amenities
  - John felt identifying parking areas and other greenway elements won't be a focus of this study.
  - Dave noted the existing boat launch already has a parking lot but under existing regulations, trail users would need to purchase a state permit to access the trail if parking here.
  - Nicols Road has access to an existing parking area. However, it may be difficult for a trail development due to the steep ditches in this area.
  - Alignment segment #23 is most likely the easiest (least regulated) option. Alignment segment #18 would likely require a boardwalk which could provide the best user experience. Need to study all of these options further.
- Other/General Issues
  - The old Cedar Ave bridge is planned to be restored and will link multiple cities/trails. It is part of a $13 million bonding request this year.

- The Gun Range presents a concern. A trail in close proximity to this area is not feasible since there wouldn't be much separation from activity areas.
- Access to the Blue Cross/Blue Shield campus will be desired. They currently have 5,000-6,000 employees at this site and maintain a supportive culture for healthy living (i.e., walking meetings).
- Eagan is working on redevelopment within the Cedar Grove area. A connection to this area would be an attractive amenity.
- Bolton & Menk has also conducted research and identified known cultural resources, Section 4(f)/6(f) properties and water resources.

5. Next Steps

Bolton & Menk will continue their research on issues within the study area and will begin to meet with agencies such as Met Council, the DNR and County Environmental Services. The next PMT is anticipated in 1-2 months after some of this agency coordination has taken place. The purpose of the next PMT meeting will be to identify fatal flaws to trail alignments to further refine the range of options.

Dakota County will create a project website and share files with the DNR so that their hydrologist and other staff members can review and provide input.

Dakota County and Bolton & Menk will conduct a field visit of the project area once the snow has melted. Bolton & Menk will also request a utilities/gopher one locate for the corridor.

6. Next Meeting Date(s)

The next PMT meeting is anticipated in 1-2 months. Bolton & Menk will send out a meeting invite with the meeting information prior to the meeting.

MINNESOTA RIVER GREENWAY
EAGAN ALIGNMENT FEASIBILITY STUDY

WETLANDS/WATER REGULATORY STAKEHOLDERS MEETING

Thursday, June 27, 2013
9:00 – 11:00 AM

Meeting Location: Dakota County Western Service Center

MEETING MINUTES

Attendees:

Chris Hartzell, Dakota County	David Holmen, Dakota SWCD
John Mertens, Dakota County	Sarah Wingert, US Army Corps of Engineers
Cindy Wheeler, DNR	Melissa Doperalski, DNR
Eric Macbeth, Eagan/Gun Club Lake WMO	Eric Johnson, Bolton & Menk
Terry Schwalbe, Lower Minnesota River WD	Kelly Henry, Bolton & Menk

1. Introductions/Project History

After attendees introduced themselves, Eric Johnson described the goals of the meeting, including hearing regulatory agency opinions about the proposed trail alignments.

2. Project Background

John Mertens provided a brief overview of the project background. He noted the current study is building upon the efforts of the 2011 Dakota County Minnesota River Greenway Master Plan for a 17-mile corridor between St. Paul and Burnsville. The current study will consider the feasibility of a potential trail alignment through the four mile section of the Minnesota River Greenway between I-494 and TH 77 in Eagan. This segment represents a gap in the Dakota County section of the regional trail and will also provide a connection to the inner city trail in Bloomington via the old Cedar Avenue Bridge. The Eagan segment is of the highest priority for the County and will be considered for potential bonding and grant opportunities.

The current feasibility study will refine the master plan alignment concepts for this area and will conclude with the identification of a preferred alignment and environmental screening for the County's use in moving forward to solicit funding for the trail construction.

3. Project Corridor

Eric described the proposed trail alignment, beginning with the southern segment along Nichols Road and the southern terminus connection at the Black Dog trail segment in Burnsville. The Nichols Road segment would include reconstruction of the roadway to provide room for the trail along the existing road. The road would be narrowed but maintained as a park access road. Approximately five additional feet of width would be necessary to accommodate the two-lane access road and the trail. There is potential to widen the road to the south toward the MnDOT pond instead of into the wetland area on the north side of Nichols Road. Melissa noted that the MnDOT pond may be considered a converted wetland, still subject to Clean Water considerations and suggested coordination with the Minnesota Pollution Control Agency regarding alteration and continued use for surface water management. The trail would turn to the north at the RR. The City could connect to the trail at the at-grade RR crossing of Nichols Road.

Moving to the north, the proposed trail alignment follows along the edge of the railroad right-of-way (ROW) past the Wastewater Treatment Facility and former treatment ponds. It is understood that the former treatment ponds have been remediated upon cessation of use for wastewater treatment. This segment crosses two designated trout streams and the Nichols Fen area.

An alternative alignment across the floodplain/wetland to an upland area near the Cedar Avenue bridge where an existing dirt trail exists would avoid the trout stream and fen crossings. A segment of boardwalk across the wetland area is under consideration. Discussion about the boardwalk included consideration of the surface and accessibility for bicycles and rollerblades in addition to pedestrians and fireproofing to withstand the occasional fires that occur along the floodplain area.

The proposed trail alignment would continue north along the railroad ROW to Quarry Lake, an old sand mine, and would utilize upland area resulting from past dredge disposal. The trail would provide public access to the lake where there is already public use for fishing and swimming, however, current access is gained by trespassing across the railroad tracks. North of Quarry Lake there is another potential for a connection to the City of Eagan if an underpass beneath the railroad is feasible from an engineering perspective and if an agreement can be made with the railroad.

There are two options for the northernmost segment and connection to the St. Paul trail. One option would remain within the State Park utilizing some upland area and an old paved trail. This option would place the trail adjacent to the existing Gun Club Lake dumpsite, a known contaminated site estimated to require $55 million to clean up. The trail would be constructed on fill through this segment to avoid disturbing contaminated soils. Alternatively, and if an underpass was feasible to cross the railroad ROW, the trail would be constructed between the railroad ROW and the Trunk Highway (TH) 13 ROW. The railroad ROW and TH13 road use converge near I-494, limiting available space for the trail. The limited space would require design exceptions for the trail which the County considers a reduction to user safety.

The trail would be constructed to Regional Greenway Standard including a 10-foot trail with 2-foot grass shoulders. Cindy noted that this is the same as the DNR trail standard. Due to poor soils throughout the area, it is assumed that the trail would be constructed on 3 feet of fill. Elevation to the 50-year flood elevation would require 0-3 feet of additional fill.

4. Open Discussion of Regulatory Issues

Kelly described the trail feasibility study is seeking to find a balance between design to a particular flood elevation and the impacts to wetlands. Melissa noted that the fen areas known to exist along the corridor will require delineation by a fen specialist to delineate the boundaries between fen and other wetland habitat. Impacts to a fen, or even construction nearby, would require an Order from the DNR Commissioner and development of a fen management plan (more accurately a plan to avoid and minimize adverse impacts to the fen). Melissa also noted that the Wetland Conservation Act (WCA) provides additional protection for protected plant communities. Sarah recommended baseline monitoring in the fens if they are to be crossed by the trail. The trail alignment alternatives currently under consideration include options to avoid impacting the fens, however, the northern segment would require a feasible option to cross the railroad.

The southern option that avoids the fen would utilize an existing dirt trail in or near the known cultural resource site, Black Dog Village. This would require Section 106 consultation, led either by a Federal funding agency or the Corps of Engineers during the Clean Water Act permit review.

At a 50-year elevation, the proposed trail is estimated to impact up to 17 acres of wetland habitat. Kelly noted that the feasibility study will evaluate a variety of trail construction methods, including boardwalk, and will consider the costs associated with wetland mitigation for fill segments. Sarah noted that the Corps could consider reduced mitigation requirements with a boardwalk. David noted that only the footprint of the boardwalk would be considered an impact under the WCA. Chris noted that the Minnesota River Greenway Master Plan included consideration of a trail segment east of the railroad that would avoid the need to cross railroad ROW and would reduce wetland impacts. Although that alternative should be described in future permit applications to demonstrate consideration, Sarah acknowledged that a trail through an industrial area could be considered more dangerous, a condition that would be considered during permit review.

Improvement of the existing dirt trail along the river was also considered during development of the Master Plan, but was dismissed due to the frequency of flooding and the associated maintenance requirements. Sarah noted that there may be limited upland areas along that alignment and that delineation would be necessary in that area to determine if that alignment would result in less wetland impact.

Kelly stated that potential additional upland areas not reflected on the National Wetlands Inventory (NWI) were noted during the field walk conducted earlier in June. Discussion followed about the appropriate timing of wetland delineation. The Corps would require a delineation and calculation of impacts in order to provide an opinion on alignment and trail construction

alternatives. A Jurisdictional Determination (JD) from the Corps would be valid for 5 years. An approved delineation under the WCA would be valid for 3 years, but would not necessarily require substantial work to update if trail construction was delayed beyond that timeframe. The DNR would be the WCA LGU for a trail alignment within the State Park.

Eric Macbeth noted that the City of Eagan has mapped the trout streams east of the railroad tracks and that the most current information is different than what is on record at the DNR Data Deli. The City can make the updated information available. The trail plan should avoid increases in surface temperature and control erosion and sedimentation to avoid impacts to the trout streams.

To conclude the discussion of regulatory issues, the County noted that future efforts to acquire grant funding would benefit from written support of the regulatory agencies. It was also noted that grant awards are often tied directly to a project location, limiting the ability to consider alignment alternatives and making it important to have agency concurrence on the trail alignment prior to project funding. Eric Macbeth said that he expected both the City of Eagan and the Gun Club Lake WMO could provide resolutions supporting the trail alignment concept, subject to future review and approvals. Cindy noted that the concept has staff support, but that support from the DNR as an agency would be better. Cindy will look into what steps would be acquired to request written agency support. Sarah noted again that the Corps would require better estimates of wetland impacts before commenting on trail alignment and construction alternatives, but can provide concurrence on early project steps (i.e., Purpose and Need) and indicate suitability of the conceptual trail location.

Melissa added that the DNR will have concerns about the potential for invasive species along the corridor. Any fill to be brought in will need to be shown to be free of invasives. She also recommended review of the Natural Heritage Information System (NHIS) database. Known populations of rare species along the corridor could require conduct of a botanical survey.

5. Next Steps

The current feasibility study is scheduled to be completed in October 2013. There is potential for future agency presentations about the trail studies to date to garner agency support and the desired written support for future grant applications.

MINNESOTA RIVER GREENWAY
EAGAN ALIGNMENT FEASIBILITY STUDY

FINAL PROJECT STAKEHOLDERS MEETING

December 18, 2013
9:00 – 11:00 AM

Meeting Location: Dakota County Western Service Center

MEETING MINUTES

Attendees:

Chris Hartzell, Dakota County	David Holmen, Dakota SWCD
John Mertens, Dakota County	Dennis Rodacker, BWSR
Kurt Chatfield, Dakota County	Brooke Haworth, DNR
Cindy Wheeler, DNR	Sarah Wingert, Corps
Dave Felleson, DNR	Juli Johnson, City of Eagan
Anton Benson, DNR	Mike Ridley, City of Eagan
Eric Macbeth, Eagan & Gun Club WMO	Tim Plath, City of Eagan
Linda Loomis, Lower MN River WD	Eric Johnson, Bolton & Menk
Scott Milburn, Midwest Natural Resources	Angie Bersaw, Bolton & Menk

1. Introductions

Eric Johnson asked each attendee to introduce themselves. He stated the purpose of the meeting was to recap the overall project vision, particularly for those who may not have been involved earlier on in the project, and to share key findings, impacts and recommendations. Eric noted a discussion of next steps would also be included.

2. Project Background

John Mertens provided an overview of the Minnesota River Greenway Master Plan and related trail planning efforts in this area. He noted the importance of the Eagan segment and the connections it will provide. Eric Johnson and Angie Bersaw reviewed a powerpoint presentation

which provided a general overview of the study goals, study area considerations, the analysis conducted, and recommendations. The presentation also mirrored the information in the draft study report which had been provided to the project stakeholders in advance of the meeting.

3. Alternatives/Findings

Eric Johnson and Angie Bersaw reviewed the trail alignments considered and the progression of the alignment decisions made during the study. They made specific note about how the alignment was refined using the information from the wetland and fen delineations to reduce impacts. Eric and Angie also summarized the recommended alignments and the impacts anticipated as outlined in both the draft study report and presentation. The following summarizes project stakeholder's discussion:

- Anton Benson noted it would be helpful if Scott Milburn could provide details on the geographic extent of his meander survey during the fen delineation completed in the fall of 2013.
- Brooke Haworth stated the Nicols Fen boundary is designated in Minnesota Statutes. She will look into how to deal with this if the boundary of that fen is different (per Scott Milburn's report) than how it was recorded in statute.
- Dennis Rodacker stated a boardwalk through the wetland may not be considered a WCA impact. Definition of fill does not typically include a footing.
- Sarah Wingert stated the Corps will typically consider clearing in a wetland an impact; however, the mitigation would likely be at a lesser ratio. She also stated any grading in a wetland is considered fill.
- Sarah commented on the potential to construct the trail in the winter. She said mats could be utilized to minimize wetland disturbance but that a wetland restoration plan would still likely be needed; however, mitigation would probably be unlikely.
- Sarah also noted fill may not be considered an impact to cultural resource sites. The Corps would need to coordinate with SHPO. This could be done prior to permitting.
- Anton stated the DNR would like to conduct prescribed fires in the state park area in the future so a fire resistant boardwalk facility would be preferable.
- Eric Macbeth asked how the trail may impact fire response. County staff felt the trail wouldn't restrict response and could actually improve access.
- Dennis stated that from a WCA perspective the Minnesota River Trail option would be preferred since it has less wetland impacts.
- Brooke questioned whether or not the Nicols Road option would require a Public Waters Permit.

- Tim Plath noted that the "future city connection" shown on Figure 1 near Nicols Road should be corrected to read future county connection. The city does not have any plans for a trail connection in that area. Tim also noted the City is currently reevaluating the future purpose of Nicols Road since north of the railroad this road will be a dead end, serving only the power plant operations. John noted that this segment of Nicols Road will also be important for the County if the boat launch area includes a trailhead in the future.
- Stakeholders asked Dakota County staff which option they preferred near the south end. Staff reported the Minnesota River option is probably preferred over Nicols Road from a user experience perspective; however, there is a substantial cost difference between the two options to consider as well.
- Eric Johnson noted the higher range of the cost estimate includes construction of a new railroad bridge if the existing bridge cannot be utilized or an agreement cannot be reached with the railroad.
- Dennis felt the cost estimate for wetland mitigation was low. He suggested assuming $80,000/acre for banking wetland credits. Brooke suggested also adding a line item in the cost estimate for public water permit costs in the range of $1,000 - $2,000. Chris Hartzell felt this could be captured in the contingency assumption.
- Suggestions for additional information to add to the report/cost estimate included:
    - Lifecycle costs of boardwalk
    - Same foundation for wood or concrete boardwalks?
    - Approximate depth of helical piers
    - Increase the wetland mitigation costs

4. Next Steps

Eric Johnson reviewed the next steps for the project which include finalizing the study report and gathering letters of support from project stakeholders for the County 's use in pursuing funding opportunities. The following summarizes specific discussion related to these elements:

- Dakota County is considering applying for Transportation Alternatives Program (TAP) funding and STP funding. The County is requesting letters of support from project stakeholders to continue coordination/partnership in working towards getting this trail funded and constructed. The County is not requesting the letters of support give a full commitment to approve the project at this time but only for agencies to continue to work together.
- Dakota County will provide a power point presentation to project stakeholders reviewing the study process, goals, findings and recommendations. Stakeholders can use this presentation to update others within their organizations and elected

officials/committees. Dakota County staff stated they would also be available to present this information to other organizations, agencies and elected officials if project stakeholders would prefer.

- The potential to restore the Area 1 fen in exchange for credit towards wetland impacts was discussed. Dennis stated it could be attempted but would be risky noting the County could spend a lot of money trying to restore the area and end up not getting credit for it, if it doesn't work out to the specific standards. Dennis said per state statute language the most the County could get credit for would be up to 100% which would not cover all of the required wetland mitigation. Dakota County staff stated they will consider this feedback as they move forward with trail development.
- Dakota County staff confirmed the report identifies the future need to complete additional survey work on Areas 3 and 4 to confirm fen boundaries and previous findings. This will also be considered as they move forward with trail development.

Eric Johnson thanked project stakeholders for their participation in the project and the County stated they looked forward to future coordination on this project.