

ENVIRONMENTAL ASSESSMENT WORKSHEET

This Environmental Assessment Worksheet (EAW) form and EAW Guidelines are available at the Environmental Quality Board's website at:

<http://www.eqb.state.mn.us/EnvRevGuidanceDocuments.htm>. The EAW form provides information about a project that may have the potential for significant environmental effects. The EAW Guidelines provide additional detail and resources for completing the EAW form.

Cumulative potential effects can either be addressed under each applicable EAW Item or can be addressed collectively under EAW Item 19.

Note to reviewers: Comments must be submitted to the RGU during the 30-day comment period following notice of the EAW in the *EQB Monitor*. Comments should address the accuracy and completeness of information, potential impacts that warrant further investigation and the need for an EIS.

1. **Project title:** *Nelson Slough Improvement Project*

2. **Proposer:** Middle-Snake-Tamarac Rivers Watershed District (MSTRWD)

Contact person: Mori Maher

Title: Watershed District Administrator

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3. **RGU:** Minnesota Department of Natural Resources (DNR)

Contact person: Sara Mielke

Title: EAW Project Manager

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4. **Reason for EAW Preparation:** (check one)

Required:

EIS Scoping

Mandatory EAW

Discretionary:

Citizen petition

RGU discretion

Proposer initiated

If EAW or EIS is mandatory give EQB rule category subpart number(s) and name(s):

Minn. R. 4410.4300, subpart 27 (A) Public waters, public waters wetlands, and wetlands:

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 according to Minnesota Statutes, chapter 103G, the DNR or local governmental unit is the RGU.

5. Project Location: Exhibit 1: Location Map

County: Marshall County

City/Township: Strandquist, Minnesota/Lincoln and East Park Township

PLS Location (¼, ¼, Section, Township, Range): Sections 21, 22, 23, 27 & 28, Township 158N, Range 44W.

Watershed (81 major watershed scale): Tamarac Watershed (69)

GPS Coordinates: Approximately 48.493259, -96.339955

Tax Parcel Numbers: 12-0060-000, 12-0061-000, 12-0062-000, 12-0064-000, 12-0065-000, 12-0066-000, 12-0074-000, 12-4068-001, 12-4074-001, 12-4087-202, 12-5087-002, 12-5087-301, 12-6065-001, 12-6068-002, 12-6072-001, 12-6074-002, 12-6074-004, 12-6075-001, 12-6087-004, 12-6087-201, 12-6110-001, 12-6110-002, 12-7068-003, 12-7074-003, 12-7087-003, 22-0116-000, 22-0118-000, 22-0120-000, 22-0123-000, 22-0124-000

Exhibits and Appendices:

Exhibit 1: Location Map

Exhibit 2: USGS 7.5 Minute Map

Exhibit 3: USDA Soils

Exhibit 4: Minnesota Biological Survey – Sites of Biodiversity Significance

Exhibit 5: Trigger Points Map

Appendix A: Nelson Slough Preliminary Plans

Appendix B: Minnesota State Historic Preservation Office Letter

Appendix C: Natural Heritage Information System Letter

6. Project Description:

- a.** Provide the brief project summary to be published in the *EQB Monitor*, (approximately 50 words).

The proposed project includes stabilizing several miles of Judicial Ditch 19 (JD 19) and improving structures within Nelson Slough, including replacement of the 50-year old outlet structure and increasing the height of the embankments. The installation of rock drop structures and flattening of the channel side slopes in strategic locations will improve slope stability and alleviate severe channel erosion that has occurred in JD 19 immediately upstream and downstream of the site. Upon completion, the proposed project will provide a reduction in flood damage to adjacent agricultural lands and public transportation infrastructure within the JD 19 sub watershed, downstream Tamarac River and Red River of the North. The project will also provide more control over impoundment water levels, improving wildlife habitat at Nelson Slough.

- b.** Give a complete description of the proposed project and related new construction, including infrastructure needs. If the project is an expansion include a description of the existing facility. Emphasize: 1) construction, operation methods and features that will cause physical manipulation of the environment or will produce wastes, 2) modifications to existing equipment or industrial processes, 3) significant demolition, removal or remodeling of existing structures, and 4) timing and duration of construction activities.

Existing Impoundment Facility

Nelson Slough is an on-channel, multi-purpose impoundment site located in Marshall County, Minnesota. The site controls flow from 68.6 square miles of the JD 19 Watershed, approximately 66% of the 103.5 square mile watershed.

According to the Minnesota Department of Natural Resources, one of the goals of the site is to improve waterfowl habitat by creating wetland features, including both open water and emergent vegetation. A 50:50 ratio of open water to emergent vegetation is desirable for wetland wildlife habitat; however, since the 1970s invasive hybrid cattail (*Typha x glauca*) growth has shifted this ratio to about 25% open water and 75% hybrid cattail cover.

Table 1: Nelson Slough - Existing Critical Elevation Summary

Existing Site Components	Elevation (NAVD88)
Sill of Outlet Structure	1098.0
Primary Spillway	1102.3
Secondary Spillway	1103.5
Top of Dam (varies)	1106.0 – 1106.5

The original outlet structure consisted of a stop log control bay and two-stage spillway. In 2003, the stop log bay was replaced with a 72” by 54” sliding gate that opens from the sill of the outlet structure. The gate is not used for daily operation and remains closed unless drawdown is needed for internal maintenance. The primary spillway is 6-feet wide at 1102.3’ and the secondary spillway is 70-feet wide at 1103.5’ (**Table 1**).

DNR installed a temporary gage in the Nelson Slough in 2019 to monitor the water level within the impoundment site. Water levels were recorded over the 2019 and 2020 growing seasons. The precipitation during the 2019 growing season was unusually high, resulting in an atypical hydrograph. The abundant precipitation also led to difficulties in controlling the water level within the impoundment.

In 2019, water levels recorded within the site ranged from 1103.2’ to 1105.2’. The water level was approximately 0.9 to 2.9 feet above the design operation elevation of 1102.3’. The average water level within the site for 2019 was near 1103.5’, with higher water levels recorded in late September and October. The hydraulic model, along with volume-discharge equations, calculated that it would take several months, without any additional rainfall, for Nelson Slough to draw down from 1103.5’ to 1102.3’ under existing operation.

In 2020, water levels recorded within the site ranged from 1101.7’ to 1104.3’. The average water level was 1102.8’, which was approximately 0.5 feet above the design operation elevation of 1102.3’, because it was not possible to adequately drain. The existing outlet structure lacks the ability to operate to the standards set forth in the original operation and maintenance plan. The resulting large fluctuations in normal water levels are detrimental to nesting water birds. The existing structure does not meet current industry standards for freeboard or principal spillway drawdown.

Proposed Changes to Impoundment Facility

The Nelson Slough Improvement Project consists of the complete removal of the old outlet structure, construction of a new outlet structure, and reconstruction of the earthen embankments that form the north, west and south sides of the impoundment. The proposed embankments will be wider and higher than the existing embankments, and will meet current industry design standards.

The proposed outlet structure will feature movable gates to allow for gated storage during both spring and summer flood events, thus increasing the flood storage potential. The project will maintain the original design operating level, but the improvements will allow the pool to reach that operating level more quickly with a more efficient drawdown. The outlet structure will have the ability to draw the pool level down from the spring gated elevation of 1105.5 to the normal operating elevation of 1102.3 by discharging approximately 300 cubic feet per second (cfs) for 20 to 30 days, while continuing to maintain water levels within the banks of JD 19 downstream. This estimate assumes no additional precipitation within that timeframe.

The new outlet will direct water from the impoundment into the Main Trunk of JD 19 along the west embankment of the impoundment, similar to the existing outlet. The outlet structure will have a three-stage weir. The two lower stages will have movable gates, allowing water to be released at varying pool elevations (**Table 2**).

The first (lowest) stage of the outlet will be a 40-foot-wide weir structure with movable gates. The base of the weir would be set at an elevation of 1102.0 feet, enabling water above that elevation to flow through the outlet when the gate is open. Half of the gate (20 feet wide) would be left open to pass water under normal conditions, while the other half (20 feet) would remain closed. Both gate sections (40-feet) would be opened as needed to draw down the pool level. The 20-foot-wide opening was sized to maintain a normal operating water level at approximately 1102.3’.

The second stage of the spillway would be 70 feet wide and would be gated to enable all or a portion of this width to pass water. The base of the second stage weir would be set at an elevation of 1104.0’ allowing water above that elevation to pass through the second stage of the outlet.

The third stage spillway would a 250-foot structural weir (no gates) set at an elevation of 1105.5’.

An additional gate will be installed below the first stage weir to allow the site to be drawn down to 1098.0’ for maintenance. This gate will not be open during normal operations.

Table 2: Nelson Slough Improvements - Critical Elevations Summary

Proposed Project Components	Elevation (NAVD88)
Drawdown Gate	1098.0
1st Stage Spillway	1102.0
Normal Operating Water Level	1102.3
2nd Stage Spillway	1104.0
3rd Stage Spillway	1105.5
Top of Dam	1109.5

Floating cattail bogs that partially plug the outlet have been an issue in the past. The goal of the proposed longer spillway length, built-in trash barriers, and upstream cattail deterrent is to reduce plugging by floating bogs.

The proposed embankment design features a 12-foot top width at an elevation of 1109.5 feet. This is approximately 3.0 to 3.5 feet higher than the existing embankment elevation.

Proposed Changes to JD 19

The inlet to the site is the Main Trunk of JD 19. The existing side slopes of the ditch channel have experienced sloughing and shown slope instability. The side slopes between Marshall County Road 118 and the existing Nelson Slough pool in the SE ¼ of Section 15, East Park Township, are between 1:1 and 3:1 (H:V – Horizontal:Vertical). In order to stabilize the inlet channel into the site, the project includes flattening the south side slope to a 4:1 (H:V) slope along approximately 12,000 feet of the channel's length. There are no proposed modifications to the bottom width or bottom elevations.

The outlet of the site is the Main Trunk of JD 19. A grade stabilization component will be included as part of the project to stabilize the outlet channel from Nelson Slough approximately 3.3 miles downstream to the center of Section 23 in Lincoln Township. This section of channel has degraded due to sloughing and erosion of the side slopes and channel incision. The proposed stabilization will include: 1) flattening the south side slope to an approximate 3:1 (H:V) slope, 2) filling/excavating the channel bottom to the proposed grade, with some potential slope work on the north side slope, and 3) adding rock riprap drop structures to armor each grade drop along the channel. The rock riprap grade drops would have a maximum drop of 1.8 feet and would create a stable grade averaging 0.1 percent along the length of the channel.

Construction

The major construction components are as follows:

- Mobilizing equipment and machinery to and from the site;
- Clearing and grubbing existing trees, shrubs, and other vegetation;
- Placing and maintaining erosion control devices throughout construction;
- Removing the existing outlet structure;
- Installing the new outlet structure;
- Excavation of topsoil and subsoil;
- Embankment work;
- Borrow Sites/ditch grade stabilization – riprap drop structures, excavation slope work;
- Aggregate surfacing a portion of embankment top;
- Establishing vegetation along embankment;
- Ditch excavation work.

Construction will be conducted in phases to minimize erosion and sediment transfer caused by construction activity. Best management practices (BMPs) for erosion and sedimentation control during construction are discussed in Section 11. The outlet structure and the embankments would be constructed first, and phase two would include the inlet and outlet channel stabilization. Once the embankment and outlet structure work is completed the gates can be closed, creating a large sediment basin for the inlet stabilization and also cutting off any upstream flows impacting the downstream grade stabilization. Rock check dams will be placed at the downstream end of the outlet grade stabilization work to minimize sediment transfer downstream.

Operations

The project will be operated and maintained in compliance with applicable Federal, State, and local laws, including dam safety rules and regulations. The MSTRWD and DNR will maintain a record of all inspections and significant actions of operation and maintenance and prohibit the installation of any structure or facility that will interfere with the operation or maintenance of the project. The operating plan will be reviewed annually by a committee appointed by the MSTRWD and DNR. The committee will include representatives from State agencies, MSTRWD, the local ditch authority and others deemed appropriate. As experience is gained through operation, the committee can make changes to improve the efficiency of operation and maintenance of the project by the issuance of an amendment to the operating plan by mutual consent of MSTRWD and DNR.

The project will be operated based on water levels at trigger points on JD 19, the Tamarac River, and the Red River of the North. Three trigger points are proposed, including JD 19 at the intersection with Hwy. 59, the USGS Stephen gauge on the Tamarac River, and the USGS Drayton gauge on the Red River (**Exhibit 5: Trigger Points Map**). As water level elevations recede below the target elevations at the trigger points, this signifies that the ditch can accommodate additional water and gates will be opened to release more water from the impoundment accordingly.

Full drawdowns have long been recognized as a valuable management tool for wetlands and shallow lakes in order to enhance waterfowl and wildlife habitat, reinvigorate native wetland vegetation, and improve water quality.¹ Water levels will be regularly monitored throughout the open water season. Shallow lake surveys will be completed by DNR to monitor habitat conditions and document results of habitat management. Full drawdowns will be performed when deemed necessary by DNR Wildlife staff to reestablish habitat or to enable other critical maintenance activities and will normally be scheduled in advance to minimize disruption of essential project operations. Drawdowns for habitat purposes will follow a management plan to be developed by DNR Wildlife staff and agreed to by MSTRWD.

Water levels within the site will fluctuate based on the operating condition and the magnitude of a storm event during the operating condition (**Table 3**). Following an event, the gates may need to be operated to draw the site down to the normal operating level of 1102.3'. Modeled water levels for the operating conditions are shown in the Table 3, and operating conditions are defined as follows:

1. Spring Condition – First and second stage gates closed providing gated storage to 1105.5'. (The gates will be closed the prior fall before freeze-up and will remain closed until spring).

¹ Minnesota Department of Natural Resources (2010). Shallow Lakes Management Plan. <https://files.dnr.state.mn.us/recreation/hunting/waterfowl/shallowlakesplan.pdf>

2. Summer Condition with Operation – First stage gate closed providing storage to 1104.0’.
3. Summer Conditions without Operation – First stage gate half open (20 feet wide) providing storage to 1102.0’.

Table 3: Peak Water Levels and Pool Footprint, assuming a starting water surface elevation of 1102.3’.

	Spring Condition 10-day Runoff Event	Spring Condition 10-day Runoff Event	Summer Condition with Operation 24-hour Rainfall	Summer Condition with Operation 24-hour Rainfall	Summer Condition without Operation 24-hour Rainfall	Summer Condition without Operation 24-hour Rainfall
Event	Peak Elevation <i>ft</i>	Pool Area <i>acres</i>	Peak Elevation <i>ft</i>	Pool Area <i>acres</i>	Peak Elevation <i>ft</i>	Pool Area <i>acres</i>
2-year	-	-	1,103.35	1,973	1,103.05	1,895
5-year	-	-	1,103.86	2,105	1,103.53	2,020
10-year	1,106.1	2,887	1,104.24	2,225	1,103.91	2,118
25-year	1,106.2	2,953	1,104.74	2,399	1,104.48	2,309
50-year	1,106.4	3,004	1,105.12	2,539	1,104.88	2,448
100-year	1,106.5	3,059	1,105.53	2,705	1,105.30	2,612

Elevations are referenced to the NAVD88 datum

Timing and Duration:

The estimated schedule is outlined below:

Full Site Drawdown for Construction: 4 months. Proposing to start late fall, after nesting season.

Total Construction Length: Approximately 18 months. (Assuming a start in May, no construction January through March, finish following November.)

Inlet/Outlet Ditch Work: 4 months

Levee Construction: 5 months

Outlet Structure Removal: 1 month

New Outlet Structure Construction: 5 months

c. Project magnitude:

	Impact Zone
Total project acreage (including pool area)	2594.66 acres (4.054 sq.mi.)
Linear project length	10.9 miles
Number and type of residential units	N/A
Commercial building area (in square feet)	N/A
Industrial building area (in square feet)	N/A
Institutional building area (in square feet)	N/A
Other uses – specify (in square feet)	N/A
Structure height(s)	N/A

d. Explain the project purpose; if the project will be carried out by a governmental unit, explain the need for the project and identify its beneficiaries.

The purpose of the project is to provide flood damage reduction to agricultural lands during the 10-year, 24-hour rainfall event, and to reduce flood damage to local roads and highways within the Judicial Ditch 19 watershed. The project will contribute incrementally to the overall, basin-wide goal of reducing peak flows to the Red River of the North by twenty percent. Homeowners, owners/operators of agricultural land, and local and state agencies that own and maintain roads and highways as well as taxpayers supporting these roads will be the beneficiaries of improved flood damage infrastructure as a result of the project.

Another purpose of the project is to enhance wildlife habitat. Examples of natural resource enhancements include, but are not limited to:

- Removal of cattail growth to restore a 50:50 ratio of open water to emergent vegetation. The improvements should help reduce cattail overgrowth; however active management may still be required.
- The efficiency of the proposed outlet structure will reduce the variability of water levels in Nelson Slough and operations will maintain a more stable water level near the normal pool elevation. Many water birds nest in areas that can easily be flooded, and reducing the water level fluctuations will improve the overall nesting success of many species.
- The outlet will allow for periodic drawdowns of the basin. Temporary drawdowns have shown to improve water quality, remove undesirable fish species, and increase vegetation diversity.
- Designing the embankment to current standards will allow the infrastructure to be resilient for the next 50-years and ensure year-round recreational activities.

In summary, the proposed improvements to Nelson Slough will bring the site up to current dam safety design standards, provide downstream flood damage reduction by adding gated storage during the spring snowmelt and large summer rain events, improve wildlife habitat, and allow for more effective management of the natural resources within the site.

e. Are future stages of this development including development on any other property planned or likely to happen? Yes No

f. If yes, briefly describe future stages, relationship to present project, timeline and plans for environmental review.

g. Is this project a subsequent stage of an earlier project? Yes No
If yes, briefly describe the past development, timeline and any past environmental review.

The site was identified as part of the Watershed Work Plan completed in 1965 (Marshall County Soil Conservation District, 1965) and constructed in 1971. To our knowledge, environmental review was not performed at that time.

7. **Cover types:** Estimate the acreage of the site with each of the following cover types before and after development:

Cover types are based on National Land Cover Data (NLCD) 2016² and estimates were determined within the project corridor. The estimates in acres for project corridor are listed in **Table 4**. Prior to construction, the project corridor is predominantly made up of wetlands (1967.12 acres; 75.81 % of corridor) and deep water/streams (503.82 acres; 19.42 % of corridor).

Table 4: Nelson Slough: Estimation of Cover Types (changes calculated based on preliminary designs and field delineated wetland boundaries)

	Before (acres)	After (acres)
Wetlands	1967.12	1959.22
Deep water/streams	503.82	503.82
Wooded/forest	16.56	13.22
Brush/Grassland	6.01	6.01
Cropland	26.37	26.37
Lawn/landscaping		
Stormwater Pond		
Developed (Low, Medium, High Intensity)	1.34	1.34
Developed (open spaces)	73.45	84.68
TOTAL	2594.66	2594.66

8. **Permits and approvals required:** List all known local, state and federal permits, approvals, certifications and financial assistance for the project. Include modifications of any existing permits, governmental review of plans and all direct and indirect forms of public financial assistance including bond guarantees, Tax Increment Financing and infrastructure. *All of these final decisions are prohibited until all appropriate environmental review has been completed. See Minnesota Rules, Chapter 4410.3100. (See Table 5).*

² Multi-Resolution Land Characteristics Viewer (2016) National Land Cover Data. <https://www.mrlc.gov/viewer/>

Table 5: Permits and Approvals Required

Unit of Government	Type of application	Status
U.S. Army Corps of Engineers (USACE)	Section 404 Permit	To be applied for
Minnesota Pollution Control Agency (MPCA)	National Pollutant Discharge Elimination System Construction Wastewater Permit (including Stormwater Pollution Prevention Plan)	To be applied for
Minnesota Pollution Control Agency (MPCA)	401 Water Quality Certification	To be applied for
Minnesota Department of Natural Resources (DNR)	Water Appropriations Permit – Dewatering (if needed)	To be applied for as needed
Minnesota Department of Natural Resources (DNR)	Dam Safety Permit	To be applied for
Minnesota Department of Natural Resources (DNR)	Public Waters Work Permit	To be applied for
Marshall County	Conditional Use Permit	To be applied for
Marshall County	Wetland Conservation Act Permit	To be applied for

Cumulative potential effects may be considered and addressed in response to individual EAW Item Nos. 9-18, or the RGU can address all cumulative potential effects in response to EAW Item No. 19. If addressing cumulative effect under individual items, make sure to include information requested in EAW Item No. 19

9. Land use:

a. Describe:

- i. Existing land use of the site as well as areas adjacent to and near the site, including parks, trails, prime or unique farmlands.

Based on aerial imagery and NASS 2019³ data, the project corridor is located within a rural landscape dominated by open water, herbaceous wetlands, and woody wetlands with tracts of deciduous forests and developed open spaces (Table 6). The adjacent landscape is dominated by large forested areas and agricultural fields broken up by wetland complexes, lakes, and residential properties. The JD 19 system flows through the project corridor from east to west.

Table 6: Project corridor Land use (NASS – Cropland Data Layer 2019).

Cover Type	Acres	Percent of Corridor
Alfalfa	2.08	0.08
Barren	1.74	0.07
Canola	0.30	0.01
Corn	0.10	0.00
Deciduous Forest	68.61	2.64
Developed/Low Intensity	1.34	0.05

³ United States Department of Agriculture (2019) National Agricultural Statistics Service – Cropscape, Cropland Data Layer. <https://nassgeodata.gmu.edu/CropScape/>

Developed/Open Space	73.45	2.83
Fallow/Idle Cropland	0.63	0.02
Grassland/Pasture	0.53	0.02
Herbaceous Wetlands	1654.37	63.76
Mixed Forest	0.02	0.00
Open Water	492.06	18.96
Other Hay/Non-Alfalfa	0.22	0.01
Sod/Grass Seed	0.47	0.02
Soybeans	1.93	0.07
Spring Wheat	1.83	0.07
Woody Wetlands	295.00	11.37

Most of the project is located within the East Park Wildlife Management Area (WMA). The East Park WMA encompasses 10,427.41 acres, including three water access points and eight primitive campsites. There are several recreational opportunities including hiking, bird watching, wetland species viewing, and hunting. The WMA includes a 600-acre Wildlife Sanctuary that provides waterfowl habitat for feeding and resting. The WMA is managed to maintain several native plant communities. The management includes hydro-axing, timber harvesting, and prescribed burns. A review of the Minnesota Land Cover Classification System (MLCCS)⁴ data indicated that the East Park WMA is dominated by aspen forests (5,615.53 acres), seasonally flooded deciduous shrubland (2,348.14 acres), and semi-permanently flooded emergent vegetation (1,417.93 acres). Other land cover present within East Park WMA includes water, grassland/emergent vegetation, mesic oak savanna, planted grassland and forbs – hayfield on hydric soils, planted or cultivated vegetation (greater than 96 % vegetation cover), shrubland, and upland deciduous shrubland. The Nelson Slough impoundment situated within the WMA is predominately water, semi-permanently flooded emergent vegetation, seasonally flooded deciduous shrubland, and aspen forests.

Minnesota snowmobile trail no. 288 is located within the project corridor. Snowmobile trail no. 288 runs parallel to 425th Street NW as it enters Nelson Slough and follows East Park Drive NW along the northern border of Nelson Slough and the project corridor (**Exhibit 1: Location Map**).

The United States Department of Agriculture (USDA), Natural Resources Conservation Service (NRCS), and Web Soil Survey's⁵ *Farmland Classifications* within the project corridor include approximately 279.23 acres (10.76 % of corridor) of *Farmland of Statewide Importance*, 16.29 acres (0.63 % of corridor) of *All Areas are Prime Farmland*, 1885.94 acres (72.69 % of corridor) of *Not Prime Farmland*, and 413.19 acres (15.92 % of corridor) of *Prime farmland if drained*. The *Farmland Classifications* identify the soils and locations that are best suited to grow crops regardless of a locations current land use. These classifications are also identified in **Table 7**.

⁴ Minnesota Department of Natural Resources (2018) Minnesota Land Cover Classification System. <https://gisdata.mn.gov/dataset/biota-landcover-mlccs>

⁵ USDA-NRCS (2010) US Department of Agriculture-Natural Resource Conservations Service. Soil Survey of Minnesota by County (Marshall County). <http://websoilsurvey.nrcs.usda.gov/app/> (Accessed March 2021).

Table 7: Project Corridor Farmland Classifications from Web Soil Survey.

Classification	Acres	Percent of Area
<i>All areas are prime farmland</i>	16.29	0.63
<i>Farmland of statewide importance</i>	279.23	10.76
<i>Not prime farmland</i>	1885.94	72.69
<i>Prime farmland if drained</i>	413.19	15.92

- ii. Plans. Describe planned land use as identified in comprehensive plan (if available) and any other applicable plan for land use, water, or resources management by a local, regional, state, or federal agency.

Marshall County Comprehensive Land-use Plan (2000)⁶

The vision detailed in the *Marshall County Comprehensive Land-use Plan* includes a stable population and employment base, a strong modern agricultural sector, high quality natural resource base to support human and wildlife needs, and a well-functioning public infrastructure. To obtain county goals, the plan describes four development policies for Marshall County, Minnesota. This includes:

1. Land-use: “Supporting the existing balance of land-use in the county, studying land-use trends, and implementing zoning ordinances.”
2. Agriculture: “Maintaining agricultural production while transitioning to economically viable forms of farming and processing.”
3. Population and Economic Development: “Preventing the projected population loss and supporting the population growth within the capacity of public infrastructures.”
4. Natural Resources Management: “Supporting locally based approaches in protecting the quality of natural resources and making economically responsible improvements.”

Judicial Ditch #19 (JD 19) Watershed Plan Draft Report (2020)⁷

The Middle-Snake-Tamarac Rivers Watershed District (MSTRWD) and Natural Resource Conservation Service (NRCS) prepared a draft watershed plan for the JD 19 watershed, a sub-watershed of the Tamarac River Watershed. The draft Watershed Plan identifies the goal to provide improved flood damage protection for agricultural lands and public transportation infrastructure. Rising water levels in Nelson Slough and JD 19 require improved and reinforced ditch systems to protect crops and roadways. The draft watershed plan reviewed project alternatives based on four objectives and the proposed project was the only project to meet or partial meet the following objectives:

1. A five percent reduction in total crop acreage that would be inundated between 24-hours and 120-hours by flood water as a result of a 10-year, 24-hour rainfall event.

⁶ Marshall County Land Use Planning Committee and Marshall County Board of Commissioners (2000) Marshall County Comprehensive Land-use Plan.

https://cms.revize.com/revize/marshall/document_center/countyordinances/Comprehensive%20Land-Use%20Plan%202000.pdf

⁷ Middle-Snake-Tamarac Rivers Watershed District and Natural Resources Conservation Service (2020) Judicial Ditch #19 Watershed Plan – Screening of Alternatives for Detailed Review. <https://mstrwd.org/wp-content/uploads/JD-19-Screening-Alternatives-Report-2020-02-26-DRAFT-1.pdf>

2. A twenty percent reduction in peak flow rate during 10-year, 24-hour rain event at the junction of US Highway 59 and JD 19.
3. A twenty percent reduction in total volume of flow during 10-year, 24-hour rainfall event at the junction of US Highway 59 and JD 19.
4. A no-increase in peak flow rate at the outlet of JD 19 during a 10-year, 24-hour rainfall event.

Minnesota Prairie Conservation Plan (2018)⁸

The *Prairie Conservation Plan* was developed as a 25-year plan to conserve, enhance and restore the Prairie Region of Minnesota. The Prairie Region is primarily the west and southwest portions of Minnesota and is broken up into the “Prairie” zone and the “Forest/Prairie Transition” zone. The *Prairie Conservation Plan* describes four approaches to prairie conservation including:

1. “All areas of native prairie should be protected from conversion to other land uses.”
2. “Core areas with a high concentration of native prairie, other grasslands, wetlands and shallow lakes should be enhanced and restored to ensure that the land remains 40 % grassland and 20 % wetland, at a minimum, with the remainder used as cropland or for other uses.”
3. “Habitat corridors connecting core areas have been more clearly defined, and they continue to include large grassland/wetland complexes at about six-mile intervals along the corridors. Within the corridor complexes, there is a goal of 40 % grassland and 20 % wetland, and for the remainder of the corridors, 10 % of each legal land section should be maintained in permanent herbaceous perennial cover.”
4. “The remainder of the Prairie Region, there is a goal to maintain 10 % of each major watershed in perennial grassland and wetland vegetation.”

The East Park WMA is identified as a habitat within a “Prairie Core Area” and is subject to the management goals of maintaining 40 % grassland and 20 % wetland while permanently protecting 50 % of that land.

Minnesota Department of Natural Resources Duck Action Plan (2020-2023)⁹

The *Minnesota DNR Duck Action Plan* is a four-year plan that parallels the DNR’s 50-year “Long Range Duck Recovery Plan” which describes strategies to increase the breeding duck population and restore the hunter numbers and duck harvests. The Duck Action Plan describes four goals including:

1. “Increase the amount of wetland and grassland habitat for ducks.”
2. “Maintain and enhance wetland, grassland, and forest habitats for ducks.”
3. “Increase opportunities for and participation in outdoor recreation related to ducks and their habitats.”
4. “Increase public awareness and appreciation of wetland conservation for ducks and people.”

To meet the goals of the *Duck Action Plan*, several objectives and strategies were developed.

- a. Maintain existing WMAs while increasing acquisitions in priority areas in Minnesota.
- b. Increase both quality and quantity of duck habitat management on state lands.
- c. Support partners’ conservation efforts that protect and enhance duck habitats.

⁸ Minnesota Prairie Plan Working Group (2018) Minnesota Prairie Conservation Plan. 2nd edition. http://files.dnr.state.mn.us/eco/mcbs/mn_prairie_conservation_plan.pdf

⁹ Minnesota Department of Natural Resources (2020) Duck Action Plan 2020-2023. https://files.dnr.state.mn.us/wildlife/waterfowl/duck_action_plan.pdf

- d. Increase DNR coordination of Duck Plan conservation efforts within Minnesota as well as priority management actions in the Mississippi Flyway.
 - e. Improve public access for outdoor recreation and wetland appreciation.
 - f. Publish information on wetland and upland habitats, highlighting private land stewardship, recreational opportunities, and how these habitats contribute to Minnesota.
 - g. Define research and monitoring priorities for ducks and duck habitats.
- iii. Zoning, including special districts or overlays such as shoreland, floodplain, wild and scenic rivers, critical area, agricultural preserves, etc.

Marshall County administers a Shoreland Ordinance¹⁰ and there are no other special overlays or designations for zoning, floodplain, scenic rivers, critical areas, agricultural preserves, etc. The Marshall County Shoreland Management Ordinance regulates the use and orderly development of shorelands in the county to prevent and eliminate pollution of public waters, to maintain historic values of significant historic sites in the unincorporated areas of Marshall County, and to preserve and enhance their natural resources as provided in the Environmental Rights Act (Minnesota Statutes 116B). There are no features located within the project area that are defined under the Marshall County Shoreland Ordinance.

- b. Discuss the project’s compatibility with nearby land uses, zoning, and plans listed in Item 9a above, concentrating on implications for environmental effects.

The proposed project is compatible with the nearby land uses, zoning, and plans listed in Item 9a. The project is made up of JD 19, Nelson Slough impoundment, wetland complexes, and several tracts of deciduous forests. The project is surrounded by forested and agricultural land uses. The improvements to the outlet structure will allow flood waters to discharge from Nelson Slough through JD 19 quickly and efficiently. The overall land use along the project corridor will not be changed by the improvements to JD 19.

The beneficial implications of this project include improved flood protection to agricultural land and roadways as well as improved habitats at Nelson Slough. These implications will be consistent with the current WMA management plans and *Chapter 86A.05, Subd. 8 Item C* to “perpetuate, and if necessary, reestablish quality wildlife habitat for maximum production of a variety of wildlife species.....Physical development may provide access to the area, but shall be so developed as to minimize intrusion on the natural environment.” The fluctuations in water level at Nelson Slough will be reduced by the project, allowing operations to more quickly return to the normal pool elevations and efficiently move water from the impoundment into JD 19 following heavy rainfall events.

- c. Identify measures incorporated into the proposed project to mitigate any potential incompatibility as discussed in Item 9b above.

n/a

¹⁰ Marshall County, Minnesota (2017) Marshall County Shoreland Ordinance.
https://cms.revize.com/revize/marshall/document_center/countyordinances/Shoreland%20Ordinance%2010_19_17.pdf

10. Geology, soils and topography/landforms:

- a. Geology - Describe the geology underlying the project area and identify and map any susceptible geologic features such as sinkholes, shallow limestone formations, unconfined/shallow aquifers, or karst conditions. Discuss any limitations of these features for the project and any effects the project could have on these features. Identify any project designs or mitigation measures to address effects to geologic features.

The bedrock underlying the project corridor is covered by 100 - 400 feet of calcareous glacial drift left from glacial periods. A review of the Minnesota Geological Survey: D1-Surficial Geology of Minnesota¹¹ notes that the project corridor includes two surficial geologic features: Marshall and Roseau. The Marshall geologic feature is characterized by glacial lake sediment as well as nearshore and shallow water. Aged back to the last glaciation period, the glacial deposits are gravelly sand beach deposits. The Roseau geologic feature is characterized by washed glacial till, also aged to the last glaciation. These deposits are clay textured diamicton plain deposits.

The DNR and Minnesota Geologic Survey assess areas of shallow groundwater systems and their susceptibility to ground water pollution. The geologic susceptibility is the time it takes for surface water to reach ground water. The sediment underlying this project area is identified as low to lowest geologic sensitivity to pollution to ground water. The geologic features do not have any limitations nor are they susceptible to adverse impacts from the proposed project. The geologic features at the site have been previously altered, during the original construction of the levees, outlet structure, and JD 19 ditch system. The changes to the existing infrastructure should not cause any impacts to the underlying geology beyond the alterations of the original project.

- b. Soils and topography - Describe the soils on the site, giving NRCS (SCS) classifications and descriptions, including limitations of soils. Describe topography, any special site conditions relating to erosion potential, soil stability or other soils limitations, such as steep slopes, highly permeable soils. Provide estimated volume and acreage of soil excavation and/or grading. Discuss impacts from project activities (distinguish between construction and operational activities) related to soils and topography. Identify measures during and after project construction to address soil limitations including stabilization, soil corrections or other measures. Erosion/sedimentation control related to stormwater runoff should be addressed in response to Item 11.b.ii.

Soils

According to the USDA-NRCS Soil Survey,¹² the predominate soils in the project area include:

- *I79A, Berner, Cathro and Haug soils, ponded, 0 to 1 percent slopes, (28.63 % of corridor)*
- *IWa, Water, (16.55 % of corridor)*
- *I71A, Berner and Cathro soils, ponded, 0 to 1 percent slopes, (12.41 % of corridor)*
- *I127A, Percy loam, 0 to 1 percent slopes, (11.63 % of corridor)*

¹¹ University of Minnesota - Minnesota Geological Survey (2019) D-1 Surficial Geology of Minnesota. <https://mnngs-umn.opendata.arcgis.com/app/1813f21e8b7f4087bf5f44ef82ab2012>

¹² USDA-NRCS (2010) US Department of Agriculture-Natural Resource Conservations Service. Soil Survey of Minnesota by County (Marshall County). <http://websoilsurvey.nrcs.usda.gov/app/> (Accessed March 2021).

All soil units identified within the project area are shown in **Exhibit 3: USDA Soils Map**. The soils within the project corridor are characterized by low to moderate runoff potential. The soil textures within the corridor are predominantly muck (51.39 % of the corridor), loam (13.51 % of the corridor), mucky loam (8.27 % of the corridor), and fine sandy loam (6.51 % of the corridor) (**Table 8**).

The conversion of landscapes surrounding the Nelson Slough to agricultural land uses, including the installation of drainage ditches and drain tiles, has altered the region’s hydrology. The runoff from these fields flows through the several drainage ditch systems in the area, some of which flow through Nelson Slough.

The construction of the outlet structure may temporarily impact Nelson Slough through the complete drawdown of the site prior to construction and temporarily routing of water through a culvert adjacent to the outlet structure during construction. Construction of the outlet structure will require permanent excavation of the soil (approximately 5,500 cubic yards) where the structure will be placed. The improvements to the slough’s embankment will require permanent excavation (approximately 103,500 cubic yards) to remove unsuitable and organic material from the existing embankment and the footprint of the proposed embankment. The proposed project will also require fill (approximately 228,935 cubic yards) to increase the embankments by 3 to 3.5 feet vertically, with embankment fill added from the existing embankment top out past the exterior/dry embankment sideslope. No embankment work is proposed on the interior/wet side-slope of the embankment below the normal pool elevation of 1102.3.

The borrow source for the fill material is being proposed from within the interior of Nelson Slough. Additional geotechnical soil borings will be taken during final design to determine suitability of the underlying soils at a finer scale, and used to select corresponding locations and depths of the borrow pits within Nelson Slough. Excavation of fill material will create a number of shallow open water pools in areas currently occupied by hybrid cattails. Since the goal is to have additional open water areas when the impoundment is at normal operating levels, the borrow pits creating these pools will extend below the elevation of 1102.3’.

Approximately 199,900 cubic yards of soil will be excavated, including 103,500 cubic yards from the embankment; 5,500 cubic yards at the outlet structure; and 90,900 cubic yards from JD 19 ditch. There will be approximately 228,935 cubic yards of fill along the outside of the embankments. The excavation of mucky subsoils and import of fill for the embankments will improve stability of soils and prevent significant erosion of the soils over time. The replacement of the soils during construction will impact the permeability, composition, and structure of the soils, but is expected to have minimal impact since this site was previously altered. During construction, soil erosion control devices will be used to stabilize exposed soils and prevent erosion and sedimentation. All erosion controls will be compliant with MPCA’s administered NPDES/SDS stormwater permit and approved by the DNR, and will be constructed of natural and biodegradable materials.

Table 8: Soil Textures

Texture	Acres
Extremely gravelly	17.39
Fine Sand	14.84
Fine sandy loam	168.93

Texture	Acres
Loam	350.55
Loamy fine sand	16.83
Loamy sand	24.03
Muck	1333.37
Mucky loam	214.65
Sandy loam	24.61
Water	429.46
Total for Area of Interest	2594.66

Topography

The project corridor and the surrounding landscape is located within the Tallgrass Aspen Parklands (TAP) Province, the Lake Agassiz, Aspen Parklands (LAP) Section, and the Aspen Parklands Subsection of the DNR Ecological Classification System.¹³ The TAP Province is an ecotone between semi-arid landscapes that were historically covered by prairie and conifer-deciduous forests. Water features within the TAP Province were formed by glacial ice and inundation from Glacial Lake Agassiz. The LAP section is solely made-up of the basin of Glacial Lake Agassiz. The LAP section is predominantly mesic prairie, wetland prairie, and woodland communities with some wet depressions, peatlands, forested peatlands, and wet forests. The Aspen Parklands Subsection is characterized by lacustrine plains and water reworked till plains. The subsection’s general topography is level to gently rolling hills.

11. Water resources:

- a. Describe surface water and groundwater features on or near the site in a.i. and a.ii. below.
 - i. Surface water - lakes, streams, wetlands, intermittent channels, and county/judicial ditches. Include any special designations such as public waters, trout stream/lake, wildlife lakes, migratory waterfowl feeding/resting lake, and outstanding resource value water. Include water quality impairments or special designations listed on the current MPCA 303d Impaired Waters List that are within 1 mile of the project. Include DNR Public Waters Inventory number(s), if any.

The proposed project is located in proximity to several deep water and wetland features, many of which are identified by the DNR National Wetland Inventory (NWI) Wetland Finder.¹⁴ Two water features are identified as public waters by the DNR and are under regulatory restrictions.¹⁵ East Park WMA (Basin; ID: 45001100) and East Park WMA (Basin; ID: 45011600) (**Table 9**). There are no

¹³ Minnesota Department of Natural Resources. Ecological Classification System: Hardwood Hills Subsection. <https://www.dnr.state.mn.us/ecs/222Ma/index.html>

¹⁴ Minnesota Department of Natural Resources (2020) National Wetlands Inventory (NWI) Wetland Finder. <https://arcgis.dnr.state.mn.us/ewr/wetlandfinder/> (Accessed March 2021).

¹⁵ Minnesota DNR (2021) Minnesota Department of Natural Resources Public Waters Inventory. http://www.dnr.state.mn.us/waters/watermgmt_section/pwi/maps.html (Accessed March 2021).

Minnesota Pollution Control Agency designated impaired waters¹⁶ within the project area. Downstream and outside of the project area, the JD 19 stretch from US 59 to Tamarac River has been impaired by *Escherichia coli* (*E. coli*) since 2012 and fish bioassessments since 2020. A TMDL study is targeted for completion in 2027.

Judicial Ditch 19

Judicial Ditch 19 is a drainage ditch system established in 1910 and includes the main channel and thirteen lateral channels. The ditch system provides drainage to 103.5 square miles of Marshall and Roseau Counties. The ditch system was designed to provide flood protection against a two-year to a five-year rainfall event. Hydraulic modeling of JD 19 shows that the upper reaches of the ditch currently have decreased capacity and support a 2-year rainfall event, while the lower reaches support a 5-year rainfall event.

Public Waters

Table 9: Nelson Slough, Public Waters Inventory

PWI ID	Name	Type	Total Shoreline (miles)	Total Area (acres)	Area within Corridor (acres)
45-0011-00	East Park WMA	Basin	8.06	1489.35	1489.35
45-0116-00	East Park WMA	Basin	7.59	320.46	3.52
		Total	15.66	1809.80	1492.86

East Park WMA (45-0011-00)

The East Park WMA (45-0011-00) public water basin makes up most of Nelson Slough. Located just east of Strandquist, Minnesota, East Park WMA public water basin is approximately 1,489.35 acres in area with 8.06 miles of shoreline. East Park WMA is classified as a 2B- healthy warm water aquatic community and 3C- Industrial cooling and materials transport use without a high level of treatment. There are no aquatic invasive species listed by DNR. No water quality data has been published for this public water basin.

East Park WMA (45-0116-00)

The East Park WMA (45-0116-00) public water basin made up of scrub-shrub and forested wetlands. Located along E Park Drive NW, East Park WMA public water basin is approximately 320.46 acres in total area (3.52 acres within project corridor) with 7.59 miles of shoreline in total.

Wetlands

There are several wetland features located within and adjacent to the project corridor. The NWI identifies seven wetland types within the project corridor (**Table 10**). The wetlands are dominated by freshwater emergent wetlands (PEM1; palustrine, emergent, persistent), freshwater forested wetlands (PFO; palustrine, forested), and Lake (L2UBHh; lacustrine, littoral, unconsolidated bottom, permanently flooded, diked/impounded). The other wetlands include freshwater shrub wetlands (PSS; palustrine, scrub-shrub), freshwater shrub/emergent wetlands (PSS/EM; palustrine, scrub-shrub/emergent), and freshwater pond wetlands (PUB; palustrine, unconsolidated bottom).

¹⁶ Minnesota Pollution Control Agency (2020) Impaired Waters Viewer (IWAV). <https://www.pca.state.mn.us/water/impaired-waters-viewer-iwav>

Table 30: Wetland Types within the project corridor

Wetland Type	Acres	Percent of Total Wetland Area
Freshwater Emergent Wetland	1258.17	52.22
Freshwater Forested Wetland	322.95	13.40
Freshwater Pond	50.47	2.09
Freshwater Shrub Wetland	213.15	8.85
Freshwater Shrub/Emergent Wetland	80.35	3.33
Lake	484.32	20.10
Total	2409.41	100.00

ii. Groundwater – aquifers, springs, seeps. Include: 1) depth to groundwater; 2) if project is within an MDH wellhead protection area; 3) identification of any onsite and/or nearby wells, including unique numbers and well logs if available. If there are no wells known on site or nearby, explain the methodology used to determine this.

Based on the groundwater profile of the Red River Valley Region published by the Minnesota Pollution Control Agency,¹⁷ groundwater in the region is characterized as having dissolved solids and being in limited supply. The regional geology includes historical beach ridges. Beach ridges are local recharge areas and are susceptible to groundwater contamination. Groundwater quality is further contaminated by the high-dissolved solids such as manganese, arsenic, chloride, sulfate, nitrate, and total dissolved solids. There are often limited water supplies in this rural landscape with some potential conflicts with pumping activities in North Dakota. The project is located in Minnesota’s Groundwater Province 5 “Western Province.” The Western Province is characterized by “loam and clay loam glacial sediments with limited surficial and buried sand aquifers while the Cretaceous and Precambrian bedrock are also limited aquifers.”¹⁸ Cretaceous bedrock is located just north of the project boundary. Based on the *Depth of Water Table*¹⁹ Map from the DNR Ecological and Water Resources Division, the project boundary is located in areas with water tables between 0 and 10 feet in depth.

There are limited resources describing the groundwater present within the project corridor. The USDA “Web Soil Survey” includes an “Aquifer Assessment” tool to identify soils series that could potentially include sensitive surficial aquifers. Based on soil properties, this tool assesses aquifer vulnerability and potential risks of nitrogen contamination. Approximately 47.3 % of the project corridor includes soils identified as “sensitive” and 35.5 % of the soils are classified “not sensitive.” The soils identified as sensitive are sand-textured soils located within the Nelson Slough impoundment.

¹⁷ Minnesota Pollution Control Agency (1995) Ground Water Profile: Red River Valley Region. <https://www.pca.state.mn.us/sites/default/files/gwp-redriver.pdf>

¹⁸ Minnesota Department of Natural Resources (2021) Minnesota Groundwater Provinces. https://files.dnr.state.mn.us/waters/groundwater_section/provinces/2021-provinces.pdf

¹⁹ Minnesota Department of Natural Resources, Ecological and Water Resources Division (2016) Depth to Water Table. https://files.dnr.state.mn.us/waters/groundwater_section/mapping/mha/hg03_plate2.pdf

Based on the Minnesota Department of Health Source Water Protection Areas online database, there are no Drinking Water Supply Management Areas (DWSMAs) or Wellhead Protection Areas within or near the project corridor.²⁰ According to the MDH’s Minnesota Well Index, there are no wells within the project corridor, though several are located adjacent to the project corridor (**Table 11**).²¹

Table 14: Wells adjacent to the Project Corridor (no wells located within the project area). All well logs are available through the Minnesota Well Index.

Unique Well Number	Depth to water (feet)
00401977	7
00430092	12
00678759	15
00735653	16
00806555	-3 (artesian)
00244850	1.4
00219642	18
00215363	n/a
00101684	6
00244847	3
00215351	18
00244848	7
00244845	24
00244846	9
00215353	10

b. Describe effects from project activities on water resources and measures to minimize or mitigate the effects in Item b.i. through Item b.iv. below.

i. Wastewater - For each of the following, describe the sources, quantities and composition of all sanitary, municipal/domestic and industrial wastewater produced or treated at the site.

Construction related to the project will not produce or treat any sanitary, municipal/domestic, or industrial wastewater.

1) If the wastewater discharge is to a publicly owned treatment facility, identify any pretreatment measures and the ability of the facility to handle the added water and waste loadings, including any effects on, or required expansion of, municipal wastewater infrastructure.

Not applicable.

²⁰ Minnesota Department of Health (2020) Source Water Protection Web Map Viewer. <https://mdh.maps.arcgis.com/apps/View/index.html?appid=5051b7d910234421b0728c40a1433baa>

²¹ Minnesota Department of Health (2020) Minnesota Well Index. <https://mnwellindex.web.health.state.mn.us/>.

2) If the wastewater discharge is to a subsurface sewage treatment systems (SSTS), describe the system used, the design flow, and suitability of site conditions for such a system.

Not applicable.

3) If the wastewater discharge is to surface water, identify the wastewater treatment methods and identify discharge points and proposed effluent limitations to mitigate impacts. Discuss any effects to surface or groundwater from wastewater discharges.

Not applicable.

ii. Stormwater - Describe the quantity and quality of stormwater runoff at the site prior to and post construction. Include the routes and receiving water bodies for runoff from the site (major downstream water bodies as well as the immediate receiving waters). Discuss any environmental effects from stormwater discharges. Describe stormwater pollution prevention plans including temporary and permanent runoff controls and potential BMP site locations to manage or treat stormwater runoff. Identify specific erosion control, sedimentation control or stabilization measures to address soil limitations during and after project construction.

During construction, erosion and sedimentation control devices will be utilized within the construction zone to minimize stormwater discharges into Nelson Slough and the JD 19 ditch system. Erosion and sedimentation controls will be used to avoid impacts to adjacent land, wetlands, JD 19 and the Tamarac River downstream, and sensitive habitat areas. Best Management Practices (BMPs) will be utilized during construction of the outlet structure, embankment, and JD 19 ditch-bed. These BMPs will include, but are not limited to, sediment basins, silt fences, erosion control blankets, silt curtains, rock check dams, and straw sediment control logs. During construction of the embankments and the JD 19 ditch, downslope control devices such as silt fences, composite berms, and straw logs will be placed around wetlands and other waterbodies to prevent sedimentation and contamination from stormwater runoff. Turbidity curtains or silt curtains will be utilized during the construction of the outlet structure to control any movement of sediments, nutrients, and oils. Construction will be followed by the restoration of disturbed areas, which may include, but is not limited to, grading to final contours, seeding, and mulching. Areas of re-seeding will be done using a Minnesota Board of Soil and Water Resources (BWSR) northwest native seed mix.

The drainage within the project corridor follows the ditch system of JD 19. JD 19 flows into the project corridor from the east along E Park Drive NW, pools in the Nelson Slough Impoundment site, then flows out of Nelson Slough through JD 19 and continues west to the Tamarac River, which in turn flows to the Red River of the North.

During and following construction, stormwater quality and quantity will be managed with temporary sediment controls to minimize potential stormwater impacts. The project proposers will develop an erosion control plan, apply for a MPCA Construction Stormwater General Permit, and prepare a Stormwater Pollution Prevention Plan (SWPPP) to address permanent and construction-related erosion, sediment, and pollution control. The standards and rules established by local and watershed agencies will be followed to the extent possible to mitigate the water quality and quantity impacts created by the proposed project.

iii. Water appropriation - Describe if the project proposes to appropriate surface or groundwater (including dewatering). Describe the source, quantity, duration, use and purpose of the water use and if a DNR water appropriation permit is required. Describe any well abandonment. If connecting to an existing municipal water supply, identify the wells to be used as a water source and any effects on, or required expansion of, municipal water infrastructure. Discuss environmental effects from water appropriation, including an assessment of the water resources available for appropriation. Identify any measures to avoid, minimize, or mitigate environmental effects from the water appropriation.

Although water appropriation is not anticipated, the project will comply with all water appropriation requirements during construction. A water appropriation permit will be required in any situation in which dewatering occurs at a volume greater than the allowed 10,000 gallons per day. Dewatering would comply with the MPCA NPDES Construction Stormwater Permit and would be discharged in a manner that does not create nuisance conditions or adversely affect the receiving water or downstream properties.

iv. Surface Waters

a) Wetlands - Describe any anticipated physical effects or alterations to wetland features such as draining, filling, permanent inundation, dredging and vegetative removal. Discuss direct and indirect environmental effects from physical modification of wetlands, including the anticipated effects that any proposed wetland alterations may have to the host watershed. Identify measures to avoid (e.g., available alternatives that were considered), minimize, or mitigate environmental effects to wetlands. Discuss whether any required compensatory wetland mitigation for unavoidable wetland impacts will occur in the same minor or major watershed and identify those probable locations.

Direct impacts include changes to wetland size (permanent excavation and fill) and loss of physical habitats (vegetation removal and hydrology impacts). Indirect impacts include creating disturbed non-wetland areas and a new wetland edge, and changes in wetland functions such as an altered hydrology regime, flood storage, and habitat alterations. The current condition of the site includes previously disturbed lands due to the construction of the original embankment, outlet structure, and drainage ditches. Impacts to undisturbed areas will be minimal and will likely not produce any changes to the area's functionality. The wetlands on the outer edge of the embankments will be further fragmented, and the loss of total wetland area will cause a decrease in hydrologic storage.

The design phase of construction was used to minimize, and where possible, avoid impacts to wetlands and other sensitive aquatic resources. Erosion control devices will be used to prevent wetland impacts outside of the construction limits. Wetland mitigation may include the purchase of wetland credits, and will be based on federal and state permit requirements and adherence to the findings of the Technical Evaluation Panel (TEP).

Local, state, and federal permits will be required for all wetlands impacted as a result of the proposed project. These include permitting under the Clean Water Act (CWA), Minnesota Wetland Conservation Act (WCA), and DNR Public Water Works permitting program. Temporary and permanent impacts will be mitigated in coordination with the DNR and will meet all state and federal regulations and guidelines. Wetland impacts outlined here are based on preliminary designs and are subject to change once construction designs are finalized.

All impacts within public waters will be mitigated through a Minnesota Public Works Permit and requirements based on the findings of the TEP. All wetland impacts outside the public waters jurisdiction will be mitigated through a Wetland Conservation Act (WCA) Permit and mitigation as required by the permit conditions. A permit application will be submitted to the USACE and mitigation will be based on the agency's jurisdictional determination.

Impacts Due to Construction Activity

Nelson Slough Outlet Structure: The replacement of the Nelson Slough outlet structure will impact the impoundment and portions of JD 19 directly downstream of the outlet structure. The footprint of the proposed outlet structure is larger than the existing structure, resulting in permanent impacts to the sediment and surface waters of the impoundment. Permanent excavation and fill will be required for placement of the new outlet structure. Based on the preliminary design, replacing the outlet structure will require approximately 5,500 cubic yards of excavation. Prior to construction, the waters of the Nelson Slough impoundment will be temporarily drained to allow for access to the outlet structure and borrow sources. Water will be routed through a culvert adjacent to the outlet structure to facilitate work in dry conditions. This work is expected to take four months and is proposed to start late fall, after nesting season. While the impoundment is drained, the aquatic habitats within Nelson Slough will be temporarily impacted. Temporary impacts will be minimized through BMPs and DNR approved erosion control devices. Mitigation for permanent impacts may include the purchase of wetland credits and will be based on federal and state permit requirements and adherence to the findings of the Technical Evaluation Panel (TEP). The application will be reviewed by the TEP, which includes representatives from the local government unit(s) (LGUs), BWSR, DNR, and the U.S. Army Corps of Engineers. The TEP will agree upon the wetland replacement strategy (if needed) for the proposed project and issue permits based on these requirements.

Nelson Slough Embankment Modification: The existing embankments will be modified and reinforced, which will affect both Nelson Slough and the adjacent wetlands. The impacts will be the result of excavation and fill along the outside edges of the existing embankment. There will be permanent fill to the adjacent wetlands during the widening of the embankments. Impacts to existing upland and wetland areas will include approximately 103,500 cubic yards of excavation and 228,935 cubic yards of embankment fill. Any un-usable soils will be placed along the back-slopes of the embankments or transported off-site to borrow pits. Wetland impacts will be mitigated through the permitting process detailed above. Temporary impacts will be minimized through BMPs and DNR approved erosion control devices. Re-seeding of the embankment will be done with Minnesota BWSR northwest native seed mixes.

JD 19 Channel Stabilization: The majority of the environmental impacts resulting from this project will occur within the channel of the JD 19. Before construction begins, the control structure upstream of JD 19 will be temporarily closed to drain JD 19 and expose the ditch bottom. The section of the project in the JD 19 system will be stabilized by repairing existing eroded sections and reinforcing the ditch with rock drop structures, thereby reducing sediment transfer downstream. Construction will include regrading, resloping, and installing approximately seven rock drop structures. In order to complete the regrading and install the rock drop structures. Construction will result in approximately 90,900 cubic yards of topsoil stripping and excavation. The un-usable excavated soils from the ditch will be placed along the existing spoil bank that was created from the original construction of JD 19. The spoil bank is located along the field side of ditch system rather than the road side.

Tables 52-14: Wetland Types and Impacts (based on preliminary construction limits and aquatic resources delineation)

Embankment Construction		
Wetland Type	Jurisdiction	Size of Impact
Deep Marsh	WCA	0.020 acres
Wet Meadow	WCA	1.637 acres
Hardwood Swamp	WCA	3.296 acres
Other Waters	WCA	0.039 acres
Shallow Marsh	WCA	1.616 acres
Scrub Shrub	WCA	3.358 acres

Outlet Structure Construction		
Wetland Type	Jurisdiction	Size of Impact
<i>Outlet Structure Construction</i>		
Other Waters	WCA	0.047 acres
Deep Marsh	Public Waters	0.002 acres

JD 19 Regrade		
Wetland Type	Jurisdiction	Size of Impact
Deep Marsh	Public Waters	0.076 acres
Other Waters	WCA	*5.595 miles

b) Other surface waters- Describe any anticipated physical effects or alterations to surface water features (lakes, streams, ponds, intermittent channels, county/judicial ditches) such as draining, filling, permanent inundation, dredging, diking, stream diversion, impoundment, aquatic plant removal and riparian alteration. Discuss direct and indirect environmental effects from physical modification of water features. Identify measures to avoid, minimize, or mitigate environmental effects to surface water features, including in-water Best Management Practices that are proposed to avoid or minimize turbidity/sedimentation while physically altering the water features. Discuss how the project will change the number or type of watercraft on any water body, including current and projected watercraft usage.

The Nelson Slough is made up of two Minnesota Public Waters; 3.5 acres of East Park WMA (45011600) and 1,489.4 acres of East Park WMA (45001100) fall within the project corridor. Based on preliminary designs, approximately 0.002 acres of East Park WMA (45001100) would be impacted during project construction (*refer back to Table 13*). The impacts to these public waters will occur along the roadside ditch system. All impacts will be limited to the construction period. BMPs will be used to minimize impacts to Minnesota Public Waters and permanent impacts will be mitigated through a Public Works Permit and the WCA TEP process.

During construction of the outlet structure, Nelson Slough will be drained. This will be temporary and will effect habitats. These temporary impacts will be limited to the construction timeline for the outlet structure.

Post construction operation of the impoundment water control structure will alter the existing surface water levels of Nelson Slough impoundment. The changes to operational levels resulting from the project are not anticipated to alter the use of watercraft at the impoundment. The existing operations of Nelson Slough include a designed normal pool elevation of 1,102.3 feet (NAVD 1988 datum) that “bounces” up to 1,103.5 feet (NAVD 1988 datum) after rainfall events (**Table 15**). The water level “bounce” refers to the short-duration change in water level from rainfall and runoff. For a 10-year storm, the goal is to keep the bounce below 2.0 feet and for 90 % of the stormwater to be released within 10-days of the onset of bounce. With the existing outlet structure operations, a small precipitation event quickly raises the water level above the normal pool elevation and it stays elevated for extended periods of time. The proposed outlet structure will allow water to flow through the system more quickly, which will reduce duration of the bounce. The maximum pool elevation and bounce above the normal pool elevation of 1,102.3’ for a range of 24-hour rainfall events are shown in Table 15.

Because the improved outlet structure increases the ability to control the water level, temporary drawdowns of the impoundment will be possible as a management tool during operation of the impoundment. Drawdowns of Nelson Slough will be conducted based on DNR Wildlife operation and maintenance plan that will define habitat management triggers. DNR Wildlife will coordinate with the Middle-Snake-Tamarac Rivers Watershed District to develop a management plan for Nelson Slough during non-flood periods.

Table 6: Pool Bounce - Summer 24-hour Rainfall

Event	Existing Conditions	Existing Conditions	Summer Condition without Operation	Summer Condition without Operation	Summer Condition with Operation	Summer Condition with Operation
24-hour Rainfall	Peak Elevation <i>ft, NAVD88</i>	Bounce <i>feet</i>	Peak Elevation <i>ft, NAVD88</i>	Bounce <i>feet</i>	Peak Elevation <i>ft, NAVD88</i>	Bounce <i>feet</i>
2-year	1,103.99	0.49	1,103.05	0.75	1,103.35	1.05
5-year	1,104.33	0.83	1,103.53	1.23	1,103.86	1.56
10-year	1,104.59	1.09	1,103.91	1.61	1,104.24	1.94
25-year	1,104.95	1.45	1,104.48	2.18	1,104.74	2.44
50-year	1,105.25	1.75	1,104.88	2.58	1,105.12	2.82
100-year	1,105.56	2.06	1,105.30	3.00	1,105.53	3.23

Existing Conditions – Starting pool elevation at 1103.5 based on observation and hydraulic modeling, 1.2’ above desired normal pool

Proposed Summer Operations – Starting pool elevation at 1102.3 desired normal pool elevation

The regrading and installation of rock drops within the JD 19 ditch system will have impacts to surface waters that flow through JD 19. Surface water impacts within JD 19 will include temporary drainage or water diversion methods to access the ditch embankment and bed. Temporary impacts will be limited to the construction zone and construction period and are anticipated to be negligible with the use of project BMPs, such as silt curtains within the ditch and silt fences along banks and adjacent roadways. Construction vehicles will be washed prior to work within JD 19 to prevent oil and gas from contaminating the surface water. Fuel stations will be located away from all surface water features.

As mentioned in the previous sections, the utilization of BMPs including, but not limited to, silt curtains, silt fences, and erosion control logs will be used to limit and minimize impacts to surface waters and other aquatic resources. Other minimization measures will include cleaning machinery prior to construction and placement of refueling sites away from sensitive resources. The project will acquire and comply with permits including the DNR Public Works Permit, WCA permit, CWA permit, and MPCA NPDES Construction Stormwater Permit.

12. Contamination/Hazardous Materials/Wastes:

a. Pre-project site conditions - Describe existing contamination or potential environmental hazards on or in close proximity to the project site such as soil or ground water contamination, abandoned dumps, closed landfills, existing or abandoned storage tanks, and hazardous liquid or gas pipelines. Discuss any potential environmental effects from pre-project site conditions that would be caused or exacerbated by project construction and operation. Identify measures to avoid, minimize or mitigate adverse effects from existing contamination or potential environmental hazards. Include development of a Contingency Plan or Response Action Plan.

The MPCA, “*What’s in My Neighborhood*” online database²² was reviewed for the presence of potentially contaminated sites and for other environmental information in the project area. There are no sites located within the project corridor, but one site is located one mile south of E Park Drive NW along the eastern portions of the project corridor. This site is the Kevin Roppe Farm (MPCA: 089-126009) and is operating as an active feedlot. Due to the extended distance the potential contaminate site is from the project corridor, neither the project nor the surface water within the project corridor will be impacted by the site.

b. Project related generation/storage of solid wastes - Describe solid wastes generated/stored during construction and/or operation of the project. Indicate method of disposal. Discuss potential environmental effects from solid waste handling, storage and disposal. Identify measures to avoid, minimize or mitigate adverse effects from the generation/storage of solid waste including source reduction and recycling.

Solid wastes generated from construction include asphalt, concrete, gasoline, motor oil, metal, and plastic materials. Some naturally-occurring solid wastes include trees, stumps, rocks, gravel and soil materials. All solid wastes generated from construction will be disposed of at a licensed solid waste storage facility or an approved and regulated facility. All construction materials from replacement of the outlet structure, improvements to JD 19 ditch system, and embankment improvements will be directed to the appropriate facilities for disposal or recycling.

All materials and debris produced from the proposed project will be disposed of in accordance with MPCA specifications. No construction materials will be placed in wetlands, floodplains, or any sensitive resource areas. Contamination of soils during construction of the proposed project will be handled in accordance with MPCA requirements.

²² Minnesota Pollution Control Agency (2020) What’s in My Neighborhood.
<https://mpca.maps.arcgis.com/apps/webappviewer/index.html?id=9d45793c75644e05bac197525f633f87>

c. Project related use/storage of hazardous materials - Describe chemicals/hazardous materials used/stored during construction and/or operation of the project including method of storage. Indicate the number, location and size of any above or below ground tanks to store petroleum or other materials. Discuss potential environmental effects from accidental spill or release of hazardous materials. Identify measures to avoid, minimize or mitigate adverse effects from the use/storage of chemicals/hazardous materials including source reduction and recycling. Include development of a spill prevention plan.

The hazardous materials present at the construction site will be limited to fuel and lubricants necessary to maintain construction equipment. All fuel and lubricants will be stored in temporary storage tanks in a predetermined area away from wetlands, surface waters, or any other sensitive resources. Refueling of construction equipment will occur at the predetermined area and will not occur near wetlands or waterbodies to avoid contamination from spills. If a spill were to occur during construction, the project engineer and Minnesota Duty Officer will be contacted and appropriate action will be taken immediately to remediate the spill in accordance with MPCA guidelines and regulations in place at the time of project construction. Potential effects from a hazardous material spill or release could include impacts to water quality or wildlife habitats. The stormwater pollution prevention plan incorporated into the final design will address a spill prevention plan.

d. Project related generation/storage of hazardous wastes - Describe hazardous wastes generated/stored during construction and/or operation of the project. Indicate method of disposal. Discuss potential environmental effects from hazardous waste handling, storage, and disposal. Identify measures to avoid, minimize or mitigate adverse effects from the generation/storage of hazardous waste including source reduction and recycling.

No above or below ground storage tanks are planned for permanent use in conjunction with the project. Temporary storage tanks for petroleum products may be used for refueling equipment during construction. A spill kit will be kept near any storage tanks. No hazardous wastes are anticipated to be generated with this project.

13. Fish, wildlife, plant communities, and sensitive ecological resources (rare features): Describe fish and wildlife resources as well as habitats and vegetation on or in near the site.

The proposed Nelson Slough Improvement Project is located in a landscape predominately made up of freshwater emergent, freshwater pond, freshwater scrub-shrub, and freshwater forested wetlands. The East Park WMA is approximately 10,500 acres in size with diverse habitats including the aforementioned wetlands, aspen forest, shrubland, and open water.

The climate within the province is dry and cold with precipitation rates estimated between 20 and 22 inches per year. The lack of precipitation results in evapotranspiration rates exceeding precipitation rates and therefore an annual deficit two to six inches of water. The majority of water on the landscape in this region comes from snowmelt and runoff from nearby agricultural fields. The region is highly drained through several interconnected ditch systems. Spring melt and high rainfall events result in large amounts of runoff moving into the ditch systems from agricultural fields. Based on the designs of the drainage ditches, runoff events can overwhelm the ditch systems, resulting in flooding of local roadways and agricultural fields.

Nelson Slough is within the East Park Wildlife Management Area and is identified by the DNR as a Public Water (East Park WMA; ID: 45001100). A State Wildlife Sanctuary is located in the northern

portions of the WMA and closed off to visitors from September 1st to October 31st. Nelson Slough is approximately 1,700 acres of open water and marsh-type wetlands that is managed for wildlife habitat. Nelson Slough is an impoundment and not a lake; accordingly it is not managed by DNR Fisheries for fish stocking or recreational use.

- a. Describe rare features such as state-listed (endangered, threatened, or special concern) species, native plant communities, Minnesota County Biological Survey Sites of Biodiversity Significance, and other sensitive ecological resources on or within close proximity to the site. Provide the license agreement number (LA-944) and/or correspondence number from which the data were obtained and attach the Natural Heritage letter from the DNR. Indicate if any additional habitat or species survey work has been conducted within the site and describe the results.

State-Listed Species

There are currently 17 species listed as present within Marshall County. State listed species within Marshall County include eight threatened species and nine endangered species. The piping plover (*Charadrius melodus*) and Poweshiek skipperling (*Oarisma poweskiek*) are the only federally listed species within Marshall County. Neither the piping plover (*Charadrius melodus*) nor Poweshiek skipperling (*Oarisma poweskiek*) have been noted as being present within the project area. Potential habitat for the northern pocket gopher (*Thomomys talpoides*), horned grebe (*Podiceps auritus*), and Wilson's phalarope (*Phalaropus tricolor*) are present at Nelson Slough and the adjacent landscape.

The United States Fish and Wildlife Service (USFWS) identified the Canada lynx (*Lynx canadensis*) and the Northern long-eared bat (*Myotis septentrionalis*) as threatened species within Marshall County, Minnesota. The USFWS Information for Planning and Consultation (IPaC) tool²³ identified the Canada lynx and Northern long-eared bat as potentially present within the project corridor. The IPaC identified no migratory bird species within the project corridor. No critical habitats were identified within the project corridor.

Minnesota Biological Survey (MBS)

The Minnesota Biological Survey (MBS) identifies and describes sites of biodiversity significance and areas of native plant communities.²⁴ Sites of biological significance are ranked based on landscape context and ecological function, native plant community quality and rarity, and species quality and rarity. The ranks include *below*, *moderate*, *high*, and *outstanding*, in which a “below” rank lacks rare species/native plant community occurrence or does not meet MBS standards and an “outstanding” rank has the best quality of rare species/native plant communities. A review of these data shows six sites of biodiversity significance and 50 areas of native plant communities within or adjacent to the project corridor (**Table 16; Table 17; Exhibit 4: MBS Sites of Biodiversity Significance**). It is also important to note that the Nelson Slough impoundment is considered a Lake of Outstanding Biological Significance (LBS). The plant community is ranked as outstanding for this LBS.

²³ United States Fish and Wildlife Service (2020) Information for Planning and Consultation tool.
<https://ecos.fws.gov/ipac/location/index>

²⁴ Minnesota Department of Natural Resources, Minnesota County Biological Survey (2020) Native Plant Communities and Rare Species of Marshall County, Minnesota.
<https://files.dnr.state.mn.us/eco/mcbs/maps/marshall.pdf>

Wetlands within Outstanding MBS Sites of Biodiversity Significance or particular native plant communities may qualify as “rare natural communities” under the Wetland Conservation Act. Minnesota Rules, part 8420.0515, subpart 3 states that a wetland replacement plan for activities that modify a rare natural community must be denied if the local government unit determines the proposed activities will permanently adversely affect the natural community. This will be considered during the WCA decision making process.

Table 16: Minnesota Biological Survey (MBS) Sites of Biodiversity Significance

ID	Site Name	Biodiversity Ranking	Site Total Acres	Total Acres in Corridor	Area of Impact (acres)
9266	EAST PARK 16	Moderate	3826.11	22.27	1.23
9268	EAST PARK 14	Moderate	1018.25	80.96	11.75
9269	EAST PARK 23	Moderate	497.7	288.37	0.00
9270	EAST PARK 25	Below	1736.43	1736.44	20.62
9271	EAST PARK 20	Outstanding	2004.28	31.38	5.36
9274	EAST PARK WMA 34	Below	2780.67	389.55	4.70

Table 77: Minnesota Biological Survey (MBS) Native Plant Communities

Native Plant Community	Description	Conservation Status Rank (S1-S3 are rare)	Number of Sites in Corridor	Total Acres in Corridor	Area of Impact (acres)
AWAF_CX - Aspen Woodland/Forest Complex	Complex community	(S3, S4)	19	319.90	6.26
FDw44a - Aspen - (Cordgrass) Woodland	Fire-Dependent Forest/Woodland System	S3	1	2.19	0.70
FDw44b - Aspen - (Chokecherry) Woodland	Fire-Dependent Forest/Woodland System	S4	1	6.72	1.87
MRn93 - Northern Bulrush-Spikerush Marsh	Marsh System	(S2, S3)	4	49.17	4.07
OPp91 - Prairie Rich Fen	Open Rich Peatland System	(S3)	1	0.47	0.16
UPn23a - Mesic Brush-Prairie (Northern)	Upland Prairie System	S2	2	2.22	0.32
WFw54 - Northwestern Wet Aspen Forest	Wet Forest System	(S4)	1	12.41	2.21
WMn82a - Willow - Dogwood Shrub Swamp	Wet Meadow/Carr System	S5	11	96.29	9.34
WMp73a - Prairie Meadow/Carr	Wet Meadow/Carr System	S3	10	1098.99	2.89

Additional Surveys

Houston Engineering conducted wetland delineation and Floristic Quality Assessment (FQA) surveys during the fall of 2020. The results of the wetland delineation includes 15 wetland areas (totaling 118.7 acres) and one other water feature (totaling 191 linear feet in length). The majority of the wetlands include natural complex of low-relief hardwood swamp, shrub-carr, wet prairie/meadow, sedge meadow, shallow marsh, and deep marsh wetlands. The results of the FQA include three assessment areas and several different plant communities. Assessment Area 1 showed that native species coverage over all plant communities ranged between 75-92%, and the overall Biological Condition Rating of the assessment area was “fair.” Assessment Area 2 showed that native species coverage over all plant communities ranged between 84-91%, and the overall Biological Condition Rating of the assessment area was “fair.” Assessment Area 3 showed that native species coverage over all plant communities ranged between 75-100%, and the overall Biological Condition Rating of the assessment area was “fair.” The dominant species identified during the FQA can be seen in **Table 18**. Species richness at Nelson Slough is shown in **Table 19**. The full results, including all “Biological Condition Ratings” and “Weighted Coefficient of Conservatism (wC)” values, are detailed in the Nelson Slough Floristic Quality Assessment Report (available upon request).

Most commonly found species include:

- Trees: quaking aspen (*Populus tremuloides*), balsam poplar (*Populus balsamifera*), and bur oak (*Quercus macrocarpa*).
- Shrubs: gray dogwood (*Cornus racemosa*), Bebb’s willow (*Salix bebbinana*), alder-leaved buckthorn (*Rhamnus alnifolia*), pussy willow (*Salix discolor*), sandbar willow (*Salix interior*), Saskatoon serviceberry (*Amelanchier alnifolia*), chokecherry (*Prunus virginiana*), and American filbert (*Corylus americana*).
- Grasses: reed canary grass (*Phalaris arundinacea*), brome grass (*Bromus inermis*), fowl blue grass (*Poa palustris*), Kentucky blue grass (*Poa pratensis*), blue joint grass (*Calamagrostis canadensis*), dark green bulrush (*Scirpus atrovirens*).
- Graminoids: broad-leaf cattail (*Typha latifolia*), narrow-leaf cattail (*Typha angustifolia*), hybrid cattail (*Typha x glauca*), woolly sedge (*Carex pellita*), Pennsylvania sedge (*Carex pensylvanica*), field horsetail (*Equisetum arvense*), and lake sedge (*Carex lacustris*).
- Forbs: bird’s foot trefoil (*Lotus corniculatus*), eastern poison ivy (*Toxicodendron radicans*), Canada goldenrod (*Solidago canadensis*), marsh vetchling (*Lathyrus palustris*), golden Alexanders (*Zizia aurea*), Canada anemone (*Anemone canadensis*), giant goldenrod (*Solidago altissima*), yellow/white sweetclover (*Melilotus officinalis*), tall meadow rue (*Thalictrum dasycarpum*), and western poison ivy (*Toxicodendron rydbergii*).
- Vines: American bittersweet (*Celastrus scandens*).

Table 88: Dominant species (top 50 % in descending order) for each plant community over all strata (three AAs combined), * species are non-native / invasive.

Plant Community	Dominant species
Wet Prairie	reed canary grass*, fowl blue grass, woolly sedge, quaking aspen
Shrub-Carr	quaking aspen, reed canary grass*, sandbar willow, blue joint grass
Hardwood Swamp	quaking aspen, reed canary grass*, gray dogwood, balsam poplar, fowl blue grass, Bebb’s willow, alder-leaved buckthorn
Shallow marsh	hybrid cattail*, lake sedge
Fresh Meadow	woolly sedge, lake sedge, dark green bulrush
Upland Prairie	brome grass*, reed canary grass*, bird’s foot trefoil*, quaking aspen, Canada goldenrod, Kentucky blue grass*

Plant Community	Dominant species
Upland Shrubs	quaking aspen, brome grass*, bird's foot trefoil*, American filbert, Western poison ivy
Upland Forest	quaking aspen, brome grass*, balsam poplar, bur oak, gray dogwood, American filbert, Kentucky blue grass*, Canada goldenrod, Western poison ivy

Table 99: Summary of species observed on site and used for Floristic Quality Assessment.

Species Richness	Full Species List	Full Species List	Listed Species used in FQA	Listed Species used in FQA
	Number Observed	% of Total Species	Number Observed	% of Total Species
Total Species:	160	-	133	-
Native Species:	145	91	120	90
Non-native Species:	15	9	13	10

Invasive Species

The DNR identifies 44 terrestrial invasive species that occur in Minnesota and have the potential to occur within the project corridor. These species are divided into four classifications, including prohibited-eradicate, prohibited-control, restricted noxious weeds, and specially regulated. Of the identified terrestrial invasive species approximately 15 species are listed under prohibited-eradicate, 11 species are listed under prohibited-control, 16 species are listed under restricted noxious weeds, and five species with specially regulated status. There are 38 aquatic invasive species identified in Minnesota including 18 animal species, 10 plant species, and 10 identified diseases. The project will comply with the *Minnesota DNR Operational Order 113* to “prevent the introduction, establishment, or spread of invasive species by implementing site-level management.”²⁵

Terrestrial invasive²⁶

Of the plant species listed by the DNR as invasive, six species have been reported in Marshall County, Minnesota and have the potential to be present within the project corridor. These include Canada thistle, purple loosestrife, common buckthorn, European common reed, Tartarian honeysuckle, and western poison ivy. All construction equipment will be thoroughly checked for seeds, soil, and vegetation pre-construction and will be thoroughly cleaned post-construction to

²⁵ Minnesota Department of Natural Resources (2017) Operational Order 113 – Invasive Species Prevention and Management. https://files.dnr.state.mn.us/assistance/grants/habitat/heritage/oporder_113.pdf

²⁶ Minnesota Department of Natural Resources (2020) Terrestrial Invasive Species. <https://www.dnr.state.mn.us/invasives/terrestrial/id.html>

prevent the spread of any invasive species at the site. A thorough cleaning will be done to remove all seeds and debris from construction equipment.

Aquatic Invasive²⁷

Zebra mussels (*Dreissena polymorpha*) are the only listed aquatic invasive species reported in Marshall County, Minnesota. The spread of invasive species is managed through state aquatic invasive species laws including the “clean, drain, and dispose.” All construction equipment will be thoroughly cleaned pre- and post-construction to prevent the spread of any invasive species.

Infested Waters²⁸

The DNR identifies no waterbodies within or adjacent to the project corridor. The Red River of the North is infested with zebra mussels (*Dreissena polymorpha*) and is the only infested waterbody within Marshall County, Minnesota.

Rare Features

The DNR Natural Heritage Information System (NHIS) (LA-944) was consulted to identify the presence of rare features in relation to the project corridor. A review of the NHIS data identified five rare features within the project corridor. These rare features include:

- Trumpeter swan (*Cygnus buccinator*) – Federal: not listed; Minnesota: Special Concern – observed in 1993-06-15 and 1993-08-10.
 - The Trumpeter swan’s habitat includes small ponds and lakes or bays of larger lakes with extensive tracts of emergent vegetation that includes cattails, bulrushes, and sedges. Ideal habitat includes about 100 m of open water for take-off, stable levels of unpolluted water, emergent vegetation, low levels of human disturbance, and the presence of muskrat (*Ondatra zibethicus*) houses and American beaver (*Castor canadensis*) lodges for use as nesting platforms.
- American white pelican (*Pelecanus erythrorhynchos*) – Federal: not listed; Minnesota: Special Concern - observed 2014-07-23.
 - The American white pelican utilizes large but shallow waterbodies that offer abundant feeding resources. This species nests on flat, bare islands that are isolated from predators and human disturbance. There is not a known nesting colony for this species at this location.
- Franklin’s gull (*Leucophaeus pipixcan*) – Federal: not listed; Minnesota: Special Concern - observed in 1981-06-26, 1988-05-27, 1991-07-08.
 - The Franklin’s gull requires large prairie marshes with low vegetation density or areas between open water and cattails. Optimal breeding habitat includes patchy zones of low-density vegetation, intermediate density vegetation, and open water areas. Some examples of feeding habitats include wet pastures, farm fields, and marshes. Water level fluctuations, human disturbances, and disease has impacted this species population
- Colonial Water bird Nesting Area – observed 1985-07-23.
- Sheathed pondweed (*Stuckenia vaginata*) - Federal: not listed; Minnesota: endangered - observed 2019-09-05.

²⁷ Minnesota Department of Natural Resources (2020) Aquatic Invasive Species. <https://www.dnr.state.mn.us/invasives/ais/id.html>

There are also seven rare features located within a one-mile radius of the project corridor. These rare features include:

- Dry sedge (*Carex xerantica*) – Federal: not listed; Minnesota: Special Concern - 2 sites – observed in 1991-07-31 and 1991-08-04.
- Blunt sedge (*Carex obtusata*) – Federal: not listed; Minnesota: Special Concern - 2 sites – observed in 1991-07-31 and 1991-08-04.
- Yellow rail (*Coturnicops noveboracensis*) – Federal: not listed; Minnesota: Special Concern - 2 sites – observed in 1992-05-31 and 1992-05-30.
 - A state-listed bird species of special concern, the Yellow rail has been documented in the vicinity of Nelson Slough. They are dependent on wetland systems and are extremely vulnerable to changes in hydrology; even a slight change of one inch in water depth can cause yellow rails to abandon the area.
- McCalla's willow (*Salix maccalliana*) – Federal: not listed; Minnesota: Special Concern - observed 1991-07-03.
 - McCalla's willow, a state-listed species of special concern, has been documented in nearby wetlands. This willow species is a small shrub found in high-quality shrubby wetlands in the northwestern area of the state. This species has the potential to be found in the direct vicinity of the proposed project and, if present, could be impacted. If desirable, surveys could be completed to better understand impacts to this and other potentially present state-listed species.

b. Discuss how the identified fish, wildlife, plant communities, rare features and ecosystems may be affected by the project. Include a discussion on introduction and spread of invasive species from the project construction and operation. Separately discuss effects to known threatened and endangered species.

The project affects several sensitive habitats including native upland plant communities, native aquatic plant communities, and water bird nesting sites. The Nelson Slough embankments intersect many of the MBS native plant communities and construction on these embankments will ultimately result in impacts and alterations to these communities. Approximately 43.66 acres of MBS Sites of Biodiversity Significance and 27.82 acres of MBS Native Plant Communities will be impacted by the proposed construction activities. The potential implications for these impacts include habitat loss, habitat fragmentation, loss of native species, invasion of non-native or invasive species, and reduction of overall biodiversity of these site. Various species of birds, mammals, amphibians, and reptiles that utilize these habitats for forage, cover, and breeding will be further fragmented by the additions to the current embankments. Since these habitats have already been altered during the original construction of the embankments, the additional embankment height and length proposed in this project will have minimal impact to the project area.

MBS sites that intersect JD 19, the Nelson Slough embankments, or the Nelson Slough outlet structure will be affected during construction. The construction activities in JD 19 will not cause any permanent effects to MBS sites, but may cause some temporary effects within the construction zone. The widening of the embankments will result in permanent effects to adjacent MBS sites, including some loss of existing habitat directly adjacent to the embankment. The construction of the Nelson Slough outlet structure will include permanent effects to MBS sites from excavation and construction of the structure.

Channel stabilization of JD 19 will include excavation (approximately 90,900 cubic yards) and placement of several rock drop structures. Impacts to wildlife habitats include temporary displacement and/or habitat inaccessibility and will occur during the construction period and during high water levels, generally 24-72 hours following heavy rainfall events, during which flood waters will be released into JD 19. Upon construction completion, the project will allow increased flood storage during spring runoff and heavy rainfall events but will also allow water to move through Nelson Slough and into the JD 19 ditch system more quickly per the operating plan, maintaining the normal pool elevation during the nesting season.

Operation of the impoundment at the normal pool elevation and reduction of the bounce following heavy rainfall events is expected to improve the water bird habitat conditions within Nelson Slough. The bounce of water levels and extended periods of high water is detrimental to water birds that nest just above the surface of the water. Other wildlife including upland birds, small mammals, reptiles, and amphibians are also poorly adapted to highly variable water levels. Highly variable water levels affect the overall diversity of these species, but also reduce the site's vegetative cover that is important for food, cover, and breeding success of these species. Several small mammals utilize aquatic vegetation and the vegetative zone between upland and wetlands plants for forage and cover. Most species of frogs, salamanders, and toads are not adapted to fluctuating water level regimes and rely heavily on stable water levels, water temperatures, and water quality for breeding success and survival. Reducing the severity and duration of the water level bounces will alleviate impacts such as species mortality, habitat loss, habitat changes, and loss of important forage. Maintaining a pool elevation with less bounce will maximize the marsh habitat benefits of Nelson Slough and improve nesting habitat for water bird species that require shallow/deep marsh or floating mat habitats for breeding, foraging, and cover as well as open water areas for resting and foraging.

The changes in water levels of Nelson Slough will also result in changes in the mosaic of emergent vegetative wetlands and open waters. Fluctuations in water levels could affect available cover and nesting areas for many wildlife species including water birds. This is significant due to the "colonial water bird nesting site" that was identified by NHIS to be present at Nelson Slough. Colonial-nesting water birds gather in large assemblages during the nesting period and rely on the availability of fish and aquatic invertebrates for food. Changes in operation of Nelson Slough could create stressors to the aquatic life that would affect resilience and stabilization of aquatic populations and ultimately affect food sources for colonial water birds. As mentioned above, changes in vegetative cover and nesting areas from increased water fluctuations would affect nesting success of water birds, especially if these water fluctuations occur during nesting periods.

The existing outlet structure slowly discharges water from Nelson Slough into JD 19, resulting in extended periods of high-water levels within Nelson Slough. The proposed outlet structure will be designed to increase water storage but also to move water out of Nelson Slough more quickly. The regrading of JD 19 will provide sufficient flow capacity for the increased capacity of the outlet structure. As a result of the project, Nelson Slough will operate at the designed operating pool elevation except for short periods of increased water levels during the spring melt and large precipitation events. This will likely improve the key habitats for some over-water nesting birds and waterfowl, upland birds, aquatic invertebrates, amphibians, reptiles, and aquatic mammals that utilize the site for forage, cover, and breeding.

The majority of the proposed project is within or adjacent to the ordinary high-water level of Nelson Slough (East Park WMA - 45001100) and JD 19. The modifications to the embankments around Nelson Slough will affect adjacent wetlands by way of excavation and fill. Regrading of JD 19 will

require excavation and fill that will temporarily affect any aquatic habitat within JD 19. These habitats will redevelop following construction activities. No mitigation for new operation of the proposed outlet structure for the fall and summer proposed operations is anticipated since the goal is to try maintain the original 1971 operation level of 1102.3 more consistently than current operations.

State-listed Species

Potential effects to state-listed species include potential loss/fragmentation of habitats, changes in habitat types, potential mortality of species, and dispersal of species during construction. The northern pocket gopher, though not documented in Minnesota since 1991, could be affected from the construction activities along the levees. The northern pocket gopher is absent in closed canopy forests but often inhabits disturbed areas such as roadside ditches and flood control berms. Although not anticipated to be present at Nelson Slough, potential effects to the gophers include destruction of under-ground burrows that could be present within the levees and temporary dispersal of the species. Horned grebe nesting habitats occur within the project area and include emergent wetlands or areas with shallow water and persistent emergent vegetation. There are no persistent breeding populations identified in Minnesota, but some potential impacts to this species include loss of floating nests, loss of habitat, and potential species dispersal. Excavation within wetlands with emergent vegetation will result in temporary loss of vegetation used for nesting and cover by the horned grebe. Wilson's phalaropes are commonly found within the short vegetation of wet prairies, rich fens, and grass-dominated/sedge-dominated wetlands. Similar to horned grebes, potential impacts from the project include loss/fragmentation of habitats and temporary dispersal of the species. Work completed within emergent wetlands could reduce and fragment potential habitats used by this species.

Federal-listed Species

The USFWS IPaC tool identified the Canada lynx (threatened species) and northern long-eared bat (threatened species) as potentially being affected by activities in this location. This is likely due to potential habitats being present within the project corridor. The Canada lynx's habitat within the United States includes boreal forests/temperate forests that receive heavy snow for greater than four months and support healthy populations on snowshoe hare (*Lepus americanus*). The Canada lynx populations in the United States typically found in unsuitable habitats and were the result of mass dispersal events from Canada during periods of snowshoe hare declines. Consistent lynx populations are rare in the United States, and the closest population to the project corridor occurs in northeastern Minnesota. The rarity of this species in the U.S. makes it unlikely that populations occur within or adjacent to the project corridor, but it cannot be ruled out that individuals are present within the large tracts of hardwood forests. The northern long-eared bat's habitat in the summer is the bark of both live and dead trees, caves and crevasses, and barns and sheds. During the winter, the bat hibernates in small crevasses in caves and mines. The continuous tracts of forests in the project corridor could provide summer habitat for the northern long-eared bat. Tree removal associated with construction will be coordinated with the DNR and USFWS prior to construction to determine the presence of any northern long-eared bats and will comply with the USFWS 4(d) Rule.

There are no DNR identified infested waters within the project corridor. The Middle-Snake-Tamarac Watershed District will consult with the DNR prior to construction as a precautionary effort to avoid the spread of both terrestrial and aquatic invasive species as a result of the project.

- c. Identify measures that will be taken to avoid, minimize, or mitigate adverse effects to fish, wildlife, plant communities, and sensitive ecological resources.

The preliminary design phase of the project was utilized to maximize the reduction in adverse effects to the MBS native plant communities, rare features, sensitive resources, and species identified as threatened, endangered, or of special concern. Prior to construction, the project proposer will coordinate with the DNR and USFWS to ensure that no threatened or endangered species are present within the construction zone. If a protected species is observed during construction, all activities will pause and coordination with federal and state agencies will occur prior to continuing construction activities.

Measures will be taken to avoid or minimize impacts to all federal and state threatened and endangered species. With the high presence of water birds, and several utilizing Nelson Slough as nesting habitats, construction activities are planned to occur outside of the nesting season. Construction activities that occur during the nesting season, late April through early June, could disrupt nesting Trumpeter swans and plan to be avoided. Operational water levels would reach their highest level by early April in potential nesting areas to avoid flooding nests. Yellow rails start nesting in late May and the young typically fledge by the end of June. Changing water levels from early May through mid-July are planned to minimal to avoid impacts to Yellow rail.

Following completion of construction, the slopes and toes of the embankment will be reseeded with a Minnesota BWSR northwest native seed mix, and additional specific species may be targeted in consultation with the DNR. Only weed-free mulches, topsoils, and seed mixes will be used.

The improved outlet structure and regraded JD 19 will allow for future temporary drawdowns of the impoundment for habitat management purposes. Temporary drawdowns are a management tool that can improve aquatic vegetation diversity, invertebrate abundance, water quality, and manage undesirable aquatic species. Drawdowns of Nelson Slough will be conducted based on DNR Wildlife Section plans and only after the project meets all management triggers. DNR Wildlife Section will coordinate with the Middle-Snake-Tamarac Rivers Watershed District to develop a management plan for Nelson Slough during non-flood periods.

These temporary water level manipulations mimic historic droughts and can improve water clarity, remove fish or temporarily reduce fish abundance, and increase aquatic invertebrate abundance. Habitat trigger points will be developed for operation of the project, likely based on quantitative factors such as vegetation frequency and water clarity.

Adverse effects to aquatic resources may result from the fluctuating water levels and construction of the outlet structure. During construction, best management practices will be utilized to prevent surface water contamination, sedimentation, stormwater runoff, soil contamination, and spread of invasive species. Construction of the outlet structure will require the impoundment to be drawn down or the outlet area will need to be dammed in order to access the soil bed. A drawdown period will temporarily displace wildlife utilizing the impoundment and potentially kill aquatic species during construction, but should improve water quality and aquatic vegetation diversity, kill undesirable fish, and increase invertebrate abundance.

Adverse effects to the native plant communities and habitats along the Nelson Slough embankments will be mitigated through reseeded with a Minnesota BWSR northwest native seed mix. For sites that cannot be reseeded the watershed district will work with DNR to develop a vegetative management plan. During and after construction, erosion control devices will be utilized to reduce soil erosion and

sedimentation. All erosion control devices will be environmentally friendly to reduce impacts to wildlife.

14. Historic properties:

Describe any historic structures, archeological sites, and/or traditional cultural properties on or in close proximity to the site. Include: 1) historic designations, 2) known artifact areas, and 3) architectural features. Attach letter received from the State Historic Preservation Office (SHPO). Discuss any anticipated effects to historic properties during project construction and operation. Identify measures that will be taken to avoid, minimize, or mitigate adverse effects to historic properties.

In July 2018, HEI contracted with McFarlane Consulting LLC to perform a Phase Ia Literature Search of the Judicial Ditch 19 subwatershed in Marshall and Roseau Counties, Minnesota (available upon request). The project corridor is located within Lincoln and East Park townships in Marshall County, Minnesota.

The literature search determined that there are six historic cemeteries (Mamrelund Cemetery, Bethesda Cemetery, Mission Covenant Cemetery, English Cemetery, Wikstrom Cemetery, and Huntly Cemetery) located within the subwatershed. There are no National Register of Historic Places (NRHP) or archaeological sites identified from the Literature Search. The subwatershed contains portions of several glacial beaches and strandlines from glacial Lake Agassiz. Since these beaches and strandlines have high potential for containing prehistoric cultural properties, and ground disturbing activities and inundation will occur in the construction of the project, McFarlane Consulting LLC concluded that a Phase I Archaeological survey would be warranted.

The State Historic Preservation Office (SHPO) was contacted to review archeological and historic databases for potential features within the project corridor. A SHPO letter was received on May 12, 2021 concurring with the findings of McFarlane Consulting LLC and recommending a Phase I Archaeological Survey be conducted for the project (**Appendix B - Minnesota State Historic Preservation Office Letters**).

In July 2021, McFarlane Consulting was contracted to complete a literature search and field investigation of the proposed project corridor (available upon request). The literature search identified no National Register of Historic Places (NRHP), archaeological sites, historical structures, cemeteries, or historic trails within the Nelson Slough Project corridor. The field investigation identified no cultural resources and a recommendation of “No Properties Affected” was proposed. On August 4, 2021, a second letter was received from SHPO concluding that, “there are no properties listed in the National or State Registers of Historic Places and no known or suspected archaeological properties in the area that will be affected by this project.” (**Appendix B - Minnesota State Historic Preservation Office Letters**).

15. Visual:

Describe any scenic views or vistas on or near the project site. Describe any project related visual effects such as vapor plumes or glare from intense lights. Discuss the potential visual effects from the project. Identify any measures to avoid, minimize, or mitigate visual effects.

Nelson Slough is part of the East Park WMA and is open to public recreational opportunities such as hunting, hiking, and bird watching. Construction of the proposed project will cause temporary visual

impacts to visitors and may prevent recreational use to areas of Nelson Slough. These impacts will be temporary and restricted to the construction period. Although the majority of the surrounding landscape is large tracts of agricultural fields, several residential properties are located within a half mile of JD 19. During construction, these properties and local roadway users may be impacted from dust clouds, vapor plumes, and intense light glares. This will be mitigated or minimized through dust control measures, timing of construction, and orientation of construction lights. Some examples of dust control methods include keeping soil wet with water, using dust suppressant chemicals, reducing machinery speed on exposed soils, and limit overall soil disturbance. Construction activities will be confined to normal working hours and glares will be managed through placement, height, and angles of construction lights.

There are no other scenic views or vistas within the project corridor. The project construction will result in temporary annoyances to local residences and visitors. Visual annoyances will be relative to the viewers' perspective of the project area.

16. Air:

a. Stationary source emissions - Describe the type, sources, quantities and compositions of any emissions from stationary sources such as boilers or exhaust stacks. Include any hazardous air pollutants, criteria pollutants, and any greenhouse gases. Discuss effects to air quality including any sensitive receptors, human health or applicable regulatory criteria. Include a discussion of any methods used assess the project's effect on air quality and the results of that assessment. Identify pollution control equipment and other measures that will be taken to avoid, minimize, or mitigate adverse effects from stationary source emissions.

The project will not result in stationary source air emissions concerns.

b. Vehicle emissions - Describe the effect of the project's traffic generation on air emissions. Discuss the project's vehicle-related emissions effect on air quality. Identify measures (e.g. traffic operational improvements, diesel idling minimization plan) that will be taken to minimize or mitigate vehicle-related emissions.

Construction of the proposed project activities will utilize heavy machinery and equipment typical of construction projects. Current air quality is not anticipated to be adversely impacted from the use of this machinery and equipment. These emissions will be temporary and will not exceed emission standards. There are no mitigation measures planned during construction activities. Equipment will be maintained to operate under factory-suggested operations and maintenance intervals to avoid inefficiencies in operations.

Following completion of the proposed project, it is not anticipated to result in an increase in traffic and emissions. No mitigation plans have been established for the potential increase in traffic.

c. Dust and odors - Describe sources, characteristics, duration, quantities, and intensity of dust and odors generated during project construction and operation. (Fugitive dust may be discussed under item 16a). Discuss the effect of dust and odors in the vicinity of the project including nearby sensitive receptors and quality of life. Identify measures that will be taken to minimize or mitigate the effects of dust and odors.

Dust and odors generated from the project will be negligible and temporary. Dust and odors will occur during construction activities including removal of the current outlet structure, installation of the new outlet structure, improvements to the embankments, and improvements to JD 19. Although much of the surrounding landscape is large tracts of agricultural fields, several residential properties that could be impacted from dust and odor pollution are located within a half-mile of JD 19 and a mile of Nelson Slough. East Park WMA visitors would be impacted from dust and odors and the construction zones will be restricted. These impacts will be limited to the duration of construction and confined to the construction area. Dust will be managed using dust control methods include keeping soil wet with water, using dust suppressant chemicals, reducing machinery speed on exposed soils, and limit overall soil disturbance. Odors generated from construction will include exhaust from diesel engines and fuel storage. Odors will be managed by zone restricting, operation timing, and through standard emission controls.

17. Noise

Describe sources, characteristics, duration, quantities, and intensity of noise generated during project construction and operation. Discuss the effect of noise in the vicinity of the project including 1) existing noise levels/sources in the area, 2) nearby sensitive receptors, 3) conformance to state noise standards, and 4) quality of life. Identify measures that will be taken to minimize or mitigate the effects of noise.

The construction activities are likely to produce noise. The construction crew will be required to follow local noise ordinances and restrictions.

The noise generated by construction activities will be due to the mobilization and use of heavy machinery and equipment. Noise impacts from construction activities will be temporary and restricted to the construction period. There are no anticipated permanent noise pollution as a result of the project. Existing noise within the project corridor and nearby areas are directly associated with traffic and agricultural operations. Residents and visitors located near or adjacent to the construction zone will be temporarily impacted from increased noise resulting in some adverse effects to quality of life. These adverse effects to quality of life include annoyances during everyday activities especially outdoor activities. All residents will be notified about the timing and duration of construction prior to the beginning of construction. Noise pollution will be minimized through restricting the use of heavy machinery during normal working hours.

The project is exempt from Minnesota Noise Standards, per Minn. Stat. 116.07, subd. 2a., provided that all reasonably available noise mitigation measures, as approved by the commissioners of MnDOT and MPCA, are employed to abate noise.

18. Transportation

a. Describe traffic-related aspects of project construction and operation. Include: 1) existing and proposed additional parking spaces, 2) estimated total average daily traffic generated, 3) estimated maximum peak hour traffic generated and time of occurrence, 4) indicate source of trip generation rates used in the estimates, and 5) availability of transit and/or other alternative transportation modes.

The construction will not cause any adverse impacts to the adjacent roadways (425th Street NW and E Park Drive NW). Traffic is not likely to be impeded since 425th Street NW is a dead-end road and E Park Drive NW is closed to motor vehicle most of the year. Visitors to the WMA will be restricted to the area outside of the construction zone. Access to the impoundment, levees, and access road to the water control structure will be restricted during construction periods. Once operational, the project

would provide reduced interruption of transportation access to roads and highways during large floods.

Discuss the effect on traffic congestion on affected roads and describe any traffic improvements necessary. The analysis must discuss the project's impact on the regional transportation system. *If the peak hour traffic generated exceeds 250 vehicles or the total daily trips exceeds 2,500, a traffic impact study must be prepared as part of the EAW.* Use the format and procedures described in the Minnesota Department of Transportation's Access Management Manual, Chapter 5 (*available at: <http://www.dot.state.mn.us/accessmanagement/resources.html>*) or a similar local guidance,

Peak hour traffic generated will not exceed 250 vehicles nor will total daily trips exceed 2,500 as a result of the project. There may be temporary slowed traffic along 425th Street NW and 410th Street NW during mobilization and rubble removal. There are no traffic improvements necessary to accommodate the temporary construction or operations and maintenance activities associated with the project.

There is a designated public parking area and boat ramp along 410th Street NW that provides public access to the WMA. The DNR will be closing the WMA within the construction zone to provide safety for both the public and the construction workers. No temporary parking spaces will be provided. Limited access and some traffic congestion will occur during construction activities in this area. Traffic may be reduced to one lane but will not require detours. Extra traffic will be limited to construction vehicles and heavy machinery. No extra public traffic is anticipated upon completion of the project.

- b. Identify measures that will be taken to minimize or mitigate project related transportation effects.

The majority of the WMA including the levees, impoundment, and access roads will be closed to the public during construction. In order to allow East Park WMA visitors to make accommodations, the public will be informed when construction is anticipated to begin. The project does not require a detour.

19. Cumulative potential effects: (Preparers can leave this item blank if cumulative potential effects are addressed under the applicable EAW Items)

- a. Describe the geographic scales and timeframes of the project related environmental effects that could combine with other environmental effects resulting in cumulative potential effects.

Environmental impacts related to this project will be temporary during the construction period, and permanent after the conversion from the existing to the proposed infrastructure.

Temporary impacts limited the construction period (estimated 6 to 9 months) include potential flood damage during construction, when impoundment is not operational; disturbance to aquatic habitat; loss of vegetation during ditch regrading; risk of erosion; displaced habitat; and dust, noise, visual impacts, and delays to transportation.

Permanent impacts related to this project include a reduction in wetlands; changes to soil types, affecting permeability; potential for erosion in ditches due to increased and sustained flows; reduction in certain "undesirable" fish species; and displaced habitat.

b. Describe any reasonably foreseeable future projects (for which a basis of expectation has been laid) that may interact with environmental effects of the proposed project within the geographic scales and timeframes identified above.

Lilac Ridge Water Management Project²⁹

The proposed Lilac Ridge Water Management Project includes the construction of an off-channel impoundment along with the channel grade stabilization along approximately 3 miles of JD 14 Main Branch within the Lilac Ridge area. The project is approximately 23 miles away from the Nelson Slough, and construction is expected to occur between May 2023 and October 2024.

Newfolden Flood Prevention Project³⁰

The City of Newfolden Flood Prevention Project consists of a Phase I and Phase II. Phase I of the Project is located in the City of Newfolden, MN (City) and consists of the replacement of a Canadian Pacific Railway (CP) culvert crossing within the Middle River to lower the 1% Annual (100 Year) Floodplain with an Effective Base Flood Elevation of 1098.1' on the east side of the City. Phase II of the project will be the construction of an off-channel impoundment site north of the City approximately 1.5 miles. The site consists of an inlet channel and exterior ditches that will move water into the 350 acre impoundment site. The impoundment is located in New Maine Township, Sections 27 and the inlet channel is in Section 33. The inlet channel will divert flows from Judicial Ditch 21 (JD 21) to the west, under CSAH 8, and into the impoundment site. The project will also include minor ditch work on the east side of CSAH 8 and the construction of a new road ditch along 140th Avenue Northwest. The project is approximately 10 miles away from Nelson Slough and construction is expected to occur between 2022 and 2023.

Marshall County Highway³¹

Marshall County Highway Department is planning three road projects in the vicinity of Nelson Slough within 2022 and 2023. Mill and overlay work is being planned for County Road 30, County Road 4, and County Road 1 at distances of 9.5 miles, 11.5 miles, and 14 miles from Nelson Slough, respectively.

c. Discuss the nature of the cumulative potential effects and summarize any other available information relevant to determining whether there is potential for significant environmental effects due to these cumulative effects.

²⁹ <https://mstrwd.org/wp-content/uploads/EAW-Press-Release-note-6-21-21.pdf>

³⁰ <https://mstrwd.org/wp-content/uploads/Brochure-for-website.pdf>

³¹ <https://cms1files.revize.com/marshall/Highway%20Department/Five%20year%20Plan%20Map%202019.pdf>

Lilac Ridge Water Management Project³²

Because there is not an existing impoundment at the Lilac Ridge project site, there should be no accumulation of effects due to flooding during construction, disturbing the aquatic habitat, or loss of aquatic vegetation. Similarly, there will be no effect on fish species or other habitat displacement during construction. There could be a risk of erosion of soil and sediment during construction, but this effect is not likely to accumulate due to the distance between projects. Dust, noise, and disruption of vistas are not likely to accumulate due to the distance between projects. Because the two projects are separated by a highway, the delays in transportation are also unlikely to accumulate.

Effects due to the permanent loss of wetlands have the potential to accumulate, however both projects plan to purchase wetland credits to mitigate these losses. Both projects may cause changes in permeability due to changes in soil types, but this effect should be minor and not likely to accumulate at this distance. Increased flows in ditches will be mitigated with rock drop structures in both projects, making these effects unlikely to accumulate. Lastly, habitat displacement during high water levels in the impoundment could temporarily accumulate as spring floods are generally happening on the same timeline throughout the region.

Newfolden Flood Prevention Project³³

Because there is not an existing impoundment at the Newfolden project site, there should be no accumulation of effects due to flooding during construction, disturbing the aquatic habitat, or loss of aquatic vegetation. Similarly, there will be no effect on fish species or other habitat displacement during construction. There could be a risk of erosion of soil and sediment during construction, but this effect is not likely to accumulate due to the distance between projects. Dust, noise, and disruption of vistas are not likely to accumulate due to the distance between projects. Because the two projects are separated by a highway, the delays in transportation are also unlikely to accumulate.

Effects due to the permanent loss of wetlands have the potential to accumulate, however both projects plan to be purchasing wetland credits to mitigate these losses, and the wetland losses for the Newfolden project are very minor at 0.007 acres. Both projects may cause changes in permeability due to changes in soil types, but this effect should be minor and not likely to accumulate at this distance. Increased flows in ditches will be mitigated with rock drop structures in both projects, making these effects unlikely to accumulate. Lastly, habitat displacement during high water levels in the impoundment could temporarily accumulate as spring floods are generally happening on the same timeline throughout the region.

Marshall County Highway Projects³⁴

Because the highway projects mainly consist of work on the roadways, many of the disturbances to surface waters, land use, habitat, and soil/sediments are not applicable. The effects that could

³² <https://mstrwd.org/wp-content/uploads/EAW-Press-Release-note-6-21-21.pdf>

³³ <https://mstrwd.org/wp-content/uploads/Brochure-for-website.pdf>

³⁴ <https://cms1files.revize.com/marshall/Highway%20Department/Five%20year%20Plan%20Map%202019.pdf>

accumulate among these projects would be related to dust, noise, disruption of vistas, and transportation. However, at the distances of separation between these projects and the access to major thoroughfares between the projects, these effects are unlikely to accumulate.

20. Other potential environmental effects: If the project may cause any additional environmental effects not addressed by items 1 to 19, describe the effects here, discuss how the environment will be affected, and identify measures that will be taken to minimize and mitigate these effects.

There are no additional environmental effects other than what has been provided in this EAW.

RGU CERTIFICATION. *(The Environmental Quality Board will only accept **SIGNED** Environmental Assessment Worksheets for public notice in the EQB Monitor.)*

I hereby certify that:

- The information contained in this document is accurate and complete to the best of my knowledge.
- The EAW describes the complete project; there are no other projects, stages or components other than those described in this document, which are related to the project as connected actions or phased actions, as defined at Minnesota Rules, parts 4410.0200, subparts 9c and 60, respectively.
- Copies of this EAW are being sent to the entire EQB distribution list.

Signature /s/ Sara R Mielke Date 9/30/2021

Title EAW Project Manager