AGP/NORTHLAND PIER DECISION SUMMARY
MINNESOTA POLLUTION CONTROL AGENCY
SITE REMEDIATION UNIT 2

Site Name: AGP/Northland Pier Slip
Address: Duluth, Minnesota 55802
SR /AI Number: SR0001013/Al191640
Project Manager: Steven M. Schoff
Technical Analyst: Mike Bares

STATEMENT OF PURPOSE
This Decision Summary presents the selected remedial action for the AGP/Northland Pier Slip section of the St. Louis River Area of Concern (SLRAOC) and summarizes the facts and determinations made by the Minnesota Pollution Control Agency (MPCA) in approving the selected response actions. The response actions were designed to minimize or remove exposure to sediment contaminants that bioaccumulate in the food chain to levels that are protective of human health and the environment. MPCA is proposing to conduct limited dredging and removal of contaminated sediments above cleanup levels followed by capping and arming, in order to minimize risks to human health and the environment and to be protective in the long term.

SITE BACKGROUND AND HISTORY
AGP/Northland Slip is an approximate 8.4-acre active shipping slip in the Duluth Harbor basin within the inner portion of the Duluth Harbor located in the eastern side of Rice’s Point. It is located near the mouth of the St. Louis River in the Duluth Superior-Harbor within the boundaries of the SLRAOC. Historical releases of contaminants resulted in sediment contaminated with lead, polycyclic aromatic hydrocarbons (PAHs), polychlorinated biphenyls (PCBs), mercury, cadmium, copper, zinc and other metals. Due to these releases, the MPCA identified the AGP/Northland Slip a san area requiring remedial action to address contamination, a “Remedial Action Area”, for the SLRAOC.

The AGP/Northland Slip and surrounding area is highly industrialized as it has been for over a century. Current Slip tenants include a marine construction company which rents the south side and a bituminous contractor company on the northern side of the AGP/Northland Slip.

SITE HISTORY
The AGP/Northland Slip has undergone several physical modifications since European settlement of the area. The area encompassing the northern section of the Duluth Harbor was initially marshland. Modern development of the harbor began after 1861. Construction of the Duluth Ship Canal was started in 1870, thereby providing a Duluth entry into the harbor from Lake Superior.

The Duluth-Superior Harbor, which connects to Lake Superior, has a long history of serving the manufacturing and shipping needs for the Duluth-Superior Region and has been home to significant historical heavy industry including paper mills, coal gasification plants, and steel processing. The Duluth-Superior port remains active in the transportation of iron ore, coal, limestone, and grain, and is the largest port on the Great Lakes in terms of shipping volume.
The U.S. Army Corps of Engineers Maritime Museum in Duluth retains several historical photos of the AGP/Northland Slip and harbor development over time.

DESCRIPTION OF CONTAMINANTS

In 2010-2011 The United States Environmental Protection Agency (EPA) and United States Army Corps of Engineers (USACE) conducted an extensive sediment characterization project in the St. Louis River AOC. MPCA used the AOC-wide sediment characterization data as a baseline for its planning level analysis of the assessment data, which determined areas of the SLRAOC in need of remediation, additional investigation, or restoration. The MPCA conducted an investigation of sediment quality in the Slip as documented in the 2015 Remedial Investigation Report for the Slip. Based on this study the AGP/Northland Slip has been identified as a Remedial Action Area for the SLRAOC where remedial action to mitigate contaminated sediments is needed. Contaminants present include PAHs, lead, arsenic, copper, mercury, zinc, cadmium, and PCBs. Total PAHs are the primary chemical of concern (COC) for the AGP/Northland Slip. The MPCA estimates the volume of contaminated sediment to be about 22,000 cubic yards within the 1.5 acre remedial area in the head of the 8.4 acre slip. The AGP/Northland Slip is a high priority for remedial action in the SLRAOC based on:

- Exceedance of the mid-point Sediment Quality Target (SQT) for PAHs over a 1.5-acre area of the 8.4-acre slip.
- Presence of bio-accumulating contaminants, including PAHs, mercury, and PCBs that contribute to fish advisories in the SLRAOC.
- Large continuous area of bioactive zone sediments and benthic habitat impacted by contaminants.
- Presence of exposed contaminated sediments vulnerable to erosion and re-suspension in the slip.
- High potential for continued development of this area for commercial use.

Contaminated sediment was generally identified in the head of the AGP/Northland Slip and considered to present a high likelihood of significant effects to benthic invertebrate communities from exposure to contaminated sediments at the AGP/Northland Slip.

<table>
<thead>
<tr>
<th>Contaminant Of Concern</th>
<th>Level 1 SQT</th>
<th>SQT Midpoint Cleanup Level</th>
<th>Level 2 SQT</th>
<th>Units</th>
<th>Number Sample Stations</th>
<th>Stations &gt; Level 1 SQT</th>
<th>Stations &gt; SQT Midpoint</th>
<th>Stations &gt; Level 2 SQT</th>
<th>Maximum Conc. Detected</th>
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<tr>
<td>Total PAHs</td>
<td>1600</td>
<td>12,300</td>
<td>23,000</td>
<td>μg/kg</td>
<td>97</td>
<td>42</td>
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<td>Lead</td>
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<td>97</td>
<td>15</td>
<td>3</td>
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<tr>
<td>Zinc</td>
<td>120</td>
<td>290</td>
<td>460</td>
<td>mg/kg</td>
<td>97</td>
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<td>1</td>
<td>1</td>
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</tbody>
</table>

μg/kg = micrograms per kilogram
mg/kg = milligrams per kilogram

The MPCA did not conduct fish tissue or other biological studies specifically for Slip; however, the Minnesota Department of Health (MDH) placed fish consumption advisories for mercury and PCBs for the water bodies that comprise the SLRAOC. Completing remedial actions that eliminate or significantly reduce the exposure of benthic organisms to legacy contaminated sediments in the AGP/Northland Slip will contribute to meeting the SLRAOC goals for this beneficial use indicator.
As identified in the St. Louis River Remedial Action Plan (RAP, 2016) and later verified in the Final Sediment RI Report AGP/Northland Slip, dated November 2015, the Slip is contributing to the following beneficial use impairments to the SLRAOC:

1) Restrictions on dredging  
2) Fish consumption advisory  
3) Degradation of the benthos environment

As recommended by the RAP, areas that are contributing to river sediment impairments should be addressed through remedial activities. In addition, the St. Louis River, including the Duluth/Superior Harbor, is listed as impaired water on the Clean Water Act 303(d) list for bioaccumulative toxins. Toxins include mercury, PCBs, and pesticides (DDT, dioxin, etc.). According to the MPCA, it is recommended by many programs that bioxins be reduced within the St. Louis River estuary and harbor. Removing or isolating the contaminated sediments from the surface water/sediment interface will help in the reduction of the impaired water resulting from bioaccumulative toxins in the SLRAOC.

Risk to human health
The AGP/Northland Slip is within an active harbor surrounded by commercial properties. Exposure from contaminated sediments to the public is limited given the depth to sediments within the AGP/Northland Slip. No public swimming or wading is permitted or practical, and AGP/Northland Slip does not serve as a public water supply. All information to date indicates that the proposed future use of the AGP/Northland Slip is consistent with the current use. The major contaminant PAHs, are generally non-volatile and not emitted from the waters of the AGP/Northland Slip; therefore, the only remaining pathway for human exposure to contamination from the AGP/Northland Slip is fish consumption. The relatively small size and consistent deep water does not provide significant high quality fish habitat; however, fish consumption advisories are in effect for selected fish species in the SLRAOC due to elevated concentrations of PCBs and mercury found in fish tissue (MDH, 2000). There is a potential that contaminated sediments in the AGP/Northland Slip are contributing bioaccumulative contaminants into the fish food chain and contributing to the overall impaired use in the SLRAOC. In summary, risk to human health from contaminated sediments in the AGP/Northland Slip is low.

Ecological risks
The depth to which benthic and other higher trophic level organisms can penetrate sediment varies, but for water depths of greater than 2.5 meters at the nearby St. Louis River Interlake Duluth Tar Superfund Site, the maximum potential penetration depth was estimated to be 0.5 meters, with the majority of the activity within the upper 15 centimeters. Accounting for the root penetration of aquatic plants increases the depth of penetration of all flora and fauna up to a depth of 1.0 meter or greater. Where water depths are less than 2.5 meters, higher trophic level organisms have the potential to penetrate the sediment to a depth of 1.0 meter or greater. Root penetration by aquatic plants has the potential to increase the maximum depth that burrowing benthic organisms can penetrate to approximately 1.0 meter. Deeply rooted shallow water and emergent aquatic and terrestrial plant roots can penetrate and be exposed at 1.0 meter or greater. Since post remedy water depths in the AGP/Northland Slip will be greater than 2.5 meters the sediment interval of greatest relevance for ecological exposure is the top 0.5 meters. It should be noted that no recent investigation of the AGP/Northland Slip has found the presence of aquatic plants growing in the sediment.

There are limited pathways by which ecological receptors might be exposed to contaminants in the sediments at the AGP/Northland Slip. Direct environmental exposure pathways include direct contact with contaminated sediments or water by benthic invertebrates and fish, and ingestion of sediments by
sediment dwelling organisms and fish, which feed on invertebrates living in sediment. Indirect exposure pathways include ingestion of invertebrates by fish, or fish that have bioaccumulate sediment contaminants in their tissues.

The limited screening ecological risk assessment prepared for the detailed investigation was conducted by comparing the sediment chemistry results with the Level 1 and Level 2 SQTs (Crane et al, 2000). SQTs are contaminant values that represent a level of protection of sediment-dwelling organisms. Level 1 SQTs identify chemical concentrations, which will provide a high level of protection for designated water uses, specifically for aquatic life. By comparison, a lower level of protection for designated water uses will be provided by the Level 2 SQTs. Therefore, goals of the SQTs developed for the protection of sediment dwelling organisms are:

- Level 1 SQTs are intended to identify contaminant concentrations below which harmful effects on sediment dwelling organisms are unlikely to be observed.
- Level 2 SQTs are intended to identify contaminant concentrations above which harmful effects on sediment-dwelling organisms are likely to be frequently or always observed.

Based on a comparison of the available analytical data and SQT values, the contaminants detected in the AGP/Northland Slip sediments exceeding the SQT values are considered a risk to the benthic community and the larger ecological environment, where they are found in the top meter of sediment.

**SELECTION AND DESCRIPTION OF REMEDY**

As the MPCA staff evaluated potential remediation options for the AGP/Northland Slip, the following remedial action objectives (RAOs) were established that should be accomplished by the remediation project.

1. Minimize or remove exposure to sediment contaminants that bioaccumulate in the food chain and contribute to fish consumption advisories.
2. Minimize or remove exposure of the benthic organisms to contaminated sediments above the preliminary sediment cleanup goals.
3. Preserve water depth to enable the current use of the AGP/Northland Slip.
4. Enhance deep-water aquatic habitat if conditions allow.

A Focused Feasibility Study (FFS) was completed in 2016 to evaluate alternatives to remediate contaminated sediments that represent a risk to the aquatic community that was identified in the 2015 Remedial Investigation. Alternatives were identified and screened to determine if they meet the RAOs. The following alternatives were evaluated in this FFS:

**Alternative 1: No Action** — The No Action Alternative reflects the site conditions described in the baseline risk assessment and remedial investigation. The No Action Alternative included within this FFS does not include any treatment or engineering controls, institutional controls (ICs), or monitoring. There are no costs associated with the No Action Alternative. A No Action Alternative applied to the AGP/Northland Slip would not meet criteria for protection of human health and the environment, but is included as an alternative for comparison purposes.

**Alternative 2: Monitoring and Institutional Controls** — This alternative does not provide any immediate improvement to protectiveness but is included as a possible placeholder to be used as an interim response. An interim response may be required should funding sources be unavailable until a later date or be distributed based on-site prioritization. The monitoring and ICs alternative would consist of
evaluating trends in sediment chemical concentrations, sediment toxicity, and COC bioaccumulation within aquatic organisms (i.e., benthic organisms) over time. ICs appropriate for maintaining protectiveness of human and environmental health would be implemented, if applicable, until sufficient contaminant degradation, transformation, isolation, or other natural recovery processes reduce Site-related risks to acceptable levels; however, natural recovery of contaminated sediments is not anticipated within a reasonable time frame at the AGP/Northland Slip, or should an alternative remedy be implemented.

**Alternative 3: Cap and Armor**—This alternative would consist of constructing a 0.95-meter thick cap (sand plus armor; 3.1 feet) over approximately 1.5 acres with sediment concentrations exceeding the cleanup level (CUL; Midpoint SQTs) for COCs. Prior to cap construction, a limited amount of sediment “grading” may be conducted to prevent excessive gradients and/or excessively shallow areas after cap construction. Armoring will be completed across the entire cap to prevent scouring due to prop wash as the AGP/Northland Slip is actively used and the entire slip is subjected to intense wave action. Approximately 5,200 cubic yards of sand and 2,400 cubic yards of appropriately sized armor material will be used for the cap and armoring. Following cap construction, ICs will be implemented to protect the capped area.

**Alternative 4: 1-Meter Dredge, Cap, and Armor**—This alternative would consist of dredging 1.0 meter (3.3 feet) of sediments exceeding the CUL, in a 1.5-acre area, and capping. Total cap thickness will be 0.95-meter, sand plus armor. The dredged sediments would be transported by barge to a staging area, stabilized with amendment materials as needed, transported by roadway, and disposed of at an off-site landfill. The benefits of dredging 1.0 meter prior to cap placement would be offsetting draft loss due to capping. Armoring will be completed across the entire cap to prevent scouring due to prop wash as the AGP/Northland Slip is actively used. Total dredge sediment volume is anticipated to be 7,900 cubic yards. Approximately 5,200 cubic yards of sand and 2,400 cubic yards of appropriately sized armor material will be used for the cap and armoring. Following cap construction, ICs would be implemented to protect the capped area.

**Alternative 5: Dredge with Thin-Layer Cover**—This alternative would consist of complete removal of all sediments exceeding the CUL in a 1.5-acre area. The dredged sediments would be transported by barge to a staging area, stabilized with amendment materials as needed, transported by roadway, and disposed of at an off-site landfill. Following sediment removal, a 0.15-meter (0.5 feet) thin-layer sand cover would be placed to reduce surface concentration of dredge residuals through mixing of the upper sediment layer. The total dredge volume is anticipated to be 24,000 cubic yards (including over dredge); however, this volume may increase based on pre-design vertical delineation results. Approximately 1,200 cubic yards of sand will be used for thin-layer cover. ICs and a long-term monitoring program would not be implemented following completion of remedy construction if complete removal of contaminated sediments were achieved.

The FFS included a comparative analysis to identify and compare advantages and disadvantages of each of the alternatives. This evaluation was done using the National Oil and Hazardous Substances Pollution Contingency Plan (NCP) remedy selection criteria in general accordance with EPA guidelines for feasibility studies (EPA, 1990) which divides criteria into three groups.
1. **Threshold Criteria**, which relate to federal statutory requirements that each alternative must satisfy in order to be eligible for selection and including:
   - Overall protection of human health and the environment in both short and long term.
   - Compliance with applicable or relevant and appropriate requirements (ARARs) under federal, state, or local environmental laws and regulations.

2. **Primary Balancing Criteria**, which are the technical criteria upon which the detailed analysis is based on, including:
   - Long-term effectiveness and permanence.
   - Reduction of toxicity, mobility, or volume through treatment.
   - Short-term effectiveness.
   - Implementability.
   - Costs.

3. **Modifying Criteria based on state agency and community acceptance.**

**THRESHOLD CRITERIA**

Only those alternatives that would meet the threshold criteria of providing overall protection of human health and the environment were carried forward with the comparative analysis. Alternative 1 and Alternative 2 are not protective of human health or the environment, but were carried forward. Alternative 1 is required for analysis under the NCP. Should anticipated future Site use change, Alternative 2 may provide an interim alternative in which monitoring is completed while future use and a suitable alternative are determined. Alternatives 3, 4, and 5 would adequately protect human health and the environment from unacceptable risks posed by hazardous substances, pollutants, or contaminants present at the Site. Alternatives 3, 4, and 5 would eliminate, reduce, or control exposure to contaminated sediment; however, contaminated sediment would remain in-place under Alternatives 3 and 4 requiring monitoring to ensure long-term effectiveness. Alternative 5 would provide the highest level of protection, since contaminated sediments would be removed from the aquatic environment.

**BALANCING CRITERIA**

**Long-term effectiveness and permanence**

Alternative 1 and Alternative 2 are not effective in the long-term or permanent. Alternatives 3 and 4 are effective in the long-term. However, contaminated sediment would remain in place under Alternatives 3 and 4, requiring long-term operation and maintenance (O&M) and ICs to ensure long-term effectiveness; therefore, they are not as permanent. Disposal of sediment at an off-site landfill would be equally effective in the long-term. Since all contaminated sediments would be removed, Alternative 5 would provide the most permanence, even though contaminants would not be permanently destroyed.

In summary, Alternative 5 will provide a high achievement of this criterion by removing all of the contaminated sediment in the aquatic environment above the CULs. Alternatives 3 and 4 will provide a moderate and moderate to high achievement of this criterion, respectively. Alternatives 3 and 4 isolate contaminated sediments through capping, more over Alternative 4 removes approximately 1 meter (3.3 feet) of contaminated sediment in the aquatic environment above the CUL. Alternatives 1 and 2 provide no achievement of these criteria. No physical barriers or contaminated sediment removal occur in these alternatives.

**Reduction of toxicity, mobility, or volume through treatment**

Treatment of contaminants sediments to reduce toxicity, mobility, or volume is not a major component of any of the evaluated alternatives. However, with Alternatives 4 and 5, the addition of a solidification
agent to dredged sediment is proposed as a means to bind excess free water. Addition of the solidification agent would indirectly reduce the toxicity and mobility of sediment disposed of at an off-site landfill.

Therefore, removal of contaminants from the aquatic environment and treatment of the sediments would provide a reduction in toxicity and mobility of contaminants. Removal and treatment of the contaminants would be considered permanent.

Alternatives 1, 2, and 3 would not provide a reduction in the toxicity, mobility, or volume through treatment. Alternative 4 removes a portion (1 meter) of contaminated sediment. In addition, for Alternatives 3 and 4 the contaminated sediment would be capped in-place, reducing the mobility of the sediment.

In summary, Alternative 5 will provide the highest achievement of this criterion by removing all of the contaminated sediment in the aquatic environment above the CULs. Alternative 4 would be the next highest with partial removal of contaminated sediment. Some contaminated sediment would remain in place underneath a 0.95-meter cap (3.1 feet). Alternative 3 will provide a moderate achievement of this criterion, since contaminated sediment would remain in the aquatic environment underneath a 0.95-meter cap. Alternative 1 and 2 provide the lowest achievement of this criterion as no reduction in mobility is provided.

**Short-term risks**

There are no short-term risks associated with Alternatives 1 and 2 as no actions would be implemented at the Site. The rest of the alternatives would have some short-term risks during implementation of the remedy. Alternatives 3, 4 and 5 require varying amounts of dredging/capping that may impact short-term effectiveness. The potential short-term risks increase as the volume of contaminated sediment to be dredged increases due to additional coordination. The potential short-term risks to the community and workers with Alternatives 4 and 5 are associated with increase boat/barge traffic, safety, noise, and related impacts due to working in the Duluth Harbor and other publicly accessible locations. There are also potential short-term risks to workers from dust created from stabilization agents that are stockpiled and mixed. Truck transportation of dredged sediments to an off-site landfill would also have an increase in the short-term risks to the community and workers.

Short-term adverse effects to aquatic habitat and biota would be similar among Alternatives 3, 4, and 5, and would include displacement of fish and smothering of benthic organisms; however, Alternative 3 would likely present less adverse effects since no dredging will take place only capping. Benthic organisms would be expected to be re-established for all alternatives within several growing seasons.

Short-term adverse effects to surface water may also occur during dredging and capping/habitat restoration activities. Surface water control structures have shown that they are reliable in minimizing these short-term adverse effects.

Short-term risks with dock wall stability during dredging operations for Alternatives 4 and 5 are also a concern and increase significantly with the total dredging option.

The time frame estimates do not include additional construction time that would be required at the staging area including: construction of a gravel staging pad, stabilization, and off-site transportation to a landfill (Alternatives 4 and 5).
Overall, Alternative 3 will have the highest achievement of the short-term effectiveness criterion followed by Alternatives 1 and 2. Alternatives 4 and 5 will have low achievement of short-term effectiveness criterion due to an increase in short-term risks from dredging, stabilizing, and hauling contaminated sediment.

**Implementability**

Dredging, capping, restoration, surface water control structures, as well as monitoring and O&M, that would be required under Alternatives 3, 4, and 5 are all technically feasible and implementable from an engineering perspective. These technologies have been implemented successfully at other sediment sites and could be readily implemented at the AGP/Northland Slip.

Dredging contaminated sediment with significant debris may pose additional but not insurmountable difficulties (Alternatives 4 and 5). Vertical extent of contamination is unknown at this time; extent of contamination may increase the difficulty to implement (Alternatives 4 and 5). Vertical extent of contamination should be defined prior to implementation of an alternative. In addition, there are concerns with the stability of the dock walls during dredging activities (Alternatives 4 and 5). Dock wall inspection should be conducted prior to implementing an alternative; this cost estimate is not included for Alternatives 4 and 5. There would be a higher risk to the stability of the dock walls under a total removal scenario (Alternative 5).

Implementability also includes administrative feasibility of the remedy. As with most sediment remediation activities, multiple State and Federal agencies and other stakeholders input is required, providing a lower achievement of administrative feasibility of implementing a remedy. Additional time will be required to obtain any necessary approvals and permits from other agencies. Both Alternatives 4 and 5 will require more coordination with other regulatory agencies than Alternative 3, as no off-site disposal will be required. Permits for capping, however, would be required for Alternatives 3 and 4.

In summary, Alternative 1 has no actions to be implemented, so will provide the greatest achievement of the implementability criterion. Alternative 2 has minimal actions implemented so will be the second most implementable. Alternative 3 is third easiest to implement since it requires no dredging. Alternative 5 will provide a low achievement of the implementability criterion. Alternative 4 includes implementability challenges associated with both Alternatives 3 and 5 as it is a combination of both technologies. Therefore, the partial removal scenario would likely provide the lowest achievement of the implementability criterion.

**Cost effectiveness**

Cost estimates developed for each alternative are included in the remedy descriptions of the FFS. The cost estimates include: capital costs, including both direct and indirect costs; annual O&M costs; and net present value of capital and O&M costs.

Several factors that could greatly affect cost could not be reasonably estimated during this FFS and are not included in the estimated costs. These factors, which should be evaluated during final design, include:

- Dock Wall Repair: The risks of damage to and stability of dock walls described within this report increases as dredging volume increases. The vertical area of dock wall to be exposed during dredging for Alternative 5 is larger compared to Alternative 4. The costs for repair of damage to larger areas of dock wall could be significant. Additional measures to ensure dock wall stability during construction should be considered during the design phase. These measures, however, could add both time and cost to the remedial actions.
• Sediment traps or other means of limiting incoming sediment to maintain appropriate water depth may be required; this need will be further evaluated in the design phase of this project. If sediment traps are implemented, long-term maintenance of these traps such as sediment removal will be required. Costs for installation and/or maintaining these sediment traps are not included.

• While this FFS assumes that Former Hallett Dock #7 will be used as a staging area for Alternatives 4 and 5, costs associated with preparing Former Hallett Dock #7 for staging use and renting it are not included in this estimate and could significantly impact the final cost.

• Additional costs for habitat enhancement materials are dependent on final design and are not included.

In summary, based on the cost estimates to date, Alternative 1 provides the lowest cost option, followed by Alternatives 2, 3, 4, and 5, respectively. Alternative 3 provides the most cost effective option that includes addressing contaminated sediments at the Site. Alternative 5 will provide the lowest achievement of the cost criterion.

MODIFYING CRITERIA
The modifying criteria, which includes state agency and community support and acceptance, were evaluated during the public notice period in July and August 2017 and at a public open house meeting held on July 20, 2017. Feedback received from stakeholders and the public during this period was limited with no current landowners attending the public meeting. MPCA actively engaged the AGP/Northland Slip landowners in meetings throughout 2017-2019. The MPCA has developed a modified Alternative 4 based upon the needs of the individual Slip landowners identified in these meetings while providing for an appropriate environmental clean-up.

GREEN SUSTAINABLE REMEDIATION CRITERIA

Greenhouse gas emissions
Alternative 1 would not produce greenhouse gas (GHG) emissions. GHG emissions production from Alternative 2 would be limited to equipment mobilized for periodic sampling. Alternatives 3, 4, and 5 would result in GHG emissions from the mobilization, operation, and demobilization of all fuel-powered construction equipment required to dredge and/or install the cap/cover. Alternatives 4 and 5 would also produce emissions during transport by water to the handling area and during transport by land to the disposal facility; however, Alternative 4 would produce less GHG emissions than Alternative 5 because the amount of dredging is less with Alternative 4. Reduction of emissions can be accomplished by using equipment that is compliant with the latest EPA non-road engine standards and retrofitting older equipment with appropriate filters.

Toxic chemical usage and disposal
Portland cement is the stabilization agent used for Alternatives 4 and 5. There are no other toxic chemical usage and disposal considerations associated with these alternatives.

Energy consumption
Alternative 1 would not consume fossil fuels. Alternative 2 would consume minimal fossil fuels for periodic sampling events. Alternative 3 would result in the consumption of fossil fuels for the mobilization, operation, and demobilization of all diesel-powered construction equipment associated with the installation of the cap material, considerably less than Alternatives 4 and 5. Alternatives 4 and 5 would result in the consumption of fossil fuels for the mobilization, operation, and demobilization of all diesel-powered construction equipment associated with the dredging, hauling, and disposal of the contaminated sediment and the installation of the cap/cover material. Because the amount of sediment...
removed in Alternative 4 is considerably less than in Alternative 5, the energy consumption for sediment dredging and hauling would be less than Alternative 5.

Use of alternative fuels
Alternative 1 would not require the use of alternative fuels. Biodiesel blended fuels (B10 or B20) could be used as a supplemental fuel source for all diesel powered construction equipment associated with Alternatives 2 through 5.

Water consumption
Alternative 1 would not require the consumption of water. There are few water consumption considerations associated with Alternatives 2 through 5. Alternative 2 would consume the least amount of water required to decontaminate personnel and sampling equipment. A minimal quantity of water would be required to decontaminate personnel and equipment during sediment dredging and/or capping activities with Alternatives 3, 4, and 5. Water treatment associated with dredging is not considered water consumption.

Waste generation
Alternatives 1 and 3 would not generate waste. Alternatives 4 and 5 would generate waste that includes the dredged contaminated sediments. Alternative 5 would generate more waste than Alternative 4 because all the contaminated sediment would be removed from the Site and disposed of.

COMPARATIVE ANALYSIS SUMMARY
The comparative analysis of alternatives narrative discussion and quantitation table did not clearly indicate a preferred alternative to address the contamination at the Site. Alternatives 3, 4, and 5 were protective of human health and the environment. No significant difference in the balancing criteria score was found between Alternatives 3, 4, and 5 other than cost. Alternative 1 was not protective and will not be selected or considered further. Alternative 2 is not protective although provides an interim alternative with continued monitoring. Should future Site use change, Alternative 2 could be implemented until future Site use is determined and an appropriate Alternative can be implemented. At this time, it is understood that future Site use will remain the same; therefore, Alternative 2 will not be considered further.

The modifying criteria, state/support agency acceptance, and community acceptance are assessed formally after the public comment period. Stakeholder and community input will provide valuable insight as the MPCA considers information for the selection of a preferred alternative. The MPCA will conduct outreach activities to resource managers, current slip users, the public and local units of government prior to the public comment period. Current slip user input could heavily sway which alternative is chosen if slip boat and large vessel traffic is determined to have specific draft requirements.

Based on the information provided in the FFS report and on input provided by adjacent property owners, comments from the public meeting and other stakeholders, the MPCA staff has selected Alternative 4: 1-Meter Dredge, Cap, and Armor as the preferred option for remediation of contaminated sediment in the AGP/Northland Slip. The Clean-up will not change the current bathymetry as need to maintain the current use of the slip. Some of the primary reasons for selecting Alternative 4 as the preferred option are summarized below.

- Alternative 4 is protective of human health and the environment, and, with adequate long-term maintenance, it provides the same level of protection and long-term effectiveness as Alternative
5. Alternative 4 would require long term monitoring and maintenance of remaining contaminated sediment and the protective cap.

- Alternative 4 reduces the risk of compromising the stability of dock walls that might be associated with the deeper dredging required for 5.
- Alternative 4, even with the addition of an approximately 28-inch cap, still allows for maintaining an adequate bathymetry for current uses of the AGP/Northland Slip.
- Primary stakeholders, including adjacent property owners support Alternative 4, which will not affect the current uses of the AGP/Northland Slip.

**DETAILED DESCRIPTION OF SELECTED REMEDIAL ALTERNATIVE 4: 1-Meter Dredge, Cap, and Armor**

Since development of the FFS, the AGP/Northland Slip remedial Alternative 4 has been further evaluated by a Federal Value Engineering team and project stakeholders. Based on feedback from these groups, some design details of the selected alternative have been modified from those presented in the FFS.

The selected Remedial Alternative 4 will consist of the dredging of sediments with COC concentrations exceeding CULs at the surface at the head of the slip and equal approximately 7,859 square feet. The area along the AGP dock with COC concentrations exceeding CULs will be dredged to a final elevation of 578.1 to allow placement of cap and armor while maintaining usable depth for current and future business use. The dredged sediments would be transported by barge to a staging area, stabilized with amendment materials as needed, transported by roadway, and disposed of at an off-site landfill. Once dredging is complete the area would be capped. The objective of capping sediments at the Site is to limit exposure of aquatic organisms to contaminated sediments, and thereby limit transfer of chemical contaminants to higher trophic organisms, and enhance the aquatic habitat in a manner that contributes to the removal of BUIs if conditions allow. The cap design should be congruent with current and/or planned use of the Site. It should be noted that the cap would be constructed in areas of the Site currently suitable and/or used for mooring vessels; therefore, armoring will be completed across the entire cap.

Following cap construction, ICs would be implemented and long-term monitoring (LTM) would commence. The major components of the 1-Meter Dredge, Cap, and Armor Alternative are described in the following sections.

**Long-term monitoring**
LTM would commence after remedy implementation and would include collection of Site data to ensure that cap integrity is maintained as long as COCs remain in sediments above the CUL; ensure that ICs continue to be enforced as long as COCs remain in sediments above the CUL; and ensure that sediment contaminants are not migrating into or through the cap.

**Institutional controls**
ICs will be necessary to maintain the cap integrity because contaminated sediments will remain in-place with this alternative. ICs may include restrictions on dredging, boat depths, boat use that may erode cap materials, and large craft anchoring.

**Cost**
The costs associated with each alternative are presented as Class 4 (+50/-30) estimates and are appropriate for remedial design alternative evaluations only. The estimated total present value cost for the modified Alternative 4 is $4,710,000.
PUBLIC COMMENTS AND RESPONSES

On July 20, 2017, the MPCA held an open house for public review and comment on the AGP/Northland Slip alternatives. The MPCA published a request for comments on July 5, 2017 and accepted public comments through August 4, 2017. The MPCA reviewed each comment letter received, and categorized and summarized the significant comments, criticisms, and new relevant information in aggregate along with the MPCA staff’s response to those comments. The summarized comments and responses are provided in the table presented below.

<table>
<thead>
<tr>
<th>Summary of public comments and MPCA responses</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Comment:</strong> Alternative 3 or any clean-up choice that changes the current bathymetry would devalue property and not allow for the use of the Slip for ship delivery of products.</td>
</tr>
<tr>
<td><strong>Response:</strong> The MPCA appreciates your comments in regards to the proposed cleanup of AGP/Northland Slip. The MPCA has responded to this concern by selection of Alternative 4 as the MPCA preferred Alternative. Alternative 4 will provide adequate bathymetry and protects human health and the environment.</td>
</tr>
<tr>
<td><strong>Comment:</strong> Prefers a remedy that keeps the full length of the Slip available for future maritime use without added barriers and is an ideal way to clean-up the Slip to remove and dispose of contaminated material where feasible.</td>
</tr>
<tr>
<td><strong>Response:</strong> The MPCA understands the desire to remove contaminated material from the Slip. Limited dredging with capping is more economical than a full dredge. Alternative 4 will not affect the current use of the Slip and will be protective of human health and the environment.</td>
</tr>
<tr>
<td><strong>Comment:</strong> Prefers a remedy that removes all contaminated sediment from the Slip (Alternative 5), The long list of dangerous contaminates at this Site-leads us to believe removal should be a necessary step on the remediation process.</td>
</tr>
<tr>
<td><strong>Response:</strong> The MPCA understand the desire to remove contaminated material from the Slip. Limited dredging with capping is more economical than a full dredge. Alternative 4 will not affect the current use of the Slip and will be protective of human health and the environment.</td>
</tr>
</tbody>
</table>

MPCA site decision

The selected response actions are consistent with the Minnesota Environmental Response and Liability Act, Minn. Stat. §§ 115B.01 to .18, and are not inconsistent with the Federal Comprehensive Environmental Response, Compensation, and Liability Act, 42 U.S.C. § 9601 et seq and the National Contingency Plan, 40 C.F.R Part 300. I have determined the selected response actions are protective of public health, welfare, and the environment.

Kathryn J. Sather  
Division Director  
Remediation Division

10/11/2019  
Date