July 2013 version

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 addresses 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:** Chambers' Grove Aquatic Habitat Enhancement Project

2. **Proposer:** MN Department of Natural Resources
   Contact person: John Lindgren
   Title: SLR AOC Coordinator
   Address: 5351 North Shore Drive
   City, State, ZIP: Duluth, MN 55804
   Phone: (218) 525-0853 ext.209
   Fax: (218) 525-0855
   Email: john.lindgren@state.mn.us

3. **RGU:** MN Department of Natural Resources
   Contact person: Ronald Wieland
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4. **Reason for EAW Preparation:** (check one)

Required:	Discretionary:
☐ EIS Scoping	☐ Citizen petition
X Mandatory EAW	☐ RGU discretion
	☐ Proposer initiated

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

   Minnesota Rule: part 4410.4300, subpart 27, item A. Wetlands and public waters.

5. **Project Location:**
   County: St. Louis
   City/Township: Duluth/Fond du lac
   PLS Location (¼, ¼, Section, Township, Range):

¼, ¼	Section	Township	Range
NE1/4 of NE1/4	7	48N	15W

   Watershed (81 major watershed scale): St. Louis River
   GPS Coordinates: DMS Coordinates: 92 17' 04" W, 46 39' 38" N
   Geographic Coordinates: latitude: 44.059414; longitude: -92.049253
   Tax Parcel Numbers: 010-2730-00900

   At a minimum attach each of the following to the EAW:

   - County map showing the general location of the project;

   Figure 1: Regional location of Chambers' Grove Aquatic Habitat Restoration Project within the Lower St. Louis River Area of Concern.

- U.S. Geological Survey 7.5 minute, 1:24,000 scale map indicating project boundaries (photocopy acceptable); and

Figure 2: Topographic map of the Chambers' Grove Aquatic Habitat Restoration Project near Fond du Lac, MN.

- Site plans showing all significant project and natural features. Pre-construction site plan and post-construction site plan.

Figure 3: Existing conditions at Chambers' Grove Park showing full extent of the project area with locations of degraded aquatic habitat features identified.
Figure 4: Aerial view of Chambers' Grove existing conditions.
Figure 5: Proposed project developments: Boulder weir and j-hook vanes, toe-wood sod-mat bank, sidewalks, fishing platforms and canoe access, channel reshaping cut and fill and construction access zone.
Figure 6: Curved cross-section at proposed boulder weir.
Figure 7: J-hook cross sections at 2+50. Cross sections aligned at a 30^{o} upstream angle.
Figure 8: J-hook cross sections at 6+00. Cross sections aligned at a 30^{o} upstream angle.

- Attachments

  A. Background on St Louis River Area of Concern (AOC)
  B. DNR Natural Heritage Information System Concurrence

6. Project Description:

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

The Minnesota Department of Natural Resources (MDNR) intends to use natural channel design techniques to enhance spawning habitat for Lake Superior migratory fish species, particularly lake sturgeon, by constructing three riffle features about 1.4 miles below the Fond du Lac Dam on the St. Louis River in Duluth, Minnesota. Project will include removing an engineered retaining wall along the shoreline and naturalizing the bank with vegetation. Designs will include access features planned by the City of Duluth. This project supports the Lower St. Louis River Area of Concern Remedial Action Plan.

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.

The Minnesota Department of Natural Resources (MDNR) proposes the Chambers' Grove project to rehabilitate aquatic habitats in the lower St. Louis River in concurrence with the St. Louis River Area of Concern (AOC) Remedial Action Plan (see Attachment A) and MDNR St. Louis River Estuary Fisheries Management Plan (Figures 1, 2, 3 and 4). MDNR leads the Restoration Site Team (RST), which has developed the site design plans to achieve project objectives. The RST is comprised of resource specialists from MDNR, Minnesota Pollution Control Agency (MPCA), US Army Corps of Engineers (USACE), City of Duluth, Wisconsin Department of Natural Resources (WDNR), Fond du Lac Band of Lake Superior Chippewa, and Minnesota Land Trust (MLT). The MLT serves as the MDNR authorized representative for managing project construction. National Oceanic and Atmospheric Administration (NOAA) has provided funding for the project through the Great Lakes Restoration Initiative (GLRI).

The Chambers' Grove project (Figures 5, 6, 7 and 8) involves aquatic enhancement of approximately 1000 feet (0.2 mile) of side-channel and shoreline of the St. Louis River near the Fond du Lac neighborhood, immediately upstream of the State Highway 23 Bridge. The Chambers' Grove project is situated about 1.4 river miles downstream from the Fond du Lac Dam.

As characterized by previous fisheries research on the river, sturgeon spawning habitat requires adequate flow velocity (1-2 feet/sec) (ft) and complex hydraulics created by boulders and bedrock features. Habitat that meets these characteristics, which are essential for migratory fish, including lake sturgeon, walleye and longnose sucker, is extremely limited due to the dam barrier, shortness of the reach that support sufficient flow velocities, limited areas of boulder/cobble fields, and the effects of Lake Superior water levels on the lower St. Louis River. This spawning area is vital to both St. Louis River estuary as well as the western Lake Superior populations of these species. Chambers' Grove is the best place to improve spawning habitat because of the suitable flows and coarse substrates.

The current condition of the aquatic habitat in the side-channel is minimally suitable for lake sturgeon spawning. The project area lacks a key element for sturgeon and other riffle spawning species—the hydraulic complexity created by pour-overs. Present estimates show less than 0.1 acre of marginal quality spawning habitat exists within the project area. Construction of boulder weir and j-hook vanes will create small scale cascades that increase hydraulic complexity. If successfully constructed, about 1.5 acres of good to excellent spawning habitat will be created by the project. The exact amount and quality spawning habitat will vary depending on river flows and Lake Superior water levels. The weir construction will make spawning habitat suitable over a wider range of river flows.

The main objectives of the Chambers' Grove Project are: 1) reestablish favorable spawning habitat for migratory fishes of Lake Superior by constructing rock riffles; 2) improve flow regime and stability of side-channel; 3) naturalize shoreline by removing artificial structures; and 4) improve access for outdoor recreational opportunities, such as fishing and launching canoes, while achieving American's with Disabilities Act (ADA) compliance for proposed shorefront access structures. The 1000-foot retaining wall constructed of sheet pile, gabions, boardwalk and safety fence will be removed along the riverfront of Chambers' Grove Park and the shoreline (littoral zone) will be stabilized with toe wood and other organic materials. The bank's riparian area above the ordinary high water level (OHWL) will be naturalized with native vegetation.

Due to a major flood event in June, 2012, the side-channel entrance is clogged with gravel, stone, and debris deposited as a shoal that prevents sufficient flow from entering the channel (Figure 3). The Chamber's Grove Project includes reworking the depth of the channel entrance to recreate riverine flow dynamics that support spawning habitat. A rock weir will be configured at the entrance to allow sufficient flow volume and to create micro-turbulence eddies ideal for fish spawning. Two j-hook-shaped rock configurations will be placed in the side-channel to provide additional spawning habitat and enable better river access. Large boulders will be placed in line to create the flow dynamics favorable for spawning. In addition these features will help maintain the natural channel form by concentrating flow velocities towards the center of the side channel. The boulders will be will be partially buried and layered in cobbly substrates to prevent dislocation during future high flow events (Figures 5 and 6).

The Chambers' Grove Park, a long established park of the Duluth park system, contains an artificial shoreline that has deteriorated over time. In the 1990's, a retaining wall (iron sheet piling and rock-filled gabion baskets) were added to the park's shoreline and capped with a wooden boardwalk and safety fence. The boardwalk reduced access to the river and the hardened vertical surfaces reduces the value of nearshore aquatic habitat. Under agreement with the City of Duluth, the MDNR will

restore the shore area (littoral zone) along the park's riverfront. The project has been closely designed with the City, which has agreed to provide construction equipment access to the project site and space for staging materials and equipment during a scheduled park closure. The City plans to rehabilitate the park's amenities, concurrently or after this project is completed (Figure 4).

Project construction is scheduled for mid-July to mid-October, 2015. Specific dates for construction will be determined upon completion of site analysis, public environmental review, and permitting requirements.

Over the past year MDNR has collaborated with numerous AOC affiliates to plan and design the Chambers' Grove project. Studies were conducted to describe conditions of the side-channel and assess the Chambers' Grove park riverfront structures. The rarity of spawning habitat was identified and efforts were made to determine ways to enhance suitable spawning areas. Modelling and an alternative assessment were conducted to identify the preferred design represented in this EAW. Modelling identified potential effects on the river hydrology caused by the proposed weir and j-hook structures. Soil borings along the park's riverfront were taken to determine condition of substrate and depth of bedrock. Final project designs incorporated the objectives and concerns of adjacent landowners.

Project designs were based on natural stabilizing design techniques which have been successfully applied by MDNR below the Fond du Lac Dam and along other rivers in the state. In August of 2009, the channel substrate along an 800 foot reach directly below the Fond du Lac Dam was prepared to mimic quality spawning habitat for surgeon. The St. Louis River Sturgeon Spawning Habitat Enhancement Project at Fond du Lac Dam improved approximately 5.5 acres of channel for sturgeon spawning. Three riffle sections were constructed sequentially 250 feet apart, beginning about 200 feet below the dam. Large boulders were implanted in an arc across the river channel to form the riffle sections and were randomly placed over about 500 feet of river channel between the dam and the bottom riffle section. Successful sturgeon spawning has been attributed to these constructed features.

This project incorporates similar aquatic enhancement goals as completed elsewhere in the state to naturalize shorelines, improve spawning habitat, and improve river flow and channel/bank stability. Some shoreline enhancements have improved access for fishing, boating, and other water recreation activities.

Construction machinery may include: hydraulic excavators (track-hoe), dozers, cranes, front-end loaders, skid-steer loaders, landscaping tractors, dump trucks, pickup trucks, and other implements. Project construction will likely be sequenced in the order of listing, although some work will be phased to limit soil exposure and other activities may occur concurrently due to permit, machinery, staffing, and time constraints: 1) removal of artificial structures along the shoreline; 2) preparation of access points for stationing machinery along the shore (i.e. cranes) or moving machinery into public waters along the corridors proposed for cut/fill and boulder placement; 3) naturalize exposed shoreline by sculpting shore slope to create 0.3 ac littoral zone (approximately 900 feet long x 15-20 ft wide); 4) anchoring and partially burying toe-wood and other large woody debris in the littoral zone using native substrate for cover; 5) placing soil and live shrub/sod mats above the normal water level; 6) constructing six flat-rock fishing access platforms, ADA compliance sidewalk, and a canoe access area (0.2 ac); and 7) landscaping and reseeding (1.9 ac) of the river bank and backshore (construction access zone/riparian area) with native plantings and wildflowers. The size of the area under construction at any given time will be identified in the plans and permit applications provided to authorities.

Significant demolition, removal or remodeling of existing structures along the park's riverfront will be completed. The boardwalk will be dismantled and loaded into dump trucks for transport to a land fill, unless materials can be recycled. Existing steel sheet pile and gabion basket walls will be removed from the shoreline using the hydraulic excavator. Gabion rock may be reused for developing riffle structures, if rock fragments have the right dimension to use as base materials for construction the weir and j-hooks. The sheet metal pilings will be recycled.

Organic materials such as root wads, log pilings, and live, mixed-shrub/grass sod mats will be used to protect the shore from erosion, improve access and habitat for wildlife, and improve shore stability. The toe-wood includes 1 to 2 foot diameter complete tree trunks, a minimum of 20 feet long. Depending on sizes available, approximately 200 trees with intact root crown (root wads) will be required. The source of these organic materials has not been determined.

Once the natural substrates are unencumbered by sheet pile and gabion revetment, the shoreline can be reworked and naturalized mostly using a hydraulic excavator. The use of toe-wood and sod mats will help to stabilize the river bank and support re-establishing native vegetation. Logs and root wads are driven into the river bank. Additional tree branches are used to fill voids. Fill and living native sod mats are placed on the wood layers. Additional plantings of native shrubs, trees, grasses, and wildflowers will be used to re-establish the riparian zone. The toe-wood will protect the bank while the native vegetation becomes established. The submerged wood will improve habitat structure for fish and other aquatic life. Shore slope and dimension will be designed to resist erosion during flooding and ice flow damage and maintain connectivity during low and high water levels.

Concurrent to naturalizing the shoreland, MDNR will excavate/fill portions of the channel and place gravel substrates and boulder alignments at the channel entrance and along the two proposed j-hooks corridors (Figures 5, 6, 7, and 8). Large boulders will be placed in the river to create a riffle-pool sequence. Each riffle structure will extend up to just above the bankfull elevation on the northern shoreline and terminate at low water levels. Additionally, groups of large boulders will be distributed between the middle and lower riffles. The boulder configurations will change hydraulic vectors to reduce the potential for bank erosion along the park shoreline.

Three cut/fill areas totaling approximately 1.4 ac (~½ cut / ½ fill) will be reworked to deepen portions of the side channel where flow is restricted. The three deepened areas will be centrally located in the channel to promote the highest flows and the three fill areas will be aligned at a 30 degree upstream angle from the north shore to about 1/3 of the way across the channel. The structures will limit flow and stress on the proposed naturalized shoreline (Figure 5).

The elevation of the lateral bar, or shoal, at the head of the section would be lowered and stabilized with a weir across the entire channel to increase flows into the north channel and reconfigured to shift the river thalweg and re-orient flow vectors away from the river bank to mid-channel. Class IV riprap (cobbles (3-10 in. diameter) and stones (10-24 in. diameter), excavated from the shoal will be used as base substrate for implanting the boulders. Channel depth would be 4 feet deep at the center of the weir during normal flow (4,000 cubic feet/second) (cfs) and six feet deep during flows reaching the bankfull level (5000 cfs). The boulders would be centered 10 feet apart leaving gaps roughly 5 to 6 feet wide. The higher velocities through these gaps will facilitate sediment transport and maintain flow in the north channel. An arch shaped weir configuration will create convergent flow vectors that will help to maintain the thalweg along the focal point of the arch.

Once proper depth profile is achieved for the weir and j-hook location, the rocks for the weir and the two j-hooks will be placed in the configuration as provided in design specifications that are still under development. An approximately 10-foot wide corridor will be needed to create the proper depth and

alignment of materials. For the upstream weir, the shallow depths (about 3 ft) allow a track-hoe to be used to place materials beginning at the far end of the weir and backing off towards the north shore. Because of the greater water depths (more than 4 feet), construction of the two j-hooks will utilize a track hoe for nearshore stone placement and a crane for constructing the more distant terminal ends. A preliminary survey of materials indicates that the channel contains a surplus of gravel, cobble, and stone material for establishing the underlayment for the weir/j-hook structures. The excess materials will be removed and likely placed into beneficial use elsewhere. If no immediate use is identified, the materials will be placed in an upland gravel pit. The only imported materials expected are the large stone features for the weir and j-hook structures and the large rock components of the river access platforms.

Providing shore access fishing and a carry-down boat launch for canoes and kayaks is an important aspect of this project. The fishing platform designs incorporate large boulders similar to those used in the J-hook vanes and boulder weirs and are aesthetically and functionally consistent with a naturalized shoreline. The project design includes features compliant with Americans with Disabilities Act (ADA) requirements to provide anglers with disabilities additional opportunities for outdoor recreation.

c. Project magnitude:

Total Project Acreage	10.5
Linear project length (river segment)	1,000 lineal feet
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.

Since it was constructed in 1924, the Fond du Lac Dam has blocked fish migration to upstream spawning habitat for lake sturgeon and other riffle spawning species, such as walleye, smallmouth bass, longnose sucker and white sucker. Quality spawning habitat for lake sturgeon and walleye is comprised of riffle segments of medium to large-sized rocks where seasonal river flows are relatively high. Specifically, lake sturgeon spawn below cascades, in glides at the head of riffles and in eddies surrounded by rapids where turbulent flows keep substrates clean. The dam has reduced the availability of historical habitat. To compensate for this loss and improve natural fisheries populations, it is crucial to restore and enhancing spawning habitat within the area from the dam to the Highway 23 Bridge.

In areas farther downstream where the influence of lake levels begins to eliminate suitable flow velocities, creating these riffle spawning habitat types would be impracticable, if not impossible. Under low flow conditions, the finer substrate particle sizes become unattractive as spawn beds for these fish species. By recreating habitat that meets the necessities of lake sturgeon, the project also helps to improve spawning habitat for other species

The river at Chambers' Grove is the best remaining opportunity to substantially improve riffle spawning habitat below the Fond du Lac Dam. Three separate features inhibit full use of the area. First, the river bank at the Chambers' Grove site is encroached by steel sheet piling and rock filled gabion revetment and backfill, forming a 0.2 mile length of hardened vertical river bank (retaining wall). The structures eliminate the bank's natural slope and transition to the river and reduce the

exposure of substrates to the detriment of aquatic organisms. The revetment has eliminated shallow, low velocity nearshore habitats beneficial for rearing young fish. The revetment has begun to fail as ice and high flow events have damaged the structures. Additionally, the revetment forms a barrier that prevents access to the river for outdoor recreational uses such as fishing and canoeing. Due to extensive damage by repeated high water events and ice flows, the boardwalk has lost some of its appeal and functionality. American's with Disabilities Act (ADA) compliant river access will be designed and integrated into the installation. A carry-down water-craft access will also be constructed.

Second, a large amount of coarse material was deposited as a shoal at the upstream end of the project site during record flooding of 2012. This lateral bar substantially reduces channel capacity and concentrates flow directly into the north bank revetment structures. Third, additional structure is needed instream to increase hydraulic complexity created by pour-overs and physical features needed for successful lake sturgeon spawning.

This is a habitat restoration and enhancement project. The purpose of the project is to increase the available area of suitable lake sturgeon spawning habitat in the area between Fond du Lac Dam and Highway 23 Bridge. The section of the St. Louis River from the Fond du Lac Dam downstream for approximately one mile is what remains of the primary spawning grounds for biologically and culturally significant migratory and resident populations of riffle spawning species lake sturgeon, walleye and longnose sucker. This spawning area is vital to both St. Louis River estuary as well as western Lake Superior populations of these species.

The goals of the project are to increase the availability of high quality spawning habitat by 20 percent in the St. Louis River below Fond du Lac Dam. Along with an earlier project to enhance spawning habitat directly below the dam, these projects cumulatively will restore all reasonably available spawning habitat for lake sturgeon below the dam. The overall purpose is to accomplish MDNR fisheries management objective of a maintaining a self-sustaining native population of lake sturgeon in the St. Louis River and western Lake Superior.

This project supports the objectives of both MDNR St. Louis River Estuary Fisheries Management Plan for long range fisheries management and the Lower St. Louis River Area of Concern Remedial Action Plan. The Chambers' Grove Project is identified on the Prioritized List of Actions to remove Beneficial Use Impairment #9, loss of fish and wildlife habitat and recovery of Lake Sturgeon population contributes to removal of Beneficial Use Impairment #2, loss of fish and wildlife populations, which will contribute to the delisting of the St. Louis River Area of Concern. As part of the State of Minnesota's efforts to delist the Lower St. Louis River AOC, the project will contribute to removal of the Loss of Fish and Wildlife Habitat and Reduced Fish and Wildlife Populations impairments. Project completion will contribute toward the goal of restoring 1,700 acres of aquatic habitat in the St. Louis River AOC.

In addition to producing more suitable spawning conditions for lake sturgeon and other fish species over a wider range of river flow, the project will replace traditional bank stabilization structures with techniques that are more visually and functionally compatible with the area's recreational use. The project is designed to fit with the City of Duluth's Chambers' Grove Park Small Area Plan which outlines park improvement and long term management objectives for the park.

State of Minnesota, residents of Minnesota, Federal environmental agencies, estuary users, adjacent residents, the general public, and key stakeholders listed in this EAW are beneficiaries.

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

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

The St. Louis River was originally listed as one of 43 AOC's identified around the Great Lakes in 1987 (Attachment A). In 1992, a Stage I Remedial Action Plan (RAP) was developed by a broad based group of AOC partners including state fish and wildlife agencies from Minnesota and Wisconsin, the Fond du Lac Band of Lake Superior Chippewa, the U.S. Fish and Wildlife Service (FWS), the MPCA, Minnesota Sea Grant, the U. S. Environmental Protection Agency (EPA), NOAA, and non-governmental organizations and academic institutions that outlined overall program objectives to address Beneficial Use Impairment (BUIs). In 2013, MPCA reconvened program partners to complete an update to the RAP that outlines, as much as possible, specific action steps to remove each BUI.

This project is the one of ten aquatic habitat restoration projects included in the 2013 AOC RAP Update. The other restoration projects identified in this document include:

- Perch Lake – approximately 2 miles downstream of Chambers' Grove. This oxbow is isolated from the river by an undersized road crossing. The project objective is to enhance aquatic organism passage to river and restore sheltered bay habitat. The construction date has not been scheduled.

- Radio Tower Bay – approximately 3 miles downstream of Chambers' Grove. The project objective is to dredge waste from historic sawmill operations and restore wild rice beds on 24 acres of sheltered bay habitat. This project is underway and construction will be completed in 2015.

- Mud and Spirit Lake - approximately 6 miles downstream of Chambers' Grove. Project objectives are to address contamination found in sediments, restore historic depth of surface waters and restore sheltered bay habitat. Project construction has not been scheduled at this time.

- Knowlton Creek – approximately 9 miles east. The project objectives are restore/reconstruct stream channel to the St. Louis Bay and remove and replace culvert. All work would occur within the creek channel and floodplain. The EAW is under development by MDNR. The project is scheduled for construction in 2016.

- St. Louis Bay sites at Grassy Point, 40th Ave W, and 21st Ave W - approximately 10-14 miles downstream from Chambers' Grove. These projects have similar objectives, which are to address possible chemical contaminants and other limiting factors causing impairments to aquatic life and restore sheltered bay and estuary flats habitat. The projects encompass approximately 890 acres in a near-continuous length of shoreline of approximately 3.5 miles. The combined state-federal environmental assessment is underway with the federal Environmental Assessment recently completing its public review. Additional state sponsored EAWs will be initiated soon. Construction is scheduled to occur intermittently in a phased approach during the period starting in 2016 and completing in 2022.

- Kingsbury Bay – Approximately 10 miles downstream of Chambers' Grove. The project objective is to restore shallow sheltered bay habitat by excavation of the deposited sediment at the mouth of Kingsbury Bay as well as enhance hydrologic connection of the wetland complex. Project construction has not been scheduled.

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

Since the Stage I RAP (1992), significant work has been done to restore the AOC with well over $420 million invested in the St. Louis River estuary since 1978 on infrastructure upgrades, remediation of

contaminated sediments, and habitat restoration and protection in the AOC. Improved municipal wastewater treatment and significant progress on control of wet weather overflows have contributed to water quality improvement and returning fish and wildlife populations. Some contaminated sites have been remediated and/or restored, including Hog Island/Newton Creek in Wisconsin and the St. Louis River Interlake/Duluth Tar Superfund site in Minnesota. In addition, numerous habitat protection and restoration projects have been completed across the AOC. A few examples include:

- 9 acres of spawning habitat for lake sturgeon and other riffle spawning species enhanced below the Fond du Lac Dam;
- 16 acres of sheltered bay habitat restored at Tallas Island where Knowlton Creek reaches St. Louis Bay;
- Protection of more than 11,000 acres of erosion sensitive lands and forest and wetland habitat in Wisconsin's St. Louis/Red River Streambank Protection Area, two Wisconsin State Natural Areas within the Pokegama River watershed and Clough Island; and
- 2.5 acres of colonial waterbird nesting habitat were created at Wisconsin Point.

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

	Before	After		Before	After
Wetlands	3.2	3.5	Lawn/landscaping	0.0	0.0
Deep water/streams	5.3	5.3	Impervious surface[1]	0.5	0.2
Wooded/forest	1.5	1.5	Stormwater Pond		
Brush/Grassland	0.0	0.0	Other (describe)		
Cropland	0.0	0.0			
			TOTAL	**10.5**	**10.5**

[1] Existing impervious surface includes the sheet pile, boardwalk, and parking lot area; proposed impervious surfaces include the fishing access platforms, sidewalk, and canoe access area. No designated parking will be developed in the project area.

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.*

Unit of government	Type of application	Status
MDNR	Public Waters Work Permit	Application pending
MDNR	Prohibited Invasive Species Permit	Application pending
MDNR	LSCZ federal consistency review	Application pending
MPCA	NPDES/SDS Construction Stormwater General Permit	Application pending
MPCA	Section 401 Water Quality Certification	If needed
MHS SHPO/NOAA	Section 106 concurrence letter	Application pending
USACE	RHA, Section 10	Application pending
USACE	CWA Section 404 Permit [1]	Application pending
City of Duluth	Temporary Access Agreement/License	Application pending
City of Duluth	Erosion & Sediment Control Permit	Application pending
City of Duluth	Flood plains, Shorelands, and Wetlands	Application pending

Unit of government	Type of application	Status
NOAA	Section 7 review/coordination	Application pending
NOAA	GLRI Funds ($400,000)	Award Received

[1] If the USACE determines authorization using a Section 404 Regional General Permit (e.g., RGP-003-MN), rather than an Individual Permit, the MPCA's Section 401 WQ Certification is included in the RGP. RHA-Rivers and Harbors Appropriation Act of 1899; CWA-Clean Water Act.

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.

The proposed project is located in the uppermost section of the St. Louis River estuary in the Fond du Lac neighborhood of Duluth, Minnesota. The project is located on a side channel adjacent to the City of Duluth Chambers' Grove Park. The park was established in the 1920's on the former site of a brownstone quarry and residence. The predominant impact to the project area is the approximately 1000 feet of steel sheet pile and rock filled gabions constructed in the late 1960's along the park's riverfront.

The Fond du Lac Dam, located approximately one mile upstream from the project area, was built in 1924 for the projection of electricity. The dam has a height of 85 feet and generates ten megawatts of power. The dam has caused significant flow alterations and loss of spawning habitat, although the amount of habitat is unknown.

The project is bounded on the eastern (downstream) end by the MN State Highway 23 Bridge across the St. Louis River and on the south by an undeveloped island (Bayliss Island) under private ownership. The nearest residential/commercial development is a private campground and neighborhood located eastward from Highway 23, approximately 900 feet from the project area. The project area is used exclusively as natural environment and public recreation.

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.

The project area is part of the Western Planning Area for the City of Duluth. The Duluth Comprehensive Plan characterizes the project area as river front recreation. The land surrounding the project area is currently designated as City Park, as an area of park and open space dedicated to active recreation, with some developmental impacts allowed for facilities, parking, and water access structures. Development is limited to low intensity uses, such as trails, viewshed protection and access. The parks' operation is to provide water access for fishing, canoeing, and kayaking, and limited parking availability. The City proposes to redevelop and repair the park facilities damaged during a flood in June 2012. The project design has been reviewed by the City. The project is being integrated into the park redevelopment plans. The park is part of a Sensitive Lands Overlay due to severe development limitations relating to, e.g., soils, wetlands, or steep landscape.

A small neighborhood commercial zone is located east of Highway 23 and south of Highway 210, across from Chambers' Grove Park. The area is occupied by a private campground. Further east is zoned as low density residential area. A majority of the land extending from Chambers' Grove Park for considerable distance to the north and west, past the city boundary and into Midway Township is designated as Preservation with a Sensitive Lands Overlay, i.e., lands with high natural resource and scenic value and substantial restrictions to development due to limitations.

Carlton and St. Louis County comprehensive plans or long-range resource management plans do not directly address aspects related to fisheries habitat improvements. The project and anticipated land uses enabled by the project are compatible with the county comprehensive plans.

The project is included as a component of the Lower St. Louis River Area of Concern (AOC) Remedial Action Plan (RAP) and is funded through National Oceanic and Atmospheric Administration under the Great Lakes Restoration Initiative, launched in 2010 to accelerate efforts to protect and restore the largest system of fresh surface water in the world. The Chambers' Grove Project will contribute to the removal of St. Louis River AOC Beneficial Use Impairments (BUI) #9 (Loss of Fish and Wildlife Habitat), and #2 (Degraded Fish and Wildlife Populations). This project is one of ten projects identified to remove BUI #9 from the list of impairments in the St. Louis Bay estuary.

The project supports objectives identified by the MDNR, Section of Fisheries, St. Louis River Estuary Fisheries Management Plan (2007). The Plan identifies the reestablishment of a self-sustaining lake sturgeon population for western Lake Superior and the St. Louis River. The project area is part of the primary spawning area for the west subpopulation of lake sturgeon. Historically, the St. Louis River was the most important spawning area for the western Lakes Superior lake sturgeon population.

iii. Zoning, including special districts or overlays such as shoreland, floodplain, wild and scenic rivers, critical area, agricultural preserves, etc.

The project area lies within the following special districts or overlays: 1) the FEMA 100 year floodplain of the St. Louis River (Zone A, not mapped floodway); and City of Duluth zoning rural residential class 1 (RR-1), "natural environment" shoreland management zone and stormwater rate control, zone A. The bank restoration portion of the project is located adjacent to the channel within the 100 year floodplain of the St. Louis River.

The project is within the Lake Superior Coastal Zone under the jurisdiction of the Minnesota Lake Superior Coastal Program (MLSCP). The project is a federal action that has reasonably foreseeable effects on coastal uses or resources. It will be subject to federal consistency review. The MDNR and federal agencies must follow the requirements of 15 Code of Federal Regulations (CFR) 930, Subpart C, which require a review of federal activities or federally funded projects to determine whether projects are consistent, to the maximum extent practicable, with the enforceable policies of MLSCP.

The evaluation of federal consistency with the Coastal Management Program is a brief evaluation on the relationship of the proposed activity and any reasonably foreseeable coastal effects to the enforceable policies of the management program. The review included identifying whether federally approved state coastal policies are met, including approved county shoreland ordinances and approved flood plain ordinances.

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

This Chambers' Grove Aquatic Habitat Enhancement project is fully compatible with the nearby land use and local governmental plans and zoning for the project area and environs. The project is

designed to fit with the City of Duluth's Chambers' Grove Park Small Area Plan which outlines park improvement and long term management objectives for the park. City of Duluth engineers and planners have approved the design plan, which is consistent with the City's comprehensive plan and its parks and trails development plan.

American's with Disabilities Act (ADA) compliant river access will be designed and integrated into the installation. A carry-down water-craft access will also be constructed. Natural channel design stabilization is compatible with "natural environment" shoreland management. Modeling results indicate no effect to flood water surface elevation due to the project. The project contributes directly to Lower St. Louis River RAP to remove impairments causing loss of fish and wildlife habitat (BUI#2) and for the loss of fish and wildlife populations (BUI#9). The project supports MDNR's long range management objectives for lake sturgeon and walleye populations by increasing and improving the area of suitable spawning habitat within the designated spawning sanctuary.

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

The project meets requirements of the local zoning and overlay districts. Applications for a temporary access license, erosion and sediment control permit, shoreland permit, wetland permit, and floodplain compliance will be provided to the City for approval. Proposed habitat and recreation enhancements are compatible with RR1 zoning. There is no known incompatibility due to project activities and potential future uses of the project area. Adjacent private lands to the south on Bayliss Island and the private campground, east of Highway 23, will not be affected.

10. Geology, soils and topography/land forms:

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.

Geologic formations in the area surrounding the project location include Fond du Lac sandstone. The sandstone formations are above Paleozoic bedrock and are overlain and interbedded with siltstone, shale, and slate. Sandstone is visible along the cliffs above the project area. Geotechnical investigation illustrates river bed and banks in this vicinity are entirely fluvial deposits. Bedrock outcrops occur ¼ mile upstream of the project area. Banks are predominately coarse to fine sandy material. Borehole investigations indicated that bedrock is more than 25 feet below ground level.

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.

NOTE: For silica sand projects, the EAW must include a hydrogeologic investigation assessing the potential groundwater and surface water effects and geologic conditions that could create an increased risk of potentially significant effects on groundwater and surface water. Descriptions of water resources

and potential effects from the project in EAW Item 11 must be consistent with the geology, soils and topography/land forms and potential effects described in EAW Item 10.

The project area is located at the lower end of a higher gradient canyon section of the St. Louis River, where the river valley initially widens to include a broader floodplain bench. NRCS Soil types for the shoreline are classed as Udifluvents and Fluvaquents, loamy with 0 to 2% slopes rarely flooded (100 yr floodplain). The instream channel bed is composed of cobble, gravel and sandy fluvial deposits. Red lacustrine clays deposited in the bed of glacial Lake Duluth and bedrock are the dominant components of hillside areas.

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 below the Fond du Lac Dam and just upstream of the MN State Highway 23 Bridge on the Minnesota side of the St. Louis River, , a designated public water (PWI #975W). The river reaches Lake Superior about 20 miles downstream from Chambers' Grove project area. Lake Superior is an Outstanding Resource Value Water (ORVW).

The project area consists of 5.3 acres of river channel, 1.5 acres of forest, and the remainder a combination of riverfront structures (retaining wall, boardwalk and safety fence), parking area and mowed parkland maintained by the City of Duluth. The mowed areas are above the OHWL of the St. Louis River. The riverfront structures and parking lot are classified as impervious surfaces (0.5 ac). The preliminary wetlands determination completed for the project indicated that the mowed parkland contained hydric soils and would support hydrophytic vegetation if allowed to naturalize (3.2 ac). The areas were preliminarily classified as jurisdictional wetland (wet meadow) and determined to be regulated under Wetland Conservation Act rules. Besides being managed as lawn, the wetland areas have been disturbed by the riverfront developments and, as soil borings revealed, the placement of four to eight feet of historical fill.

This reach of the St. Louis River is classified by the MPCA as a Class 2B, 3C, 4A, 4B, 5, and 6 waterbody (*Minnesota Rules*, part 7050.0470). It is protected as outlined by the numeric and narrative water quality (WQ) standards (*Minnesota Rules*, parts 7050.0220 through 7050.0226, and part 7050.0210). The applicable state designated use classifications (Class 2B, 3C, 4, 5, and 6) and the referenced water quality standards are provided below. The narrative standards described under *Minnesota Rules*, part 7050.0210 apply to all waterbodies, regardless of their designated use classification.

- Class 2B: aquatic life and recreation (includes cool and warm water sport fish). The applicable WQ standards are defined in Minn. R. 7050.0222, subparts 1 and 4.
- Class 3C: industrial consumption (includes all waters of the state that are or may be used as a source of supply for industrial process or cooling water, or any other industrial or commercial purposes, and for which quality control is or may be necessary to protect the public health, safety, or welfare). Class 3C also specifies the protection of cool and warm water sport fish, indigenous aquatic life, and wetlands. The applicable WQ standards are defined in Minn. R. 7050.0223, subparts 1 and 4.

- Class 4: agriculture and wildlife. Includes all waters of the state that are or may be used for any agricultural purposes, including stock watering and irrigation, or by waterfowl or other wildlife and for which quality control is or may be necessary to protect terrestrial life and its habitat or the public health, safety, or welfare. Class 4A also includes a sulfate limit of 10 mg/L for the protection of wild rice where it is present. Class 4A waters also include cold water sport fish (trout waters) and 4B waters includes cool and warm water sport fish; both are also protected for drinking water. The applicable WQ standards are defined in Minn. R. 7050.0220 Subparts 3a and 4a, and 7050.0224, subparts 1, 2 and 3.
- Class 5: aesthetic enjoyment and navigation. The applicable WQ standards are defined in part Minn. R. 7050.0220, subpart 3a, and 7050.0225.
- Class 6: other uses and protection of border waters. The applicable WQ standards are defined in Minn. R. 7050.0226.

The St. Louis River is Minnesota's largest tributary to Lake Superior and sections are listed as impaired waterways on the MPCA's Clean Water Act 303d Impaired Waters List. Specifically, the MPCA has identified that the following contaminants exceed the applicable state water quality standards for this reach of the St. Louis River (Fond du Lac to Mission Creek [No. 04010201-513]): concentrations of DDT, dieldrin, PCBs, and mercury in fish tissue and PCBs and mercury in the water column.

The Lower St. Louis River is also a Great Lakes Area of Concern (AOC) because of legacy pollution and other impairments. The Lower St. Louis River Remedial Action Plan (RAP) lists nine beneficial use impairments (BUI) for the AOC. The primary BUIs addressed with the proposed project outcomes is Loss of Fish and Wildlife Habitat (BUI#2) and Degradation of Fish and Wildlife Populations (BUI#9).

ii. Groundwater – aquifers, springs, seeps. Include: 1) depth to groundwater; 2) if project is within a 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.

Springs are located along nearby sandstone formations and outcrops above the project area. Construction will be confined to the river channel and nearshore areas where there are no springs.

There are no known wells within the project area. The Phase I cultural/historic evaluation found no evidence or records of wells in the vicinity of the site. Construction will occur along the bank or in the river channel where the water table is high or surface waters exist. Geotechnical investigation completed during soil borings by USACE found that the groundwater table ranged from three to seven feet below ground surface. In addition, groundwater depth is dependent on the river stage.

Due to the nature of project activities, the construction and operation of this project will not have an effect on groundwater supply or quality.

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.
   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.
   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.

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.

The project will not generate or release wastewater during construction or operation.

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.

The land flanking the north shoreline is the only source of runoff that will be affected by project construction. The runoff is generated as overland flow and distributed along the river front, where it discharges to the river. The drainage is generated from minimally developed park land, consisting of approximately ten acres of lawn/landscaped space, a small picnic shelter/restroom structure, and an access road and parking lot. The land surface gently slopes toward the river. The boardwalk along the river bank covers about 4000 square feet (8 ft x 500 ft). No existing erosion problems are known along the riparian zone.

Preconstruction quantity and quality of runoff is moderated by the grass cover, infiltration capacity of soils, and sheet pile and gabion bank barrier along the river front. Existing impervious surfaces (0.5 ac)--the boardwalk/sheet pile and paved parking areas are unlikely to generate much sedimentation but some pollutants from engine leaks originate from the parking lot.

About 5.2 ac of the project area are considered above the OHWL, including 1.5 ac of unaffected forest cover, 0.5 ac of riverfront structures and parking area classified as impervious surfaces, and 3.2 acres of wet meadow. About 1000 feet of shoreline along the St. Louis River will be reworked to remove the boardwalk and under structure composed of artificial sheet pile and gabion baskets. The 0.3 ac area of riverfront structures will be converted to a natural river bank and stabilized with layered placement of root wads and other organic material. The location of the bank and elevation of the floodplain will not be affected. The development of about 0.2 ac of impervious surfaces for river access, including the fishing access platforms, the sidewalk, and the canoe access area, is proposed. This would result in a 0.3 ac reduction of impervious surfaces from pre-project levels. A 25-foot wide riparian zone (1.9 ac) will be prepared and reseeded with native vegetation, making the total construction footprint above the OHWL about 2.2 ac of shoreland.

The toe wood will add stability to the river bank. The incorporated shrub-sod mats and soil layers the toe wood will enable quick root establishment and vegetative growth along the shoreline. Several temporary platforms will be positioned to allow the transfer of boulders to in-water locations. In-water and shoreline construction will be phased to enable incremental soil stabilization as the project proceeds. Following project construction there will be 0.1 ac of natural-surface walkways and 0.1 ac of fishing piers and canoe access, which represents a decrease of 0.3 ac of impervious surface.

During and after construction, there is a higher risk of erosion occurrences. Approximately one or two growing seasons will be necessary to fully stabilize the area, after which erosion and sedimentation rates are anticipated to be lower than pre-project levels.

The contractor will be required to obtain an NPDES/SDS Construction Stormwater General Permit (CSGP). A stormwater pollution prevention plan (SWPPP) will be prepared according to the

requirements of the CSGP. The SWPPP will ensure that project layout, construction activities, and installed erosion control best management practices (BMPs) will prevent untreated stormwater from discharging from the project area to the St. Louis River. The City of Duluth may also require an Erosion & Sediment Control Permit.

When surface waters affected by the proposed project are listed impaired by MPCA, additional requirements described in Appendix A of the CSGP are applicable but depend on the type of potential pollutant released by the proposed construction. It appears that the project will not exacerbate pollutant levels that have caused the listed impairments for this reach of St. Louis Bay.

The project will not result in any measurable change to the stormwater drainage patterns, discharge rates or locations because no structures or features will be built that change land surface elevations and drainage patterns. Once fully stabilized the quality of stormwater runoff reaching the river will improve insofar as the herbaceous and woody plant mats will be better able to filter stormwater runoff than the existing hard surface features of the riverfront.

Steps to minimize potential effects to stormwater quality during construction include:

- Develop a project design that reduces amount of impervious surfaces of the project area. A 0.3 ac reduction of impervious surfaces is anticipated.
- Work will be administered during a period when flows rarely reach or exceed bankfull levels.
- Phasing of excavation, fill, and demolition will minimize duration and extent of soil disturbance.
- Movement of heavy equipment in the riparian areas will be minimized.
- Installation of all runoff control structures and devices before construction begins.
- Best Management Practices to minimize soil erosion will be incorporated into project designs and specified to the contractor in the engineering plans. The BMPs will include silt fence, fabric logs, seeding/mulching, and limiting the size of disturbed soil areas.
- Seeding/mulching and erosion control blanketcover will be installed immediately and phased as sectors of construction are completed.
- Structures to minimize sediment discharge to the St. Louis River during bank construction activities will be installed and maintained.
- Emergency spill response protocol will be written into permit obligations.
- Final shoreland area will includes a minimum 50 ft natural vegetation buffer zone.

The City of Duluth received a multi-agency cost-share grant from the EPA to be used during the redevelopment of the Chambers' Grove Park. The grant will enable the City to develop "green" stormwater management for reducing stormwater pollution from reaching surface waters by adopting the principals of low impact development (LID). If the project creates one or more acres of reconstructed impervious surfaces, the LID goal is to capture and retain more than one inch of runoff from the area on site, thus reducing the volume of pollution bearing runoff that reaches surface waters in an unfiltered state. The improvements will also include relocating a parking area to an area more distant from the shoreline.

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.

The project will not appropriate water for construction or operation.

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.

A preliminary wetland assessment determined that the project area has 3.2 acres of wet meadow. The City of Duluth owns the riverfront lot on which the Chambers' Grove Park is located and would be the local governmental unit representative that administers compliance with state wetland statutes and regulations (Article 50-18B) pertaining to the Wetland Conservation Act. Any development impacting wetlands requires the formal approval by the designated city wetland representative. City ordinances require the applicant submit a complete wetland delineation performed by a professional wetland delineator. Avoidance, minimization and mitigation protocol for wetlands is generally determined under consultation with the local TEP, which includes representatives of the US Army Corps of Engineers, MDNR, Board of Water and Soils Resources, St. Louis County Soil and Water Conservation District, City of Duluth, among possibly others. The site's existing condition as mowed parkland, the proposed reduction in amount of impervious surfaces by 60 percent, and the beneficial aspects of naturalizing the river bank and riparian area will be factors that are included in the consideration of mitigation requirements for wetland losses. Mitigation for losses of wetlands due to the impervious surface developments proposed in the modified wetland area may be required.

A Joint Application Form for Activities Affecting Water Resources in Minnesota will be submitted to the USACE for review and approval. See the following section regarding US Army Corps of Engineers permit considerations.

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.

Construction activities will occur in-water (below the OHWL) and on the floodplain (above the OHWL) of the St. Louis River (a public water). The work will occur on a side-channel, along the shoreline, and in the riparian area of the City of Duluth Chambers' Grove Park , situated about 20 miles upstream from Lake Superior, which is designated an ORVW. The channel substrate is largely composed of cobble and course gravel, which when disturbed is unlikely to produce large amounts of suspended sediment.

The work is scheduled during the months of July, August, September, and October 2015, when monthly average flow rates are generally lowest. At the approximate 95th percentile, average flows (cfs) of 4520, 2710, 2800, and 4750 is not exceeded during these months, respectively (gage data from St. Louis River at Scanlon, MN). The OHWL is generally considered the bankfull level of the river, a

stage that may be reached on an approximate annual or biennial frequency. Water level along this reach is controlled by the Lake Superior surface elevation. Modelling flow volume using a lake level anticipated during construction yields a 604-foot river elevation at the 5000 cfs flow rate (Scanlon gage). Gage data indicates a low probability (approximately 4 percent or less) flow rates will exceed 5000 cfs on any given day during the scheduled construction season (mid-July to mid-October).

Construction of three cross-channel/j-hook riffles will involve the in water placement of approximately 126 cubic yards of 12 to 36-inch boulders, 160 cubic yards of cobble, and 400-36 to 60-inch diameter boulders. A small portion of the shoreline toe wood placement would also occur in water, if river level is elevated. The cobble-debris shoal at the entrance of the side-channel will be reworked after its access is achieved by a partial construction of the base of the weir along the north side. The proposed in water construction area will include approximately 1.4 ac of cut/fill/boulder placement area. With the exception of incidental placement of material at the end of the weir and j-hook structures, all fill placement will occur below the OHWL. A track-hoe and crane will be used for sculpting the correct channel depth and linear placement of boulders. Where water is shallow, i.e., less than three feet deep, a track hoe will work within the water column to move substrates and place boulders. In areas too deep for the track hoe, a crane will be positioned on a stable platform along shore to work the substrates and align boulders.

In water BMPs will be used to avoid or minimize turbidity/sedimentation during construction:

- Timing of construction is planned to coincide with a period of low flow in the river and the season of low precipitation season (mid-summer to mid-fall).
- The in-water construction activities will be scheduled in a manner that minimizes the amount of days necessary for disturbances to occur in the river.
- Timely monitoring of river flow and downstream conditions will be carried out to alert construction crews of impending increases in river flows. Work stoppage of in-water construction will occur if flows exceed suitable conditions (5000 cfs) or river level exceeds 604-foot elevation (North American Vertical Datum of 1988-NAVD88). Actual workable flows will depend on type and location of in water work.
- Minimize repeated movement of equipment operating instream.
- Construction activities that will disturb soils on the river bank that are below the OHWM shall be conducted in phases to minimize soil exposure and erosion.
- In water BMP control devices shall be used to the extent practicable (e.g., turbidity curtains, upstream diversions), and shall be deployed prior to any in-water construction activities.
- The possibility of temporarily diverting the river upstream of the project site, so that in-river construction activities can be done in the dry or with reduced flows, shall be evaluated and encouraged if methods are consistent with requirements for fish and wildlife resources (13a) and rare features (13b). Imported boulders and gravel shall be required to be free of dirt and debris at delivery.
- Imported boulders and gravel shall be required to be free of dirt and debris at delivery.

By requiring the contractor to develop and use these in-water BMPs during the construction activities, the project's short-term turbidity impacts will be mitigated to the extent practicable, cognizant of the applicable state water quality standards. The same BMPs will also serve to help avoid and/or minimize the project's potential to exacerbate the existing MPCA CWA 303(d) listed impairments that are identified above (Item 11a.i).

The proposed project will not result in further degradation of the referenced water quality standards the uses specified. The primary sources for mercury and PCBs in the environment are atmospheric

deposition (Hg) and historic or current industrial releases. These chemicals can be found in soil, but sediment testing by MPCA in 2010 and further testing that is required to address dredge material management (see Item No. 12a) provide no evidence that soils in the project area have elevated levels of toxic chemicals. The project does not include any application or release of compounds that would increase delivery of mercury, PCBs, phosphorous, nitrate/nitrite, or suspended solids to the water body.

The project is likely to increase the usage of this side channel by canoes and kayaks. The carry-down access enables a safer launch area for paddlers. The weir feature at the upstream end of the project re-establishes passage to the main stem of the river. The project area is rarely used by motorized watercraft because of shallow depths.

The project will shift the thalweg of the river and change the cross section profile, but will not change channel capacity, floodplain elevation, or bank location. Although the project will alter the channel's current (flow vectors) and its cross section profile, no effects are anticipated on the river's surface water course and hydrology (discharge volume and water surface elevation) outside the project area.

The proposed project will result in a more natural river channel that provides improved spawning habitat suitability for various fish species over a wider range of flows and is not anticipated to adversely affect the water resources, shoreland or floodplain in the area.

The project will be administered either using the US Army Corps of Engineers (the Corps) Section 404 Clean Water Act (CWA) Regional General Permit (RGP) or the Individual Permit. The project generally conforms to the definition of an authorized activity permitted under the RGP (RGP-003-MN), if protocols stipulated in the RGP are followed. The 404 RGP defines restoration as the re-establishment or rehabilitation of sites that historically supported wetlands or streams and frequently retain some wetland components (e.g., hydric soils) or stream processes even after human-made disturbances such as drainage and urban development. If the RGP is applied, the Section 401Water Quality Certification is incorporated within the RGP as an attachment.

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 lower St. Louis River is identified as an area of concern (AOC) in part due to historic contamination of sediments. Rigorous testing of sediments has been conducted in the lower part of the bay, where contamination is problematic, and more widely testing upstream in Fond du Lac Reservoir and just downstream of the project area. The limited sampling is based on evident low risk assessment for contamination in this reach. The coarse cobble and gravel substrates contain minor amounts of fine and organic sediments, which normally harbor the persistent chemicals of concern. The sampling found little evidence of chemical contaminants in river sediments along the reach containing the project area (Phase IV Sediment Quality Database for the St. Louis River AOC, June 2006).

The MPCA What's In My Neighborhood website (WIMN) revealed only one applicable site in proximity to the project area that could introduce contamination into this segment of the river. An active NPDES/SDS Construction Stormwater General Permit is in place at a site below the Fond Du Lac Dam,

where road repairs are being implemented. Sedimentation into the St. Louis River could occur from the project activities.

There is no historic record of any dumps, landfills, storage tanks, pipelines that could be affected by the project. There was a sandstone quarry and homestead near the site in the early 1900's, but the adjacent property has been a city park since the 1920's.

With no evidence of local contamination, no conflicts are anticipated and no mitigation to prevent exacerbating the contamination would be required. While dredging and working the bank, there is a small risk that some hidden contamination could be discovered. When unknown materials are encountered, i.e. buried containers, unknown seepage, oils, etc., the proposer will evaluate the risk of contamination and remove the materials under guidance from authorities that manage hazardous materials.

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.

Approximately 200 cubic yards of excavated materials will be removed from the river channel during project construction. An NPDES/SDS Dredge Materials Management Permit is not required by MPCA for excavating this amount of material from surface waters. For volumes that do not reach the threshold requiring a MPCA Dredge Materials Management Permit, MPCA requests that a few sediment samples are taken. Materials will be tested for contamination according to MPCA protocols. The risk of contamination is very low. This site is more than 15 miles upriver from the heavily industrialized portion of the river, containing historic industrial sites, docks, and the U.S. Steel Superfund site, where contaminants are prevalent.

For any sample with a contaminant level exceeding Sediment Quality Target 1 (SQT1) MPCA would be notified and consulted. MDNR would follow disposal recommendations found in MPCA guidelines, Managing Dredge Materials in the State of Minnesota.

It is anticipated that the material will contain minor amounts of contamination and classified suitable for beneficial use on upland sites. Materials will be transferred immediately to a selected location for beneficial use or stored in a local borrow pit until a beneficial use can be identified. A Notification to Manage Dredged Materials without a Permit form will be completed and submitted to the MPCA. The applicable protocol identified in MPCA Managing Dredged Material Environmental Risk Assessment guidelines includes:

- Prior to construction one sediment core will be collected and subjected to a sieve analysis to determine the particle size range.
- If the material has a component of fine sands, silts, clays, or organic material, two samples will be collected and tested according to the AOC Quality Assurance Program Plan (QAPrP) recommendations established for chemical contaminants. The QAPrP provides guidance on data collection and analysis to ensure all data generated in the AOC meets the minimum data quality standards. The data is used to develop sound remediation and restoration designs and to document progress toward the targets related to the removal of beneficial use impairments.
- Surplus material will be disposed of at an upland site according to MPCA dredged material disposal guidelines.

- Transport and disposal of dredged material will follow MPCA Dredged Material Disposal Best Management Practices.

Removing the retaining wall along the river front will yield approximately 165 tons of waste steel sheet pilings and rock-filled gabion baskets. An additional 100 cy of mixed debris will be generated from the demolition of the boardwalk, obsolete asphalt path, and electric street light units.

Project construction will minimize the adverse effects of generating solid waste by focusing on reuse and recycling. A solid waste reduction plan will be a component of the required submissions for construction bids and responses will be factored into the selection process. Bids will receive higher scores if the contractor segregate demolition materials and considers:

- Reuse appropriate clean stone and dirt rubble on-site as part of the construction,
- Surplus clean stone and dirt can be transferred to acceptable land fill, or gravel pit for off-site reuse.
- Clean surplus stone and dirt will not be mixed with asphalt or other objectionable materials that require disposal in a landfill
- Separate untreated wood from mixed demolition waste for reuse, composting, or biofuel
- Recycle waste metals (sheetpile, gabion baskets, electric wire, light poles, guard rails).

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.

Equipment fuels, oils, lubricants and other materials typical for use by earthmoving equipment will be used during project construction. No other chemicals or hazardous materials are needed for this project.

The Contractor will be required to prepare a Spill Prevention and Response Plan to address accidental spillage, or leakage. The following measures shall be required to avoid or minimize spills during construction:

- Fueling and equipment maintenance will not be allowed within 100 feet of the water's edge without deploying spill capture methods.
- The contractor shall maintain fuel spill containment kits and trained spill response personnel on site at all times.
- Any spill or release of petroleum products will be reported to the construction site supervisor who will take immediate action to minimize the potential for groundwater or surface water pollution.
- In the event of a significant spill or release (more than 5 gallons), the construction site supervisor will immediately deploy on-site equipment and supplies to contain the spill and contact the Minnesota Duty Officer, the MDNR and MPCA.
- Temporary, above ground, on-site fuel storage will not be allowed within the 100 year floodplain.
- Below ground storage tanks will not be allowed.

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.

The project will not generate or store hazardous wastes either during construction or operation.

13. Fish, wildlife, plant communities, and sensitive ecological resources (rare features):

a. Describe fish and wildlife resources as well as habitats and vegetation on or in near the site.

The project area is located within the Douglas Lake-Modified Till Plain Land Type Association (LTA), which comprises a part of the Glacial Lake Superior Plain ecological subsection. Historically, the forest type in the area was comprised of white and Norway pine, cedar, aspen, and birch. Aspen forest is the dominant forest type today.

Glacial Lake Superior Plain Subsection. A glacial lake plain covers almost all of the subsection. It lies about 400 feet above the current level of Lake Superior. The plain is deeply dissected by numerous rivers and small streams. The subsection is represents an area where red clayey soils that were laid down in the beds of ancient Glacial Lakes Nemadji and Duluth and further modified by glacial forces. Existing clay soils form a relatively narrow band along the south and west shore of Lake Superior. Water has cut significantly deep valleys throughout the region and the down cutting continues to deposit the clayey sediments into Lake Superior. The subsection covers a very small area in Minnesota and a much larger portion in Wisconsin.

The St. Louis River within Jay Cooke State Park and below the Fond du Lac Dam runs through a narrow and deeply incised valley. Adjacent uplands rise approximately 150 feet above the valley floor. Between the dam and Lake Superior, river gradient becomes lower and the valley becomes much wider beginning about the location of the project area.

Douglas Lake-Modified Till Plain Land Type Association. - The Douglas Lake-Modified Till Plain LTA encompasses the deep-water portion of the Glacial Lake Duluth basin. The landscape has been deeply eroded by post glacial lake streams, such as the St. Louis River and numerous other high gradient streams that drain into the lower St. Louis River. Uplands occupy 92%, wetlands occupy 7%, and lakes occupy 1% of the LTA. Ninety percent of the LTA has soils with clay texture. The St. Louis River floodplain in the project area is comprised of soils with loamy textures.

The St. Louis River between the Fond du Lac Dam and the State Highway 23 Bridge is a critical spawning area for riffle spawning migratory fish species associated with Lake Superior as well as species resident to the estuary. The MDNR manages the first 0.4 mi below the dam as a spawning sanctuary. The remaining 1.2 mi. between the sanctuary and State Highway 23, is a critical spawning area recognized by both WDNR and MDNR wildlife agencies for Lake Superior migratory fish. A seasonal restriction on angling is the only restriction imposed on this reach, which contains the project area. Migratory and resident fish species that utilize this section of the river for spawning include lake sturgeon, walleye, longnose sucker, small mouth bass, muskellunge, northern pike, yellow perch, and white sucker.

As characterized by previous fisheries research, sturgeon spawning habitat requires adequate flow velocity (1-2 ft/sec) and complex hydraulics created by boulders and bedrock features. Habitat that meets these characteristics, which are essential for migratory fish is extremely limited due to the barrier to their upstream migration caused by the Fond du Lac Dam, shortness of the reach that support sufficient flow velocities, limited areas of boulder/cobble fields, and the effects of Lake Superior water levels on the lower St. Louis River. This spawning area is vital to western Lake Superior populations of these species and the fisheries of St. Louis River estuary, in general. Chambers' Grove is the best place to improve spawning habitat because of the suitable flows and coarse substrates.

Due to a major flood event in June, 2012, the entrance to the side-channel containing the project area is clogged with gravel, stone, and debris deposited as a shoal that prevents sufficient flow from entering the channel. The channel bed is composed mostly of gravel, cobble, stones, and boulders that characterizes spawning habitat. However, the current condition of the aquatic habitat in the project area is minimally suitable for lake sturgeon spawning. The project area lacks a key element of spawning habitat for sturgeon and other riffle spawning species—the hydraulic complexity created by pour-overs..

In August of 2009, the channel substrate along an 800 foot reach directly below the Fond du Lac Dam was prepared to mimic quality spawning habitat for surgeon. The St. Louis River Sturgeon Spawning Habitat Enhancement Project at Fond du Lac Dam improved approximately 5.5 acres of channel for sturgeon spawning with the completion of three rock riffle structures and random boulder placement.

Successful sturgeon spawning has been documented using these constructed features. Fond du Lac Resource Management has captured larval lake sturgeon in drift nets immediately below the restoration project in both 2013 and 2014. Additionally since project completion, MDNR has observed an increasing number of spawning adults within the project area during mark-recapture sampling each year.

Construction of boulder weir and j-hook vanes will create small scale cascades that increase hydraulic complexity. If successfully constructed, about 1.5 acres of good to excellent spawning habitat will be created by the project. The exact amount and quality spawning habitat will vary depending on river flows and Lake Superior water levels.

The river bank at the Chambers' Grove site is encroached by steel sheet piling and rock filled gabion revetment and backfill, forming a 0.2 mile length of hardened vertical river bank (retaining wall). The structures eliminate the bank's natural slope and transition to the river and reduce the exposure of substrates to the detriment of aquatic organisms. The revetment has eliminated shallow, low velocity nearshore habitats beneficial for rearing young fish. The adjacent riparian area is mowed park land.

b. 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-____) and/or correspondence number (**ERDB #20150230**) 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.

The MDNR's Natural Heritage Information System (NHIS) was consulted in 2015 to determine if any rare plant or animal species or significant natural features are known to occur within an approximate one mile radius of the proposed project area (Attachment B). The project has the potential to affect the following four state-listed species of special concern: the eastern elliptio (Elliptio complanata), black sandshell (Ligumia recta), creek heelsplitter (Lasmigona compressa),and the lake sturgeon (Acipenser fulvescens),

Creek heelsplitter mussels prefer substrates composed of sand, fine gravel, and mud. The creek heelsplitter most often colonizes areas downstream of riffles in small pools and uses habitats characterized by swift currents and water depths ranging one to three feet deep. Black sandshell mussels prefer areas dominated by sand or gravel along riffle and run areas of medium to large rivers. The eastern elliptio is a habitat generalist and tolerates most substrates except deep silt and rocky bottoms.

Lake sturgeon prefer moderately clear, large rivers and lakes. They are most often found over firm sand, gravel, or rubble bottoms. Lake sturgeon travel widely in loose aggregations across their range.

They use extensive areas of shallow water to find food, lightly dragging their barbels along the bottom in search of prey. Spawning occurs between April and early June, when aggregations can be seen in shallow water (1 to 15 feet deep).

The proposed project is within an area that the Minnesota Biological Survey (MBS) has identified as a Site of High Biodiversity Significance. Sites of Biodiversity Significance (SBS) have varying levels of native biodiversity and are ranked based on the relative significance of this biodiversity at a statewide level. Sites ranked as High contain very good quality occurrences of the rarest species, high quality examples of the rare native plant communities, and/or important functional landscapes. This particular Site is more than 2000 acres, but it does include Bayliss Island where, in 2001, MBS identified the following rare native plant communities: Gravel/Cobble Beach (River), Estuary Marsh (Lake Superior), and Black Ash – Silver Maple Terrace Forest.

Project activities may affect the Gravel/Cobble Beach community but the other native plant communities are outside of the construction zone. In addition to naturalizing the shoreline to complement the SBS in the area, the project will incrementally enhance the stability of the St. Louis River channel and floodplain. Three other SBSs are located within ½ mile of the project area, one of which is representative of riverine habitats and aquatic species of special concern (Fond du Lac to North Bay SBS – Outstanding). The other two sites and the Fond du Lac to North Bay SBS encompass mostly upland habitats, rare features, and natural communities that will not be affected by project activities.

No additional habitat or species surveys have been conducted within the project area.

c. 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.

Approximately 1.4 acres of river side-channel will be reworked, i.e. by excavation, filling, and rock placement, to create the proper structure and hydraulics that support sturgeon spawning habitat. Instream construction will cause temporary physical disturbance of habitat resulting in a potential loss of some benthic species (including mussels) due to burial and a limited number of mobile species unable to escape during the movements of materials and construction equipment.

The predominant substrate within the project vicinity is cobble and rubble which is not preferred habitat for the creek heelsplitter, the black sandshell and is not tolerated by the eastern elliptio. The species are unlikely to be directly affected as substrate within the project area is generally too coarse for their presence and the flow currently entering the side channel is limited.

Instream construction will disturb the riverbed causing a temporary release of sediments to the water column. Use of best management practices (11.B.IV.ii) are expected to reduce the spatial extent, magnitude, and duration of sedimentation and its effect on sensitive resources, including mussels. Minor downstream siltation is anticipated due to the coarseness of the substrates and materials used for construction of riffle structures.

Much of the side channel is currently suitable habitat for foraging lake sturgeon but only a very small area is likely suitable spawning habitat (0.1 ac). There is extensive foraging habitat upstream and downstream from the project area that fish can utilize during project construction. The conversion of foraging habitat to spawning habitat will cause a minor loss of foraging habitat. Once complete the project will increase spawning habitat suitability on 1.4 ac of in channel riffle and 0.3 ac of improved littoral zone. Foraging habitat will remain largely unchanged. The project may result in an increase of

up to 20 percent in the availability of high quality spawning habitat in the St. Louis River below Fond du Lac Dam.

Proposed work will not impede passage of aquatic organism along the main channel. Construction is scheduled so it does not affect spring spawning runs.

The project activities could affect the Gravel/Cobble Beach (River) community. The boulder weir that is proposed to be constructed at the entrance of the side channel would terminate in the vicinity of the mapped Gravel/Cobble Beach community. Disturbances related to weir construction will all occur in water below the OHWL. The Beach community occurs above the OHWL.

Hydraulic model results indicate no substantial change in water surface elevation, flow vectors or velocity in the main river channel for all modeled flows. The project is not expected to change the suitability of the main channel for use by aquatic species.

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

The following practices will be implemented to minimize adverse effects to sensitive resources:

- The construction contractor will be required to monitor and ensure vegetation establishment within contract specifications. Specifications for revegetation will include performance standards for use of native species and the control of weedy and exotic species.
- DNR Operation Orders 113 that describes the protocol to use in the inventory and management of invasive species will be followed.
- The contamination of surface waters by the introduction of invasive species is unlikely because machinery will be cleaned before entering the site and materials introduced to the site will be free of organic debris.
- Timing of construction to mid-summer through late fall avoids impact to lake sturgeon and other fish species migrating upstream to spawn.
- Foraging lake sturgeon and other fish species would not be directly impacted since they are not generally present in the area of in water activity during the mid-summer to mid-fall construction period. Although some juvenile lake sturgeon may be present, they can avoid the project area by moving through the two other adjacent channels. The large spawning population will not return to the project area until the spring following project construction.
- The Gravel/Cobble Beach (River) community will not be affected because work in the vicinity of the community will occur below the OHWL.
- See Item No. 11.b.ii for discussions on sediment control and Item No. 12c for discussions on the use of protocol for spill prevention and response plan.
- The QAPrP for AOC projects indicates that successful BUI removal must be based on a premise that biological indicators will respond positively to aquatic habitat improvements completed at a restoration site. In order to evaluate progress and ultimately determine success, habitat improvement targets and appropriate biological response variables must be quantified. After project completion, the newly created spawning areas will be monitored to determine their use by migratory fish species. Successful recruitment of lake sturgeon and other migratory fish will be one of the parameters used to indicate project success (see Item 12b).

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.

Cultural resource investigations were conducted in the vicinity of the project, including Chambers' Grove Park and Bayliss Island, located opposite the park on the St. Louis River. Literature research identified four historic (post-Contact) properties that may contain additional physical remnants: a railroad line, a post-Contact stone quarry, and two post-Contact habitations. Duluth Archaeology Center and Wolfshead Research Logistics completed a Phase I archeological investigation for the City and the MDNR (Duluth Archaeology Center Report No. 14-48, December 2014). The Phase I field survey included pedestrian walkover of the terrestrial part of the area of potential effect (APE), with shovel testing focused on the island, which is outside of the project area. Shovel testing was deemed unnecessary on the mainland component as a result of previous disturbance and soil core analysis, which showed the river front area received from three to eight feet of fill material. In addition, underwater surveys (remote sensing and visual searches) were conducted in the side channel of the river between the island and the mainland.

During the field survey, physical remnants of several historic properties were located in the vicinity of the project area: the Chambers Quarry (21SL1162), the Lake Superior and Mississippi Railroad- Fond du Lac to Thomson Segment (XX-RRD-026), and on Bayliss Island, the remains of a cabin or residence, named the Bayless Cabin (21SL1218). A fourth historic residence recorded in the area, the Chambers House, could not be field verified.

The quarry was abandoned by 1895. The quarry site is currently overgrown with mature forest. The phase I cultural/historic evaluation found no evidence (on-site evidence, or historic records) that the quarry was used for any purpose following abandonment. No part of the proposed project will disturb the quarry site.

During the electro-magnetic underwater survey a total of 24 metallic anomalies were detected. Without exception all of the ferrous objects were buried in the tightly knit rock cobble of the river bottom. The distribution of the anomalies suggests two main areas of concentration: between the old cabin site on Bayless Island and the north shore of the river and near the Highway 23 Bridge. No excavation was attempted to identify the objects. Both of these areas are outside of the proposed construction zone.

This distribution of metallic anomalies is consistent with what one might expect from items that were lost or discarded during transport between the island and the mainland and during the construction of the Highway 23 Bridge. Another potential explanation for the anomalies comes from anecdotal reports. A local resident stated it has been common practice to throw old coil bedsprings into the water to provide habitat structure for fish.

Section 106 Compliance is being processed through the National Oceanic and Atmospheric Administration (NOAA), Great Lakes Environmental Research Laboratory, Ann Arbor, MI. The Phase I report has been made available to the Minnesota Historical Society, State Historic Preservation Office (SHPO) for review. In order to achieve compliance, a compliance letter must be prepared by NOAA for submission to SHPO. Once SHPO receives the letter, they will make a determination on findings and, if the review is accepted, will issue a concurrence letter.

The conclusion of the cultural resource investigation, barring any excavation near the location of instream metallic anomalies, no potentially vulnerable cultural items are present within the underwater, shoreline or upland portion of the Chambers' Grove project area.

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.

Chambers' Grove Park is a scenic public space that provides the general public access to and a naturalistic view of the St. Louis River. The river shoreline can be seen from the Highway 23 Bridge. Construction will temporarily restrict public access and reduce the scenic qualities of the adjacent park.

The following mitigation will help to minimize visual impacts during construction:

- The Park shall be closed to the public during the construction phase of the project.
- Contractor will be required to maintain construction site in a neat and orderly condition.
- All unused material rubbish, waste, trash and any objectionable properties will be collected regularly and disposed of in accordance with applicable disposal laws and regulations.
- The contractor will set-up and maintain fencing and other deterrents to guide pedestrians around the active work area and to prevent access by the public to the construction zone.
- The contractor shall be required to clean trucks leaving the site to prevent tracking and spillage of mud and other debris onto public streets. If debris, mud, or other waste material is deposited on any street or right of way used during construction, the areas will need to be cleaned.

Once the project is complete, it will result in a more naturalized shoreline, which will improve the scenic qualities along the riverfront of Chambers' Grove Park.

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.

No Stationary source emissions will be created by this project.

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-related emissions will be minor and temporary in nature, arising from the use of gasoline and diesel powered equipment during construction. Equipment used will include excavators, loaders, trucks and cranes. Fuel exhaust emissions contain pollutants including carbon monoxide, nitrogen oxides, reactive organic gases, sulfur dioxide, and suspended particulate matter, all of which carry some associated health risks. All equipment is required to meet state and federal emission standards and meet the Conformity Requirements under Section 176(c) of the Clean Air Act, as amended and 40 C.F.R. 93.153.

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.

The proposed project may create some temporary dust during construction activities. Fugitive dust could arise from hauling and stockpiling of earthen and large woody materials and during construction when soils are exposed and areas are prepared for planting. Offensive odors are unlikely as the site has little organic soils that will be disturbed and construction materials do not contain volatile compounds.

The contractor will be required to follow best management practices to reduce dust such as:

- Covering loads during transport
- Watering access routes and exposed soils
- Placing mulch, temporary cover and erosion control mats on exposed areas and stockpiles.
- Requiring fill and stone materials to be clean and free of dirt and debris.

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.

Minnesota Rules, part 7030.0040 establishes two noise levels, L10 and L 50, based on the percent of time noise levels exceed the standard over a one-hour time period: L10 is defined as "noise levels exceeding the standard for 10 percent of the time for one hour (6 minutes/hour)" and L50 is defined as "noise levels exceeding the standard for 50 percent of the time for one hour (30 minutes/hour)." The rules also establish daytime and nighttime noise level standards based on Noise Activity Classification (NAC) levels. *Minnesota Rules*, part 7030.0050 defines NAC levels based on land uses as 1, 2, 3, or 4. NAC Level 1 includes residential areas.

The nearest receptors are located approximately 600-1200 feet east and south of the project area, respectively. There are residences across the river and a residential neighborhood east of the Highway 23. The residential neighborhoods located east and south of Chambers' Grove are classified as NAC Level 1. The minimum distance to the nearest sensitive receptor is 600 feet.

Noise standards established for NAC Level 1 areas are as follows (all noise levels are measured in decibels (dB): daytime standards (7:00 am to 10:00 pm) for the respective L levels are 65 dB (L10) and 60 dB (L50); and nighttime standards (10:00 pm to 7:00 am) are 55 dB (L10) and 50 dB (L50).

According to the Federal Highway Administration, the average noise level at 50 feet from typical diesel-powered mobile construction equipment is 87 dB (FWHA Construction Noise Handbook, Table 9.1). Sound decreases from a point source at a rate of 6 dB for every doubling of distance from the source (MPCA Guide to Noise Control in Minnesota).

The table below provides an estimated noise level as a function of distance, based on information from the FHWA handbook and the MPCA guide.

Distance of Source (ft)	Noise Level (dB)	Notes/Reference
50	87	Calculated from FHWA handbook
100	81	Average referenced for excavator/generator in Table 9.1, FHWA handbook
600	51	Calculated based on the MPCA guide
900	33	Calculated based on the MPCA guide

Construction will use equipment classified as "mobile equipment" including dozers, cranes, graders, excavators etc., operate in a cyclic fashion in which a period of full power is followed by a period of reduced power. Typical sounds will include engine noise, sounds of metal on rock, and safety back-up alarms. The Highway 23 embankment and Bayless Island will partly shield most of the populated areas from construction related noises. Once complete the project will not generate noise.

Chambers' Grove construction will temporarily generate noise above current park noise levels. Construction noise estimates are well below rural residential class 1 (RR-1) noise standards for the nearest sensitive receptor. The contractor will be required to minimize noise effects by:

- Restrict equipment operation only during daylight hours (7am – 10 pm), Monday-Saturday.
- Require all equipment to have properly operating muffler systems.
- Restrict idling time for inactive equipment to 15 minutes.
- Inform construction operators of the nearby campground and schedule loud operations for mid-day.
- Notify adjacent landowners and businesses about the intent of the project, duration, expected noise levels and complaint procedures.

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.

Highway 23 Fond du Lac to Duluth is categorized by Minnesota Department of Transportation (MNDOT) Access Management as a Principal Arterial rural road (Category 4A) and is a separated four lane surface road through Fond du Lac. Fond du Lac is a rural residential neighborhood with 3-5 scattered commercial businesses and no industrial uses. In 2013, MNDOT estimated the Average Annual Daily Traffic (AADT) for Hwy 23 at Fond du Lac as 1,950 trips/day and 8,000 trips/day at Beck's Road in Gary-New Duluth. The current access to the adjacent Chambers' Grove Park is recreational use of a small rural park and estimated to be less than 100 trips/day, with peak use occurring on summer weekends. The City of Duluth is closing the adjacent Chambers' Grove Park on July 15, 2015. The Park is scheduled to remain closed until December 2016.

Between mid-July 2015 and mid-September 2015, construction related transportation of the Chambers' Grove project is expected to generate less than 100 trips/day for a short duration, i.e., equivalent to trips generated by a small business with 5-10 employees and 40-50 deliveries/day. Construction activities will be restricted to weekdays. Entrance to the site is located at a bend in the road. Contractors will be allowed to use the unused parking area for construction staging and equipment storage of the Park during project construction.

Project operation is expected to:

- Moderately increase recreation related traffic above existing Park use due to improved fishing and boat launch.
- Have no effect on timing of peak use (weekends and evenings).
- Have no effect on alternative transportation modes.

b. 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.

No traffic congestion is expected on Highway 23 as a result of project construction or operation. The 100 trips/day estimate of traffic levels during construction is expected to be offset by the closing of the Park to visitors, resulting in no net change between 2015 and 2016. Once the project activities are completed and the Park reopened, an additional 50 trips/day, equivalent to a 2.5% increase in traffic is projected.

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

Construction contractor shall be required to place and maintain Truck Hauling and Construction Entrance warning signage during construction.

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

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

Construction is slated to occur during the period beginning in mid-July and ending about mid-October, 2015. Project developments will be largely confined to the project area and adjacent Chambers' Grove Park. Noise, odors, and dust would be somewhat elevated within several hundred feet of the construction zone. The only actions that occur outside of the project vicinity would be the hauling of earthen and organic materials and the removal debris during the demolition of the boardwalk and sheet piling. Traffic would increase incrementally, approximately equivalent to traffic generated by a small business with 40-50 daily deliveries. Water quality was evaluated in greater detail to determine the potential for cumulative effects. Water quality of the Lower St. Louis River could be affected by sedimentation originating from project construction, up to several hundred feet downstream.

a. 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.

Several projects recently completed or planned in the foreseeable future within the same geographic area (upper reaches of the lower St. Louis River) and timeframe (July to December 2015) were evaluated for interaction of environmental effects: MDNR Sturgeon Habitat Restoration at Fond du Lac Dam; Chambers' Grover Park improvements; MNDOT Repair of Highway 210 at Jay Cooke State Park; MDNR Mission Creek Flood Damage Response; and several Lower St. Louis River AOC Remedial Action Plan projects.

MDNR Sturgeon Spawning Habitat Restoration at Fond du Lac Dam – approximately 1.4 miles upstream from project. This project was completed in 2012 approximately 1.4 mi feet upstream at the base of the Fond du Lac Dam. The project had the same objective to remove failing infrastructure and improve the quality and quantity of suitable spawning habitat for lake sturgeon and other riffle spawning species. Sediment starvation below the dam has resulted in selective removal of erodible fine materials, and over time the streambed has become armored with coarse materials. The project has resulted in minimal sedimentation downstream.

City of Duluth Chambers' Grove Park Flood Damage Repair and Improvement Project will be constructed adjacent to the Chambers' Grove Aquatic Habitat Restoration Project. However, construction is scheduled to begin in July 2016. More than six months following completion of this project. City of Duluth proposes to develop new access road, parking area, toilet facility, and playground and establish a regionally significant trailhead for the Duluth Traverse Trail and the Gateway Flow base trail. Project is slated for the summer of 2016. A grant has been provided to the City of Duluth to manage stormwater during and after project developments under the standards and principles of LID (Item No. 11b.ii. of this EAW).

MNDOT repair of Highway 210 at Jay Cooke State Park is scheduled for construction during the summer and fall of 2015. This project will require a large amount of earthwork and delivery of equipment and road building materials at the same time as the Chambers' Grove Aquatic Habitat Project. However, MNDOT will access the construction site from Carlton, MN. No activity is planned near Fond du Lac. This work is upstream of the Fond du Lac Dam.

Mission Creek Flood Damage Response Project. MDNR and MNDOT are addressing 2012 flood damage along the lower Mission Creek corridor approximately ½ from the Chambers' Grove site. Bridge replacement project is planned and stream channel restoration projects are being considered. No construction is scheduled before summer of 2016.

The following are current or future AOC projects:

Radio Tower Bay – approximately 3 miles downstream of Chambers' Grove. Dredging of waste deposited in the bay by a historic sawmill was removed from the bay in 2014 and pumped to a settling pond above Mud Lake. This project is underway and construction will be completed in 2015. Much of the in water construction has been completed.

Mud and Spirit Lake - approximately 6 miles downstream of Chambers' Grove. Project objectives are to address contamination found in sediments, restore historic depth of surface waters and restore sheltered bay habitat. Project construction will include removal of some contaminated sediments, capping of other contaminated sediments with clean sediment, constructing habitat features, such as islands, and reestablishing submergent vegetation similar to native aquatic marsh communities. Project construction has not been scheduled at this time.

Knowlton Creek – approximately 9 miles east. The project objectives are restore/reconstruct the lower Knowlton Creek stream channel to the St. Louis Bay. Work in the creek channel and floodplain could cause temporary increases in sedimentation into St. Louis Bay. The EAW is under development by MDNR. The project is scheduled for construction in 2016. The distance of separation from the Chambers' Grove project is nearly 10 miles.

St. Louis Bay sites at Grassy Point, 40th Ave W, and 21st Ave W - approximately 10-14 miles downstream from Chambers' Grove. These projects address chemical contaminants and other limiting factors causing impairments to aquatic life and have a goal to restore sheltered bay and estuary flats habitat. The projects encompass approximately 890 acres in a near-continuous length of shoreline of approximately 3.5 miles. The combined state-federal environmental assessment is underway with the federal Environmental Assessment recently completing its public review. Additional state sponsored EAWs will be initiated soon. Construction is scheduled to occur intermittently in a phased approach during the period starting in 2016 and completing in 2022. These projects are several orders of magnitude greater than the Chambers' Grove Project.

Kingsbury Bay – approximately 10 miles downstream of Chambers' Grove. The project objective is to restore shallow sheltered bay habitat by excavation of the deposited sediment at the mouth of Kingsbury Bay as well as enhance hydrologic connection of the wetland complex. Project construction has not been scheduled.

b. 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.

The MDNR has examined whether the proposed project could have a significant effect on water quality due to sedimentation when considered along with other projects that: (1) are already in existence, are actually planned for, or for which a basis of expectation has been laid; (2) are located in the surrounding area; and/or (3) might reasonably be expected to affect the same natural resources.

Noise, odors, dust, and increases in traffic are not regarded as having the potential for cumulative effects due to the minor incremental increases of these effects from proposed project activities.

Potential cumulative effect on water quality is distributed widely in a spatial context and without substantial temporal overlap. The potential for cumulative sedimentation effects on surface waters is anticipated to be minor for a variety of reasons. For some projects, channel substrates were too coarse to contribute substantial sedimentation; for some projects, sediments would be largely contained on-site because surface waters could be isolated from the river; some projects were of minor scale; and/or some projects were dispersed temporally or spatially enough to prevent cumulative effects. The potential cumulative environmental effect on water quality due to sedimentation was considered a minor potential.

Potential beneficial effects of AOC restoration projects include additional aquatic habitat restoration projects at locations throughout the estuary including 21st Ave West, 40th Ave West, Grassy Point, Radio Tower Bay, Perch Lake, Spirit Lake, Kingsbury Bay and Knowlton Creek. The cumulative potential effects of these projects is anticipated to increase fish and wildlife habitat, increase fish and wildlife populations, and decrease anthropogenic impacts to St. Louis River Estuary. All these cumulative potential effects will be beneficial to the St. Louis River Estuary and lead to its delisting as a Great Lakes AOC.

Once complete, the Chambers' Grove Aquatic Habitat Enhancement project will have a positive effect on the environment. The quality and area of suitable habitat for species of concern (lake sturgeon) will be improved and higher quality recreational access to the river will be provided.

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 the how the environment will be affected, and identify measures that will be taken to minimize and mitigate these effects.

No other potential environmental impacts have been identified; all known or anticipated environmental impacts have been addressed above, in Items 1 – 28.

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 _____ Date May 19, 2015

Title Environmental Review Planner