ENVIRONMENTAL ASSESSMENT

Dredged Material Placement in Support of Aquatic Habitat Restoration 21st Avenue West, 40th Avenue West, and Grassy Point St Louis River Area of Concern Duluth, Minnesota

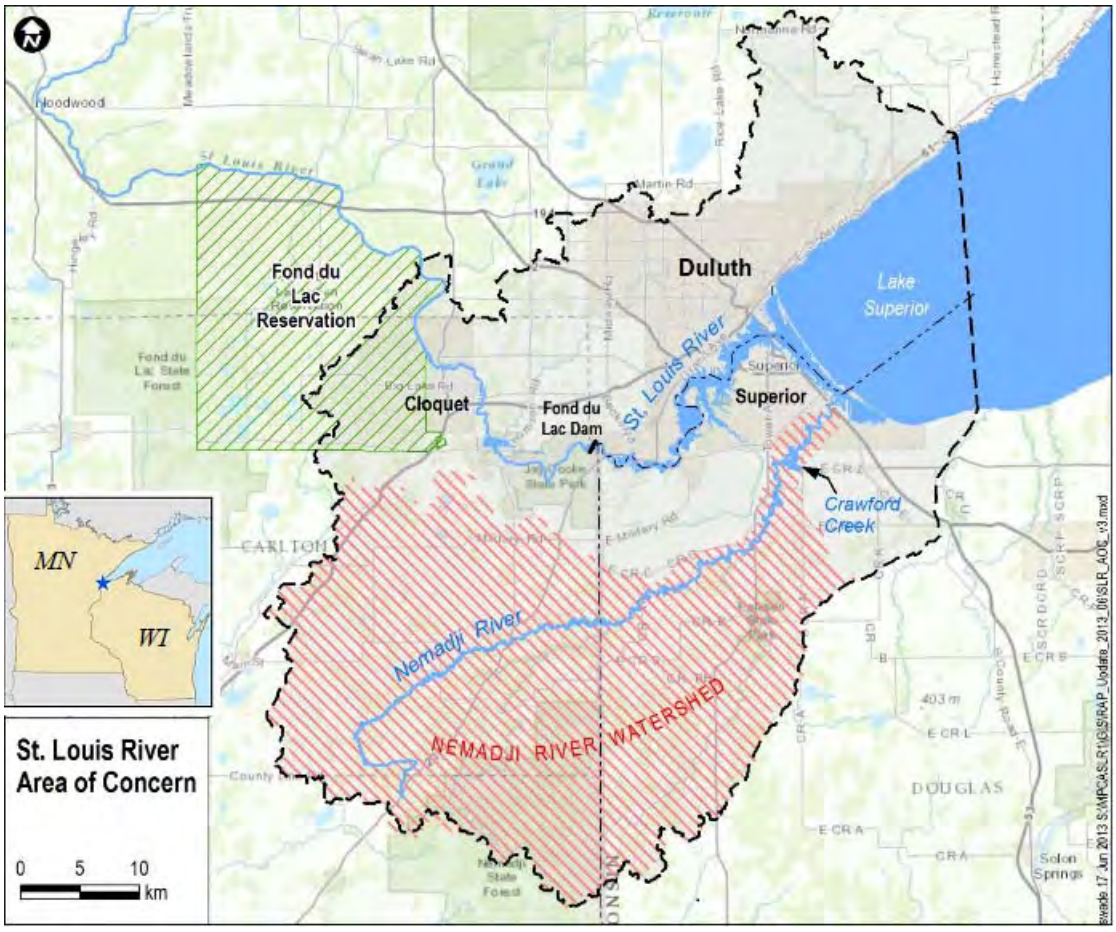

Figure adapted from St. Louis River Area of Concern Implementation Framework document.

February 2015
Detroit District, U.S. Army Corps of Engineers
in cooperation with the
State of Minnesota

Project Title: Dredged Material Placement in support of Aquatic Habitat Restoration, St Louis River Area of Concern, Duluth, Minnesota

Abstract: The Detroit District, U.S. Army Corps of Engineers (USACE), proposes to place suitable shoal material dredged from the Federal navigation project into State-specified target areas to reduce water depths and allow for natural colonization of aquatic vegetation. Habitat islands may also be included for added diversity. The State of Minnesota, in concert with the approved St. Louis River Area of Concern Remedial Action Plan (RAP) (MPCA and WDNR, 2013) for the St. Louis River Area of Concern (SLRAOC), proposes to use dredged material that will be placed in-water as fill in support of aquatic habitat restoration efforts to remove beneficial use impairments in the SLRAOC. Consistent with achieving the restoration goals set forth in the RAP, suitable dredged material would be provided from the Federal navigation channel, Erie Pier, and/or other sources in accordance with United States Army Corps of Engineers (USACE) and State of Minnesota standards. Placement of the dredged material will provide for improvement of benthic substrate and development of aquatic habitat features towards the goal of delisting beneficial use impairments (BUIs) from the AOC—specifically BUI #4, "Degradation of Benthos," and BUI #9, "Loss of Fish and Wildlife Habitat." The proposed restoration sites include the 21st Avenue West, 40th Avenue West, and Grassy Point which encompass approximately 890 acres in a near-continuous length of shoreline of approximately 3.5 miles. The dredged material will provide a base of shallower areas of varying depths (and possibly habitat islands) for State-proposed habitat features such as softened shorelines and aquatic habitats interspersed with open water areas to support a diverse assemblage of vegetation, fish and wildlife. Areas of contaminated sediment would be buried to isolate it from exposure to benthic organisms (bottom dwelling organisms). The State of Minnesota intends to provide growth medium at each restoration site using organic sediment excavated from the Kingsbury Bay and/or Perch Lake RAP restoration sites to promote growth of submergent and emergent aquatic vegetation.

ACRONYMS USED IN THIS DOCUMENT

AOC	Area of Concern (for impaired natural resources)
BMP	Best Management Practice
BUI	Beneficial Use Impairment (in an AOC)
CFR	Code of Federal Regulations
CWA	Clean Water Act
EA	Environmental Assessment
EAW	Environmental Assessment Worksheet
EIS	Environmental Impact Statement
FONSI	Finding of No Significant Impact
HSI	Habitat Suitability Index
WIDNR	Wisconsin Department of Natural Resources
MNDNR	Minnesota Department of Natural Resources
MPCA	Minnesota Pollution Control Agency
NEPA	National Environmental Policy Act
PCB	Polychlorinated Biphenyls
RAP	Remedial Action Plan being implemented for the SLRAOC
RGU	Responsible Governmental Unit (prepare the EAW per State regulation)
SLR	St. Louis River
SLRAOC	St. Louis River Area of Concern
SOF	Statement of Findings
SQT	Sediment Quality Targets as defined by the State of Minnesota
USACE	U.S. Army Corps of Engineers
USEPA	U.S. Environmental Protection Agency
WDNR	Wisconsin Department of Natural Resources
WLSSD	Western Lake Superior Sanitary District

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Aquatic Habitat Restoration
21st Avenue West, 40th Avenue West, and Grassy Point
St Louis River Area of Concern
Duluth, Minnesota

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ENVIRONMENTAL ASSESSMENT

Dredged Material Placement for
Aquatic Habitat Restoration
21st Avenue West, 40th Avenue West, and Grassy Point
St Louis River Area of Concern
Duluth, Minnesota

1.0 INTRODUCTION

Project Proposal

1.01 This Environmental Assessment (EA) addresses U.S. Army Corps of Engineers (USACE) participation in the proposed action through provision of suitable shoal material from the Federal channels at Duluth-Superior Harbor, Minnesota and Wisconsin, to ecosystem restoration sites in St. Louis Bay, specifically the 21st Avenue West, 40th Avenue West, and Grassy Point Restoration Sites (Figure 1). The State of Minnesota, in concert with the approved[2] *St. Louis River Area of Concern Implementation Framework: Roadmap to Delisting, Remedial Action Plan Update* (RAP), proposes to use dredged material acceptable for aquatic habitat restoration with the goal of removing beneficial use impairments (BUIs) in the St. Louis River Area of Concern (SLRAOC)[3].

St. Louis River Estuary

1.02 The St. Louis River Estuary includes 12,000 acres of freshwater wetlands, tributary streams and bays that provide for one of the largest, productive and ecologically valuable freshwater ecosystems in the Great Lakes. This system provides primary nursery habitat for more than 40 species of fish and valuable habitat diversity for a wide variety of birds. This same estuary is also a primary driver for the economic health and vitality of the region and provides for measurable ecosystem services to the surrounding communities.

Duluth-Superior Harbor

1.03 Duluth-Superior Harbor is at the western end of Lake Superior between Duluth, Minnesota, and Superior, Wisconsin, on the St. Louis River, one of largest tributaries of Lake Superior (Figure 2). The St. Louis River has a drainage basin of 3,640 square miles at Duluth. The estimated yearly mean flow is 2366 cubic feet per second at Scanlon, Minnesota, about 33 river miles upstream from Lake Superior. The St. Louis River, after dropping 550 feet in elevation, flattens out and flows through ten miles of estuary. The estuary is characterized by an abundance of backwater areas, bays, and dense beds of aquatic vegetation before entering the upper reaches of the Duluth-Superior Harbor, at which point the river is about 2,000 feet wide.

2. The RAP is approved by both states (Minnesota and Wisconsin) and the US Environmental Protection Agency.
3. The SLRAOC, which covers an irregular shaped area roughly 65 miles long and 40 miles wide, is one of forty-four designated Areas of Concern over impaired water resources within the Great Lakes ecosystem.

1.04 The Federal navigation project (Figure 2) includes 17 miles of channels, anchorage areas, and maneuvering areas, with authorized depths ranging from 32 feet at the harbor entrances to 20 feet upstream. The harbor is divided by Rice's Point into the inner harbor in St. Louis Bay and the outer harbor in Superior Bay. The outer harbor is separated from Lake Superior by two natural sand and gravel barriers, Minnesota Point and Wisconsin Point, which combined extend about 10.5 miles along Lake Superior. Maintenance dredging operations for the Federal navigation project remove approximately 100,000 cubic yards per year (10-year average).

Figure 1. Aquatic Habitat Restoration Areas for 21st Avenue West, 40th Avenue West, and Grassy Pt. (Base imagery from Google Earth.)

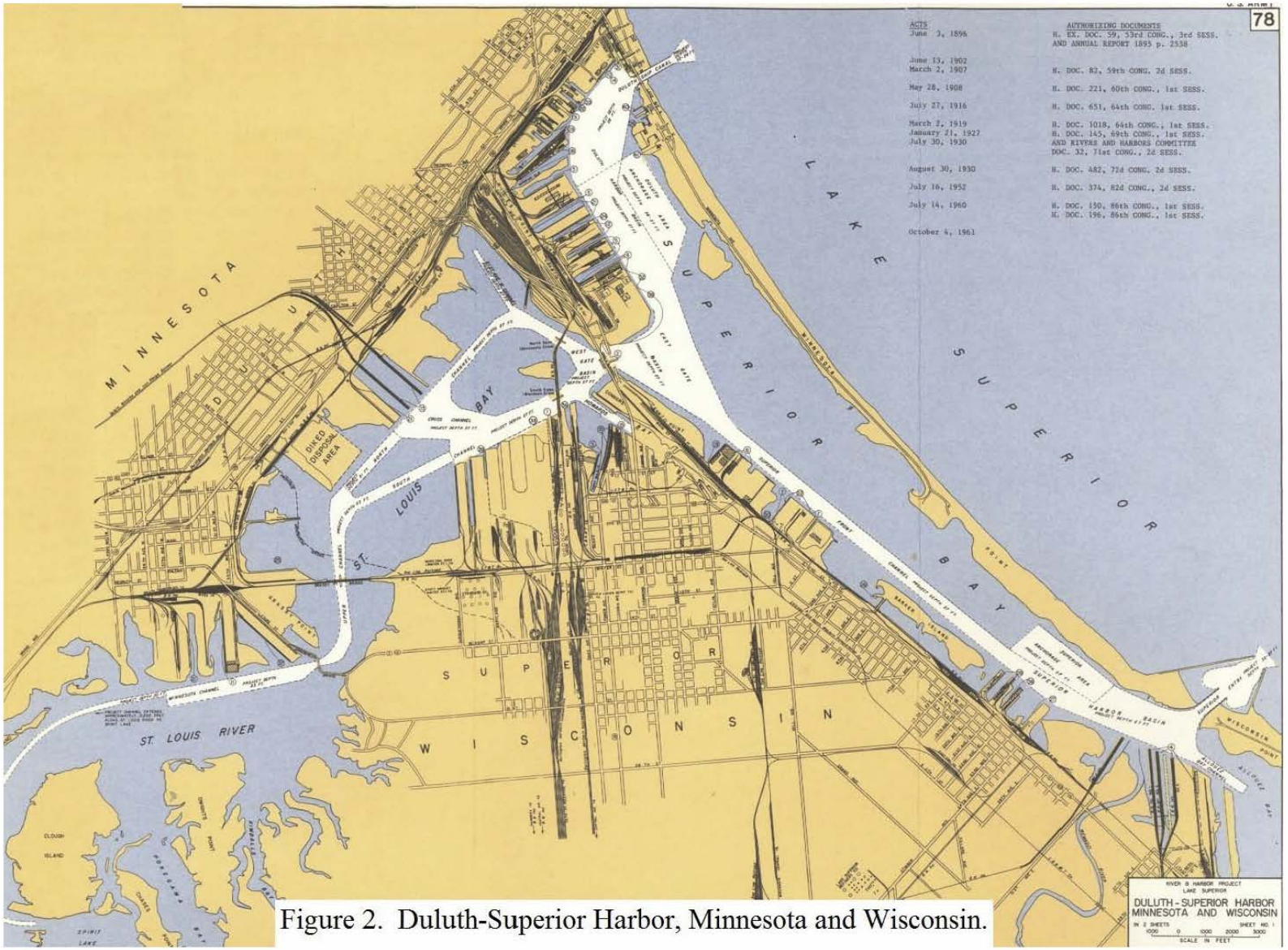

Figure 2. Duluth-Superior Harbor, Minnesota and Wisconsin.

St Louis River Area of Concern

1.05 The SLRAOC was listed by the International Joint Commission[4] in 1987 as one of forty-three Areas of Concern (AOC), defined as geographic areas that have experienced environmental degradation from legacy related impacts, within the Great Lakes ecosystem. The Remedial Action Plan (RAP)[5] provides the rational for listing the nine beneficial use impairments (BUIs), removal targets for each BUI, strategies to remove each BUI, and the actions still needed to achieve BUI removal. The goal is to remove each BUI and delist the SLRAOC by 2025. The BUIs associated with legacy related impacts include, but are not limited to remediating contaminated sediments, restoring loss of aquatic habitat and the health of the benthic community, and reducing sediment loading to the estuary.

1. 06 Nine beneficial use impairments (BUIs) are identified in the RAP as follows:

BUI 1: Fish Consumption Advisories
BUI 2: Degraded Fish and Wildlife Populations
BUI 3: Fish Tumors and Other Deformities
BUI 4: Degradation of Benthos
BUI 5: Restrictions on Dredging
BUI 6: Excessive Loading of Sediments and Nutrients
BUI 7: Beach Closings and Body Contact Restrictions
BUI 8: Degradation of Aesthetics (this BUI was removed in August 2014[6])
BUI 9: Loss of Fish and Wildlife Habitat

1.07 The dredged material placement proposed in this EA will support habitat restoration activities intended to address primarily BUI 4, Degradation of Benthos, and BUI 9, Loss of Fish and Wildlife Habitat. As stated in the RAP, the target for removal of the Degradation of Benthos BUI will be justified when:

> "The benthic community in historically degraded areas (e.g, chemically, biologically, or physically degraded area) of the SLRAOC does not significantly differ from unimpacted sites of comparable characteristics within the SLRAOC. Benthic communities' characteristics including native species richness, diversity, abundance, and functional groups will be considered when comparing sites."[5]

1.08 The placement of dredged material into the restoration sites will provide suitable sediment in support of habitat for benthic organisms and, thus, address BUI 4 by reducing the degradation of benthos caused by past contamination and habitat deterioration. This alone would lead to habitat restoration through natural recovery, but natural recovery is extremely slow in an aquatic environment and could take decades or longer. For this reason, the State of Minnesota intends to provide enhancements within the restoration sites to produce quality habitat features within several years. The State-proposed enhancements, particularly vegetation establishment, address BUI 9, specifically target #3 of the following criteria for BUI 9 removal:

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4. The International Joint Commission was established by the 1909 Boundary Waters Treaty as the bi-national organization (United States & Canada) responsible for the Great Lakes and other boundary waters (MPCA & WDNR 1992).
5. MPCA et. al., 2013. St. Louis River Area of Concern Implementation Framework: Roadmap to Delisting (Remedial Action Plan Update). July 15, 2013. A collaborative effort of the Minnesota Pollution Control Agency, the Wisconsin Department of Natural Resources, the Minnesota Department of Natural Resources, the Fond du Lac Reservation, the St. Louis River Alliance, and the U.S. Environmental Protection Agency.
6. http://dnr.wi.gov/topic/greatlakes/documents/SLRFinalAestheticsRemovalPackage.pdf

1. "Remediation of contaminated sediment at prioritized sites within the SLRAOC is complete." (This work mostly occurs under BUI 5, which is being separately addressed in other RAP restoration projects.)

2. "Programs are in place to discourage further proliferation and further introduction of non-native invasive species." (This work is being done under separate RAP initiatives and involves documentation of existing non-native invasive species management programs.)

3. "At least 50% of known degraded aquatic habitat acreage (1,700 acres) is rehabilitated through implementation of projects in accordance with a restoration site. The number of acres restored will be equivalent to the area of a restoration site, since the restoration work will be designed and constructed with an overall goal to provide for fish and wildlife habitat for the entire site as a whole." (This work involves the State-proposed habitat enhancements, which are built on the base of dredged material that is to be supplied to each of the three restoration sites.)

4. "Additional aquatic or hydrologically connected habitat throughout the SLRAOC watersheds has been successfully protected and rehabilitated sufficiently to maintain healthy fish and wildlife populations through implementation of projects at prioritized restoration sites." (This work is mostly designated in the Nemadji and Knowlton Creek Watershed action items, which are being separately addressed in other RAP restoration projects.)

1.09 The site designs will take into consideration the contaminant character of the existing sediments, which is generally moderate with some isolated spots of higher contamination. These spots may require placement of thicker layers of dredged material to provide a buffer zone for benthic activity[7]. Ultimately, the density, diversity, and health of benthic organisms that populate the newly placed material will determine success and lead to removal of BUI 4 and contribute to removal of BUI 9.

Pilot Dredged Material Placement Project

1.10 In cooperation with the State of Minnesota and in anticipation of a full scale aquatic ecosystem restoration that this EA addresses, the USACE in 2013 began placing dredged material in the inner bay of the 21st Avenue West site (Figure 3) as part of a three-year pilot project[8] to determine effectiveness of dredged material placement for habitat restoration in terms of material stability, ability to support aquatic vegetation, and effects on water quality. The pilot project, which continues through 2015, involves the placement of a total of approximately 375,000 cubic yards and includes turbidity monitoring, bathymetric surveys of material stability, and placement of supplemental organic material for growth medium.

1.11 Turbidity monitoring is being conducted on the pilot dredged material placement in 2015 to continue evaluation of turbidity levels associated with placement of dredged material in 21st Ave West Channel embayment and to fill in data gaps from 2013 and 2014 monitoring. Results of turbidity monitoring in year 1 (2013) and year 2 (2014) of the pilot project suggested that use of a silt curtain confines some of the elevated turbidity within the project limits and that average turbidity levels measured outside of the curtain during placement would not incur negative long-term impacts on the aquatic ecosystem. A more rigorous turbidity monitoring plan will be implemented in 2015 to determine applicable mixing zones and whether water quality can be protected without the implementation of a silt curtain.

7. A variety of methods are available to calculate minimum material depth to isolate benthic activity from underlying contaminants and these methods will be taken into account in the site designs. They are too complex to present as part of this environmental assessment, but information can be provided to interested parties upon request.

8 Environmental Assessment and Finding of No Significant Impact. 2012. *Dredged Material Placement, 21st Avenue West Embayment, Duluth, Minnesota*. USACE (available at http://www.lre.usace.army.mil/missions/environmentalservices.aspx)

Figure 3. Location of Pilot Project within the 21st Avenue West Restoration Site. (Base imagery from Google Earth.)

1.12 Based on preliminary conclusions to date, impacts of dredged material placement on water quality are generally localized to the dredged materials placement areas, relatively short-term in nature and do not result in a significant detrimental impact on the aquatic ecosystem. The 2014 turbidity monitoring results show an average of about 59 percent reduction in turbidity levels outside the silt curtain when dredging mixed material that included fine-grained sediments such as clay. Measured suspended solids levels rarely exceeded the concentration that would result in impacts to spring walleye spawning and nursery activity, which shows that the potential for adverse biological impacts is likely negligible. Unless the State of Minnesota approves operations at these critical times (with appropriate protective measures), dredge material placement activities will be timed to avoid the potential for impacts on critical fish spawning and nursery life stages.

1.13 For a more detailed discussion of the turbidity monitoring results, see Section II.a. of the Clean Water Act Section 404(b)(1) Evaluation (Attachment 1). Additionally, bathymetric surveys before and after dredged material placement in 2013 and again in 2014 show that the material is remaining in the locations it was placed, suggesting a level of stability similar to that of the existing sediments in the site (see Figure 404-2 in Attachment 1 of this EA).

Project Purpose and Need

1.14 The purpose of the proposed dredged material placement at the three ecosystem restoration sites is to place dredged material from maintenance of the Federal navigation project in an environmentally acceptable, cost effective manner with the added benefit of supporting environmental improvement efforts. The purpose of the State's aquatic habitat restorations are to help achieve the goals of the RAP, specifically the removal of BUI 4, and BUI 9, necessary steps towards delisting the SLRAOC. The dredged material placement will address BUI 4 and provides a base from which the State can implement habitat improvements to address BUI 9. The need for habitat restoration in the SLRAOC stems from the habitat degradation that resulted from historic industrial era impacts.

1.15 Habitat improvement is referenced extensively in the Lower St. Louis River Habitat Plan (SLRCAC, 2002) and the RAP. Macrophyte assemblages are the primary feature associated with aquatic habitats, providing refugia for productive fish and invertebrate populations. The lower reaches of the St. Louis River are lacking of these diverse and abundant submergent and emergent aquatic vegetation colonies. Active management in restoring estuary flats and sheltered bay areas in the estuary is necessary because if left to natural processes, it would take decades or longer to restore.

1.16 Beneficial use of dredged material will provide bulk fill to form a base for State-proposed habitat features and a cost-effective means of building aquatic habitat restoration with the end goal of removing BUIs from the SLRAOC. The dredged material will be placed at varying depths (possibly including placement to form habitat islands), which in conjunction with State-proposed enhancements, will encourage a diversity of plant growth (i.e., floating leaf, emergent, submergent) and reduced wave action to provide for sheltered fish nursery and spawning habitat. It would also increase avian habitat and migratory bird food sources in the harbor. In this regard, the State plans to add organic sediment[9], if deemed to be required for restoration, layered on top of the dredged material as a supplemental source of seed and nutrients to improve habitat for benthic invertebrates and aquatic vegetation.

1.17 Dredged material may be supplemented with suitable material from Erie Pier.[10] Fill may also be obtained on-site where restoration may require some excavation for restoration of site bathymetry.

9. From other RAP sites as discussed in the next section under "Borrow Sites for Organic Growth Medium."
10. Erie Pier occupies approximately 82 acres along the Duluth shoreline. Erie Pier was constructed in 1979 to hold dredged material from the Federal navigation project. Since the late 1980s Erie Pier has also been used for reprocessing of dredged material for beneficial reuse.

Project Authority

1.18 The removal and placement of dredged material from the Federal navigation project is conducted under navigation servitude[11] and is authorized as part of harbor operation and maintenance, which is intrinsic to the original harbor authorizations.[12] Dredged material would be provided to the habitat restoration sites from the Federal navigation channels in accordance with United States Army Corps of Engineers (USACE) standards.[13] The placement of dredge material from other sources (such as Erie Pier or on-site excavation) and the actual habitat restoration activities would be done under other Federal (non-USACE) and/or State authorities.

Environmental Compliance

1.19 This EA addresses USACE participation in the proposed action of placing suitable dredged material from the Federal channels at Duluth-Superior Harbor, Minnesota and Wisconsin, in three sites as determined by the State of Minnesota and other RAP partners in support of habitat restoration in the aquatic ecosystem of the St. Louis River Estuary. The participation of the State of Minnesota involves detailed design of the use of the shoal material in developing the habitat restorations.

1.20 Under Minnesota Rules 4410.4300 Subpart 27.A (Wetlands and Protected Waters), this project requires a State-mandated Environmental Assessment Worksheet (EAW) for the proposed actions. For each of the three sites, an EAW will be prepared by a Responsible Governmental Unit (RGU) and circulated for public review subsequent to the public review of this EA. Each EAW will provide more specific information and design refinements to the proposed actions at the subject site. Upon completion of State-level environmental review[14] the USACE would make a decision on the Federal EA regarding the need for a Federal EIS. If the USACE determines that an EIS is not necessary, they would provide that decision to the public in a Federal Finding of No Significant Impact (FONSI).

1.21 Upon completion of public review and comment on this USACE EA, the following would occur separately for each of the three restoration sites (21st Avenue W, 40th Avenue W, and Grassy Point)[15]:

- Development of a State Environmental Assessment Worksheet (EAW)
- Federal Coastal Consistency Determination submitted to State
- Public Review of the EAW (distributed to same addresses as the USACE EA)
- Finding of Fact on the EAW

11. The common law principal of navigation servitude is the public's right of free use of all streams and water bodies for navigation.
12. Superior Harbor, Wisconsin, was originally authorized in 1867. Duluth Harbor, Minnesota, was originally authorized in 1871. The two harbors were combined in 1896 as the Duluth-Superior Harbor, which has been expanded by ten subsequent River and Harbor Acts.
13. USACE funding level for dredged material placement is based on the least cost, engineeringly feasible alternative that complies with the Clean Water Act Section 404(b)(1) Guidelines.
14. If the RGU finds that an EIS is necessary, then additional documentation and reviews would be required of the RGU at the State-level of environmental reviews.
15. This sequence assumes that the State EAW Finding of Fact is a determination of no significant impact. If not, then an State Environmental Impact Assessment would be needed prior to the remaining steps.

- MNDNR Public Waters Work Permit
- State Section 401 Water Quality Certification
- Compliance with Section 106 of the National Historic Preservation Act
- Corps site specific FONSI (if Corps determines a Federal EIS is not needed)
- Other applicable permits (Wetland Conservation Act, NPDES, etc. if deemed applicable by the State)
- USACE Regulatory Permit (for State-proposed features and material placements outside of USACE navigation dredging and placement)
- Project Design and Implementation

2.0 ALTERNATIVES AND THE PROPOSED ACTION

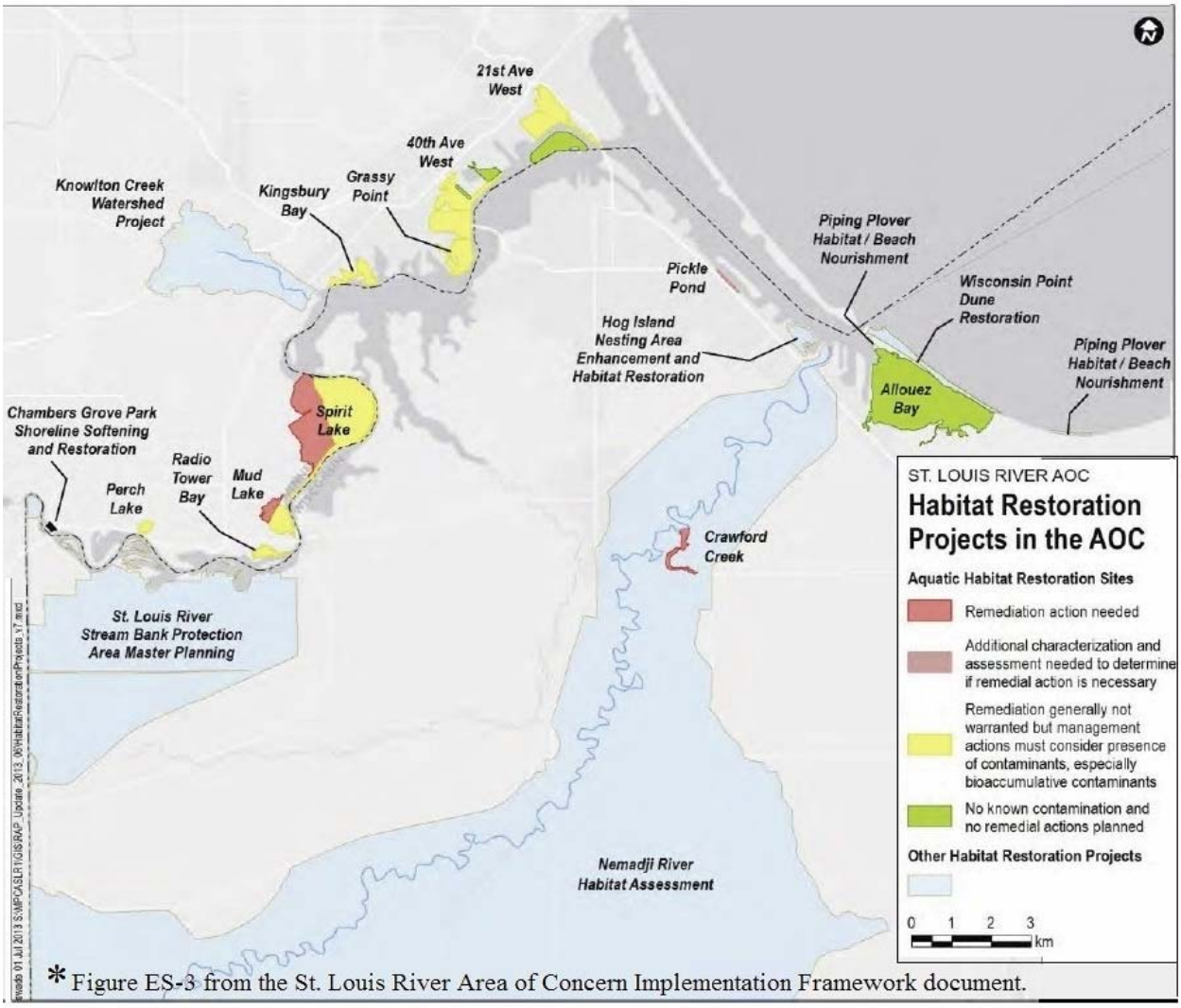
2.01 Habitat restoration sites have been identified as part of the RAP (Figure 4). Several of the sites in Minnesota involve the potential for use of dredge material from the Federal navigation channels in developing habitat at Grassy Point, 40th Avenue West, and 21st Avenue West. The placement of dredged material at these sites can be addressed under the USACE's existing operations and maintenance authority for the harbor. If navigation material is not used, the state will work with the USACE on the appropriate program and means for implementation. Other action items in the RAP are being pursued in both Minnesota and Wisconsin by State and Federal agencies with input from RAP partners and stakeholder.

Dredged Material Placement Alternatives

2.02 Alternatives to the proposed placement of dredged material in support of State-proposed habitat restoration at Grassy Point, 40th Avenue West, and 21st Avenue West include finding new upland dredged material placement sites, open water placement in Lake Superior, and no Federal action. Since the RAP partners propose to restore habitat in the interest of removing BUIs, particularly BUI 4 and BUI 9 through aquatic habitat restoration in these three sites, there is a need for large quantities of fill material to create appropriate bathymetry for production of aquatic habitat. The proposed action for the USACE is therefore to provide suitable dredged material, as material and funding are available, from the Federal navigation project at Duluth-Superior Harbor, placing the dredged material in the identified sites. This alternative is the preferred action because it results in cost benefits to the SLRAOC partners in avoiding purchase and transport of fill material, and to the USACE by providing a low-cost, environmentally acceptable dredged material placement alternative.

Description of Proposed Action

2.03 The proposed action is to place material dredged from maintenance of the Federal navigation project into the three aquatic habitat restoration sites proposed by State of Minnesota. The three proposed restoration sites encompass approximately 890 acres in a near-continuous length of shoreline of approximately 3.5 miles, within St. Louis Bay of the Duluth-Superior Harbor. Estimated dredged material quantities needed in support of the State-proposed habitat restoration activities at each site are summarized in Table 1.



* Figure ES-3 from the St. Louis River Area of Concern Implementation Framework document.

Figure 4. Habitat Restoration Projects in the St. Louis River Area of Concern.

Table 1. Preliminary Dredged Material Placement Quantities (estimates) [a, b]	Cubic Yards
21st Avenue West	*400,000* [c]
21st Avenue West (de-authorized navigation channel)	*500,000* [d]
40th Avenue West	*800,000*
Grassy Point	*100,000*
Total	**1,800,000**

a. Quantities exclusive of organic materials that the State may place for growth medium and are subject to change due to design refinements to be described in the State EAWs.
b. Actual quantities placed may vary due to physical properties of materials placed, consolidation of material, settlement of substrate, and construction methodology. Quantities would be reduced insofar as the State uses alternative material (such as from Erie Pier) to provide the needed fill or other design changes.
c. This quantity is in addition to the 375,000 cubic yards being placed under the Pilot Project.
d. This optional quantity assumes the old navigation channel is filled to an elevation of -6.0 feet below L.W.D. for restoration purposes other than BUI removal.

2.04 As can be seen in the estimated quantities, at approximately 100,000 cubic yards per year of harbor dredging, it could take approximately 14 years to complete fill placement at all three sites. However, the State desires to complete filling of all three sites in a 5-year time frame. In the interest of accelerating the habitat restoration activity, the State may pursue use of additional suitable material from the navigation channels and/or from within Erie Pier as fill. This may be most applicable to some of the restoration work at the 40th Avenue West site, which is immediately adjacent to Erie Pier. If this option is pursued, it would be detailed in the State EAW for that site. Capacity created in Erie Pier from such action would be available for future Federal harbor maintenance dredging activity.

2.05 Goals for aquatic vegetation establishment at all three sites will be established by the State using predictive models developed by the U.S. Environmental Protection Agency (USEPA) for submerged aquatic vegetation and floating leaf vegetation in the estuary. Of the two models, floating-leaf vegetation is not as certain, however, both models provide a reasonable tool to set aquatic vegetation targets because the variables used, such as depth, REI (Relative Exposure Index which is a computation of wind speed x fetch), vegetation, and bed slope are easy to measure and predict.

Monitoring and Adaptive Management

2.06 The State will monitor the sites for aquatic vegetation, benthos, and sediment character. Adaptive management measures may be necessary where there is a need to place additional dredged and/or organic material or to provide for plant propagules, and may include measures such as revised placement depth and/or location, or other measures as warranted. Adaptive management will be applied as necessary based on monitoring results and other information that becomes available after site restorations are completed in order to meet BUI removal targets.

2.07 The State monitoring goals are to determine if criteria for BUI removal have been met. The removal criterion for BUI 4 will be met when the assemblage of benthic organisms in the restoration site is not significantly different from that of a least impacted site of comparable characteristics within the SLRAOC or within the area of the SLRAOC relative to the proposed restorations—e.g., St Louis Bay. This will also contribute to the removal criteria for BUI 9 which includes restoring habitat to support healthy fish and wildlife populations.

Detailed Site Descriptions and Preliminary Designs

2.08 The following information is preliminary. Refined design information will be provided with the State EAWs for each of the three restoration sites discussed below. Placement areas indicated in the figures associated with the following site discussions are target locations. Actual placement of the dredged material will center in the indicated areas, but there will be some overlap of the boundaries due to the taper as the shoal slope extends out from the placement location; however, the majority of the placed material is expected to remain within the defined boundary. The actual locations and extent of each placement area within the three sites will be further defined in the State EAWs, and may at that time include some habitat islands.

2.09 **21St Avenue West:** The 21st Avenue West Restoration Site is 350 acres of open water flats and shallow sheltered bays. The proposed habitat enhancements for the 21st Avenue West Restoration Site are shown in Figure 5. The restoration design moving forward is limited to the Minnesota side of the state line.[16]

2.10 Restoration goals and targets for 21st Avenue West are focused on removing specific beneficial use impairments by improving aquatic habitat diversity and restoring aquatic ecosystem function that was altered since the late 1800's when the Duluth Harbor was constructed. When completed, this site will account for 350 acres towards the AOC-wide goal of restoring 1,700 acres of shallow bay aquatic habitat (BUI 9).

2.11 The conceptual design first developed by resource managers represented a reasonable effort to rehabilitate fish and wildlife habitat within the project area (Host et. al. 2013). Since then additional data on benthos, aquatic vegetation, and sediment character has been collected and analyzed to refine the concept plan into a preferred design of features including converting hardened break walls into gradually sloped shorelines and adding shoals within deep water flats to reduce exposure to excessive wave energy. The State will evaluate post-project aquatic vegetation abundance and benthic diversity through modeling the existing versus expected aquatic community response to the proposed bathymetric changes.

2.12 Restoration success will be evaluated through monitoring of the macroinvertebrate and aquatic macrophyte community by the State or other non-USACE agency. Aquatic vegetation abundance (submerged, floating leaf and emergent) and benthic diversity will be evaluated to determine if established targets have been met.

2.13 **40th Avenue West Site:** The 40th Avenue West Restoration Site is approximately 360 acres of open water flats and shallow sheltered bays near Erie Pier. The 40th site is divided into four subareas based on physical separation and differences in the proposed restoration actions (Figure 6). Habitat restoration is proposed for Subareas 1, 2, and 3. No restoration work is proposed for Subarea 4 at this time.

2.14 Restoration goals and targets are focused on removing specific beneficial use impairments by improving aquatic habitat diversity through restoration of degraded aquatic ecosystem function that occurred when the Duluth Harbor was dredged and off channel areas filled during the industrial era (late 1800's to early 1900's). Sawmill and shipping infrastructure historically developed within the site resulted in alterations to the subsurface sediment, creating extensive industrial flats exposed to wind and wave energy. Functional littoral zones were also converted to stabilize shoreline structure to create dock walls, similarly reducing ecological productivity.

16. The project design has been limited to the Minnesota waters to avoid involving a second set of permitting requirements associated with a second state. Wisconsin Department of Natural Resources SLRAOC staff are involved in the project design development and RAP oversight.

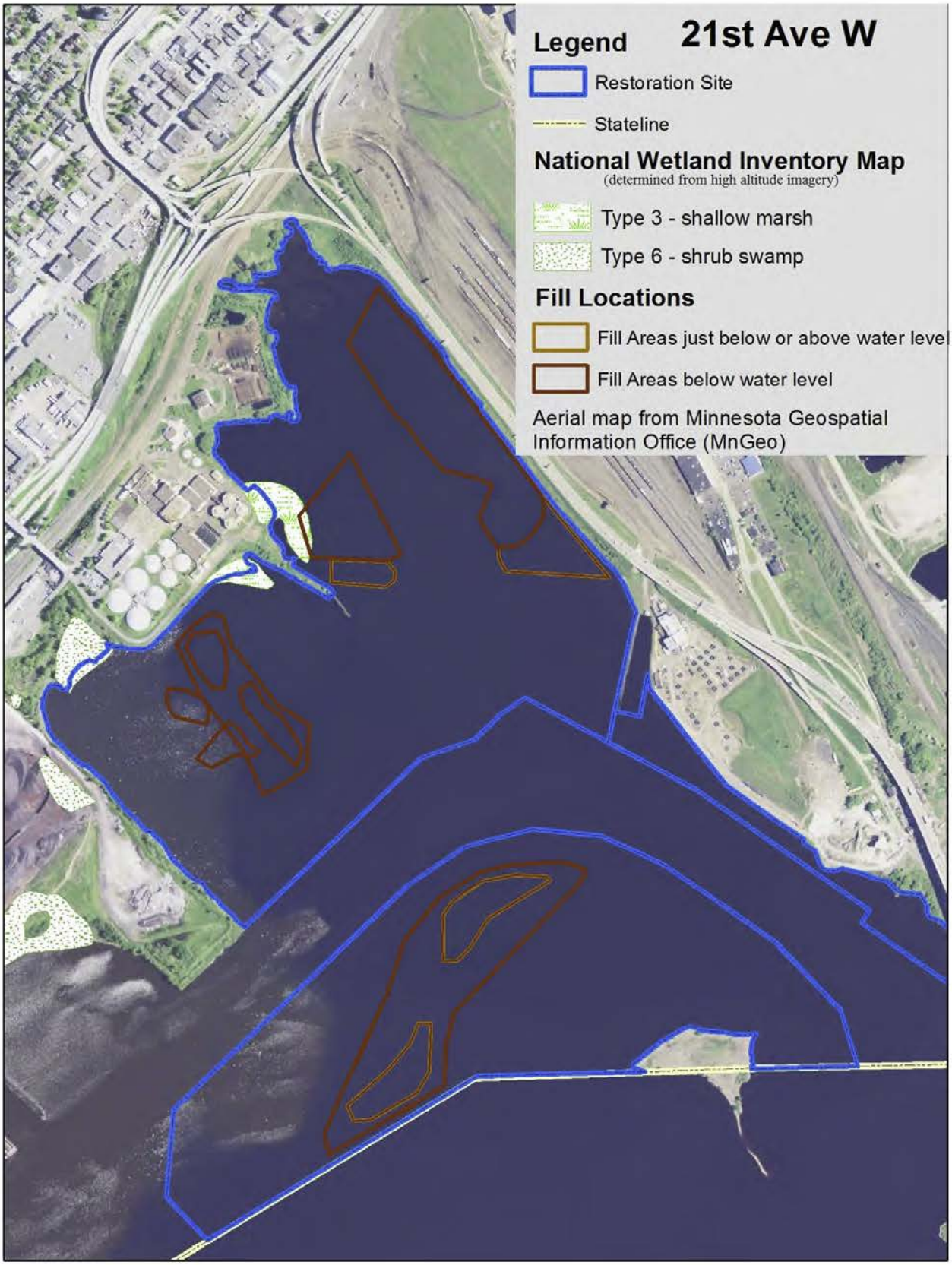


Figure 5. Preliminary Restoration Plan for 21st Avenue Site. (Image from MPCA.)

Figure 6. Preliminary Restoration Plan for 40st Avenue Site. (Image from MPCA.)

2.15 The conceptual design first developed by resource managers represented a reasonable effort to rehabilitate fish and wildlife habitat within the project area (Host et. al. 2012). Since then additional data on benthos, aquatic vegetation, and sediment character has been collected and analyzed to refine the concept plan into a preferred design of features to reduce exposure to excessive wave energy, enhance degraded estuary flats with improved substrate conditions, provide optimal depths for aquatic habitat, and convert hardened shoreline into gradually sloped shorelines for increased littoral zone in Subareas 1 and 2. The State will estimate post-project vegetation diversity abundance through models designed to predict expected aquatic vegetative response to bathymetric alterations. Restoration success will be evaluated by comparing pre-restoration to post-restoration monitoring of the aquatic vegetation and benthic communities.

2.16 Subarea 3 is a settling basin and the only subarea that requires remediation, which will be managed as a separate remediation site (RAP Action 5.13) through a USEPA Great Lakes Legacy Act partnership agreement. The sediment in the basin is being characterized further, but the indication is that there may be contaminants present that are a threat to environmental health in their present state. Once remediation of Subarea 3 is complete, it will serve as a stormwater treatment basin.

2.17 **Grassy Point Site**: Grassy Point is a 180 acre site bounded on the north by the Burlington Northern Santa Fe Railroad line, on the southwest by the C. Reiss coal dock, and on the east by the St. Louis River federal navigation channel (Figure 7). Keene Creek, a Minnesota Department of Natural Resources (MNDNR) designated trout stream, flows into the western side of the site.

2.18 Extensive wood waste exists throughout the site from historic sawmilling businesses that operated during the late 1800's and early 1900's. Wood wastes cover about 80% of the site and range from 1.5 to more than 16 feet in thickness. Wood waste materials limit invertebrate productivity, habitat potential, and recreational use of this historically open bay. Additional degradation includes sedimentation from the 5000-acre Keene Creek watershed, historic dredging, and hardened shoreline.

2.19 In the late 1990s, a limited wetland restoration project was conducted by MNDNR to remove approximately 14,000 cubic yards of wood waste from inner portions of the site. Furthermore, the Grassy Point Trail and wildlife viewing platforms were constructed afterward.

2.20 The conceptual design first developed by resource managers represented a reasonable effort to rehabilitate fish and wildlife habitat within the project area. Since then additional data on benthos, aquatic vegetation, and sediment character has been collected and analyzed to refine the concept plan into a preferred design of features including enhancing sheltered bay conditions, restoring appropriate littoral zones, reconnecting hydrologically isolated open-water wetlands, and tributary channel restoration on Keene Creek. Currently, SLRAOC partners are working to further develop project objectives and move the site to full design. The primary objectives are to reduce exposure of biological receptors to legacy contaminated sediments and address the negative anthropogenic (caused by human activities) habitat alterations.

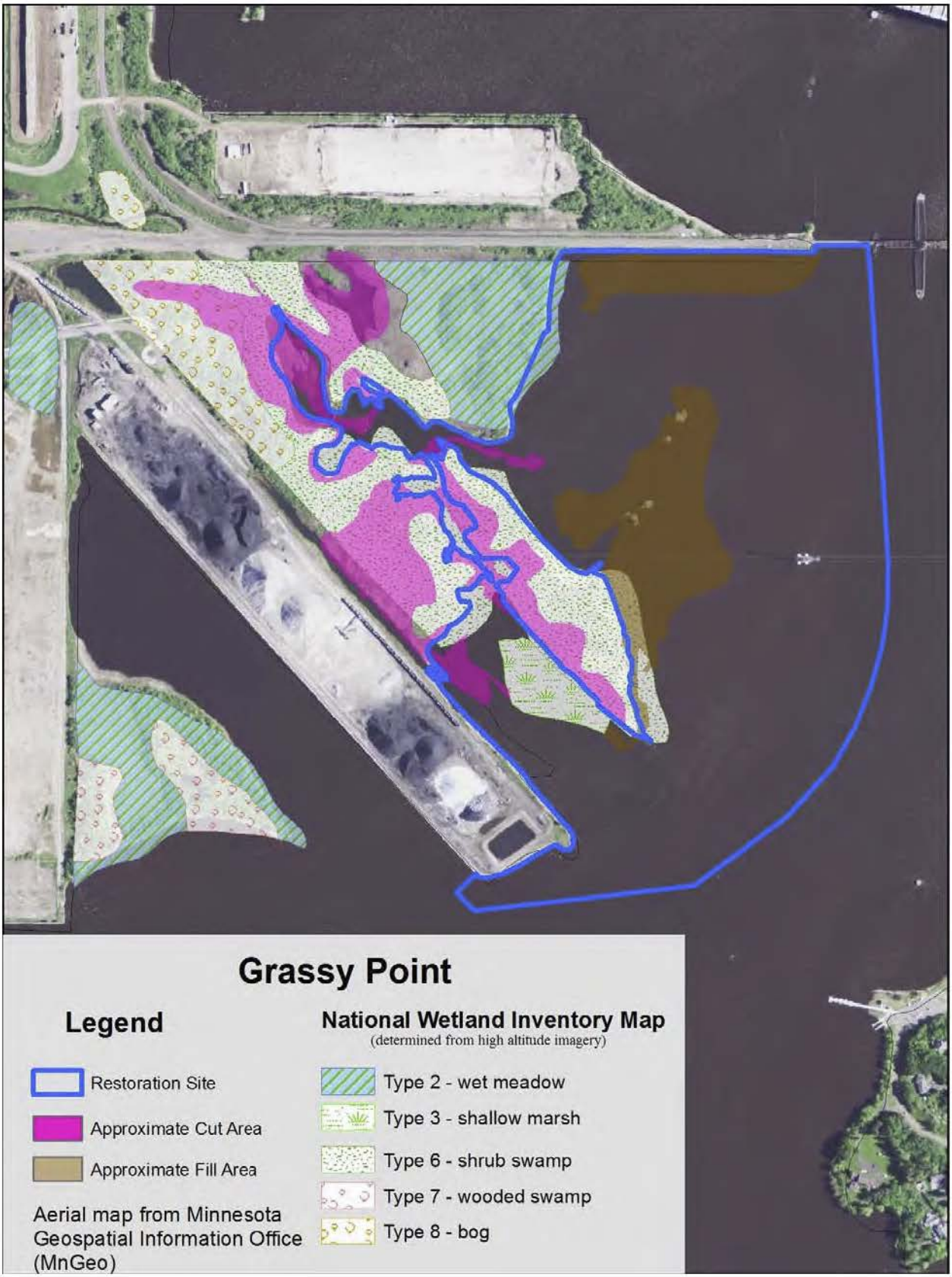


Figure 7. Preliminary Plan for the Grassy Point Restoration Site. (Image from MPCA.)

Borrow Sites for Organic Growth Medium

2.21 Kingsbury Bay and Perch Lake (see Figure 4) are restoration actions proposed under the RAP. These sites are being restored under non-USACE authorities. Both sites require removal of substantial quantities of built up organic material in order to enhance habitat by creating open water areas and varying depths. Since the material to be removed from these sites is quality organic sediment with a diverse seed stock, it may be suitable for top dressing the 21st Avenue West, 40th Avenue West, and Grassy Point restoration areas if deemed necessary to promote diverse and lush growth of aquatic macrophytes.

2.22 **Kingsbury Bay**: Kingsbury Bay is the primary depositional zone for Kingsbury Creek, a clay and bedrock-influenced tributary to the St. Louis River Estuary in Duluth, Minnesota (Figure 8). Anthropogenic impacts within the Kingsbury Creek watershed have resulted in increased sediment transport to Kingsbury Bay over the past 60 years. Deposition of this increased sediment load has reduced the overall aquatic sheltered bay habitat from approximately 16.2 acres to 5.3 acres (Figure 9). Efforts are presently underway within the watershed to minimize the transport of sediment moving down the watershed to the estuary.

2.23 Additionally, the sheltered bay complex defined as Kingsbury Bay extends around Indian Point to the Tallus Island area and includes the sheltered aquatic habitat behind the island in front of Indian Point. This area has also been impacted by the sediments originating from the Kingsbury Bay watershed. Water depth in front of the Indian Point Campground has been reduced and is threatening the conversion of the area to an emergent marsh.

2.24 Habitat improvement within the Kingsbury Bay Complex involves the restoration of approximately 11 acres of open-water wetland habitat through removal of sediment that has been deposited at the mouth of the creek. The project will also remove sediment within the wetland corridor that runs in front of Indian Point and connects Kingbury Bay to the Tallus Island wetlands. Beyond the primary goal of restoring open-water wetlands and improving hydrologic function within the entire wetland complex, this project could provide organic material as needed for a seed source and biological medium at other SLRAOC restoration sites. This strategy will improve the re-establishment of native plant species and provide healthy substrate for macro-invertebrate communities at locations such as Grassy Point, 40th Avenue West, and 21st Avenue West.

2.25 **Perch Lake:** Perch Lake is a 21 acre sheltered bay that has been hydrologically isolated from the estuary by a highway causeway and also negatively impacted by sedimentation from the watershed. The goal of this project is to restore the hydrologic connection between the estuary and the bay and re-establish bathymetry to provide over-winter fish habitat (Figure 10). As with Kingsbury Bay, the organic sediments from this site would be beneficially used as a seed source and biological medium at other restoration sites as needed. This strategy will improve the re-establishment of native plant species and provide healthy substrate for macro-invertebrate communities at locations such as Grassy Point, 40th Avenue West, and 21st Avenue West.

Figure 8. Kingsbury Bay Showing Conceptual Contours for Proposed Site Restoration. (Base imagery from Google Earth.)


Figure 9. Kingsbury Bay Photos: 1948 (left) and 2010 (right). (Base imagery from Google Earth.)

Figure 10. Perch Lake Site: 1992 (top) and 2014 (with possible excavation contours). (Base imagery from Google Earth.)

Miscellaneous Details

2.26 After State approvals are obtained, the USACE under its Operations and Maintenance authority will place suitable dredged material into the restoration sites either hydraulically or mechanically.[17] Hydraulic placement would include a baffle plate mounted at the end of the hydraulic pipeline or other similar modifications to dissipate energy and limit dispersal of the dredged material, resulting in more localized deposition. Mechanical placement would either be accomplished using a clamshell bucket or a bottom dumping scow. Additional in-water Best Management Practices (BMPs) (e.g., weighted silt/turbidity curtain, upstream diversions to limit the flow of water into the dredged materials placement areas, water quality monitoring, etc.) will also be implemented as necessary to protect water quality in accordance with State standards.

2.27 Placement activities are expected to be water based, similar to most dredging work done by the USACE in the Duluth-Superior Harbor. Any access to the waterway from land would be accomplished through existing commercial docks and public launch sites. Examples of such land access include transporting contractor personnel from hotels to the floating plant, trips to purchase and deliver parts that may fail during operations (such as a pump bearing or hoses), loading of a piece of equipment, such as a backhoe, onto a barge to assist in the operation.

2.28 The proposed action could, depending on the contractor, require one or more temporary structures, upland or in-water. Temporary structures or fill material would be at USACE-approved locations, outside of any wetlands, away from areas containing federal or state protected species or their critical habitat, or properties listed on or eligible for listing on the National Register of Historic Places or state-listed properties. Temporary activities would include precautionary measures to prevent erosion and sedimentation or other undesirable environmental effects using accepted standard practices.

2.29 The type and location of temporary structures and/or materials cannot be determined at this time, since they would be incidental to the work being performed. Examples are mooring facilities, dolphins, turnarounds, work and storage areas, access roads, and office facilities. These contractor aids would be within site boundaries or rights-of-way and would be removed when no longer needed. Temporary sites would be restored upon completion of activities using accepted standard practices for site restoration.

2.30 Some variation from the proposed action as described may occur with respect to sequence of activities, method of operation, or design details as a result of unanticipated design improvements or adaptations, site conditions, cost-saving measures, or availability of funds. Such variations, insofar as they are addressed in the State EAWs, would not necessitate further evaluation under the National Environmental Policy Act.

17. As previously noted, if needed, material could be provided from Erie Pier and/or from excavation areas within the restoration sites. These would not be under USACE Operations and Maintenance authority and so are not addressed here, but would be evaluated through the USACE Regulatory permit process.

3.0 AFFECTED ENVIRONMENT & ENVIRONMENTAL CONSEQUENCES

3.01 Adverse effects associated with the proposed dredged material placement would be minor, including temporary turbidity during dredged material placement activities, potential minor erosion after placement, burying of limited existing vegetation, reduction in existing degraded benthic organisms (bottom dwelling invertebrates) populations in the immediate placement areas by smothering, and displacement of fish during dredged material placement activities. However, no significant adverse secondary effects are expected, nor are any significant cumulative or long-term adverse environmental impacts expected to result from the proposed dredged material placement activities.

3.02 The project will contribute to State-led efforts to restore aquatic habitat in the SLRAOC and towards removal of beneficial use impairments within the SLRAOC. The suitable dredged material placed in these sites will provide improved benthic substrate that is expected to result in the development of a more diverse, healthy population of benthic organisms (macroinvertebrates and aquatic vegetation) to support improved fish and wildlife habitat. The project also provides economic benefits to the region and nation through cost effective management of dredge material removed from the Federal navigation channel.

Duluth-Superior Harbor

3.03 The St. Louis River passes through Duluth-Superior Harbor before discharging into Lake Superior (Figure 2). The harbor has two entrances, the natural river outlet in Superior, Wisconsin, between Minnesota and Wisconsin Points, and a constructed entrance canal in Duluth, at the base of Minnesota Point. On the north side of the harbor is the City of Duluth, Minnesota, which is built upon a massive rock escarpment that rises up to 880 feet above the harbor. On the south side is the City of Superior, Wisconsin, built upon a low, flat plain of red clay that extends several miles inland..

3.04 The harbor area is characterized by shallow water, interspersed with navigation channels, several deep holes from past mining activities, and many boat slips and embayments. Most of the original shoreline in the harbor has been significantly altered over time through filling for harbor activities. This filling activity, along with construction of navigation channels and boat slips, has resulted in a substantial loss in aquatic habitat in the harbor area. Land uses around the harbor vary among various municipal and industrial sites, highways and railroad tracks, commercial docks, and residential areas, situated around several embayments and peninsulas.

3.05 As reported in SLRAOC staging documents, industrialization of the bay began with dredging of the harbor and the construction of the first rail line in late 1860s. For the next 100 years numerous industries (shipping, steel, paper, lumber, tanneries, etc.) were established in the Lower St. Louis River. In addition, several dams were constructed on the river to produce hydroelectric power. As development progressed, wastewater from surrounding communities was routinely discharged into the river. Shipping, nonpoint runoff, atmospheric fallout, industrial discharges, wastewater treatment plants, and dredging were cited as factors affecting the water quality.

3.06 The project sites are all within St. Louis Bay (the inner harbor area upstream of Rice's Point). Within St. Louis Bay, water level fluctuations are directly linked to Lake Superior seiches, which in the Great Lakes occur due to prevailing winds and can move water up the river at times. This would have a positive effect on the proposed restorations creating a higher level of water interchange between open areas and restored habitats. Further discussion of this effect and of current patterns and circulation effects are included in the attached Clean Water Act Section 404(b)(1) Evaluation (Attachment 1, Section 2.b(2)).

Sediment Quality

3.07 Bottom sediments in the river include silts, sands, and fine clays. Some of these areas also contain wood waste ranging from larger wood slabs to wood chips to a mixture of sawdust and sediment. Contaminant concentrations have come down over the past 30-plus years as regulation to control pollution discharge and to provide for nonpoint source controls through BMPs have come into effect. Furthermore, dredging in the Federal navigation channel over the years has removed some of the older, contaminated sediments, which tend to collect in the navigation channel, because with its greater depth and steep sideslopes, the channel acts as sediment trap for the harbor basin. Thus the cleaning effect of shoal removal from the Federal channels has beneficial effects outside the channel insofar as surface sediment is re-suspended and deposits into the navigation channels.

3.08 Sediments within the lower St. Louis River and Duluth-Superior Harbor contain a variety of contaminants, including nutrients such as ammonia-nitrogen, and phosphorus; inorganics such as metals; and organic compounds such as oil and grease[18], polychlorinated biphenyls (PCBs) and polycyclic aromatic hydrocarbons (MPCA 2010 and 2011). Upstream and in the upper reaches of the harbor the St. Louis River flows past two Superfund[19] contamination sites—the U.S. Steel/Duluth Works Site and the St. Louis River/Interlake/Duluth Tar Site. Only the latter site is near a Federal dredging area and includes Stryker Bay, which is the embayment immediately east of Kingsbury Bay. However, the St. Louis River/Interlake/Duluth Tar Site has been remediated and should not pose a contaminant issue for dredging the nearby Federal channel. The shoal material to be dredged is tested in accordance with Section 404 of the Clean Water Act to ensure it is suitable for proposed in-water placement and/or other placement options.

3.09 Dredged Material Contaminant Character: All dredge material from the Federal navigation channel, Erie Pier, or at the restoration sites themselves must be evaluated to determine if it is suitable for in-water placement at these restoration sites. Guidance for placing materials in-water for the purpose of improving or creating aquatic habitat is currently regulated using existing Section 404 federal guidelines to ensure adequate protection of an aquatic resource (USACE 1998a, 1998b). Fundamental to the federal guidelines is the precept that dredged or fill material should not be discharged into the aquatic ecosystem, unless it can be demonstrated that such a discharge will not have an unacceptable adverse impact either

18. Oil and grease in sediment can be of natural origin from rotting vegetation or of anthropogenic origin from petroleum wastes.

19. Comprehensive Environmental Response, Compensation, and Liability Act, 1980.

individually or in combination on the aquatic ecosystem. Sampling was completed in 2011 and 2014, and would be updated periodically to ensure only suitable dredged material is used in the habitat restoration sites. Sediment, elutriate, and biological testing will need to indicate that in-water placement of these dredged materials will not cause an adverse impact on biota or water quality as detailed in Section 404(b)(1)'s tiered evaluation and under the new state agency guidelines, *St. Louis River Area of Concern Quality Assurance Program Plan for Minnesota Based Projects, Appendix 1,Managing In-Water Placement of Dredge Material for habitat Restoration Sites* (MPCA 2015), for the St. Louis River Area of Concern.

3.10 Any dredged material that does not show significant toxicity to test organisms under the methodologies and analysis of Section 404(b)(1) and Minnesota Rule 7050 will be documented for beneficial use as in-water placement. No significant adverse effects on sediment quality are expected as a result of dredged material placement in support of habitat restoration at the 21st Avenue West, 40th Avenue West, and Grassy Point. In addition, placement of the dredge material in these sites may provide appropriate cover where some in-situ elevated contaminated sediments have been characterized, helping to isolate these areas from the benthic zone.

3.11 Contaminant Character—21st Avenue West: Contaminant Concentrations and Environmental Risk Evaluation - Extensive sampling and analysis of sediment contaminants at this site conducted in partnership with the USACE revealed contaminant concentrations exceeding Level II Sediment Quality Targets[20] (SQT) (Crane and Hennes, 2007) at a few sampling locations within the site. Review of the sediment chemistry data did not indicate a risk to human health and the environment. Sediment management recommendations describe leaving areas with elevated concentrations undisturbed or further isolated to reduce exposure by adding cover (Limno Tech, 2014). Additional analysis focusing on benthic community conditions was also completed, and although functional capacity of the benthos is impaired throughout the site, no clear pathways between contaminants and the environment were observed. The potential bio-uptake of contaminants into aquatic organisms is currently being studied by the University of Minnesota Duluth (UMD) to further inform the restoration process. Sediment management recommendations will be detailed in the State EAW for the 21th Avenue West site.

3.12 Contaminant Character—40th Avenue West: Extensive sampling and analysis of sediment contaminants at this site is currently underway. The MPCA review and analysis of the sediment data to date does not indicate chemical concentrations are a risk to human health and the environment, however, limited areas may be identified where sediment concentrations may exceed Level II SQT. If any such areas are identified, the current sediment management recommendations for these areas include leaving the areas undisturbed or reducing exposure by adding cover (LimnoTech, 2013). This will be detailed in the State EAW for the 40th Avenue West site.

3.13 Contaminant Character—Grassy Point: Extensive sampling and analysis of sediment contaminants at this site is currently underway. The MPCA review and analysis of the sediment data to date does not indicate chemical concentrations are a risk to human health and the environment, however, limited areas may be identified where sediment concentrations may

20. Level II Sediment Quality Targets "are intended to identify contaminant concentrations above which harmful effects on sediment-dwelling organisms are likely to be observed."

exceed Level II SQT. If any such areas are identified, the current sediment management recommendations for these areas include leaving the areas undisturbed or reducing exposure by adding cover (LimnoTech, 2013). This will be detailed in the State EAW for the Grassy Point site.

Wetlands

3.14 Open water areas are the largest aquatic habitat type in the Duluth-Superior Harbor and St. Louis Bay. These are primarily dredged shipping channels up to 27 feet deep, a number of deep holes created by past mining activities, and adjacent shallow water areas, generally under 6 feet in depth, which are largely devoid of vegetation. Extensive stands of aquatic vegetation exist in scattered, sheltered areas of the harbor, such as Allouez Bay[21] and Grassy Point, and provide valuable habitat for a variety of plant, fish, and wildlife species. Historically, within the St. Louis River estuary approximately 7,700 acres (out of an estimated 12,000-acre total) of wetlands and open water habitat have been lost or altered through filling and dredging (MPCA and WDNR 1995). Approximately 3,000 acres of this habitat alteration/loss occurred in the lower estuary (roughly the area downstream from Grassy Point (Figure 1).

3.15 The general locations of emergent and scrub shrub wetlands at the three project sites (as determined from high altitude imagery by the National Wetland Inventory) are indicated in Figures 5, 6, and 7. Sheltered bay wetlands provide critical spawning and nursery habitat for many forage and game fish species. The waters within these sheltered bay wetlands warm earlier in the spring and contain emergent vegetation required for spawning. A number of sheltered bay areas in the harbor are either lacking wetlands or have sediment-impacted wetland areas near the mouths of the creeks that discharge into these sheltered bays.

3.16 Wetland delineations will be completed by the State where warranted. Avoidance of wetlands is a priority unless wetland scientists from both the State of Minnesota and Federal agencies agree that the proposed modifications will improve wetland quality and function. . In that respect, these restoration projects may alter a small area of impacted wetlands at 21st Avenue West and the southwest end of Grassy Point (see Figures 5 and 7). These wetlands will be restored to an equal or higher value as a result of the restoration. In addition the production of aquatic macrophytic wetland habitats in open water areas will provide for more substantial acreage of these wetland types.

Water Quality

3.17 Duluth-Superior Harbor and the lower St. Louis River have a history of water quality problems resulting primarily from municipal waste water and industrial point source discharges. Water quality has improved markedly since 1978 when the Western Lake Superior Sanitary District (WLSSD) began treating industrial and municipal waste for a 500 square mile area. As for drinking water supply, the City of Duluth's intake near the shore of Lake Superior is approximately 7 miles north of Duluth and is not impacted by activities occurring inside the harbor.

21. Allouez Bay has a surface area of approximately one square mile and is located between inside of Wisconsin Point, just beyond the Superior Entry of the harbor (see Figure 2 and lower right corner of Figure 6).

3.18 The State of Minnesota's proposed 2014 Impaired Waters List[22] for the St. Louis Bay section of the St. Louis River lists "aquatic consumption" as the "affected designated use" with the following causal pollutants and/or stressors: DDT (dichlorodiphenyltrichloroethane), dieldrin, dioxin (including 2,3,7,8-TCDD), mercury in fish tissue and in the water column, PCB in fish tissue and in the water column, and toxaphene. Listed streams that discharge into St. Louis Bay in restoration site locations include Keene Creek at Grassy Point (*Escherichia coli bacteria*—affecting aquatic recreation), Miller Creek at 21st Avenue West (chloride, lack of coldwater bio-assemblage, temperature and water—all affecting aquatic life; *Escherichia coli*—affecting aquatic recreation), and an unnamed creek discharging to the 40th Avenue West site (*Escherichia coli* —affecting aquatic recreation). Adverse effects on water quality are not likely from the dredged material placement activity as only suitable material is being placed in the restoration sites and the material will not negatively affect river and creek flows.

3.19 **21st Avenue West**: Two creeks, Miller and Coffee, discharge into the head of the 21st Avenue West embayment. Miller Creek is about 10 miles long and has approximately 10 square miles of watershed. Coffee Creek is roughly about half the size of Miller Creek. The WLSSD effluent discharge is in the middle of the 21st Avenue West restoration site, located along the west side of a long, narrow point leading southeast from the wastewater treatment plant. Sufficient open water area will be included in the design to allow for adequate water circulation through the effluent discharge location so that its function is not hindered. The treatment plant has an average discharge of 43 million gallons per day. In comparison, based upon yearly mean flow, the St. Louis River discharges about 2.1 billion gallons per day, and the combined discharge of Coffee and Miller Creeks is about 14.5 million gallons per day (Sanchez and Wilhelms, 1999).

3.20 Ecological Health of the 21st Avenue West site:

a) Aquatic macrophytes: Based on aquatic community survey data across the entire site (NRRI et al 2012), aquatic vegetation reflect an impaired condition. Total taxa counts were low (< 5 taxa out of 15 total) for open water sample points.

b) Benthic Macroinvertebrates: Historic data sets were used to establish a macroinvertebrate index score describing a gradient of benthic conditions throughout the estuary (USEPA 2014). The project site represents an impaired benthic assemblage, not only when compared to a least impaired condition within the SRLAOC, but also when 21st Avenue assemblages are compared to other restorations sites such as Grassy Point or 40th Avenue West.

3.21 **40th Avenue West**: Approximately 2,058 acres of an unnamed watershed drain directly to the St. Louis River at the 40th Avenue W Restoration site. This watershed is essentially undeveloped in the upper third and fully developed in the lower portion where a number of small unnamed buried creeks drain most of the runoff from residential, commercial, and industrial land

22. Pursuant to Section 303(d) of the Clean Water Act, States are required to submit lists of impaired waters to EPA for approval every two years. Impaired waters are those where required pollution controls are not sufficient to attain or maintain applicable water quality standards.

uses into the ponds behind Erie Pier (subarea #3) before entering the 40th Avenue W Restoration Site. It appears these ponds have retained contaminated sediment from the watershed and the sediments will be remediated before they are converted into stormwater treatment ponds for the site. This will improve the water quality draining into the St. Louis River as well as provide for some habitat restoration in its vicinity.

3.22 Ecological Health of the 40th Avenue West site:

a) Aquatic Macrophytes: Aquatic community survey data across the entire site (NRRI et al 2012) of aquatic macrophyte assemblages reflect a moderately impaired condition. Of the 684 points sampled at depths less than 2.5 meters, 159 points had no vegetation indicating about 23% of the existing site conditions show little to no indication of a diverse aquatic macrophyte community.

b) Benthic Macroinvertebrates: The site represents a moderately impaired benthic assemblage when compared to a least impaired condition (near Clough Island) and a highly impaired condition (21st Avenue West) both in the SLRAOC (USEPA, 2014). In addition, historic data sets were used to establish a macroinvertebrate index score describing a gradient of benthic conditions throughout the estuary (USEPA 2014) and the benthic condition at 40th Avenue West ranges from good to poor with an overall visual rating of moderately impaired.

3:23 **Grassy Point**: This Restoration Site currently consists of the lower Grassy Point south wetland and the south branch Keene Creek. This area consists of terrestrial wetland and shallow open water areas (2-6 feet deep) surrounded by roads and railroad. Although it is not possible to capture all of the sediment from the 3,868 acre Keene Creek Watershed that drains into Grassy Point, a small area of Keene Creek will be excavated to provide reconnection to the floodplain and may be used as a location to filter some of the sediments draining from the lower residential and commercial land uses. The area out in the bay will be restored as shallow to moderate depth wetlands by both excavating and covering areas of wood waste to provide a healthy bioactive zone for benthos and aquatic vegetation.

3.24 Ecological Health of the Grassy Point site:

a) Aquatic Macrophytes: Existing macrophyte datasets will be incorporated into a modeling process to more clearly define restoration targets for submergent, floating leaf and emergent vegetation. As with the other two sites, the Restoration Site Teams are working closely with the modeling staff at USEPA to run the model based on an iterative process that will lead to the most appropriate project objectives. Anecdotal evidence indicates that aquatic macrophyte growth is largely limited by wood waste throughout the site.

b) Benthic Macroinvertebrates: The Grassy Point Restoration Site currently contains a slightly to moderately impaired benthic assemblage when compared to a least impaired condition (near Clough Island) and a highly impaired condition (21st Avenue West) both in the SLRAOC (USEPA 2014). In addition, historic data sets were used to establish a

macroinvertebrate index score describing a gradient of benthic conditions throughout the estuary and the benthic condition at Grassy Point ranges from good to poor with an overall visual rating of slightly to moderately impaired. It appears that areas of lower benthic condition are the areas of largest and most dense wood waste.

Effects on Water Quality

3.25 An evaluation of the effects of the discharge of fill material into waters of the U.S. has been prepared for the three aquatic habitat restoration sites pursuant to Section 404(b)(1) of the Clean Water Act (CWA) and is included as Attachment 1 of this EA. The attached 404(b)(1) evaluation includes a detailed discussion of the turbidity monitoring conducted during the 2013 and 2014 dredged material placement at the pilot project area in the inner bay of the 21st Avenue West site (see 404(b)(1), Section II.c.). These monitoring results support the discussion of turbidity effects presented below.

3.26 In summary, no significant adverse effects on overall water quality are expected to result from the dredged material placement. All material dredged from the federal channels has either been tested or will be tested prior to placement activities in accordance with the draft in-water placement of dredged material management guidance (MPCA 2015), which prescribes the USACE tiered approach for placement of sediments through analysis of sediment character, biological effects testing and elutriate samples. The sediment, other than a minor amount that will carry a short distance as turbidity, will remain at the sites where it is placed. In-water BMPs will be employed, if necessary, to protect water quality in accordance with State standards. Essentially the placement activity relocates cleaner sediment from one part of the harbor, where it is interfering with shipping, to another location of the harbor where it will provide benefits of restoring depths suitable for supporting aquatic vegetation.

3.27 Placement activities would temporarily increase turbidity in the immediate dredge discharge vicinity from shoal material placement and disturbance of existing bottom sediments. Turbidity from dredged material placement will increase in the vicinity of the discharge but will decrease with distance to normal conditions. This may result in temporary turbidity similar to that of storm events, but localized and shorter term. Turbidity from hydraulic placement of dredged material will be controlled through use of a baffle plate or similar modifications at the end of the hydraulic pipeline to dissipate energy. Mechanical placement also could be used, provided there is sufficient depth for barge access to place the material. This will limit dispersal of the dredged material, resulting in more localized deposition and less turbidity. As noted above, additional in-water BMPs (e.g., weighted silt/turbidity curtain, upstream diversions to limit the flow of water into the dredged materials placement areas, etc.) will also be implemented as necessary to protect water quality.

3.28 No significant long-term contaminant releases into the water column would be expected from in-water placement of dredge material from the navigation channels. The presence of carriage water and the release of interstitial[23] water would likely create increased concentrations of suspended solids in the water column during and immediately after placement operations. The water column oxygen concentration may be temporarily reduced but would return to normal

23. Interstitial water is the water normally filling the spaces between sediment particles when in an undisturbed state.

conditions. Work will not occur during spawning periods of important fish species as determined by the State. Fish will avoid areas of active disturbance.

3.29 No significant adverse long-term changes in any background levels of contaminants or pathogenic organisms are anticipated. Placement of the navigation channel dredge material at the habitat restoration sites would improve long-term harbor water quality by supporting aquatic vegetation and in some cases would cover existing contaminated sediments. The USACE has made determinations from evaluation of elutriate testing results of sampling conducted in 2011[24] that placement of the dredged material at the site would meet state water quality standards. Water quality certification under Section 401 of the Clean Water Act would be required, to ensure the project will be protective of water quality prior to any material placement. The State environmental review process, which includes an EAW and public review, will complete the process leading up to water quality certification and project implementation.

3.30 Contractor equipment and operations have the potential for introducing petrochemical products and other contaminants into the water (and other environments) in localized areas. The contractor(s) would be required to comply with U.S. Coast Guard and Wisconsin and Minnesota Departments of Transportation regulations as applicable to marine work, construction activities, and truck transport. The USACE construction contract requires the contractor to take special measures to prevent chemicals, fuels, oils, greases, and other pollutants from entering the waterway, and to have a Contaminant Prevention Plan and a Spill Control Plan in the event of an unforeseen spill of a substance regulated by the Emergency Response and Community Right-to-Know Act or regulated under State or local laws or regulations. The Spill Control Plan describes how the contractor will handle supervision of any clean up, lists the materials and equipment that will be on-site for any clean up activity, provides names and locations of suppliers for additional cleanup supplies, and provides procedures for expediting any spill cleanup. All spills must be reported immediately to the USACE Contracting Officer and any reportable quantities also must be reported to the legally required Federal, State, and local reporting channels (including the National Response Center 1-800-424-8802). Spill kits to contain and/or neutralize accidental minor discharges are required on-site. These safeguards would minimize the chance of significant impacts.

Fisheries and Aquatic Habitat

3.31 Over 90 percent of the approximately 200 fish species in the Great Lakes are dependent on coastal wetlands for some part of their life cycle. The St. Louis River Estuary serves as the primary nursery for the more than 40 native fish species found in western Lake Superior, including walleye, lake sturgeon, muskellunge, northern pike and smallmouth bass.

3.32 Historically, the fishery in the estuary was severely degraded by habitat loss and water quality problems attributable to over 100 years of shoreline and watershed development and by heavy fishing pressure, but has improved considerably with the implementation of wastewater treatment. Current fisheries information for the estuary is provided below courtesy of MNDNR Fisheries staff (paragraphs 3.33 through 3.37).

24. Additional samples were collected in 2014 for areas not sampled in 2011, but are not discussed in this document because the analytical results are not completed yet. Sampling and analysis would be repeated approximately every 5 years.

3.33 The St. Louis River Estuary (SLRE) fishery has changed substantially since the Western Lake Superior Sanitary District (WLSSD) began treating point sources of domestic and commercial effluent from Cloquet and Duluth in 1979. The fishery has been actively managed by the MNDNR and Wisconsin Departments of Natural Resources (WIDNR) since 1980. The MNDNR conducts fisheries population assessments each year to index relative abundance of key gamefish species (Walleye, Lake Sturgeon, Northern Pike and Channel Catfish), to evaluate the Lake Sturgeon rehabilitation program, and to gather information for other fish species.

3.34 Many gamefish species were stocked in the SLRE by the MNDNR and WIDNR over the last 30 years to rehabilitate the fishery. These species have included Black Crappie, Bluegill, Brown Trout, Lake Sturgeon, Largemouth Bass, Muskellunge, Northern Pike, Pumpkinseed Sunfish, Smallmouth Bass, Tiger Muskellunge and Walleye. Walleye, Northern Pike and Muskellunge were stocked at a high rate from 1989 through 1993 in an effort to control Eurasian Ruffe and to enhance sport fishing opportunity after improvements in water quality. Stocking has resulted in the successful rehabilitation of most key gamefish species. Fisheries surveys have indicated that stocking is no longer warranted in the SLRE, and no fish have been stocked since 2006.

3.35 Lake Sturgeon, which were nearly eliminated from the SLRE by the turn of the century, were restored through intensive stocking (728,291 fry, 142,036 fingerlings, and 420 yearlings) by the MNDNR and WIDNR between 1983 and 1994. Stocking of Lake Sturgeon has established 14 year-classes from 1983 through 2000. Stocking was discontinued after 2000 and management has shifted to the evaluation of natural reproduction and recruitment.

3.36 Twenty-one stations were sampled in the SLRE with overnight gill net sets in the summers of 2013 and 2014. The most abundant species collected in 2014 were Walleye, Yellow Perch, Shorthead Redhorse and Rock Bass. Other fish species sampled in 2013 and 2014 included Black Bullhead, Black Crappie, Burbot, Channel Catfish, Common Carp, Eurasian Ruffe, Freshwater Drum, Golden Shiner, Lake Sturgeon, Longnose Sucker, Muskellunge, Rainbow Smelt, Rock Bass, Silver Redhorse, Smallmouth Bass, Tadpole Madtom, Tullibee (Cisco), White Perch and White Sucker. Population assessments indicate that the upper SLRE is mostly utilized by warm-water species (i.e., Walleye, Muskellunge, Northern Pike). The lower SLRE (Duluth Harbor) provides a unique habitat that is utilized by both warm-water species commonly found in the St. Louis River and cold-water species (i.e., Tullibee (Cisco), Rainbow smelt) common to Lake Superior.

3.37 Three Lake Sturgeon were collected in both the 2013 and 2014 population assessments. One Lake Sturgeon that measured 23 inches (total length) was collected in 2014 in upper Spirit Lake. This fish was the first naturally-produced Lake Sturgeon to have recruited to the MN DNR gill nets, achieving another step towards the goal of Lake Sturgeon rehabilitation in the SLRE. Lake Sturgeon abundance in 2013 (0.2 per net night) and 2014 (0.14 per net night) were the lowest catch rates since the early phase of the rehabilitation project in the mid 1980's (pre-2013 historic range: 0.3 to 6.5 per net night). Low catch rates for Lake Sturgeon are expected in the near term because survey nets target juveniles and no stocking has occurred for 14 years, while naturally reproduced year-classes are just recruiting to this gear.

3.38 Data collected by the Lake Superior National Estuarine Research Reserve (LSNERR, 2011) in 2011 from May through September at Blatnik Bridge indicates the waters within the lower St. Louis River are suitable for warm water fish species spawning and survival as outlined in the Habitat Suitability Indices (HSI's) developed by the USFWS in the early 1980's. The HSI's identify the range of habitat requirements that are necessary to maintain fish assemblages. The water quality of the lower river meets the requirements for warm water fish habitat for dissolved oxygen (6.68-12.78 ppm), pH (6.96-7.89) and temperatures (10.39-24.39 Centigrade) for selected warm water fish species of concern such as, northern pike, smallmouth bass, common shiner and yellow perch.

3.39 No significant adverse effects on existing fish, wildlife, plant communities, rare features and ecosystems are expected from implementing the proposed project. Existing seed stock from adjacent wetlands, from streams feeding into the project sites, and from within shoal material is expected to result in natural regeneration of aquatic vegetation in the created shallow areas. In addition, organic medium from the Kingsbury and/or Perch Lake restoration sites may be used as an additional seed and nutrient source. Plant species that are expected to occur include vallisneria, native milfoils, and pondweeds for submergents and bulrush, cattail, sedges, rushes, arrowheads (Sagittaria), burreeds (Sparganium), wild rice, and Plygonums for emergent and yellow and white water lilies and duckweeds for floating-leaved vegetation.

3.40 The construction activity for placing the dredge material into the proposed areas would disrupt nearby fish activity. Fish would tend to avoid the area during placement activities, finding temporary alternative habitat within the harbor, and return after the disturbance is gone. When placing material hydraulically, turbidity would be controlled through use of a baffle plate mounted at the end of the hydraulic pipeline to dissipate energy. Dredging and placement operations will be conducted outside of the critical time period when walleye eggs and fry (and other important fish species as determined through the State permitting process) are present so that these critical stages would not be impacted by project generated turbidity.

3.41 Dredged material placement would result in incidental mortality of benthic invertebrates from smothering, and in the destruction or displacement of other aquatic invertebrates present in the water column. The navigation channel dredge material to be placed in the ecosystem restoration area would provide a cleaner substrate for re-colonization by an improved, more diverse assemblage of benthic organisms, isolating them from the existing, more contaminated sediment. This, in conjunction with State-proposed habitat enhancements to promote aquatic vegetation, would result in increased productivity for fish and wildlife. No significant adverse effects on aquatic invertebrates are expected to occur, since those impacted are generally of a more pollutant tolerant variety that is less desirable from an overall ecological perspective.

3.42 Placement of dredged material to create shoal areas in support of efforts related to removal of BUIs and associated development of macrophytic plant beds would provide for a more diversified fishery habitat in the harbor. Insofar as desirable emergent and submergent macrophytes (aquatic vegetation) develop on the dredged material to be placed, fish and other aquatic organisms would benefit. Submergent vegetation within the estuary provides much higher quality and value than the existing open water. Submergent vegetation also provides

habitat for invertebrates as a food source for juvenile fish. Adult predators consisting of fish and avian species would be expected to traverse the area for food.

3.43 The emergent wetland provides additional habitat diversity and is the critical component for spawning. The aquatic plant remnants consisting of stems is somewhat suitable habitat for use by spawning fish such as northern pike and yellow perch, adding a component that is necessary for spawning game fish that is lacking in the submergent wetland complex. The emergent wetlands in connection with other habitat types of the area are of regional importance in providing a regionally scarce spawning habitat in the lower river. Emergent vegetation also provides a portal for the emergence of flying aquatic insects (dragonflies, mayflies, midges, craneflies, etc) which feed myriads of migrating and breeding birds and bats.

Birds

3.44 The St. Louis River Estuary is considered very valuable habitat for a diversity of bird species including waterfowl, raptors, shorebirds, gulls, and passerines. The estuary is a recognized Important Bird Area under the National Audubon Society and is noted for being one of the best and most popular sites for bird watching in Minnesota. The area serves as a corridor for migrating songbirds, shorebirds, and raptors and provides critical food and shelter for these migrants.

3.45 Birds seen foraging in the marshes of the St. Louis River Estuary include the bald eagle, osprey, merlin, common tern, northern harrier and belted kingfisher. Resident birds include double-crested cormorant, Virginia rail, sora, marsh wren, common yellow-throat, swamp sparrow, song sparrow and yellow warbler, and a variety of waterfowl. Over the years, more than 230 bird species have been documented in the estuary.

3.46 Aquatic habitat that results from the placement of dredged material may provide habitat for a variety of water oriented birds and is not likely to have any adverse effects on these birds. These habitats benefit species such as marsh wrens, soras, Virginia rails, American bitterns, least bitterns, and yellow-headed blackbirds, while more floating-leaved vegetation would benefit species such as black terns, aerial insectivores such as swallows, pied-billed grebes, mallards, wood ducks, blue-winged teal, and American black ducks (Niemi et al. 1979, p. 26).

3.47 Niemi et al. (1979) reports the following (in summary):

a) Non-persistent emergent and floating-leafed vegetation is important for black terns, all five species of swallows, pied-billed grebes, wood duck, blue-winged teal, mallards, and American black ducks.
b) Emergent vegetation is important for marsh wren, sora, American bittern, Virgina rails, least bittern, and yellow-headed blackbird.
c) The highest water bird use is found in Allouez Bay, in West St. Louis Bay, and at Hearding Island.
d) Allouez Bay had the best emergent vegetation.
e) Male wood ducks use the estuary for molting.
f) The area has uniquely high diversity of passerines during migration.

g) Breeding passerines are mostly common species typical of forests, edges, or urban settings.
h) Three species meriting special mention are marsh wren, sedge wren (formerly short-billed marsh wren), and yellow-headed blackbird.

Invasive Species

3.48 According to MNDNR sampling, a variety of invasive species have entered the harbor in recent years, including alewife, carp, Eurasian ruffe, freshwater drum, round goby, threespine stickleback, white perch, spiney water flea, snails, and zebra and quagga mussel. The impact of these exotic animal species in the colder waters of Lake Superior has been limited to date. Only the ruffe has become abundant in the harbor; however, the MNDNR sampling suggests that the ruffe peaked in abundance in 1992 and is currently declining. The MNDNR is managing predator species, in part, to control exotics. The zebra mussel has not become a problem in the harbor, probably because the waters of Lake Superior are too cold for zebra mussels and are lacking calcium and nutrients necessary for zebra mussel growth.

3.49 Purple loosestrife, an exotic wetland plant species that grows fast, is hardy, crowds out native vegetation, and is of little value to fish and wildlife, is well established throughout the harbor. Purple loosestrife is currently growing in the harbor among the native vegetation but there has not been a noticeable decline in fish, waterfowl, or marsh bird populations (MPCA and WDNR 1992). The potential for adverse impacts upon fish and bird populations would increase if loosestrife becomes more abundant in the estuary. Both Minnesota and Wisconsin Departments of Natural Resources have released German loosestrife beetles in the harbor as a potential loosestrife control method.

3.50 Placement impacts associated with the potential introduction of, or accidental harboring of, invasive species are expected to be minimal. Purple loosestrife and phragmites both occur in Duluth-Superior Harbor. Allowing for sufficient water depth above the placed material and promoting re-vegetation with native species to provide competition to the establishment of invasive species will help prevent the establishment of invasives. The presence of aquatic invasive species could affect fish and wildlife benefits and will have to be managed carefully. This is being done as part of the overall SLRAOC wide efforts at removing BUI 9 and will be addressed as part of the State-proposed monitoring programs to follow the SLRAOC delisting activities.

Terrestrial Habitat

3. 51 Project impacts on terrestrial habitat are limited to the areas where dredged material will be placed for shoreline softening effects. In these cases, the effects will be beneficial by providing a natural interface between the aquatic and terrestrial environments, which will benefit wildlife that use shoreline habitats.

Federally Listed Species

3.52 Current Federal listings under the Endangered Species Act for St Louis County, Minnesota include Canada lynx (threatened and critical habitat), northern long-eared bat (proposed

endangered), piping plover (endangered and critical habitat), and rufa red knot (proposed threatened). USACE Federal determinations for these listings are provided below:

Canada Lynx (*Lynx canadensis*): There is no habitat for the Canada lynx in the proposed project areas and they are outside the designated critical habitat area; therefore the proposed activities at the three sites would have no effect on the Canada lynx or its critical habitat.

Northern Long-Eared Bat (*Myotis septentrionalis*): The project activities do not involve trees and the nearby trees are sufficiently distanced from the project activity sites that any bats that may be present would not be disturbed; therefore, the project activities would have no effect on the northern long-eared bat.

Piping Plover (*Charadrius melodus*): The project would have no effect on piping plover or their critical habitat. Piping plover have not nested in the harbor in recent years and, by working with the U.S. Fish and Wildlife Service and MNDNR in the design, adverse impacts on the existing piping plover critical habitat at Interstate Island will be avoided.

Rufa Red Knot (*Calidris canutus rufa*): These birds are rare in the Duluth area, but occasionally pass through in migration stopping to feed in coastal wetlands. Rufa red knot may benefit from restored aquatic habitat; therefore the project may affect, but are not likely to adversely affect, the rufa red knot. Any effects on this species would be positive through increased habitat area and quality.

Cultural Resources

3.53 Cultural resource surveys in accordance with federal and state requirements will be completed at 21st Avenue and 40th Avenue West, Grassy Point, Kingsbury Bay, and Perch Lake. The Section 106 coordination will be completed afterward. The dredged material placement plans for each site will be prepared to avoid known shipwreck sites, archeological sites, and other cultural resources:

3.54 21St Avenue West: Possible National Register eligible properties on the shoreline. These will be evaluated during the Phase II cultural resources survey.

3.55 40th Avenue West: One shipwreck near the shoreline of the southwest corner. Location will be verified in the Phase II survey. There are potential National Register eligible properties on the shoreline. These will be evaluated during the Phase II cultural resources survey.

3.56 Grassy Point: An archaeological survey of the underwater portion of the Grassy Point parcel located five loci of cultural resources. Two are remnants of sawmills; identified as the St. Louis Lumber Mill and the Lesure Lumber Mill. Three are shipwrecks, two scows and one a more complex vessel. A Phase II archeological evaluation will be conducted in advance of construction to determine whether any loci are eligible for the National Register of Historic Places.

3:57 Each refined project design, 21st Avenue West, 40th Avenue, and Grassy Point, will be coordinated further through the State EAW and public review process, at which time the USACE

will complete coordination with the State Historic Preservation Office (SHPO) in Minnesota under Section 106 of the National Historic Preservation Act.

3.58 Impacts upon any unidentified cultural resources that may exist in the placement areas would be minimized through special procedures in the contract specifications. Contract specifications will designate that, if during dredged material placement activities the contractor observes unusual items that might have historical, archeological, or cultural value, the contractor shall protect those items and immediately report the find to the contracting officer so that the SHPO may be notified and a determination can be made regarding whether the discovered item warrants protection or other treatment.

Recreation, Aesthetics, Noise

3.59 All three sites are interspersed among industrial areas. The 21st Avenue West Site is situated between the Western Lake Superior Sanitary District waste water treatment plant and two interstate highways. The 40th Avenue Site is interspersed with docks, a power plant, a highway bridge and a dredged material processing facility (Erie Pier). The site has about 18 acres of wetland habitat in the embayment east of Erie Pier, and small scattered wetland habitat areas in the areas west of Erie Pier. Grassy Point has about 60 acres of wetland habitat and a boardwalk nature trail extending to an open water area within and along the creek. Grassy Point is between a coal dock and a railroad line, with large coal piles visible in the background.

3.60 No significant adverse impacts to recreation or aesthetics are expected. The harbor provides a variety of recreational opportunities with fishing and other water oriented recreation, local parks, and the scenic Skyline Drive along the bluff that overlooks the harbor in many locations. Views of construction activity would not present undue aesthetic disruption in comparison with existing harbor industrial and shipping activities. After the sites are restored, the new habitat would enhance aesthetics and recreation in and around the harbor. Actual placement locations would not be available for fishing during construction, but there are many alternate sites for fishing activity, and the completed restorations will enhance fishing opportunities in the harbor.

3.61 Operation of construction equipment associated with the proposed action would result in periodic, temporary noise emissions in the placement vicinity. Equipment noise would not have adverse effects on recreation in the harbor as the placement area is within an industrial area and is subject to noise from two Interstate Highways that run alongside the site.

Air Quality

3.62 Effects on air quality will arise from emissions from equipment used to load, transport, and spread the dredged material at the beneficial use site. All equipment involved in the movement of dredged material to beneficial use sites would be required to meet emissions standards and emissions are expected to be minor. Dredged material transport impacts are considered short term. Thus, the placement impacts are exempt as *de minimis* (Latin for ‘of minimal importance’) and meet the conformity requirements under Section 176 (c) of the Clean Air Act, and 40 CFR 93.153.

Traffic and Safety

3.63 The dredged material placement activities are not expected to interfere with recreational, charter, and/or commercial vessels since the placement sites are off-channel. The dredging contractor would be required to comply with U.S. Coast Guard regulations applicable to marine work. Therefore, navigational impacts are expected to be temporary and minor.

3.64 The construction contractor most likely would bring equipment to the site by water transportation. However, some ancillary equipment (such as small craft for personnel transport to the job site) may be brought in on land. All land transport would be required to obey all applicable Federal, State, and local driving laws, and obtain any required permits for such activity.

Flood Plain and Coastal Zone Consistency

3.65 The proposed action complies with the Federal Executive Order on Flood Plain Management (E.O. 11988) because there is no practicable alternative to dredged material placement in the flood plain and the placed dredged material would not encourage floodplain development nor induce flooding. The dredged material is expected to have beneficial effects on the coastal zone of Minnesota. Since the proposed action would have no adverse effect on the coastal zone, it would be "consistent to the maximum extent practicable" with the Coastal Zone Management Act, and Minnesota's Lake Superior Coastal Program.

Climate Variations

3.66 Although the actual climate impacts that may occur at any given project site are largely uncertain, some general assumptions can be made based on long term global climatic trends, which vary between warming and cooling over periods typically measurable in hundreds of years. As our planet is currently in a warming trend, effects of a warming climate on weather patterns can generally be anticipated. The majority of Global Atmospheric Circulation Model runs indicate that, under a continuing global warming trend, air mass differences will become greater in the Great Lakes and upper Midwest regions during the fall and spring (transition) seasons, with stronger resultant atmospheric disturbances. This suggests precipitation events in the project region that do occur will generally be more intense. The interaction between the proposed project and climatic variations would not result in significant adverse effects on the environment or on climatic conditions.

Environmental Justice

3.67 The proposed actions all occur within industrial areas of the harbor, separated from residential areas by industrial development and the Interstate highways. There are no low income or minority populations in the area of potential effects for evaluation of environmental justice. Therefore, the project complies with Executive Order 12898, "Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations."

Cumulative Impacts

3.68 A wide variety of restoration efforts are planned and being implemented in the harbor that addresses a diverse assemblage of sites in need of remediation of contaminated sediments and/or restoration of habitat (Figure 11). Of these sites, the USACE is participating in the study for beneficial use of dredged material in developing piping plover habitat along Wisconsin Point, will be assisting in the dredging of contaminated sediments from Howard's Bay, and is providing assistance in other RAP projects such as Chambers Grove habitat restoration, and Knowlton Creek watershed improvements.

3.69 Various projects and measures, including dredging of the Federal navigation channels, more restrictive discharge standards, and some initial site restoration activates in select locations of the harbor have resulted in water and sediment quality improvements over the past 30-40 years.

3.70 The present proposal for aquatic habitat restoration at the 21st Avenue Site, 40th Avenue Site, and Grassy Point will have positive cumulative effects in association with other specific RAP projects. These projects focus on various aspects of restoration including the removal of non-native material, restoration of optimum bathymetry, restoration of wetland complexes, reductions in runoff and sediment transport, restoration of cold-water stream habitat, restoring connectivity and fish passage, softening of shorelines, removal of aquatic invasive species, dune restoration, and restoration of piping plover habitat. In combination, these projects will provide harbor wide improvements in habitat, sediment quality and aesthetics.

3.71 Negative cumulative impacts of the proposed action are minor, including fuel use and air emissions from equipment operations. Potential for negative impacts from exotic species exists, but would not necessarily represent a negative cumulative impact since the harbor already is heavily impacted from surrounding industrial uses and any exotic species that may find habitat in the placement area would already be occurring at the harbor. Monitoring and adaptive management measures will include limiting the establishment of exotic species.

3.72 The cumulative aquatic habitat benefits from implementation of the 21st Avenue West, 40th Avenue West, and Grassy Point restorations, especially in conjunction with other restorations in the AOC, will provide for greater overall benefits to the ecosystem. Benefits include increased quantity, quality, and diversity of habitat, increased habitat connectivity throughout the AOC, improved water quality, and improved aesthetics.

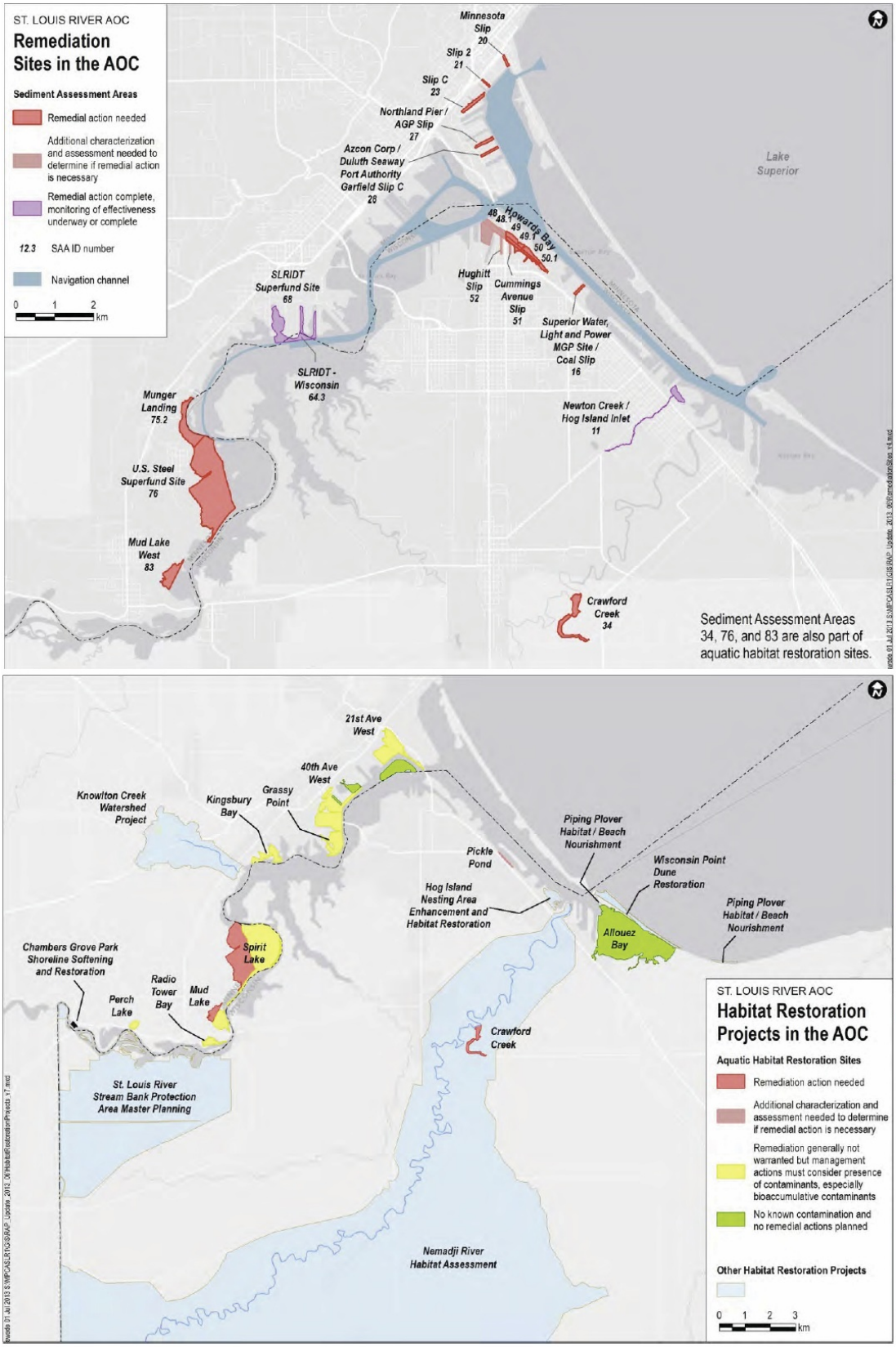


Figure 11. Remediation and Habitat Restoration Sites in the SLR AOC. (Maps from RAP documents.)

Other Resources

3.73 The proposed placement of suitable dredged material at the 21st Avenue West, 40th Avenue West, and Grassy Point restoration sites would not be expected to adversely impact community cohesion, desirable community growth, tax revenues, property values, public facilities, public services, recreation, aesthetics, regional growth, employment or the labor force, business and industrial activity, farmlands, or man-made resources. Nor would the proposed action be expected to cause displacement of people. The proposed ecosystem restorations will provide a more pleasing environment for the community in Duluth, Minnesota, and Superior, Wisconsin, which will enhance the 'livability' of the Duluth and Superior.

4.0 EARLY COORDINATION

4.01 An early coordination notice of the proposed restorations was sent in June 2014 to a variety of agencies, including the MPCA, MNDNR, Wisconsin Department of Natural Resources, U.S. Environmental Protection Agency, U.S. Fish and Wildlife Service, University of Wisconsin Sea Grant Institute, Great Lakes Indian Fish and Wildlife Commission, and various tribes in both states. Cultural resource evaluations are on-going and upon completion will be provided to the Minnesota State Historic Preservation Office (SHPO) along with determinations of effect pursuant to the National Historic Preservation Act and other applicable legislation.

4.02 Early coordination comments were received from the MNDNR (July 31, 2014), the US Fish and Wildlife Service (USFWS, August 7, 2014), and the US Environmental Protection Agency (USEPA, July 23, 2014). The comment letters are included in Attachment 2 of this EA. Because of the timing of design work on these restoration proposals, a decision was made to focus the present EA on the dredge material placement at the three restoration sites with the more detailed analysis of the State-proposed habitat restorations being addressed in the State EAWs, which would be forthcoming at a later date as design work is refined/finalized for each site. As such, while many of the comments are addressed in the present EA, some of the comments cannot be addressed until the designs are further refined and presented in the State EAWs. Meanwhile, some clarifications of the comments are provided in the following paragraphs.

Minnesota Department of Natural Resources

4.03 The MNDNR letter provides information on the EA and EAW process as well as permitting details. We note that in coordination with the MNDNR and MPCA, the proposed milestones subsequent to the public review of this EA are as follows and would repeat for each of the three restoration sites:

a) Development of the EAW to provide current site restoration design and environmental analysis, including discussion of the required State Natural Features Review, which includes consideration of State and Federal listed species.

b) USACE provides Coastal Consistency Determination to the State of Minnesota for Federal Consistency.

c) EAW Public Review (to include all contacts the USACE EA was sent to).

d) Finding of Fact to address the results of the EAW and public review comments and results in a determination regarding whether an Environmental Impact Statement (EIS) at the State level is needed.

e) If a Negative Declaration is signed, then the State would process any state permits and issue Section 401 Water Quality Certification, with conditions to ensure State water quality standards are met.

f) Upon issuance of Water Quality Certification, the USACE makes a decision regarding the need for an EIS at the Federal level. If the USACE decision is that an EIS is not needed, then a Finding of No Significant Impact (FONSI) would be signed. Based on the evaluation in this EA and that the State regulatory agencies are actively engaged in the project design, the anticipated outcome is a FONSI. Therefore a preliminary Statement of Findings/FONSI is included in the last section of this EA.

4.04 Upon completion of the environmental review and permitting process, the public will be notified of the USACE decision regarding a FONSI versus an EIS. If the decision is a FONSI, then the placement of dredged material in support of State-proposed habitat features for site restoration can proceed.

U.S. Fish and Wildlife Service

4.05 The USFWS letter discusses the structure of the inter-agency project implementation teams and the rationale for three separate projects which is to address variations in the sites and proposed restoration features. Additionally, addressing the sites separately allows for implementation to begin at one site while design and environmental review may still be on going at the other sites.

4.06 The USFWS also expresses concerns about the sediment placement for habitat restoration. In response we note that sediment will be tested and must meet USACE and State standards in order to be used in the proposed habitat restorations. Disturbance of bottom sediments is unavoidable and occurs with project activities, shipping activity, and storm events. However, these events are of limited duration and would not be likely to have any long term adverse effects from project implementation. Upon completion of dredged material placement, cleaner sediment will provide a barrier to further re-suspension of existing bottom sediments within the restoration areas and will serve to reduce sediment-disturbing wave energy coming into the sites. In the interest of efficiency and cost containment, sediment will be provided to the sites directly from the dredging activity whenever possible. If the State opts for use of material from the Erie Pier for some of the fill, that would be addressed in the EAW for the site (most likely would be 40th Avenue West as it is adjacent to Erie Pier).

U.S. Environmental Protection Agency

4.07 The USEPA provided advice on content for the EA. As noted previously, some of the details are included in this EA, but much information cannot be provided until the designs are further refined, and that information would be included in the State EAWs for each restoration site. While this EA provides concept level details and discussion, the State EAWs will provide greater detail on design and habitat expectations.

4.08 Because the three restoration projects span a multi-year time frame, we cannot provide specific location of source dredged material for the restoration sites; dredge management unit location and physical character changes based on current dredge locations and rates. However, the attached Clean Water Act Section 404(b)(1) evaluation shows the regularly dredged areas of the harbor, any of which potentially can provide fill material. In all cases the dredged material will be tested and will only be used in the restoration sites if it meets USACE and State of Minnesota standards.

4.09 Again, because the site designs are still being prepared, details of the habitat restorations including cross sections and bathymetry will be provided in the site-specific EAWs. The USACE EA addressed the placement of the dredged material in support of the State-proposed restorations, which will be monitored by the state and have adaptive management applied as necessary to the end goal of removing BUIs from the SLRAOC.

4.10 The BMPs for project construction are discussed in this EA and will be further addressed in the State EAW, State permitting, and Section 401 certification. Lessons learned in the pilot placement will be applied to provide greater efficiency of construction while minimizing adverse effects. The effects of turbidity have been well studied in the pilot project and are presented in the attached Clean Water Act Section 404(b)(1) evaluation, Section II.c.

4.11 Wetland delineation has not been completed for the project site affected areas. There are only minor areas of wetland impacted and in those cases the impacted wetland is replace by wetland/aquatic habitat of greater quality. Overall, the projects will result in a net gain in wetland area, type, and quality.

5.0 CONCLUSIONS AND DETERMINATIONS

5.01 Environmental review of the proposed placement of shoal material dredged from the federal navigation channels in support of State-proposed habitat restoration features at 21st Avenue West, 40th Avenue West, and Grassy Point, Duluth, Minnesota, indicates no significant cumulative or long-term adverse environmental effects would be expected. The adverse impacts, as summarized and discussed in this EA, are minor. The placed material will provide improved, cleaner substrate for State-proposed development of aquatic habitat to support a variety of fish and wildlife habitat features with the end goal of removing BUIs from the SLRAOC.

5.02 The proposed action has been reviewed pursuant to the following Acts and Executive Orders, as amended: Rivers and Harbors Act of 1899 (Section 10), Fish and Wildlife Act of 1956; Fish and Wildlife Coordination Act of 1958; National Historic Preservation Act of 1966; National Environmental Policy Act of 1969; Clean Air Act of 1970; Executive Order 11593, Protection and Enhancement of the Cultural Environment, May 1971; Coastal Zone Management Act of 1972; Endangered Species Act of 1973; Clean Water Act of 1977, Executive Order 11988, Flood Plain Management, May 1977; Executive Order 11990, Wetland Protection, May 1977; and Executive Order 12898, Environmental Justice, February 1994. The proposed dredged material placement would be in compliance with the above Acts and Executive Orders.

5.03 The proposed dredged material placement sites are within the 100-year floodplain; however, the placement would not significantly impact flood stages, nor would it encourage floodplain development. The placement would comply with the Federal Executive Order on Flood Plain Management (E.O. 11988) because there is no practicable alternative to placement in the floodplain in order to support aquatic habitat restoration. Since the proposed action would have no adverse effect on the coastal zone, it would be "consistent to the maximum extent practicable" with the Coastal Zone Management Act, and Minnesota's Lake Superior Coastal Program. A detailed Federal Consistency Determination will be provided to the State Coastal Administrator once design is completed for each site.

5.04 Pursuant to the Clean Water Act (CWA), a Section 404(b)(1) evaluation of the environmental effects of the discharge of fill material into waters of the U.S. has been prepared (Attachment 5). The Section 404(b)(1) evaluation concludes with the determination that "the proposed dredged material placement is in compliance with Section 404 of the Clean Water Act." A Section 401 (CWA) water quality certification (or waiver thereof) would be obtained from the state prior to reaching a final determination regarding the need to prepare an Environmental Impact Statement.

5.05 This EA has been prepared in accordance with the National Environmental Policy Act (NEPA); the *Council on Environmental Quality, Regulations for Implementing the Procedural Provisions of the National Environmental Policy Act* (40 CFR Parts 1500-1508); and the *Corps of Engineers, Policy and Procedure for Implementing NEPA* (33 CFR Part 230).

5.06 The conclusions of this EA are that adverse environmental impacts of the proposed placement of dredged material in support of habitat restoration, are minor and local in scope; the benefits of the proposed action outweigh the minor impacts that would result from the proposed

action; and the proposed action does not constitute a major Federal action significantly affecting the quality of the human environment.

6.0 PUBLIC REVIEW

6.01 This EA will be made available for a 30-day agency and public review to state, Federal and local agencies, various tribes, and other interested groups and individuals. Based on the conclusions of this EA, it appears that preparation of an EIS will not be required. Therefore, the USACE has provided a Preliminary Statement of Findings/ Finding of No Significant Impact (SOF/FONSI) is included in the next section of this EA. Following this period and a review of the comments received, and upon completion of the State EAW process for each restoration site, the District Engineer (Detroit District USACE) will make a final determination regarding the necessity of preparing an Environmental Impact Statement (EIS). If, for each restoration site, the District Engineer determines that an EIS is not necessary, a site-specific SOF/FONSI would be signed and the dredged material placement for that site implemented.

7.0 PRELIMINARY STATEMENT OF FINDINGS/ FINDING OF NO SIGNIFICANT IMPACT

Proposed Action: In accordance with the National Environmental Policy Act of 1969 (NEPA), the Detroit District, U.S. Army Corps of Engineers (USACE), has assessed the environmental impacts of placing material dredged from the federal navigation project into the 21st Avenue West/40th Avenue West/Grassy Point restoration site[25] in Duluth, Minnesota, to help the State of Minnesota restore fish and wildlife habitat for the end goal of removing BUIs from the SLRAOC. Alternatives include no Federal action, pursuit of open-water dredged material placement in Lake Superior, and pursuit of upland sites. The proposed dredged material placement in support of habitat restoration is preferred because it provides the lowest cost, environmentally acceptable, engineeringly feasible dredged material placement alternative with a beneficial use purpose.

Environmental Effects: An EA and a Section 404(b)(1) of the Clean Water Act (CWA) evaluation of the environmental effects of the discharge of fill material into waters of the U.S. was completed for the proposed placement of dredged material for aquatic habitat restoration. Based on the findings of the EA, Section 404(b)(1) evaluation, and sediment, elutriate, and biological testing done to date, implementing the proposed project would be in compliance with Section 404 of the CWA. The proposed project would not result in significant short-term, long-term, or cumulative adverse environmental effects on biota or water quality. Impacts would be minor and temporary, consisting primarily of noise and air emissions from equipment and transportation operations, and minor, short term turbidity during in-water placement activities.

[25] Note that each of the three sites will have a separate Finding, so only one site name would be in any given FONSI.

Coordination: Early coordination comments with Federal and State natural resource agencies, the SHPO, tribes and tribal interests, was completed, and the comments received are included with the EA. The EA and 404(b)(1) evaluation were sent out for a 30-day public review. A State EAW was prepared and circulated to the public for comment in order to fulfill the State requirement for a Responsible Governmental Unit (RGU) to submit an EAW for a 30-day public review. After addressing EAW comments, the RGU prepared a Finding of Fact for the EAW concluding that the proposed project does not pose the potential for significant environmental impacts and therefore a State Environmental Impact Statement is not required."

Determinations: The proposed dredged material placement has been reviewed pursuant to the following Acts and Executive Orders: Fish and Wildlife Act of 1956; Fish and Wildlife Coordination Act of 1958; National Historic Preservation Act of 1966; National Environmental Policy Act of 1969; Clean Air Act of 1970; Executive Order 11593, Protection and Enhancement of the Cultural Environment, May 1971; Coastal Zone Management Act of 1972; Endangered Species Act of 1973; Clean Water Act of 1977; Executive Order 11988, Flood Plain Management, May 1977; and Executive Order 11990, Wetland Protection, May 1977. Based on the findings of the EA, Section 404(b)(1) evaluation, and results of the 30-day public review and comment period, the proposed project has been found to be in compliance with these acts and executive orders.

The proposed dredged material placement complies with the Federal Executive Order 11988 (Flood Plain Management), because it will not adversely impact flood plains. The proposed project is within the coastal zone, as defined by the Minnesota's Lake Superior Coastal Program, but would have no adverse effects on the coastal zone or the waters of Lake Superior. Therefore, the proposed project would be "consistent to the maximum extent practicable" (as defined in 16 USC 1456, Coastal Zone Management Act, approved 1978) with the Minnesota's Coastal Program. The State of Minnesota concurred with this determination. The State of Minnesota also provided Section 401 water quality certification pursuant to the Clean Water Act. The USFWS did not object to the USACE's determination of "no effect" on Federally listed species. The SHPO provided concurrence that "no historic properties will be affected.

Finding and Conclusion: The findings of the February 2015 USACE EA and Section 404(b)(1) evaluation, and the results of the 30-day public review and comment period, and subsequent State level reviews, indicate that the proposed placement of federal navigation channel dredge material in support of State-proposed habitat restoration features at 21st Avenue West/40th Avenue West/Grassy Point) does not constitute a major Federal action significantly affecting the quality of the human environment; therefore, an EIS will not be prepared.

Date

Michael L. Sellers
Lieutenant Colonel, U.S. Army
District Engineer

8.0 REFERENCES

Bahnick, Donald A., and Markee, Thomas P. 1985. *Occurrence and Transport of Organic Micro Contaminants in the Duluth-Superior Harbor*. Internat. Assoc. Great Lakes Res., 11(2):143-155.

Crane, Judy L. and Steve Hennes. 2007. Guidance for the Use and Application of Sediment Quality Targets for the Protection of Sediment-Dwelling Organisms in Minnesota.

Glass, Gary E., Sorensen, John A., Schmidt, Kent W., and Rapp, George R., Jr. 1990. *New Source Identification of Mercury Contamination in the Great Lakes*. Environ. Sci. Technol., 24(7):1059-1069.

Host et al., 2012. An Ecological Design for the 40th Avenue West Remediation-to-Restoration Project.

Host et al., 2013. An Ecological Design for the 21st Avenue West Remediation-to-Restoration Project.

Lindgren, John P, Ongstad, Pete W. and John R. Spurrier, 1997. *The St. Louis Bay Fishery 1986-1994*. Minnesota Department of Natural Resources, Division of Fish and Wildlife, Section of Fisheries, Study 4 Report, Job 422, St. Paul.

LSNERR 2011. Unpublished data from the Lake Superior National Estuarine Research Reserve, University of Wisconsin—Superior.

MPCA 2015. Minnesota Pollution Control Agency. Appendix 1, *Managing In-Water Placement of Dredge Material for habitat Restoration Sites*, of *St. Louis River Area of Concern Quality Assurance Program Plan for Minnesota Based Projects*. January 2015.

MPCA 2013. Minnesota Pollution Control Agency & Wisconsin Department of Natural Resources, 2013. *St. Louis River Area of Concern Implementation Framework: Road to Delisting*. Remedial Action Plan Update. http://www.pca.state.mn.us/index.php/view-document.html?gid=19677

MPCA 2010 and 2011. Unpublished data from the Minnesota Pollution Control Agency.

MPCA and WDNR, 1995. *The St. Louis River System Remedial Action Plan, Progress Report.* Minnesota Pollution Control Agency and the Wisconsin Department of Natural Resources. April 1995.

MPCA and WDNR, 1992. *The St. Louis River System Remedial Action Plan, Stage One*. Minnesota Pollution Control Agency and the Wisconsin Department of Natural Resources. April 1992.

Natural Resources Research Institute, USEPA, USFWS, and St. Louis River Alliance, 2012. An Ecological design for the 40th Avenue West Remediation-to-Restoration Project. United States Fish and Wildlife Service, Cooperative Agreement 30181AJ68, NRRI/TR-2012/27.

NRRI 2012. *21st Avenue West Remediation to Restoration Project: Biological Survey and Hydrodynamic Modeling Results, April 2012*. Natural Resources Research Institute, University of Minnesota, Duluth. Contracted by the United States Fish and Wildlife Service.

Sanchez, Jose A. and Steven C. Wilhelms. 1999. *Hydrodynamic Numerical Model of St. Louis Bay in Duluth, Minnesota*. U.S. Army Corps of Engineers, Engineering Research and Development Center, Waterways Experiment Station, Coastal and Hydraulics Laboratory, Vicksburg, Mississippi.

SLRCAC. 2002. *Lower St. Louis River Habitat Plan.* St. Louis River Citizens Action Committee.

USACE. 1982. *Final Feasibility Report and Final Environmental Impact Statement on Harbor and Channel Modifications, Duluth-Superior Harbor, Minnesota and Wisconsin*. August 1982 (Revised February 1983). U.S. Army Corps of Engineers, Detroit District.

USEPA, 2014. A Benthos-based Multimetric Index for Use in the St. Louis River Area of Concern. Progress Report, Office of Research and Development, National Health and Environmental Effects Research Laboratory, Mid-Continent Ecology Division (MED), Duluth, MN, United States Environmental Protection Agency, Washington, DC. 42 pp.

ENVIRONMENTAL ASSESSMENT

Dredged Material Placement in support of Aquatic Habitat Restoration 21st Avenue W, 40th Avenue W, and Grassy Point St Louis River Area of Concern Duluth, Minnesota

Attachment 1

CLEAN WATER ACT SECTION 404(b)(1) EVALUATION Of the Effects of Placing Fill Material into the Waters of the United States

I. PROJECT DESCRIPTION

a. Project Location: The proposed dredged material placement locations are within three Remedial Action Plan ecosystem restoration sites in St. Louis Bay, specifically 21st Avenue West, 40th Avenue West, and Grassy Point as shown in the Environmental Assessment (EA Figure 1). The State of Minnesota, in concert with the approved[1] *St. Louis River Area of Concern Implementation Framework: Roadmap to Delisting, Remedial Action Plan Update* (RAP)[1], proposes to re-use dredged material acceptable for aquatic habitat restoration with the goal of removing beneficial use impairments (BUIs) in the St. Louis River Area of Concern (SLRAOC)[2] The three proposed restoration sites encompass approximately 890 acres of the Minnesota waters of St. Louis Bay, Duluth-Superior Harbor (EA Figure 2).

b. General Description of Project: Suitable dredged material from the Federal navigation project would be placed into State-specified target areas to reduce water depths for natural development of aquatic vegetation.[3] Dredged material placement may also include several habitat islands for added diversity. Preliminary site plans are included as EA Figure 5-7. These site plans are subject to refinements that will be presented in State-mandated Environmental Assessment Worksheets (EAWs) for further public review. In addition to the dredged material, supplemental material would be placed by the State of Minnesota to promote development of aquatic vegetation. Supplemental material is proposed to be obtained from Kingsbury Bay and/or Perch Lake, which are proposed habitat restoration sites that require excavation to provide open water areas. The excavated sediment is rich in seed stock and organic in nature, and so provides a suitable top dressing for the 21st West, 40th West, and Grassy Point restorations.

1 The RAP is approved by both states (Minnesota and Wisconsin) and the US Environmental Protection Agency.
2 The SLRAOC, which covers an irregular shaped area roughly 65 miles long and 40 miles wide, is one of forty-four designated Areas of Concern over impaired water resources within the Great Lakes ecosystem.
3 The State may provide fill from other sources (see discussion in Environmental Assessment) which would have to be reviewed for Section 404 compliance under the USACE Regulatory program and, therefore, is not addressed herein.

c. Authority and Purpose:

(1) The placement of dredged material from the Federal navigation project is conducted under navigation servitude[4] and is authorized as part of harbor operation and maintenance, which is intrinsic to the original harbor authorizations.[5] Dredged material would be placed at the habitat restoration sites from the Federal navigation channels in accordance with United States Army Corps of Engineers (USACE) standards.[6] The habitat restoration activities that follow placement of the dredged material are to be done under other Federal (non-USACE) and/or State authorities.

(2) The purpose of the proposed dredged material placement at the three ecosystem restoration sites is to provide cost-effective, environmentally acceptable dredged material from maintenance of the Federal navigation project with the added benefit of supporting State-proposed habitat restorations. The purpose of the State's aquatic habitat restorations are to help achieve the goals of the Remedial Action Plan, specifically the removal of Beneficial Use Impairment (BUI) #4, Degradation of Benthos, and the removal of BUI #9, Loss of Fish and Wildlife Habitat. The dredged material placement will address BUI 4 and provides a base from which the State can implement habitat improvements to address BUI 9. The need for habitat restoration stems from the habitat degradation that resulted from historic industrial era impacts.

d. General Description of Dredged or Fill Material: The proposed fill material is dredged shoal material from the Federal navigation project at Duluth-Superior Harbor. Physical analysis was conducted for sediment samples collected in 2011[7] for areas planned to be dredged at that time. However, material from any part of the harbor may be used, provided it is tested as described in this 404(b)(1) evaluation and is found suitable.[8]

(1) General Characteristics of Material (grain size, soil type): The particle size distribution data are summarized in Appendix B, Table 5 of the 2012 sediment sampling report. The analyses showed that the material in the management unit 1 area (Minnesota Channel and the Upper Channel, see Figure 404-1 on following page) averaged approximately 38 % fine material (silt/clay), with the remaining material being fine and medium sand. The material in management unit 2 (South Channel and West Gate Basin) had an average of 24% fine material (silt/clay), with the remaining material being predominantly fine sand. The remaining management units 3-6 had an average of 15-20% fine material (silt/clay). Management unit 3 includes the area of the Duluth Ship Canal, the Duluth Harbor Basin, and the Duluth Anchorage area. The material from the Duluth Ship Canal is used for beach nourishment along Minnesota Point. Management unit 4 includes

4 The common law principal of navigation servitude is the public's right of free use of all streams and water bodies for navigation.

5 Superior Harbor, Wisconsin, was originally authorized in 1867. Duluth Harbor, Minnesota, was originally authorized in 1871. The two harbors were combined in 1896 as the Duluth-Superior Harbor, which has been expanded by ten subsequent River and Harbor Acts.

6 USACE funding level for dredged material placement is based on the least cost, engineeringly feasible alternative that complies with the Clean Water Act Section 404(b)(1) Guidelines.

7 The 2012 sediment evaluation and full sampling analytical report can be viewed in the links at the bottom of this page: http://www.lre.usace.army.mil/Missions/EnvironmentalServices.aspx

8 Additional samples were collected in 2014 for areas not sampled in 2011, but the analytical results are not completed yet.

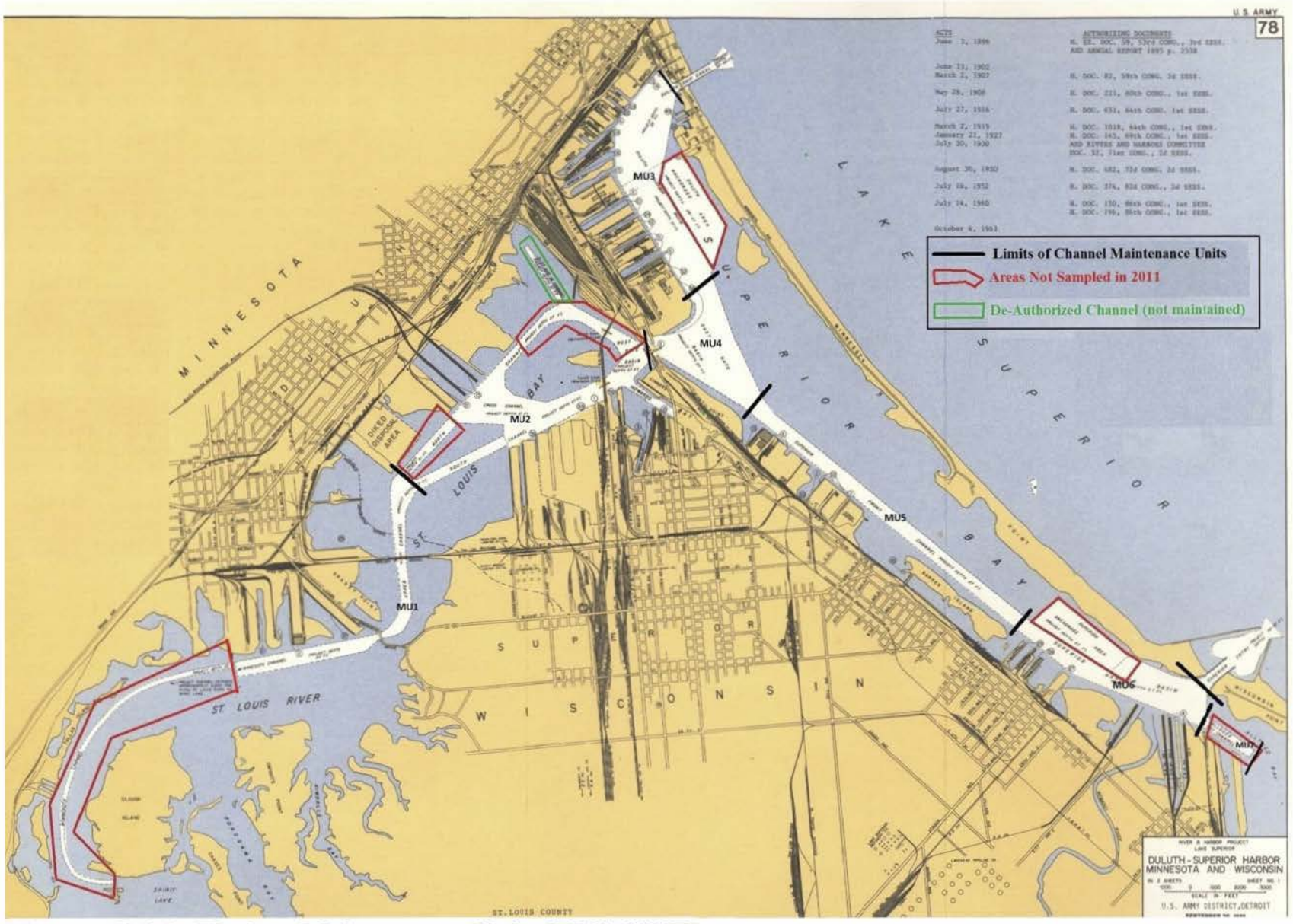


Figure 404-1. Harbor Maintenance Units MU1-MU7

the East Gate Basin channel. The remaining material in management units 3 & 4 were predominantly fine sand. The remaining material in management units 5 & 6 were a mixture of fine and medium sand. Management unit 5 includes the Superior Front Gate Basin, and management unit 6 includes the Superior Harbor Basin, Superior Anchorage Basin, and the Superior Entry channel.

(2) Quantity and Source of Material: In support of the three site restorations (21st Avenue West, 40th Avenue West, and Grassy Point), up to approximately 1,800,000 cubic yards (cy) of fill would potentially be supplied from suitable dredged material actively being removed from the Federal navigation channels.[9] On a site by site basis the preliminary fill estimates are 400,000 cy at the 21st Avenue West site; up to 500,000 cy in the de-authorized navigation channel that extends into the back embayment of the 21st Avenue West site; 800,000 cy at the 40th Avenue West site, and 100,000 cy at the Grassy Point site. These quantities are subject to change due to design refinements to be described in the State EAWs. Also additional quantities may be placed to compensate for any material consolidation over time. The quantity listed for the 21st Avenue West site is in addition to the approximately 370,000 cubic yards of dredged material placed in the inner embayment at 21st Avenue West from 2013 through 2015.

e. General Description of Proposed Discharge Site (See site descriptions in Section 2.0 of the EA and EA figures 5-7). In summary, the 21st Avenue West Restoration Site is 350 acres of open water flats and shallow sheltered bays located immediately upstream of Rice's Point in the inner harbor and encompasses the 21st Avenue West embayment, the bay area in front of the wastewater treatment plant, and the open water area out to Interstate Island; the 40th Avenue West Restoration Site is 360 acres of open water flats and shallow sheltered bays extending from the bay immediately north of the Erie Pier confined disposal facility (CDF) south and west to just before Grassy Point and including the power plant peninsula; and the Grassy Point site which is a 180 acre area immediately upstream from the 40th Avenue West site, located between the Burlington Northern Santa Fe Railroad line and the C. Reiss coal dock.

f. General Description of Disposal Method: Dredged material placement is expected to be achieved by hydraulic pumping, but other methods, such as bottom dumping barge, could be used at the discretion of the contractor, provided state water quality standards are met. Hydraulic placement would include a baffle plate mounted at the end of the hydraulic pipeline to dissipate energy and limit dispersal of the dredged material, resulting in more localized deposition. Mechanical placement would either be accomplished using a clamshell bucket or a bottom dumping scow. Additional in-water BMPs (e.g., weighted silt/turbidity curtain, upstream diversions to limit the flow of water into the dredged materials placement areas, etc.) will also be implemented as necessary to protect water quality.

9 The State may supplement with other material from time to time if necessary to achieve restoration schedules.

II. FACTUAL DETERMINATION

a. Physical Substrate Determinations.

(1) Substrate elevation and slope: The 21st Avenue West site generally varies from 2 to 6 feet in depth in the shallow areas, with depths up to 30 feet in the vicinity of a de-authorized navigation channel and up to 20 feet near a commercial slip. The 40th Avenue West site generally varies from about 2 to 7 feet in depth in the shallow areas, with depths to 20 feet at two non-Federal channels that extend into the site. The Grassy Point site generally varies in depth from about 3 to 6 feet with a maximum area about 9 feet deep. The sites would be filled to make shallow areas up to a minimum of about 2 feet deep, interspersed with deeper areas.

(2) Sediment type: No significant changes in sediment type are expected from placement of the dredged material, except where there are wood waste deposits at the Grassy Point site that would be removed or covered with dredged material.

(3) Dredged / fill material movement: No significant movement of placed dredged material is expected. Material placed in 2013 and 2014 under a pilot project at the inner 21st Avenue West embayment has not shown much movement in one year as shown in June 2013 and June 2014 bathymetric survey results for Area 4 (Figure 404-2 below) (also see associated discussion of pilot project in Section 1.0 of the EA).

(4) Physical Effects on Benthos (burial, changes in sediment type, etc.): The 21st Avenue West site represents a highly impaired benthic assemblage. The 40th Avenue West and Grassy Point sites have moderately impaired benthic assemblage, with Grassy Point ranging from good to poor. Burial of impaired benthic substrate will ultimately result in an improved benthic community as the dredged material will present a cleaner and non-toxic substrate.

(5) Other effects: No other effects identified.

(6) Actions Taken to Minimize Impacts: Site design accounts for strategic locations for dredged material placement to cover areas of contamination and to avoid areas of productive benthic community (which only occurs in parts of the Grassy Point site).

b. Water Circulation, Fluctuation, and Salinity Determinations:

(1) Water.

(a) Water chemistry – No significant effect.

(b) pH – No significant effect.

(c) Salinity – No significant effect.

(d) Salinity Gradients – Not applicable.

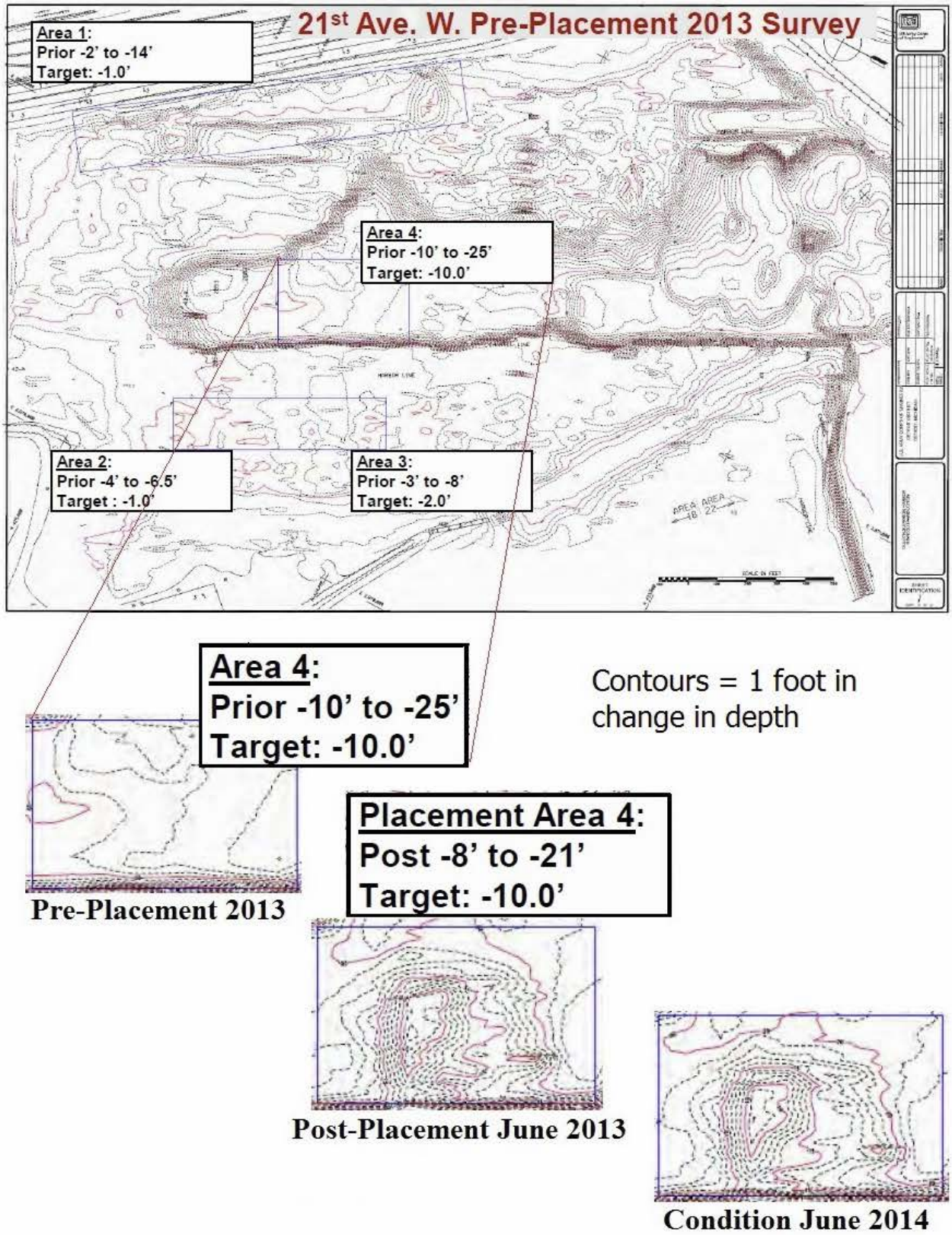


Figure 404-2. Bathymetric survey results for Pilot Area 4 at the 21st Avenue West site showing stability of placed material from June 2013 to June 2014.

(e) Clarity – Localized temporary turbidity during dredged material placement will cause short-term reduction in water clarity.

(f) Color – Localized temporary turbidity during dredged material placement.

(g) Odor – No significant effect.

(h) Taste – No significant effect.

(i) Dissolved gas levels – No significant effect. Possible short-term, temporary changes due to turbidity during dredged material placement.

(j) Temperature – No significant effect. Slight increase in temperature due to solar heating may occur in areas made shallower that are protected from wave action.

(k) Nutrients – No significant effect.

(l) Eutrophication – No significant effect.

(m) Others as Appropriate – None.

(2) Current Patterns and Circulation.

(a) Current patterns and flows – No significant effect. The proposed site restoration, including the USACE placed dredged material to reduce water depths, is being designed such that it will not enclose any portion of the tributary deltas entering the St. Louis River at the three sites (21st Avenue W, 40th Avenue W, and Grassy Pt). A large hydraulic connectivity between the St. Louis River and the areas sheltered by the shoals will exist. The maximum elevation of newly formed shoals would be 2 feet below low water datum and significant portions of deep water shall be maintained between placed shoal material. This will prevent any change in backwater effects in the tributaries entering the St. Louis River. Placement of material for shallower water depths will not affect water levels generated from seiche on Lake Superior and the 100 year water surface elevation will not change.

(b) Velocity – No significant effect. The velocity field in the vicinity of the placed material will change in direction but not magnitude. Velocity in the lower St. Louis Estuary is minimal except perhaps during large storm events. The location of newly placed material is far enough off the main channel that those velocities, even during storm events, are significantly reduced. Newly placed material is not expected to alter velocity magnitude or connectivity in the St. Louis River or its tributaries.

(c) Stratification – No significant effect.

(d) Hydrologic effect – No significant effect.

(3) Normal Water Level Fluctuations. No significant effects to normal water level fluctuations are anticipated. Water level fluctuations would not change because the controlling factor in water levels is primarily Lake Superior with some influence by flows in the St. Louis River.

(4) Salinity Gradients. Not Applicable.

(5) Actions That Will Be Taken to Minimize Impacts. Appropriate precautions for the floating plant (and other equipment) to prevent spills of material and fluids, spill response plans, and other applicable requirements (see discussion in Water Quality Effects section of the EA).

c. Suspended Particulate/Turbidity Determinations: No significant adverse effects expected. The turbidity monitoring conducted during 2013 and 2014 of the pilot project shows that the environmental impacts of dredged material placement on water quality are localized to the project site, relatively short term in nature, typical of water quality observed during storm events and not expected to have a significant detrimental impact on the aquatic ecosystem. The results of the turbidity monitoring are summarized below, followed by the suspended particulate/turbidity determinations (turbidity monitoring data for 2013/2014 available upon request).

(1) Results of 2013/2014 turbidity monitoring for 21st Avenue West Pilot dredged material placement:

(a) The pilot project conducted during 2013 and 2014 used several engineering strategies as best management practices (BMPs) to protect water quality and minimize off-site sedimentation during dredged material placement operations. These BMPs were 1) outfitting the placement end of the hydraulic pipeline with a baffle plate to dissipate energy and promote localized deposition of dredged material and 2) use of a silt curtain installed across the embayment. The silt curtain extended from one or two feet above the sediment surface to the water surface.

(b) Approximately 76,000 cubic yards (CY) and 16,000 CY of dredged material was placed hydraulically and mechanically, respectively, during the 2013 pilot project. During 2013, the silt curtain was left in place following dredging operations until there was no visible difference in the water clarity on either side of the curtain. The contractor completed the 2013 season dredging operations on November 16, 2013, and the curtain was removed two days later on November 18, 2013. Turbidity monitoring during placement of dredged material demonstrated that high levels of turbidity were generally limited to the project area, that turbidity dissipated rapidly following the end of dredged material placement, and that the silt curtain, while providing a temporary and localized improvement to water quality during placement activities, may not be necessary to protect water quality.

(c) The 2014 pilot demonstration turbidity monitoring program was conducted in two phases with respect to dredging operations in order to evaluate the utility of using a silt curtain as a best management practice. Turbidity monitoring was initiated on May

28, 2014, prior to placement of dredged material, in order to establish baseline turbidity levels[10]. Prior to dredged material placement, turbidity varied from 6.6 to 26 FNU[11] with an average turbidity of approximately 12 FNU. Background turbidity measurements were also routinely collected during the 2014 season near the Bong Bridge located approximately 2 miles upstream from the 21st Avenue West Avenue embayment project site. In addition to the pre-project and the Bong Bridge turbidity data sets, data collected by the National Oceanographic and Atmospheric Administration (NOAA) which had been collected during 2012, 2013 and 2014 for the St. Louis River Estuary was reviewed. The three sources of data indicated that background turbidity levels in the Estuary typically range from 5 to 40 NTU[12] punctuated by short term increases during storm events during which turbidity levels can rise up to 800 NTU. Because of the red clay soils in Wisconsin, turbidity within Pokegama Bay, about 4 miles upstream of the pilot demonstration site, is naturally higher than other locations in the Estuary averaging approximately 80 NTUs with spikes also occurring during storm events.

(d) The two phases conducted during 2014 dredging operations included:

(i) Phase 1 (Mechanical Placement of Sand without a Silt Curtain): From June 1 to June 30, 2014, 25,200 CY of coarse-grained sandy sediment was placed mechanically without a silt curtain. The turbidity levels measured during the period June 1 to June 30, 2014 when mechanical placement of sandy dredged material occurred without a silt curtain ranged from 6 to 33 FNU. The average turbidity within the water column during this period did not exceed 16 FNU at any location. The maximum turbidity measurement was approximately 500 ft from the discharge pipe and located within the decommissioned navigation channel at a depth of 33 feet. These data demonstrated that mechanical placement of sandy dredged material does not have a significant impact on water quality near the project site.

(ii) Phase 2a (with silt curtain): From July 9 to October 2 of 2014 approximately 102,100 CY of dredged material were placed hydraulically with a silt curtain installed.

- The dredged material consisted of fine- to coarse-grained sediment ranging in classification from lean clays to well-graded sands. The turbidity surrounding the project site was much higher during the period July 9 to October 2, 2014 when hydraulic placement of fine-grained dredged

10 Baseline turbidity levels were determined from three sampling stations with one (C1) located near the Bong Bridge approximately 2 miles upstream from the pilot placement site (this one is the primary background monitoring station), one (T61) located 4300 feet upstream of the 21st Avenue West site and one (T38) 4000 feet downstream of the site. The 90th percentile turbidity readings in water less than 15 ft in depth were 20 FNU (n=15), 24 FNU (n=426) and 26 FNU (n=78) for these three stations, respectively. The 90th percentile suspended sediment concentrations (SSC) were 17 mg/L, 19 mg/L and 21 mg/L for these three stations, respectively. (Suspended Sediment Concentration (SSC) is a laboratory measurement of the mass of filtered solids in a whole water sample; mg/L = milligrams per liter = parts per million (PPM))

11 Formazin Nephelometric Unit (FNU) is a measure of scattered infrared light at 90 degrees from the incident beam. In general, the greater the level of turbidity, the greater the scattering of light.

12 Nephelometric Turbidity Unit (NTU). This method is similar to the FNU method in that it also measures scattered light at 90 degrees, but NTU uses a white light instead of infrared. NTU and FNU are roughly equivalent.

material occurred and the silt curtain was installed. The mean average daily turbidity during this period was 143 and 59 FNU on the inside and outside of the silt curtain, respectively, indicating that the silt curtain reduced turbidity by approximately 59%. The turbidity and concentration of suspended solids quickly dissipated with distance from the silt curtain resulting in a mean average daily turbidity of 26 FNU in the navigation channel adjacent to the project site (roughly 2000 feet away). Data collected during the pilot demonstration when the silt curtain was installed showed that the silt curtain provides some control (59% reduction) but should not be considered a full barrier to migration of suspended solids from the project site. In particular, turbidity is higher in deeper water on both the inside and outside of the silt curtain compared to turbidity near the water surface.

- Because Phase II included fine grained materials, effects of turbidity on critical life stages of fisheries were evaluated in reference to walleye eggs and fry, which would serve as a proxy for other important fish species in the harbor. Of the 798 turbidity measurements collected during this time period, only four measurements were found to exceed a value that could impact the sensitive early life stages for walleye (> 250 mg/L suspended sediment concentration), showing that turbidity levels within the project area rarely exceed values that are considered detrimental to the sensitive early life stages for walleye (i.e. eggs and fry).

(iii) Phase 2b (without silt curtain): From October 5 to October 14 of 2014 approximately 15,200 CY of dredged material was placed hydraulically without the silt curtain installed.

- The dredged material consisted of fine- to coarse-grained sediment ranging in classification from lean clays to poorly-graded sand. During the period October 5 to October 14 when dredged material was placed hydraulically without a silt curtain turbidity monitoring was performed on two days: October 6 when sandy sediment was being placed and October 7 when clay sediment was being placed. The maximum turbidity observed within the navigation channel adjacent to the placement area ranged from 15 to 69 FNU with the mean average daily turbidity (21 and 31 FNU) typical of St. Louis Bay background water quality. The highest turbidity occurred within the inner portion of the embayment and quickly dissipated with distance[13] from the project area.

- Only one sample out of 344, located within the project area, was measured to have turbidity and an associated suspended sediment concentration that could have a detrimental impact on the early life stages of walleye. The data collected during this phase of work demonstrated that turbidity rarely

13 Using baseline turbidity measures as stated in the footnote #8, the suspended solids concentrations were down to 21 ppm at the monitoring location (T38) located approximately 4000 feet downstream of the placement activity.

exceeds values that are considered detrimental to the sensitive early life stages for walleye, and the elevated levels of turbidity rapidly dissipate with distance from the project area returning to values that are typical for the St. Louis Bay.

(e) Dredge material placement ceased on October 16, 2014, and turbidity monitoring was conducted on October 23 and 30, 2014. A total of 392 turbidity measurements were made during these two sampling events which ranged from 4.3 to 12 FNU. Data collected following completion of dredged material placement demonstrated that the turbidity within the project site return to background conditions within one week.

(2) Suspended Particulate/Turbidity Determinations

(a) Change at Placement Site. Hydraulic placement of the dredged material would result in suspension of particulates from the dredged material. This would result in temporary turbidity. These effects would return to pre-project conditions when dredged materials are not being placed in-water.

(b) Effects on Physical Properties of the Water Column. The waters of the St. Louis River Estuary are frequently turbid from storms and wave action.

(i) Light penetration – No significant adverse effects. Project induced turbidity would be localized and temporary. Reduced depths from shoal placement will result in greater light penetration to the substrate to promote aquatic vegetative growth.

(ii) Dissolved oxygen – No significant adverse effect. The presence of carriage water and the release of interstitial water likely would create increased concentrations of suspended solids immediately after placement operations. The water column oxygen concentration would be temporarily reduced, possibly below water quality standards. The water clarity and oxygen concentrations will return to pre-placement conditions after the turbidity subsides.

(iii) Aesthetics – No significant adverse effects. Potential for improved harbor aesthetics as aquatic vegetation develops in the restoration areas.

(iv) Other as appropriate – None identified.

(c) Effects on Biota (primary production, photosynthesis, suspension / filter feeders, sight feeders). No significant adverse effect. Shoals formed from dredged material will provide a cleaner substrate for aquatic organisms to thrive in, and the shallower depths will promote aquatic vegetation, which will reduce sediment re-suspension in the project sites.

(d) Actions to Minimize Impacts. The project would be implemented with appropriate measures to protect water quality in accordance with State standards/water quality certification. A baffle plate mounted at the end of the hydraulic discharge

pipeline would control turbidity and help focus the material placement. Results of pilot placement at the 21st Avenue West site in 2013-2014 showed that use of the baffle plate helped to localize the highest turbidity effects and allow for even settlement of the material to the bottom. Suspended sediment settled quickly within the placement site with higher concentrations remaining longer at greater depths depending on grain size characteristics. Ranges of turbidity seen within the placement site are similar to the background turbidity in the harbor during storm events. Elevated turbidity is of limited duration during the placement activity.

d. Contaminant Determinations: Contaminant analysis and bioassay testing show that with the exception of areas that are not currently maintained (Figure 404-1), the shoal material is suitable for in-water placement. Sediment Sampling and analysis will be periodically updated (and may include areas currently unmaintained) to ensure that suitability of the shoal material for in-water placement is determined based on recent (no more than 5 years old) sediment evaluation data.

(1) The following determinations are based on the information provided and discussed below:

(a) Metals: No significant effect.

(b) Chemical characteristics: No significant effect.

(c) Biological evaluation (toxicity and bioaccumulation): No significant effect.

(2) Duluth-Superior Harbor, MN-WI was sampled and evaluated in August 2011[14]. The harbor was divided into six management units (MU1 – MU6, see Figure 404-1). Sediment samples were obtained from each management unit and evaluated for chemistry, toxicity and bioaccumulation. Sediment samples were obtained from thirty locations within the Federal navigation channel (designated as DS-11-01 through DS-11-30). In addition, to determine dredged material suitability, samples were collected from two open-lake areas (MOPU and WOPU) as reference sites that are cleaner than the proposed 21st Avenue West, 40th Avenue West, and Grassy Point placement sites. Discrete sediment samples were composited into management unit/open-lake reference site samples as follows (see Figure 404-1): Federal navigation channel management units—DS-11-MU1 (DS-11-01 through DS-11-05); DS-11-MU2 (DS-11-06 through DS-11-10); DS-11-MU3 (DS-11-011 through DS-11-15); DS-11-MU4 (DS-11-16 through DS-11-20); DS-11-MU5 (DS-11-21 through DS-11-25); and DS-11-MU6 (DS-11-26 through DS-11-30); open-lake reference sites—Wisconsin, DS-11-WOPU (DS-11-31 through DS-11-35); Minnesota, DS-11-MOPU (DS-11-36 through DS-11-40). Testing was conducted in accordance with the Great Lakes Dredged Material Testing and Evaluation Manual, dated 1998. Below is a list of the tests that were performed:

(a) 10-day solid phase toxicity tests (bioassays) employing the test species Hyalella azteca (amphipod) and Chironomus dilutus (midge fly) were applied to all management unit and placement area composite sediment samples. The biological measurement endpoints for these tests were survival, and survival and growth,

[14] Additional sampling was conducted in 2014 for areas not sampled in 2011, but the analytical results are still being processed.

respectively. The primary purpose of these bioassays was to assess the potential toxicity of the dredged material to benthic organisms relative to lake/bay bottom sediments.

(b) 48-hour Ceriodaphnia dubia (water flea) acute toxicity test and 96-hour Pimephales promelas (fathead minnow) acute toxicity test were performed on 100% elutriate from the management unit samples. Survival was the biological measurement endpoint for both tests. The primary purpose of these bioassays was to assess the toxicity of contaminants potentially released to the water column during dredged material placement in the lake/bay environs.

(c) 28-day *Lumbriculus variegatus* bioaccumulation test for polychrlorinated biphenyls (PCBs) which included an analysis of the primary congeners PCB 8, 18, 28, 44, 49, 52, 66, 77, 87, 101, 105, 110, 118, 126, 128, 138, 153, 169, 170, 180, 183, 184, 187, 195, 206 and 209 was applied to all management unit and placement area composite sediment samples. This list was selected based on an assumption that total PCB tissue residues (i.e., total of 209 congeners) can be reliably estimated by doubling the subtotal concentration of the 22 PCB congeners PCB 8, 18, 28, 44, 49, 52, 66, 87, 101, 105, 118, 128, 138, 153, 170, 180, 183, 184, 187, 195, 206 and 209 (e.g., Committee on Remediation of PCB-Contaminated Sediments et al. 2001; USEPA 2002). PCBs 77, 110 and 226 were added to this group of congeners due to their toxicological importance. Lipid content in *L. variegatus* was also measured.

(d) Standard elutriate testing (SET) for metals (arsenic, barium, cadmium, chromium, copper, iron, lead, manganese, mercury, nickel, selenium, silver and zinc), ammonia, total Kjeldahl nitrogen (TKN) and total phosphorus were applied to all management unit composite sediment samples. The primary purpose of this test was to quantify the potential release of contaminants from the dredged material during placement relative to protection of water quality. SET data on the dredged material indicate that releases of metals and organic contaminants during placement activities would comply with existing, applicable Minnesota State Water Quality Standards for the Protection of Aquatic Life.

(e) Bulk sediment testing for PCBs (26 congeners) and total organic carbon (TOC) was applied to all management unit and placement area composite sediment samples. In addition, these samples were analyzed for ammonia (as N), TKN and total phosphorus. The individual samples were also analyzed for PCB aroclors, polyaromatic hydrocarbons (PAHs), metals, organic and nutrient parameters, and physical parameters.

(i) Bulk Inorganic Contaminants –While some dredged material concentrations significantly exceeded those of the open-lake reference sites (total phosphorus, TKN, barium, chromium, iron, lead, mercury, nickel and zinc), none were of significant toxicological concern.

(ii) Bulk Organic Contaminants – All PAH compound concentrations in the Federal navigation channel sediments, as well as the open-lake reference site

sediments, were non-detectable. Two PCB tests were conducted on the material: PCB aroclor testing and PCB congener testing. These results are discussed below.

- PCB Aroclors—PCB concentrations in the Federal navigation channel sediments, as well as at open-lake reference site sediments, were non-detectable at detection limits ranging from 81 µg/kg to 210 µg/kg at most sites. At DS-11-28, Aroclor 1242 and 1260 were measured at concentrations of 1100 µg/kg and 610 µg/kg, respectively (i.e., total PCBs concentration = 1.71 mg/kg), therefore, total PCBs was identified as a contaminant of concern (COC) at this site; however, this site is within the unmaintained area of the Superior Anchorage and would not be dredged at this time and therefore is not further discussed in this evaluation.

- Congeners—PCB congener concentrations in management unit sediments, as well as at open-lake reference site sediments, were mostly non-detectable. PCBs 101, 138, 153, 170 and 180 were detected in management unit DS-11-MU2 sediments at estimated concentrations (range 0.43 µg/kg to 0.79 µg/kg), and PCBs 138, 153, 170 and 180 were detected in management unit DS-11-MU5 at estimated concentrations (range 0.51 µg/kg to 1.6 µg/kg).

(f) Elutriate (Water Column) Bioassays – C. dubia and P. promelas – the mean survival of these test species exposed to all management unit sediment elutriates was 100%.

(g) Sediment Bioassays – H. azteca—The mean survival of this test species exposed to the management unit sediment samples ranged from 88±13.6% (DS-11-MU1) to 98±5.28% (DS-11-MU4, DS-11-MU5 and DS-11-MU6), and were not statistically different than that associated with the open-lake reference site DS-11-WOPU (100%). C. dilutus—mean survival of this test species exposed to the management unit sediment samples ranged from 92±14.2% (DS-11-MU6) to 98±5.28% (DS-11-MU4 and DS-11-MU5), and was not reduced by more than 20 percent, and was not statistically different than that associated with the open-lake reference sites (mean survival range 98% [DS-11-WOPU, DS-11-MOPU]). With respect to C. dilutus growth, mean biomass expressed as mean ash-free dry weight (AFDW) exposed to the management unit sediment samples ranged from 1.06 mg (DS-11-MU3), to 1.22±0.04 mg (DS-11-MU1) and 1.22±0.05 mg (DS-11-MU4). All values exceeded a mean AFDW of 0.48 mg (and MDW of 0.6 mg). These solid phase bioassay data show that the dredged material would not result in any contaminant-related unacceptable, adverse impacts if placed in the open-lake reference sites.

(h) The results were then further evaluated for toxicological significance and magnitude that it exceeds open-lake reference area sediments. Based on the available data, the toxicity to humans, birds and fish from PCB congeners that may bioaccumulate is low and near the background levels for lake sediments. The review also suggests that the measured PCB tissue residues associated with these management unit sediments was not biologically or ecologically significant relative to these two reference sites. Predictions of potential exposure to PCBs and risk to ecological

receptors and human health require explicit consideration of both spatial and temporal factors within food web models. A receptor exposure risk model (Spatially Explicit Screening-level Exposure) was used to address the relatively small spatial area for dredged material placement compared to the overall area utilized by receptors to obtain food. Fish with a larger home range than the placement area will obtain only a fraction of their diet from the proposed placement area, resulting in a net bioaccumulation reduction compared to the laboratory bioaccumulation results. This model was used to compare MU2 through MU5 to both the MOPU and WOPU open-lake reference sites using lake trout as the receptor species, which indicated negligible exposure risk with respect to fish, wildlife and human health.

(3) Detailed determination - Based on the data contained in Futurenet Group (2012) and other relevant information, contamination and toxicity associated with Duluth-Superior Federal navigation channel sediments has been shown to be comparable relative to open-lake reference site sediments. With respect to PCBs in the dredged material, bioaccumulationwould not result in unacceptable adverse impacts to the affected aquatic ecosystems. Therefore, with the exception of areas not maintained (and therefore not sampled), all material dredged from these Federal navigation channels meets Federal guidelines for open-water placement. Areas in the harbor that are not maintained may be selected for future placement into the restoration sites, provided additional chemical characterization is completed to evaluate whether dredged material from those areas is suitable. Because the dredged material is suitable for open-lake placement (per evaluation of the open-lake reference sites), with the restrictions noted above, the material is characterized as clean and would be suitable for shoal building in the 21st Avenue West, 40th Avenue West, and Grassy Point sites.

e. Aquatic Ecosystem and Organism Determinations:

(1) Existing Conditions at 21th Avenue West:

(a) Based on aquatic community survey data across the entire site (USFWS 2013), aquatic vegetation at the site reflects an impaired condition. Total taxa counts were low (< 5 taxa out of 15 total) for open water sample points.

(b) Historic data sets were used to establish a macroinvertebrate index score describing a gradient of benthic conditions throughout the estuary (EPA 2014). The project site at 21st Avenue represents an impaired benthic assemblage, not only when compared to a least impaired condition within the AOC, but also when 21st Avenue assemblages are compared to other restorations sites like Grassy Point or 40th Avenue West.

(c) Extensive sampling and analysis of sediment at this site conducted in partnership with the USACE revealed contaminant concentrations exceeding Level II Sediment Quality Targets (SQT) at a few points within the site. Review of the sediment chemistry data for 21st Avenue did not indicate a risk to human health and the environment. Sediment management recommendations describe leaving areas with elevated concentrations undisturbed or further isolated to reduce exposure by adding

cover (Limno Tech 2014). Additional analysis focusing on benthic community conditions was also completed, and although functional capacity of the benthos is impaired throughout the site, no clear pathways between contaminants and the environment were observed.

(2) Existing Conditions at 40th Avenue West:

(a) Aquatic community survey data across the entire site (NRRI et al 2012) of aquatic macrophyte assemblages reflect a moderately impaired condition. Of the 684 points sampled at depths less than 2.5 meters, 159 points had no vegetation indicating about 23% of the existing site conditions show little to no indication of a diverse aquatic macrophyte community.

(b) The site represents a moderately impaired benthic assemblage when compared to a least impaired condition (near Clough Island) and a highly impaired condition (21st Avenue West) (NRRI et al, 2013). In addition, historic data sets were used to establish a macroinvertebrate index score describing a gradient of benthic conditions throughout the estuary (EPA 2014) and the benthic condition at 40th Avenue West ranges from good to poor with an overall visual rating of moderately impaired.

(c) Extensive sampling and analysis of sediment at this site revealed a couple of limited areas where contaminant concentrations exceeded Level II SQTs. The MPCA review and analysis of the sediment data determined chemical concentrations in 40th Avenue West were not a risk to human health and the environment, however, these limited areas where sediment concentrations may exceed Level II SQT are being further assessed. At this time, the sediment management recommendations for these areas include leaving the areas undisturbed or reducing exposure by adding cover (LimnoTech, 2013).

(3) Existing Conditions at Grassy Point:

(a) Resource professionals have provided anecdotal evidence that aquatic macrophyte growth is largely limited by wood waste throughout the site.

(b) The Grassy Point Restoration Site currently contains a slightly to moderately impaired benthic assemblage when compared to a least impaired condition (near Clough Island) and a highly impaired condition (21st Avenue West) (USEPA 2014). In addition, historic data sets were used to establish a macroinvertebrate index score describing a gradient of benthic conditions throughout the estuary and the benthic condition at Grassy Point ranges from good to poor with an overall visual rating of slightly to moderately impaired. The areas of lower benthic condition likely are also areas of the largest and most dense wood waste.

(c) Based on analysis of a 2010 dataset (Limno Tech 2013), MPCA classified the Grassy Point project site as remediation generally not warranted but management actions must consider the presence of contaminants, especially bioaccumulative contaminants.

(4) The cleaner dredged material to be placed at the site would isolate the aquatic ecosystem from existing contaminated sediments and would provide a substrate suitable to support an improved benthic community, which likely would develop over time through re-colonization of the site. The completed ecosystem restoration, by increasing emergent and submergent aquatic vegetation and shallow edges would increase the complexity of habitat to provide for a variety fish and aquatic organisms. No significant adverse effects are anticipated on plankton, nekton, aquatic food web, wetlands, mud flats, vegetated shallows, species listed as threatened or endangered, or other wildlife.

f. Proposed Disposal Site Determinations: The placement operation would be conducted to meet applicable water quality standards outside mixing zone. No significant adverse impacts on municipal or private water supplies, recreational or commercial fisheries, water related recreation, aesthetics, parks, monuments, wilderness areas, research sites, or similar preserves would occur.

g. Determination of Cumulative Effects on the Aquatic Ecosystem: No significant cumulative adverse effects are expected. The dredge material placement at 21st Avenue West, 40th Avenue West, and Grassy Point is in support of State-proposed habitat restorations that are part of a larger harbor-wide restoration effort addressing a diverse assemblage of sites calculated to remove beneficial use impairment as part of the goal of delisting the estuary from being an Area of Concern for impaired water resources. These sites and USACE involvement in various remediation and restoration projects is discussed in the Cumulative Effects section of the EA.

h. Determination of Secondary Effects on the Aquatic Ecosystem: No significant adverse secondary effects are expected. Restored aquatic habitat will enhance adjacent terrestrial habitats and other existing wetlands providing secondary benefits to birds and mammals through increased quantity, quality, and diversity of habitat, increased habitat connectivity throughout the estuary, and improved water quality. The dredged material placement will support habitat restoration that will provide recreational and aesthetic benefits to the people of the Duluth-Superior Harbor vicinity and will provide economic benefits from reduced costs of maintaining the harbor facilities from efficient, beneficial dredged material handling.

III. FINDING OF COMPLIANCE OR NON-COMPLIANCE WITH THE RESTRICTIONS ON DISCHARGE:

a. Compliance With the Guidelines: No significant adaptations of the guidelines were made relative to this evaluation.

b. Alternatives Analysis:

(1) Habitat restoration sites have been identified as part of the Remedial Action Plan (EA Figure 4). Several of the sites in Minnesota involve the potential for use of shoal material from the Federal navigation channels in developing habitat for the purpose of removing BUIs: Grassy Point, 40th Avenue West, and 21st Avenue West. These sites can be addressed under the USACE's existing operations and maintenance authority for the

harbor. Other sites in the RAP are being pursued by non-Federal interests and/or with assistance of other Federal agencies, or under different USACE authorities.

(2) Alternatives to the beneficial use of dredged material by providing habitat restoration at Grassy Point, 40th Avenue West, and 21st Avenue West include finding new upland dredged material placement sites and placement in Lake Superior. Since the RAP partners propose to restore habitat in the interest of removing BUIs, particularly BUI 9 (loss of fish and wildlife habitat) and BUI 4, (degradation of benthos), through aquatic habitat restoration in these three sites, there is a need for large quantities of fill material to create appropriate bathymetry for production of aquatic habitat.

(3) The proposed action for the USACE dredged material placement from maintenance of the Federal navigation project at Duluth-Superior Harbor is to provide suitable dredged material for these restoration areas as a cost-effective and environmentally acceptable placement option. This results in cost benefits to the RAP partners in avoiding purchase and transport of fill material, and to the USACE by providing a low-cost dredged material placement alternative. Any dredged material that is not suitable for the habitat restoration sites will continue to be transported to the existing Erie Pier Confined Disposal Facility for containment and/or processing for upland site remediation in accordance with the State Disposal System permit for Erie Pier.

c. Actions To Minimize Adverse Effects.

(1) Actions concerning the location of the discharge: The discharges are in areas of lower biological productivity with areas of higher sediment contamination that does not require removal, but would be isolated from the aquatic environment and benthic zone by placement of the cleaner dredged material to form a suitable benthic zone. The discharges are intended to produce higher biological productivity through habitat restoration actions to be effected by the State of Minnesota.

(2) Actions concerning the material to be discharged: Material to be dredged from the Federal navigation channel must meet applicable Federal and State standards for beneficial use in an aquatic environment. Therefore appropriate testing will be conducted periodically on the harbor sediments, and only material that is suitable for aquatic habitat restoration will be used in the project. Unsuitable material will be place in the Erie Pier CDF and/or used for upland site remediation in accordance with the State Disposal System permit for Erie Pier.

(3) Actions controlling the material after discharge: After the dredged material is discharged, and if necessary for restoration purposed, the State of Minnesota would top dress the dredged material with biological medium to promote plant growth.

(a) Goals for aquatic vegetation establishment at all three sites will be established by the State using predictive models developed by EPA-MED for submerged aquatic vegetation (SAV) and floating leaf vegetation (FLV) in the Estuary. Of the two models, floating-leaved vegetation is not as certain, however, both of these models provide a reasonable tool to set targets for aquatic vegetation outcomes as the models

use variables that are easy to measure and predict such as depth, REI (Relative Exposure Index, which is a computation of wind speed x fetch), vegetation, and possible bed slope.

(b) The State would monitor the sites for aquatic vegetation, benthos, and sediment character. Adaptive management measures may be necessary where there is a need to place additional dredged material or provide for plant propagules. Adaptive management may include measures such as revised placement depth and/or location, or other measures as warranted. Adaptive management will be applied by the State of Minnesota as necessary based on monitoring results and other information that becomes available post-project in order to meet BUI removal targets.

(4) Actions affecting the method of dispersion: A baffle plate would be used for hydraulic discharge of the material at the site. The baffle plate dissipates energy and localizes the sediment discharge. Additional in-water BMPs (e.g., weighted silt/turbidity curtain, upstream diversions to limit the flow of water into the dredged materials placement areas, etc.) will also be implemented as necessary to protect water quality.

(5) Actions related to technology:

(a) As mentioned in the previous paragraph, a baffle plate will be used for hydraulic discharges to focus the material placement and help reduce turbidity. Additionally, a silt curtain may be used where applicable and practicable.

(b) Contractor equipment has the potential for introducing petrochemical products into the water in localized areas. Contractor(s) would be required to comply with U.S. Coast Guard and Wisconsin and Minnesota Departments of Transportation regulations as applicable to marine work, construction activities, and truck transport. Spill kits to contain and/or neutralize accidental minor discharges would be required on-site. These safeguards would minimize the chance of significant impacts.

(6) Actions affecting plant and animal populations:

(a) Wetland delineations will be completed by the State where warranted. Avoidance of wetlands is a priority unless wetland scientists from both the State of Minnesota and Federal agencies agree that the proposed modifications will improve wetland quality and function. In that respect, these restorations will alter a small area of the wetlands at 21st Avenue West and the wetlands on the southwest end of Grassy Point (see EA Figures 5 and 7). These wetlands will change to types that will be of equal or higher value as a result of the restoration. In addition the production of aquatic macrophytic wetland habitats in open water areas will provide for more substantial acreage of these wetland types.

(b) The activity for placing the shoals into the proposed areas would disrupt nearby fish activity. Fish would tend to avoid the area during placement activities, finding temporary alternative habitat within the harbor, and return after the disturbance is

gone. When placing material hydraulically, turbidity would be controlled through use of a baffle plate mounted at the end of the hydraulic pipeline to dissipate energy.

(c) Dredged material placement would result in incidental mortality of benthic invertebrates from smothering, and in the destruction or displacement of other aquatic invertebrates present in the water column. The navigation channel shoal material to be placed in the ecosystem restoration area would provide a cleaner substrate for re-colonization by benthic organisms, isolating them from the existing, more contaminated sediment. This should result in increased productivity for fish and wildlife. No significant adverse effects on aquatic invertebrates will occur since the restoration sites will be designed to enhance the benthic community.

(7) Actions affecting human use: The main human uses that could be affected are recreation and aesthetics. No significant adverse impacts to recreation or aesthetics are expected. The harbor provides a variety of recreational opportunities with fishing and other water oriented recreation, local parks, and the scenic Skyline Drive along the bluff that overlooks the harbor in many locations. Views of project activity would not present undue aesthetic disruption in comparison with existing harbor industrial and shipping activities. After the sites are restored, the new habitat would enhance aesthetics and recreation in and around the harbor. Actual placement locations would not be available for fishing during placement activities, but there are many alternate sites for fishing activity, and the completed restorations will enhance fishing opportunities in the harbor.

(8) Other actions taken to minimize adverse impacts: Timing of dredging and placement activities will be in accordance with any Minnesota Department of Natural Resources activity windows related to fish spawning activities.

d. Finding of Compliance: The placement operation would be conducted to meet applicable water quality standards outside the mixing zone. The placement operation would not violate the Toxic Effluent Standards of Section 307 of the Clean Water Act. No species Federally listed as "threatened" or "endangered," or critical habitat for such species, have been identified that would be affected by the proposed dredged material placement. The proposed action would not result in significant adverse effects on human health and welfare, aquatic life, or other wildlife dependent on the aquatic ecosystem, nor on the diversity, productivity, and stability of the aquatic ecosystem. Significant adverse effects on recreational, aesthetic, and economic values would not occur. Appropriate and practicable steps have been taken to minimize potential adverse impacts of the discharge on the aquatic ecosystem. On the basis of the guidelines, the proposed placement of dredged or fill material at the 21st Avenue West, 40th Avenue West, and Grassy Point aquatic restoration sites is specified as complying with the requirements of these guidelines.

ENVIRONMENTAL ASSESSMENT

Dredged Material Placement in support of
Aquatic Habitat Restoration
21st Avenue W, 40th Avenue W, and Grassy Point
St Louis River Area of Concern
Duluth, Minnesota

Attachment 2

EARLY COORDINATION COMMENTS

LIST OF COMMENT LETTERS:

Minnesota Department of Natural Resources (July 31, 2014)

U.S. Fish and Wildlife Service (August 7, 2014)

U.S. Environmental Protection Agency (July 23, 2014)

Minnesota Department of Natural Resources
Northeast Region • 1201 East Highway 2 • Grand Rapids MN • 55744

July 31, 2014

Charles A. Uhlarik, Chief
Environmental Analysis Branch
Department of Army
Detroit District, Corp of Engineers
477 Michigan Avenue
Detroit, Michigan 48226-2550

RE: Early Coordination Notice Document USACOE, Environmental Assessment Dredge Material Placement 21st Avenue West, 40th Avenue West and Grassy Point Duluth MN.

Dear Mr. Uhlarik:

The Minnesota Department of Natural Resources (DNR) Northeast Region appreciates the early coordination that has occurred with this Notice Document, the meetings held to facilitate the environmental review process regarding state and federal requirements, and the project specific technical communications.

From our most recent conference call on July 11th, we noted the projects also require a State Environmental Assessment Worksheet (EAW) as well as a State Natural Heritage Review. Randall Doneen, DNR Environmental Review in St. Paul, previously sent you the EAW form as well as a link to the Natural Heritage Information System (NHIS) and Lisa Joyal' s contact information to help expedite environmental review and Natural Heritage Review. The Minnesota DNR and Pollution Control Agency will soon determine which state agency will be the Responsible Government Unit (RGU).

As discussed during our conference call, a joint EA/EAW document can be prepared, in each case we need to follow procedures to meet federal and state requirements for these documents. Once RGU determination is made, the responsible state agency will assist more directly on document preparation.

As previously noted there are permit requirements for placement of material in the bed of state public waters. The State of Minnesota owns all submerged lands in the Minnesota portion of the Duluth-Superior Harbor below the ordinary low water mark. The state owns beds of navigable waters beyond the low water mark in trust for people for public uses. In the case where private parties have placed fill below the Ordinary High Water Level extending onto the beds of navigable waters, the state maintains ownership of the submerged lands as it continues to have an interest in the public rights to use the submerged lands. The state was granted ownership of lands below the ordinary low watermark at the time of statehood. The Public Trust Doctrine would prevent land from being transferred or sold to other parties.

Under the federal consistency requirements of the Coastal Zone Management Act of 1972 (CZMA), pursuant to 16 U.S.C. 1456, the placement of dredge material in the St. Louis River Estuary by the USACOE is required to be consistent to the maximum extent practicable with the enforceable policies of Minnesota's Lake Superior Coastal Program (MLSCP). Because the USACOE is, and has been, coordinating with the MNDNR and MPCA to conduct the AOC remediation and restoration projects at the locations listed above, there is no reason to expect the projects will not be consistent with those policies. Therefore, upon receipt of federal consistency determinations for the 40th Avenue West and Grassy Point

projects, MLSCP can respond with concurrence to the USACOE as has already been done for the 21st Avenue West project (concurrence letter dated May 16, 2013).

Thank you for the opportunity to comment, we look forward to cooperating with you on the upcoming environmental review, permitting, and implementation phases of these projects. The most recent conference call and upcoming coordination will greatly assist in in these matters. The DNR is excited to see these projects move forward to remove the Beneficial Use Impairments, improving the health and quality of the estuary, ultimately providing improved fishery and wildlife habitats as well as increasing the recreation potential in these areas. Please feel free to call or email me with any questions you have.

Sincerely,

Pat Collins
Regional Manager
DNR Ecological and Water Resources
1201 East Hwy 2
Grand Rapids, MN 55744
218-327-4232
Pat.Collins@state.mn.us

Cc: Mike Peloquin, DNR

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Twin Cities Field Office
4101 American Blvd E.
Bloomington, Minnesota 55425-1665

August 7, 2014

Mr. Charles A. Uhlarik
Chief, Environmental Analysis Branch
U.S. Army Corps of Engineers
Detroit District
Attn: Mr. Paul Allerding
477 Michigan Avenue
Detroit, Michigan 48226-2550

Dear Mr. Uhlarik:

This letter is in response to the Early Coordination request from the U.S. Army Corps of Engineers (Corps) dated June 18, 2014, entitled "Dredged Material Placement for Aquatic Habitat Restoration in St. Louis Bay, Duluth, Minnesota, St. Louis River Area of Concern." For the project, the Corps is proposing placement of dredged materials from the Federal navigation channel in the Duluth-Superior Harbor at three project locations in the St. Louis River: 21st Avenue West, 40th Avenue West, and Grassy Point.

The U.S. Fish and Wildlife Service (Service) has reviewed the subject of the Early Coordination request, and is providing the following comments and recommendations to help guide future proposed placement of dredged material at the three project locations. This is done with the goal of establishing beneficial fish and wildlife habitat and ensuring that ecological resources in the project locations are sufficiently protected from exposure to harmful concentrations of environmental contaminants.

Restoration

The Service is an active partner and is providing support and technical assistance to the three project locations. Project planning and implementation are being achieved through a cooperative, partnership approach. Each project location has an identified Project Team that includes a small group of partners that will be actively engaged throughout the "Remediation to Restoration" process for each location. Project Teams and partners may have overlapping membership.

Additionally, there are other teams identified for each project location, such as technical advisory teams. Members may choose to serve on different teams depending upon their interest and authorities pertaining to that project location. For example, the Service is a member of the main Project Team for both the 40th Avenue West and Grassy Point project locations, and serves as a technical advisor for the 21st Avenue West project location. However, the Western Lake Superior Sanitary District is serving on the main Project Team for the 21st Avenue West project location only.

For each project location, partners are working together to implement the Remediation to Restoration process identified in the Remedial Action Plan Update 2013. Project locations were separated because of location-specific differences, including desired habitat type, extent and type of sediment contamination, and surrounding land uses and businesses. While there is an overall goal for the lower St. Louis River to create open-water flats and shallow, sheltered bays, different conditions among the locations result in differences in specific desired habitats.

Partners are committed to the collective goal of establishing desired habitat types. Each project location will contain different desired types and quality of fish and wildlife habitat. Protection and creation of piping plover and other migratory bird habitat may be a priority for the 21st Avenue West project location, which includes Interstate Island. However, for the 40th Avenue West project location, the protection and creation of beneficial fisheries habitat may be a priority.

Determination for the beneficial use of dredged material should be considered on a project-location basis due to these differences. In Draft Environmental Assessments (EAs), current habitat types and bird uses should be addressed, as well as desired future habitat. Consultation and continued participation on Project Teams by the Corps will be essential to ensure the beneficial use of dredged materials in the AOC is consistent with location-specific remediation and restoration needs.

Sediment Placement

As Remediation to Restoration projects are being developed, the beneficial use of dredged material should be considered and addressed in project location-specific documents. For the use of dredged materials to be considered beneficial, the in-water placement of material must not cause an adverse impact to biota or water quality. Draft EAs should describe how the placement of dredged materials will restore habitat, the desired habitat types and quality, as well as include specific information on how the quality of aquatic habitat is expected to respond to project implementation. The habitats to be developed in the different project areas only contribute to achieving restoration goals (Remedial Action Plan Update 2013) to the extent that environmental quality characteristics in the project areas are also addressed.

Improvements within these project areas to fish and wildlife habitats are dependent upon the development of a community of diverse native aquatic vegetation. Multiple variables affect the establishment of a diverse native vegetation community, and these variables need to be addressed in Draft EAs. Important variables include, but are not limited to, nutrient presence and composition, substrate type (including grain size and composition), and the potential presence of invasive species. Information being gained from the pilot project at 21st Avenue West should be considered for all project locations with respect to the suitability of dredged materials for the establishment of native aquatic vegetation.

Prior to the placement of any dredged material, the Corps should ensure that the material is cleaner than the substrate upon which it is being placed. To adequately evaluate dredged material, Draft EAs need to ensure that the testing of material will meet federal and state quality guidelines for open-water placement. If placement material being considered includes the use of recently dredged material (prior to being transported and placed at the Eerie Pier Confined

Disposal Facility), information to be considered includes determining the major sources of the sediment to the dredged locations, as well as additional information regarding the source of dredged material. Continued coordination with annual dredging maintenance operations will be important. Placement of dredged materials immediately following dredging operations is desired so that dredging operations may attempt to dredge target sediment compositions.

When developing and evaluating alternatives for the individual project location Draft EAs, additional site-specific information that should be considered and assessed includes the disturbance and re-suspension of underlying (contaminated) sediments; bottom sediment physical, chemical and biological characteristics; current and projected wave conditions; turbidity; the ability to control the placement of dredged material and keep it in place; and the removal or remediation of sediment in the event that habitat benefits are not realized.

Contamination

In Enclosure 1 to your June 23, 2014 Early Coordination Request, entitled "Habitat Restoration Projects in the AOC," all three project locations are shaded yellow, which are identified as "Remediation generally not warranted, but management actions must consider presence of contaminants, especially bioaccumulative contaminants." Current project location contamination needs to be considered, as well as contaminant concentrations of the dredged material, in order to determine if the new placement of material will be better than its current placement. The lower St. Louis River has existing sediment contamination throughout the lower estuary, including in dredging locations. The Service is concerned about the suitability of the material for placement, and requests that the Corps provides adequate information prior to placement, to ensure that ecological resources in the project area are sufficiently protected from exposure to harmful concentrations of environmental contaminants.

When testing dredged material, appropriate detection limits should be used to ensure that the detection limits are below assessment values. Poor detection limits constrain the ability to adequately evaluate the data, and therefore result in poor data quality. Assessment values often used for preliminary analyses in the St. Louis River are Sediment Quality Targets, and can help guide detection level appropriateness.

Working with the Service, the Minnesota Pollution Control Agency and the Environmental Protection Agency can provide additional review to ensure adequacy of detection limits. Additionally, data should be compared to appropriate reference values and areas. The use of other project areas should not be used to determine the extent of contamination. A true reference site should be determined and used to ensure that comparisons are appropriate and adequate to determine if the material will create a risk to fish and wildlife resources. Bioaccumulation and toxicity tests should be used to provide additional information necessary to determine the risk that material may have on benthic invertebrates. These tests should also be compared to exposures using appropriate control sediment, and not sediment collected at other project locations. Placement of material on top of existing sediment should consider the bioactive zone when determining risks to fish and wildlife resources.

Due to the contaminants of concern in the lower St. Louis River, including but not limited to PAHs, PCBs, DDT, TCDD, mercury, and other heavy metals, the Service is concerned about the

placement of material and the potential for adverse impacts to ecological receptors resulting from the increase in exposure to suspended sediments and the water column. These impacts can include mortality, cancer, lower immune system responses, neurological effects, endocrine disruption and reproductive impairments. Placement needs to consider and ensure that the placement does not further degrade water quality nor mobilize existing contaminants. Draft EAs should address sediment fate, transport, and the potential transport of contaminants of concern. Additionally, sediment placement needs to consider the potential for mercury methylation. The Service is concerned about the cumulative impacts of mercury methylation with multiple projects being implemented at the same time. The cumulative impact of these projects on the transport, mobilization of contaminants, and methylation of mercury should be considered and evaluated by the Project Teams.

Conclusions

The Service would generally support the beneficial reuse of dredged material if measurable improvements in fish and wildlife habitat can be demonstrated without adverse effects, such as renewed availability of toxic substances in sediment, particularly substances like mercury. The Service would request that in Draft EAs, written confirmation from agencies with oversight be included, including a written confirmation that in-water placement of the dredged materials will not cause an adverse impact on biota or water quality.

However, due to the complexity and site-specific characteristics that exist in each project location, the Service advocates that the approval for the use of dredged material be developed and determined on a project location basis. While fish and wildlife habitat and restoration goals are being evaluated across the AOC as a whole, these project location differences affect which species may be targeted for each location, and may differ between locations. One project may target specific endangered species habitat, such as for piping plover, while another may target more universal migratory bird habitat. To adequately evaluate impacts to fish and wildlife resources, the Service would need to consider project locations separately. Future EAs should be drafted based on project locations and not encompass multiple projects in a single assessment.

The Service appreciates this opportunity to coordinate with the Corps early in the planning process, consistent with continuing efforts to restore high quality fish and wildlife habitat in the Lower St. Louis River. Please contact Zachary Jorgenson at 612-725-3548 (extension 2247) if you have any further questions.

Sincerely,

Lisa Mandell

for Peter Fasbender
Field Supervisor

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
77 WEST JACKSON BOULEVARD
CHICAGO, IL 60604-3590

JUL 23 2014

REPLY TO THE ATTENTION OF:

E-19J

Paul Allerding
U.S. Army Corps of Engineers - Detroit District
477 Michigan Ave.
Detroit, Michigan 48226

RE: Scoping Request: Preparation of an Environmental Assessment: Dredged Material Placement for Aquatic Habitat Improvements in St. Louis Bay at the 21st Ave. West, 40th Ave West, and Grassy Point sites – City of Duluth, St. Louis County, Minnesota

Dear Mr. Allerding:

The U.S. Environmental Protection Agency has received U.S. Army Corps of Engineers (USACE) correspondence dated June 18, 2014, requesting EPA's review of and comments on an early coordination request (hereby referred to as "scoping document") for the proposed placement of dredged materials from the Federal navigation channel at Duluth-Superior Harbor placement into the embayment of the 21st Avenue West Channel, the 40th Avenue West Embayment, and the Grassy Point Embayment in the St. Louis Bay in Duluth, Minnesota.

The St. Louis River AOC, designated under the Great Lakes Water Quality Agreement, is located on the western end of Lake Superior, and includes the port cities of Duluth, Minnesota and Superior, Wisconsin. It was listed in 1987 as an AOC due to large amounts of suspended solids, nutrients, and biological oxygen demand discharged to the river from various industries and communities. The majority of the BUIs for the St. Louis River AOC are related to historical habitat loss from extensive wetland filling, dredging of shallow aquatic habitat, and inputs of harmful chemicals that have contaminated the sediments and water in the river and its estuaries. The purpose of the proposal is to utilize dredged materials from the Federal navigation channel in association with habitat restoration to remove beneficial use impairments (BUIs) from the St. Louis River Area of Concern (AOC). These activities are consistent with achieving the restoration goals set forth in the *St. Louis River Area of Concern Implementation Framework: Roadmap to Delisting (Remedial Action Plan Update)*[1] *dated July 15, 2013* (hereafter: Roadmap to Delisting).

[1] Available online at http://www.pca.state.mn.us/index.php/view-document.html?gid=19677

The three proposed dredged material placement/aquatic restoration sites encompass approximately 960 acres in a near-continuous length of shoreline approximately 3.5 miles in length. Design is proposed to create open water flats and shallow sheltered bays through appropriate placement of Federal navigation channel dredged materials. This letter provides our comments on the scoping document pursuant to the National Environmental Policy Act (NEPA), the Council on Environmental Quality's NEPA Implementing Regulations (40 CFR 1500-1508), and Section 309 of the Clean Air Act. With the limited information provided, EPA offers the following comments when preparing the Draft EA for the proposed project.

Background Information and Purpose & Need

- EPA recommends that the forthcoming Draft EA identify and substantiate the need for the project, its purpose(s), and the preferred alternative. The purpose and need statements for the proposed action should be clear and concise for reviewers of the Draft EA. After underlying problems have been identified and substantiated, the alternatives identified to address/solve the underlying problems should then be identified and explained. The no-action alternative and all action alternatives that would satisfy the substantiated purpose and need should be fully assessed in the Draft EA. The Draft EA should also identify any alternatives considered but dismissed from further consideration (if applicable), and should provide elimination criteria and clear explanations for their early elimination.

- In the Draft EA, please provide an appropriate amount of background information on the St. Louis River AOC in the vicinity of the proposed project. The Draft EA should also include baseline information on interagency coordination efforts (of which USACE was a partner) that have been taken to address beneficial use impairments in the AOC Specifically, EPA recommends that USACE provide information on the St. Louis River Alliance, the completion of the Lower St. Louis Habitat Plan, discussion and identification of the 21st Avenue embayment area as a "Remediation-to-Restoration" project, and additional information on sampling taken between summer 2011 and fall 2012 by the University of Minnesota – Duluth's Natural Resources Research Institute (NRRI).

- The Draft EA should include information on both existing and proposed future conditions in the three areas of proposed dredged material placement/aquatic habitat restoration.

- EPA has reviewed the Roadmap to Delisting document, and has the following comments about this document and its connection to the forthcoming Draft EA:
    - Figure 5 – Habitat Restoration Projects in the AOC (page 19) shades the three proposed aquatic restoration sites in yellow, which are noted as "remediation not generally warranted but management actions must consider presence of contaminants, especially bio-accumulative contaminants." The Draft EA should discuss the potential for contaminants in these sites and how implementation of any proposed action could affect existing contaminants.
    - Figure 6 – Sediment Sampling Needs (page 24) notes an area in the 40th Avenue West Complex ("Ponds Behind Erie Pier") as "additional characterization and assessment needed to determine if remedial action is necessary." These ponds are included as part of the project area in Enclosure 3 of the Scoping Document. The Draft EA

should include appropriate background information on these ponds behind Erie pier, including the status of the characterization and assessment needed there, and how any characterization or contaminants found in this part of the 40th Avenue West complex may require project modification or remediation before implementation.

- USACE's previous 21st Ave West Embayment pilot project NEPA documentation stated that dredged material placement would help in determining the feasibility of full scale aquatic ecosystem restoration and help toward delisting the site from being part of the existing AOC. In the Draft EA, please provide additional information and discussion on how the proposed project would assist in delisting these sites from being part of the larger AOC.

- In addition to inputs from Miller Creek and Coffee Creek, the 21st Avenue Embayment also receives direct effluent from the Western Lake Superior Sanitary District (WLSSD) Treatment Plant. The U.S. Fish and Wildlife Service has previously noted that potential issues associated with the effluent from WLSSD include increased temperatures, which result in year-around open water near the plant, as well as potential loading of nutrients and chemicals of emerging concern, such as personal care products and pharmaceuticals. This input, and the potential for these issues to affect restoration efforts and the success of the proposed project, should be discussed in the Draft EA.

Aquatic Habitat/Spawning Areas/Water Quality

- The scoping document does not present any information on how the placement of dredged materials in the three areas as shown on the submitted figures will restore these embayments. On January 2, 2013, and March 13, 2013, EPA provided comments on the related 21st Avenue West Embayment Pilot project for aquatic habitat restoration. As in our previous comments, EPA requests during development of the Draft EA that USACE provide factual data on existing habitat types and quality, as well as specific information on how aquatic habitat is expected to increase due to project implementation, and how USACE proposes to provide substantive measurement of embayment restoration.

- The Draft EA should discuss and show (i.e. via sediment, elutriate, biological, and bioaccumulation testing, etc.) how in-water placement of dredged materials will not cause an adverse impact on biota or water quality." EPA requests written confirmation from the Minnesota Pollution Control Agency (MPCA) to this effect be included in the Draft EA.

Use of Dredged Material as Fill

- Scoping information provided to EPA did not include descriptions of future (proposed) conditions at the three identified phased locations or the amount (cubic yards) of dredged material that will be necessary for construction of each phase of the project. The scoping document did not provide background information on where dredging will occur (including maps of specific dredging locations), how dredged materials were or will be tested to ensure they are both suitable for open water disposal and also meet Minnesota Water Quality Standards, or how dredged material will be transported to the project sites. As the Draft EA

is developed, EPA recommends that this information be developed and included in the document.

- It is not clear if the project proposal is to create wetland areas or upland areas in the locations of proposed dredged material placement. EPA requests that the Draft EA further discuss what is meant by the creation of "open water flats" and "shallow sheltered bays" and the acreages of each proposed to be created. As noted in the 21st Avenue West Embayment Pilot Project, EPA would be concerned about a proposal involving the creation of significant acreages of upland within the St. Louis Bay at the phased areas submitted with your cover letter. EPA supports additional measures to increase the quality and areas of aquatic habitat within the St. Louis Bay and measures that support removal of AOC BUIs. In the Draft EA, please explain in more detail how this open-water-fill proposal came to fruition, what alternatives have been and are being studied, the implications of the no-action alternative, why and how this proposal was developed (including its relation to the 21st Avenue West pilot project), how it will support remediation of BUIs, and why it will provide better habitat than the open water lake habitat currently in place.

- The Draft EA should discuss the source location for the proposed dredged materials to be used as fill, and include narrative information and a map showing the source location of the dredged materials.

Threatened and Endangered Species

- The scoping document states that several Federally-listed endangered, threatened, proposed endangered, and proposed threatened species and their critical habitat are within the vicinity of the project. Specifically, the rufa red knot (proposed for listing as a Federally-threatened species) may be adversely affected, but is not likely to be adversely affected, by implementation of the proposed project. The scoping document also states that USACE will work with the U.S. Fish and Wildlife Service (USFWS) and the Minnesota Department of Natural Resources (MnDNR) to ensure that adverse impacts to existing critical habitat of the Federally-listed piping plover will be avoided. The Draft EA should discuss how implementation of the Preferred Alternative (including implementation of any required wetland mitigation measures) will or could affect the rufa red knot, the piping plover, or any other Federal- or state-listed species endangered, threatened, or proposed as endangered or threatened species.

Diagrams/Illustrations/Maps

- Please ensure that the Draft EA includes cross-sections of each proposed fill area.

- Please ensure that the Draft EA includes a figure of the fill areas utilizing a recent aerial photo as a backdrop.

- Existing and proposed water depths were not specified in the scoping document. EPA assumes USACE has this information and will provide it in the Draft EA, and also assumes

USACE's information is based on bathymetric maps. Please include bathymetric maps/surveys completed for the restoration areas as an enclosure with the Draft EA.

Management/Monitoring

- Open-water restoration efforts to be undertaken by other USACE districts in the Great Lakes basin have proposed utilization of the Lacustuary Qualitative Habitat Evaluation Index (LQHEI) method to score each potential restoration site. EPA supports use of such a qualitative metric to score both baseline and restoration conditions. In the Draft EA, please provide narrative information on the type of proposed metric to be utilized for management/monitoring. EPA expects baseline measurements will be taken and utilized for comparison during monitoring.

- In the Draft EA, please provide information on funding available for monitoring up to Year 5 or Year 10 (post-construction) that will also allow for adaptive management, maintenance, and monitoring of the restoration sites. EPA recommends that detailed information on maintenance and monitoring of the restoration sites be included in the Draft EA.

- EPA recommends that timeframes (however preliminary they may be) for sediment characterization, site selection, restoration plan development, and construction/implementation/planting be included in the Draft EA.

- The Draft EA should discuss how wind fetch may affect the ability for vegetation to take hold and succeed in proposed restoration areas. EPA is concerned that wind fetch, which is a surrogate for wave energy, in combination with other potentially expected limitations to expected vegetation growth in restoration areas, including bird herbivory may contribute to low levels of vegetative restoration success. EPA requests that wind fetch and bird herbivory of aquatic plants be discussed with regard to their potentials to affect restoration success.

Construction Impacts

- EPA recommends that the forthcoming Draft EA recommend specific measures and best management practices (BMPs) that will be undertaken to minimize construction impacts to air quality, water resources, soil, and other regulated resources. The Draft EA should discuss proposed construction measures, including a discussion of staging areas and their locations, access to the worksite(s), and a discussion of staging and access for in-water construction and fill placement. EPA recommends that equipment work from barges in the waterway, and that dewatering measures such as temporary portable dams or cofferdams be installed to isolate active work areas during construction.

Permitting/Agency Coordination

- The Draft EA should include a list of all Federal, state, and local permits that will be required to undertake the proposed actions. This may include Minnesota Pollution Control Agency 401 Water Quality Certification, Minnesota Public Waters Work Permits, floodplain alteration permits, and coastal zone consistency reviews. If communication with these

agencies is already underway, which EPA recommends, copies of correspondence sent to and received from these agencies should be included in the Draft EA.

- In the Draft EA, please provide correspondence from agencies with oversight on this project, including the USFWS, the State Historic Preservation Office, the MnDNR, and others. In the Draft EA, please include a list of all required as well as voluntary measures undertaken, underway, or planned to be taken by USACE with each agency regarding permitting requirements and any efforts to be taken with regard to early coordination.

- If construction plans are available, please include them with the Draft EA. EPA understands that construction plans may be draft or at less than 100% design.

Wetlands

- It is unclear if a wetland delineation has been completed or is planned to be completed. EPA recommends that USACE regulatory staff make a field visit and determination regarding whether or not wetlands are present adjacent to areas that may be used for staging or for water access.

Thank you for the opportunity to review and comment upon this scoping document. We are available to discuss our comments with you in further detail if requested. We look forward to reviewing future NEPA documents prepared for this project. If you have any questions about this letter, please contact Ms. Liz Pelloso, PWS, of my staff at 312-886-7425 or via email at pelloso.elizabeth@epa.gov.

Sincerely,

Kathleen Kowal

for Kenneth A. Westlake, Chief
NEPA Implementation Section
Office of Enforcement and Compliance Assurance

cc: Zach Jorgenson, USFWS-Twin Cities Field Office
Josh Fitzpatrick, USACE-St. Paul
Kevin Molloy, MPCA
Diane Desotelle, MPCA
Cliff Bentley, MnDNR
Rian Reed, MnDNR
Patricia Fowler, MnDNR
Cherie Hagen, WDNR
Rick Gitar, Fond du Lac Reservation