

SECTION 6.0 ENVIRONMENTAL SETTING AND IMPACT

6.1 ENVIRONMENTAL SETTING

The project is located within the North Central Glaciated Plains region. The region is dominated by glacial till materials from the Des Moines Lobe Glaciation. Glacial till materials are typically 100 to 400 feet deep, overlaying granite bedrock. Glacial till is an unconsolidated mixture of sand, silt, clay, gravel and boulders.

Two soil types comprise the majority of the project area; Lamoure Silty Clay Loam and La Prairie Loam. These soils are very similar in composition. Lamoure soils are located at toe slopes along the Little Minnesota River and in the Toelle Coulee area and have a higher clay content than La Prairie soils. La Prairie soils are most prominent in the upland areas along the Little Minnesota within the overbank areas. Both soils were formed from alluvial material on floodplains. They range between moderately well drained and somewhat poorly drained, depending on the local clay content. The area is spotted with clay, sand and gravel deposits, particularly in the Toelle Coulee area.

Vegetation native to the area consists of dry prairie and woodland complexes. These communities consist of primarily oak forests and dry grassland areas. The Minnesota DNR identified an area of these native communities north of the City of Browns Valley.

6.2 DISCUSSION OF POTENTIAL ENVIRONMENTAL IMPACTS

6.2.1 Soil and Prime Farmland Impacts

Both soil types in the project area are moderately susceptible to wind and water erosion. Because these soils are susceptible to erosion, best management practices such as watering dirt roads, vegetating soil stock piles, and other measures should be evaluated and utilized during the construction phase. Limiting erosion will help maintain water quality in the Little Minnesota River. Subsoils and gravel materials need to be evaluated on site after the final routes are chosen to determine engineering suitability. It should also be noted that soils in the area of the project

are classified as prime farm land. This classification requires contact the local NRCS office prior to construction of the project.

6.2.2 Aquatic and Geomorphic Flows

The main surface water feature in the project area is the Little Minnesota River. The project is designed to direct floodwaters from this river (and Toelle Coulee) away from Browns Valley. The Little Minnesota River Floodway is being designed to minimize floodwaters through the City during high flow events. Depending upon the type of inlet to the floodway, moderate to low flows will be affected through Browns Valley. Selection of Option 1, Option 2, and Option 3 are expected to potentially affect 2.7 miles, 1.7 miles, and 2.0 miles of stream channel respectively, through Browns Valley (distance from the floodway inlet to the floodway outlet).

The primary potential adverse impact is modifying the dominant discharge, which maintains the form and function of the river channel (see **Table 6-1**). Lowering the dominant discharge can result in sediment accumulation and the growth of trees and shrubs in the Little Minnesota River downstream from the inlet. A second potential impact is the loss of aquatic habitat, because of the reduction in discharge.

6.2.3 Wetland and Woodland Habitat Impacts

The proposed project will affect relatively small amounts of wetland and woodland habitats used by wildlife. Wetland information was obtained from the National Wetland Inventory (NWI). Most of the wetlands are riparian areas located along the Little Minnesota River. **Table 6-2** shows approximate wetland and woodland impacts by option.

The majority of wetlands in the area fall into two categories; i.e., Palustrine Emergent Temporarily Flooded (PEMA) and Palustrine Forested Broad Leaf Deciduous Temporarily and Seasonally Flooded (PFO1A and PFO1C respectively). The PFO1A and PFO1C wetlands represent riparian areas. Constructing and grading the floodways will eliminate all wetlands within the construction easement (i.e., direct impacts). Indirect impact along the Little Minnesota River through Browns Valley may occur because of the lower flows through this

portion of the river. A wetland and rare species survey should be completed following the selection of the final alignment.

The areas of the Little Minnesota Floodway and the Tolle Levee are primarily agricultural, providing limited wildlife habitat. The Creek Heelsplitter Mussel has been located along the inlet portion of the Little Minnesota Floodway and is identified as a species of greatest concern by the Minnesota DNR. The Creek Heelsplitter Mussel attaches itself to host fish rather than stationary surfaces as many mussels do. Host species may include black crappie, yellow perch and other fish.

The field survey completed for the selected alignments should confirm the presence or absence of this species. Mitigation measures to limit impacts to this species (should it be present) during project construction could include efforts to limit fish kill during construction of the floodway. Streambank elimination should have limited impact on this species. No other endangered species are known to be in the project area.

Table 6-1
Change in Discharge (Aquatic and Geomorphic Flows)
Within the Little Minnesota River through Browns Valley
Option 3, Passive Inlet

Return Period (Year)	Current Little Minnesota River Discharge (cfs)	Approximate Discharges (cfs) Through Browns Valley	
		Passive Inlet	Active Inlet
2	822	657 ¹	641 ²
5	2020	784 ¹	863 ²
10	3200	553 ³	570 ⁴
20	4660	737 ³	514 ⁵
50	7070	944 ³	546 ⁵
100	9300	1150 ³	574 ⁵

¹ 3 leaf gates fully raised.

² 4 gates on active structure fully open.

³ 3 leaf gates fully lowered.

⁴ 1 gate on active structure opened 3.5 feet.

⁵ 1 gate on active structure opened 3 feet.

**Table 6-2
Potential Physical Impacts to Wetlands, Woodlands and Streambanks**

Flood Mitigation Option	Stream Bank (ft)	Woodland¹ (acres)	Wetlands² (acres)
<i>Little Minnesota River Floodway</i>			
Option 1A			
Inlet	850	Negligible	0
Floodway			0
Outlet	1,120	4.6 Acres	3.1 PFO1Ah 0.2 PEMA
Option 1B			
Inlet	850	Negligible	0
Floodway			0
Outlet	600	3.6	1.0 PFO1Ah 0.15 PEMA
Option 2A			
Inlet	800	1.8	0
Floodway			0
Outlet	1,120	2.2	0
Option 2B			
Inlet	1,150	1.1	0
Floodway			0
Outlet	1,150	4.9	2.8 PFO1Ah 1.0 PEMA
Option 3 (Estimated)			
Inlet	1,230	1.5	0.8 PFO1Ah
Floodway			
Outlet	1,230	6.9	3.1 PFO1Ah 0.2 PEMA
<i>Toelle Coulee</i>	None	0.37	0

¹ Determined from 2006 aerial imagery.

² Based on National Wetland Inventory Maps.

6.2.4 Groundwater Impacts

The regional soil surveys suggest that the local water table may be within 10 feet of the surface in the project area. The current floodway depth as proposed is about 7 feet, similar to the Little Minnesota River. Although construction of the floodway may intersect with the water table, no significant groundwater impacts are anticipated.

6.2.5 Cultural Resource Impacts

The Minnesota and South Dakota State Historic Preservation Offices (SHPO) were contacted relative to the proposed project. No response has been received from the South Dakota SHPO. According to the Minnesota SHPO, no known archaeological sites or historical architectural properties were identified in the project area. A report from SHPO does not guarantee no historic resources are in the area of the property.

The nature of the proposed project has the potential to affect or eliminate unidentified archaeological sites. River bank areas, such as the proposed project location, are common areas to find archaeological sites. According to early Minnesota state maps, Native American reservations were present in the area of the property up to the 1870s. Related tribes should be consulted prior to construction during an archaeological survey of the area. A full archaeological survey should be conducted of the final routes to locate and mitigate any found sites prior to construction. Should important archeological resources be present, additional protection measures can be developed.

6.3 PERMITS AND APPROVALS REQUIRED

A variety of regulatory processes, permits, and approvals, are likely needed prior to construction of this project. We anticipate the completion of the following studies or documents as the basis for subsequent permitting and regulatory approvals:

- Environmental Assessment Worksheet (Minnesota);
- Wetland and threatened and endangered species field review; and
- Cultural resources field survey.

The anticipated regulatory permits and approvals needed include:

- National Point Discharge Elimination System Stormwater Construction Permit (Minnesota Pollution Control Agency and South Dakota Department of Environment and Natural Resources);
- 401 Water Quality Certification (Minnesota Pollution Control Agency and South Dakota Department of Environment and Natural Resources);
- Public Waters Permit (Minnesota DNR);
- Water Rights Permit (South Dakota Department of Environment and Natural Resources);
- Wetland Conservation Act Permit (Local Governmental Unit);
- Section 404 and Section 10 Permits (U.S. Army Corps of Engineers);
- Section 106 Memorandum of Agreement with Minnesota and South Dakota SHPO's;
- Utility Permit on Trunk Highway Right of Way (MNDOT);
- Local (County) approvals for Road modifications;
- State Department of Transportation Plan review for transportation modifications; and
- Permit to construct a Flooding and Water Impoundment structure (Upper Minnesota River Watershed District).

The City also expects to prepare and submit a Conditional Letter of Map Revision to the Minnesota DNR and the Federal Emergency Management Agency concurrent with the completion of final construction plans, to obtain the needed revisions to the 100-year floodplain.

