

FIVE-YEAR REVIEW REPORT FOR
ST. LOUIS RIVER SUPERFUND SITE
DULUTH, MINNESOTA



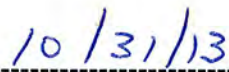
**Minnesota Pollution
Control Agency**

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LIST OF ACRONYMS

ACM	activated carbon mat
ARAR	Applicable or Relevant and Appropriate Requirement
CAD	confined aquatic disposal
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
COC	contaminant of concern
EM	environmental media
EPA	United States Environmental Protection Agency
FYR	Five-Year Review
ICs	Institutional Controls
ISRV	Industrial Soil Reference Values
LTM&M	Long Term Monitoring and Maintenance
MPCA	Minnesota Pollution Control Agency
NCP	National Contingency Plan
NPL	National Priorities List
O&M	Operation and Maintenance
OU	Operable Unit
PAH	Polycyclic Aromatic Hydrocarbon
PLP	Permanent List of Priorities
PRP	Potentially Responsible Party
RA	Remedial Action
RAO	Remedial Action Objectives
RD/RAP	Remedial Design/Response Action Plan
ROD	Record of Decision
SedOU	Sediment Operable Unit
Site	Superfund Site
SQG	Sediment Quality Guideline
SLRIDT	St. Louis River/Interlake/Duluth Tar
SOU	Soil Operable Unit
TBC	To Be Considered
TSOU	Tar Seeps Operable Unit
U.S. EPA	United States Environmental Protection Agency
USS	US Steel
VOC	volatile organic compound
yd ³	cubic yard(s)

EXECUTIVE SUMMARY

This report presents the Third Five-Year Review performed for the United States Environmental Protection Agency (USEPA) at the St. Louis River Superfund Site (SLR Site), located in Duluth, St. Louis County, Minnesota.

The SLR Site is comprised of two state Superfund sites: US Steel (USS) Site and St. Louis River/Interlake/Duluth Tar (SLRIDT) Site. The Third Five-Year addresses the following EPA Operable Units (OUs): EPA OU 02 (USS Site); EPA OU 01 (SLRIDT Tar Seep OU or TSOU); and EPA OU 03 (SLRIDT Soil OU or SOU). Although the two state Superfund sites are listed as one on the National Priorities List (NPL), they are separated by a distance of four river miles and they are listed separately on the State of Minnesota's Permanent List of Priorities (PLP).

Both sites are part of the USEPA Deferral Pilot Project and were placed under Minnesota Pollution Control Agency (MPCA) jurisdiction in 1995. The sites have separate project teams, are in different phases of investigation and remedy implementation, have different Responsible Parties (RPs), and different community group interests.

The remedial actions (RAs) performed in the 1990s addressed much of the gross contamination reducing the risk to human health and the environment. However, follow-up actions will be required for most of the completed RAs to ensure short-term and long-term protectiveness is maintained. In addition, sediment investigations and/or sediment RAs are still ongoing at both sites.

The report consists of this introductory section, Volume I (USS Site), and Volume II (SLRIDT Site). The issues and recommendations that must be addressed in response to the completed remedies are detailed in Section VIII of each volume and are summarized individually below. Protectiveness statements were developed for each OU at both sites as detailed in Section IX of each volume.

St. Louis River/US Steel Site

This is the third Five-Year Review (FYR) for the US Steel Superfund (Site) located in Duluth, St. Louis County, Minnesota. The purpose of this FYR is to review information to determine if the remedy is and will continue to be protective of human health and the environment. The triggering action for this policy FYR was the signing of the previous FYR on September 24, 2008.

The Site was an integrated steel mill (USX Duluth Works) consisting of coke production, iron and steel making, casting, primary rolling and roughing, hot and cold finishing, and galvanizing. The steel mill and coke production facility operated from 1915 until 1979 and made steel products such as nails, wire, and steel sign posts. In 1979, the blast furnaces, open hearth furnaces, fuel oil storage tanks, and a portion of the rolling mill were demolished. By 1988, the material storage area and most of the remaining buildings were demolished.

The U.S. Steel Site has 18 Operable Units (OU) within the 1989 Record of Decision (ROD) for remedial action, as well several other components that were not identified as OUs. Since the last review, one additional OU has been established for the Site. Protectiveness Statements were developed for all OUs at the Site.

Coke Plant Management Area

Contaminated areas associated with the coke plant are referred to as the Coke Plant Management Area and includes the following OUs:

- OU-A (Tar and Tar Contaminated Soil)
- OU-B (Contaminated Water in Tanks and Pipelines)
- OU-C (Solids in Large and Small Gas Holders)
- OU-D (Tar and Coking By-Products in Tanks)
- OU-E (Tar and Coking By-Products in Pipelines)
- OU-F (Polychlorinated Biphenyl [PCB] Liquids)
- OU-G (Ammonium Sulfate)
- OU-H (Lubricants, Paints, Solvents, Fuel Oils)

The Remedial Action (RA) for many of these areas involved excavation/removal and has been completed; however, the ROD did not establish TCLs for soils. The RA for OU-A specified the excavation/removal of the tar, tar-contaminated soil, and coking by-products for use as fuel; however, these materials and other contaminants not documented in the ROD are still present in several areas throughout the site at levels of concern. OU-A is the remaining OU in this group that is not protective.

Coke Plant Settling Basin Management Area

Contaminated water was routed from the settling basin on Steel Creek into the St. Louis River. The contaminated areas that were located within the watershed of Steel Creek were evaluated together and are referred to as the Coke Plant Settling Basin Management Area with the following OUs:

- OU-I (Non-Native Material in Settling Basin)
- OU-L (Creek Channel)
- OU-M (Delta and Creek Channel Area) and OU-N (Unnamed Creek Estuary)
- OU-O (Spit of Land)
- OU-J (Tar and Tar Contaminated Soil)
- OU-K (Dredge Spoil Material)
- Area between Operable Units I and J
- OU-S (crushed slag disposal and high pH area)

The RA in the ROD for OU-I, OU-L, OU-M, OU-O specified no action, subject to the completion of a PAH-treatability study to examine implementation of alternative and innovative treatment technologies; however, the ROD did not establish TCLs for soils or sediments. No action includes periodic inspections and routine water quality monitoring to verify the long-term effectiveness of the RAs. Further investigations in the aquatic based sediment units and OU-S were found not protective in the short and long term. OU-O is the only operable unit within the Coke Plant Settling Basin Management Area that is protective.

Wire Mill Settling Basin Management Area

Wastes from the “cold side” of the steel plant were discharged directly to the river through a small basin located adjacent to the St. Louis River. The contaminated areas that were located on the cold side were evaluated together and are referred to as the Wire Mill Settling Basin Management Area. OUs associated with the Wire Mill Settling Basin Management Area are as follows:

- OU-P (Wire Mill Pond)
- OU-Q (Dredge Spoil Area)
- OU-R (Wire Mill Pond Delta)

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The RA in the ROD for the Wire Mill Settling Basin Management Area (OU-P, OU-Q and OU-R) specified no action, subject to the completion of a PAH-treatability study to examine implementation of alternative and innovative treatment technologies. No action includes periodic inspections to verify that no significant changes have occurred and routine water quality monitoring to verify the long-term effectiveness of the RAs. Post-ROD sampling of estuary sediments showed that sediments were being re-worked by wave and storm events, resulting in a continuing source of contamination to the St. Louis River. Further investigations since 2008 in these units were found not protective in the short and long term.

St. Louis River/Interlake/Duluth Tar Site

This is the third Five-Year Review (FYR) for the St. Louis River/Interlake/Duluth Tar (SLRIDT) Superfund (Site) located in Duluth, St. Louis County, Minnesota. The purpose of this FYR is to review information to determine if the remedy is and will continue to be protective of human health and the environment. The triggering action for this policy FYR was the signing of the previous FYR on September 24, 2008.

The SLRIDT Site is within the West Duluth neighborhood of the city of Duluth, on the north bank of the St. Louis River, approximately four river miles upstream of Lake Superior. The Site includes approximately 255 acres of land and river bays, wetlands, and boat slips.

The Site has been used for industrial purposes since the late 1800s. From the 1880s to the early 1960s, Site operations included coking, coal tar refining, tar product manufacturing and by-product recovery gas production, and , iron production. During the years of operation, filling of the river was conducted to create the land on the 59th Avenue Peninsula. Fill was also used to form the 54th Avenue Peninsula. Discharges from the coking and pig iron operations flowed from the outfall pond/ditch of Keene Creek Bay to a southerly ditch, and finally to a 48-inch pipe at the southern end of the 54th Avenue Peninsula. Coking and pig iron industrial operations produced waste products such as coke, pig iron, coal tar, slag, sodium nitrate, and coal gas, while the tar waste products included coal tar, pitch, and oils.

Based on these industrial operations and waste products, the following three operable units of contamination were identified:

- **Tar Seeps Operable Unit (TSOU):** The tar seeps can be defined as amorphous, black residues from the coking process and other industrial activities characterized by high concentrations of Polycyclic Aromatic Hydrocarbons (PAHs). The selected remedy for the TSOU involved the targeted excavation and removal of four large tar seeps for fuel recycling, completed in March 1994. Because tar in Areas A and E could not be recycled, remediation in these areas was deferred for treatment in the Soil Operable Unit (SOU). Previous Five-Year Reviews concluded that TSOU remedial action is complete and is protective of human health and the environment, as intended by the Record of Decision (ROD).
- **Soil Operable Unit (SOU):** The RAOs for the SOU, as summarized in the ROD dated September 27, 1995, are to prevent current or future exposure to the contaminated soils and reduce the contaminant migration to ground-water. To achieve this objective, the ROD established soil cleanup levels based on contaminant leachability to groundwater and direct exposure to contaminant residue in the soil. Areas A and E were the locations of former tar distillation operations. In 1996 and 1997, approximately 14,700 cubic yards (yd³) of contaminated soil were excavated from 16 areas within Areas A and E and transported for off-site disposal. In 1997,

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approximately 30,400 yd³ of contaminated soil and debris were excavated and remediated from Areas B, C, D, and F. An additional area referred to the Maurice's Parking Lot had identified VOC soil contamination and was biovented until 2001. Additional soil-gas sampling in 2013 determined that vapor intrusion does not represent a significant risk to the building occupants in this area. The remedy is not protective based on the discovery of coal tar in Area E, tar seeps in Area B and tar layers found adjacent to the Southwest shoreline of Stryker Bay.

- Sediment Operable Unit (SedOU): There are three geographically separated areas of concern in the river within the Site impacted by contaminated sediments. A remedy for the SedOU was selected and presented in the August 2004 ROD for the SedOU. The selected remedy consists of a combination of environmental dredging, in situ capping, dredged sediment containment and institutional controls. During the last Five-Year Review, cleanup of the SedOU was ongoing. A majority of this work is now completed and will be discussed in detail later in this report. Based on the limited data collected to determine the performance of the remedy, the remedy is protective for the short term and will be long term protective when institutional controls and minor erosion issues are addressed.

Five-Year Review Summary Form

SITE IDENTIFICATION		
Site Name: St. Louis Superfund Site		
EPA ID: MND039045430		
Region: 5	State: MN	City/County: Duluth, St. Louis County
SITE STATUS		
NPL Status: Final		
Multiple OUs? Yes	Has the site achieved construction completion? No	
REVIEW STATUS		
Lead agency: State <i>[If "Other Federal Agency", enter Agency name]:</i> MPCA		
Author name (Federal or State Project Manager): Susan Johnson		
Author affiliation: State Project Manager		
Review period: 9/24/2008 – 9/23/2013		
Date of site inspection: 6/13/2013		
Type of review: Policy		
Review number: 3		
Triggering action date: September 24, 2008		
Due date (five years after triggering action date): September 24, 2013		

Five-Year Review Summary Form, cont'd

Issues For USS Site:

- OU-A: While some excavation has occurred, there are still tar pits, tar seeps, tar-contaminated soil, areas with oily liquids, and areas with contaminants exceeding MPCA human health risk values or ISRV (industrial soil reference values) throughout the Site. In addition, two contaminants, mercury and lead, have also been identified after adoption of the ROD at concentrations exceeding ISRV. All of these areas of soil contamination are designated as OU-A.
- Site Wide Trespassing: Signage has improved; however, trespassing was noted during site inspection. There were open excavations and manholes throughout the site and represent significant safety issues to trespassers as well as exposure to high levels of soil contamination.
- OU-E: A manhole and pipeline was identified during site inspection with product in it; soil surrounding this piping has not been assessed.
- OU-I: Sediment contaminants present an unacceptable risk to benthic organisms
- Area Between OU-I & OU-J: Oil sheens and tar globules observed; sediment contaminants present an unacceptable risk to benthic organisms.
- OU-J: Significant (more than 3') of slumping noted on sidewall of storage cell.
- OU-K: vegetation control requires additional control of live saplings to protect the cover integrity
- OU-L and OU-M: Sediment contaminants present an unacceptable risk to benthic organisms.
- OU-N and OU-R: Sediment contaminants present an unacceptable risk to benthic organisms.
- OU-P: Oil sheens regularly observed in pond; source material not controlled.
- OU-Q: Free product and oil sheens visible throughout wetlands; source material not controlled. Surrounding upland dredge material is also a source.
- OU-S: Soil with high pH levels exists and evidence of trespassing, including dust-generating activities such as motorcycling and four-wheeling, was noted. Unacceptable risk exists from direct contact, inhalation or ingestion of soil with high pH levels. Surface water has high pH and enters Steel Creek.
- Other - Unnamed Pond: Sediment contaminants present an unacceptable risk to benthic organisms; sheen previously observed.
- Other - Utility Structures: manholes and utility structures remain on the site.
- Other – Soils Contaminated by Above and Below Ground Petroleum Storage Tanks: Additional soil has been identified that is contaminated from storage tanks. These investigations are on-going through the petroleum program.
- Site Wide: Institutional controls have not been established to protect future users of the Site.

Recommendations and Follow-up Actions For USS Site:

- OU-A: Complete area investigations, then develop and implement a response action plan.
- Site Wide Trespassing: Improve site wide signage and stabilize open excavations.
- OU-E: Remove product and manhole, and assess surrounding soil.
- OU-I: Complete feasibility study; implement response action.
- Area Between OU-I & OU-J: Inspect and maintain booms. Complete feasibility study; implement response action.
- OU-J: Develop additional stability monitoring plan for the entire containment cell.
- OU-K: Improve vegetation control procedures.

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- OU-L and OU-M: Complete feasibility study; implement response action.
- OU-N and OU-R: Complete feasibility study; implement response action.
- OU-P: Complete feasibility study; implement response action.
- OU-Q: Complete feasibility study; implement response action.
- OU-S: Complete feasibility study; implement response action.
- Other Unnamed Pond: Complete feasibility study; implement response action.
- Other-Utility Structures: Evaluate, remediate and remove.
- Other – Soils Contaminated by Above and Below Ground Petroleum Storage Tanks: Complete investigations; implement response action.
- Site Wide: Establish ICs such as Environmental Covenants and ordinances.

Protectiveness Statement(s):

Protective:

The remedies at OU-B, OU-C, OU-D, OU-F, OU-G, OU-H and OU-O are protective of human health and the environment, as intended by the ROD. The materials associated with these OUs were removed and disposed or not action was necessary.

Not Protective:

Source material is uncontrolled and represents an unacceptable risk to human health, benthic communities and surface water.

- OU-A (Tar and Tar Contaminated Soil):** The remedy at OU-A is not protective because of the remaining soil contamination and unacceptable risk to human health.
- OU-I (Non-Native Material in Settling Basin):** The remedy at OU-I not protective as contamination presents an unacceptable risk to benthic organisms.
- Area Between OU-I and OU-J:** The remedy at the Area Between OU-I and OU-J is not protective as contamination presents an unacceptable risk to benthic organisms.
- OU-L and OU-M (Creek Channel and Delta):** The remedy at OU-L and OU-M is not protective as contamination presents an unacceptable risk to benthic organisms.
- OU-N and OU-R (Estuary Sediments):** OU-N and OU-R are not protective as contamination presents an unacceptable risk to benthic organisms.
- OU-P (Wire Mill Pond):** The remedy at the OU-P is not protective because oil sheens are regularly observed in the pond. Source material is uncontrolled.
- OU-Q (Dredge Spoils):** The remedy at the OU-Q is not protective because free product and oil sheens are visible throughout the wetlands, source material is uncontrolled and dredge material presents an unacceptable risk to benthic organisms and human health.
- OU-S (Crushed Slag Area):** The remedy at the OU-S is not protective because soil with high pH levels exists in soils and surface water. The contamination presents an unacceptable risk to human health risk through contact, inhalation or ingestion of high pH soil. Water with high pH is running off into a stream. The source material is uncontrolled.
- Other – Unnamed Pond:** The remedy at the Unnamed Pond is not protective because contaminants an unacceptable risk to benthic organisms and an oil sheen has been previously observed.

Short-term Protective:

The following units are short term protective and can achieve long term protectiveness when maintenance issues and investigations are completed.

- OU-E (Tar and Coking By-Products in Pipelines):** The remedy at OU-E currently protects human health and the environment because of the activities conducted to date; however, in order for the remedy to be protective in the long term contamination must be removed or isolated and not allowed to migrate.
- OU-J (Tar and Tar Contaminated Soil):** The remedy at OU-J currently protects human health and the environment because the contamination remains sequestered; however, in order for the remedy to be protective in the long term the cover stability must be monitored and repaired or reconstructed as needed.
- OU-K (Dredge Spoil Material):** The remedy at OU-K currently protects human health and the environment because of the cover installed over the contaminated soil; however, in order for the remedy to be protective in the long term, more aggressive vegetation control is needed.
- Other – Soils contaminated by above and below ground petroleum storage tanks:** Additional soil that is contaminated by above and below ground petroleum storage tanks has been identified at the site. Investigation of this soil is on-going; however, current exposure exists.

In general, additional and extensive investigation has found the No Action remedies as not protective for human health and the environment for a majority of the OUs for the short term and the future. Soil removals per the 1989 ROD are on-going and two feasibility studies are evaluating an array of response actions for the Coke Plant Settling Basin Management Area and Wire Mill Settling Basin Management Areas. ICs need for all OUs at the site.

Issues at SLRIDT Site:

- **SOU:** There is a tar seep, a stockpile of tar/soil generated during a utility excavation, and a tar-filled pit remaining on the EBI property in Area E. There is also a tar seep located near the northwest corner of Slip 6, within Area B.
- **SOU:** Institutional controls exist for a majority of the site; however, no Institutional Controls (ICs) have been developed for the EBI property within Area E.
- **SOU- Tar Layer and Drums near Radio Towers:** A tar layer and miscellaneous drums exist west of Stryker Bay near the Radio Towers. Because these materials were identified after the ROD, they were not included in the OUs. The tar layer has been delineated; however, remedial action is needed.
- **Sed OU:** Erosion channels have formed and are worsening in the northeast corner of Stryker Bay, in the northeast corner of Slip 6, and along the east side of Slip 6. The channels primarily exist in the native material, but are beginning to impact the surface of the caps in these areas. Riprap has been placed in the northeast corner of Slip 6; however, a new channel eroded around the riprap.
- **Sed OU:** ICs are not in place for capped aquatic areas or for conservation/buffer zones.

Recommendations and Follow-up Actions at SLRIDT Site:

- **SOU:** Assess these materials, then develop and implement a remedial action plan.
- **SOU:** Develop and execute ICs for the EBI property.
- **SOU- Tar Layer and Drums near Radio Towers:** Develop and implement a remedial action plan for these materials.
- **Sed OU:** Develop appropriate erosion controls for these areas to provide long-term protection of cap integrity.
- **Sed OU:** Develop and execute ICs to the capped aquatic areas to restrict sediment and cap disturbance, limiting activities such as anchoring, dredging or docking. Record conservation/buffer zones on appropriate deeds.

Protectiveness Statement(s):

Protective:

Tar Seeps OU: The remedy at TSOU is protective of human health and the environment, as intended by the ROD. The material from four tar seeps was removed and disposed. At that time, additional tar seep material was determined to be associated with the SOU. This remedy is complete and applies to the current use of the property; future development may require additional work as documented in the ICs.

Not Protective:

SOU: The remedy at SOU is not protective because of the tar seeps and tar contaminated soils found in several areas across the site. Remedial investigations and response actions are required. ICs exist for all but one parcel and are effective.

Short-term Protective:

SedOU: The remedy at SedOU currently protects human health and the environment because of the activities conducted to date; however, in order for the remedy to be protective in the long term ICs and minor erosion control is needed.

INTRODUCTION

The purpose of a Five-Year Review (FYR) is to evaluate the implementation and performance of a remedy in order to determine if the remedy will continue to be protective of human health and the environment. The methods, findings, and conclusions of reviews are documented in FYR reports. In addition, FYR reports identify issues found during the review, if any, and document recommendations to address them.

The MPCA, as delegated by the USEPA, is preparing this Five-Year Review Report pursuant to the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Section 121 and the National Contingency Plan (NCP). CERCLA 121 states:

If the President selects a remedial action that results in any hazardous substances, pollutants, or contaminants remaining at the site, the President shall review such remedial action no less often than each five years after the initiation of such remedial action to assure that human health and the environment are being protected by the remedial action being implemented. In addition, if upon such review it is the judgment of the President that action is appropriate at such site in accordance with section [104] or [106], the President shall take or require such action. The President shall report to the Congress a list of facilities for which such review is required, the results of all such reviews, and any actions taken as a result of such reviews.

The USEPA interpreted this requirement further in the NCP; 40 Code of Federal Regulations (CFR) § 300.430(f)(4)(ii) states:

If a remedial action is selected that results in hazardous substances, pollutants, or contaminants remaining at the site above levels that allow for unlimited use and unrestricted exposure, the lead agency shall review such action no less often than every five years after the initiation of the selected remedial action.

The SLR Site is comprised of two state Superfund sites: the USS Site and the SLRIDT Site. In 1983, the USEPA consolidated the USS Site and the SLRIDT Site into one site called the SLR Site, and added it to the NPL (the federal Superfund list). The SLR Site had a Hazard Ranking Score (HRS) of 32. Although the two state Superfund sites are listed as one on the NPL, they are separated by a distance of four river miles and have different RPs. Therefore, in 1984, the MPCA listed the two sites separately on the PLP, the state Superfund list.

The MPCA further divided the Sites as follows:

- SLRIDT Site was divided into three OUs:
 - TSOU (USEPA OU 01)
 - SOU (USEPA OU 03)
 - SedOU (USEPA OU 04)
- USS Site (USEPA OU 02):
 - This site was divided into 19 OUs (OU-A through OU-S).

This report will utilize the MPCA designation to distinguish between OUs.

U.S. Steel is conducting the cleanup at the USS Site while Interlake Corporation, Allied Signal Inc., Domtar Inc., and Beazer East Inc. are conducting the cleanup at the SLRIDT Site. Therefore, in this Five-

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Year Review Report, both the USS Site and the SLRIDT Site will be discussed; however, they have been divided into two different volumes (Volume I and II, respectively).

This is the third FYR for the St. Louis River Superfund site. The triggering action for this policy review is the completion date of the previous FYR report. A FYR is required at the Site because hazardous substances, pollutants, or contaminants remain at the Site above levels that allow for unlimited use and unrestricted exposure (UU/UE).

Volume 1.
FIVE-YEAR REVIEW REPORT FOR
US STEEL SUPERFUND SITE
DULUTH, MINNESOTA



Prepared by
Minnesota Pollution Control Agency
Remediation Division

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Figure 2: Site Map

Figure 3: Photograph Location Map

Appendices

A – Existing Site Information

B – Photograph Log from Site Inspection

C – Interview Documentation

PROGRESS SINCE THE LAST REVIEW

Table 0-1 Protectiveness Determinations/Statements from the 2008 FYR

OU #	Protectiveness Determination	Protectiveness Statement
OU-A	Not Protective	The OU-A remedy was not protective of human health and the environment because 13 additional areas of tar and tar-contaminated soil were noted across the Site during the MPCA Site Inspections. In addition, the ROD did not establish TCLs for soil. In order to make a statement regarding protectiveness, the following actions should be completed: an ecological and human health risk-based screening assessment; RAs in the additional areas; and establishment of institutional controls.
OU-B	Protective	The OU-B remedy was completed as required by the ROD and is protective of human health and the environment.
OU-C	Protective	The OU-C remedy was completed as required by the ROD and is protective of human health and the environment.
OU-D	Short-term Protective	The OU-D remedy protects human health and the environment in the short-term because the removal action was completed in accordance to the ROD. However, the ROD did not establish TCLs for soil. A component of this RA included removal of contaminated soil encountered in tank excavations. In order for the remedy to be protective in the long-term, an ecological and human health risk-based screening should be completed.
OU-E	Short-term Protective	The OU-E remedy protects human health and the environment in the short-term because the removal action was completed in accordance to the ROD. However, the ROD did not establish TCLs for soil. A component of this remedial action included removal of contaminated soil encountered in the pipe excavations. In order for the remedy to be protective in the long-term an ecological and human health risk-based screening should be completed.
OU-F	Protective	The RA taken at OU-F was completed as required by the ROD and is protective of human health and the environment.

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OU #	Protectiveness Determination	Protectiveness Statement
OU-G	Protective	The RA taken at OU-G was completed as required by the ROD and is protective of human health and the environment.
OU-H	Protective	The OU-H remedy protects human health and the environment in the short-term because the removal action was completed in accordance to the ROD. However, the ROD did not establish TCLs for soil. A component of this RA included excavation of contaminated soil encountered during the drum removals. In order for the remedy to be protective in the long-term an ecological and human health risk-based screening should be completed.
OU-I	Unknown	It is unknown if OU-I is protective of human health and the environment. OU-I is downgradient of the Crushed Slag Disposal Area and the Area Between OU-I and OU-J, and receives surface water and sedimentation from these areas which may provide an ongoing source of contamination. In order to determine if the remedy is protective the following actions will need to be completed: an ecological and human health risk-based screening; reevaluation of RAs to address contaminated material and disturbance of sediment blanket and vegetation; and institutional controls should be established.
OU-J	Short-term Protective	The OU-J remedy was completed as required by the ROD and appears to be protective of human health and the environment in the short-term. Settlement/slumping of the cover and gabion walls and erosion need to be repaired in order for the remedy to remain protective in the long-term. Perimeter fencing is needed to prevent access to the containment cell. In addition, institutional controls should be formally established in order for the remedy to be protective in the long-term.

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OU #	Protectiveness Determination	Protectiveness Statement
Area Between OU-I and OU-J	Not Protective	The Area Between OU-I and OU-J remedy was not completed and is not protective of human health and the environment. Contaminants were detected in the sediment and surface water samples at concentrations exceeding screening criteria. Tar balls and oil sheens are observed in the water, and a tar layer is present along the shore line. In order to make a statement regarding protectiveness the following actions will need to be completed: an RI; an ecological and human health risk-based screening assessment; implementation of RAs; establishment of institutional controls.
OU-K	Short-term Protective	The OU-K remedy was completed as required by the ROD and is protective of human health and the environment in the short-term. Damage to the soil cover from trespassers should be repaired and tree/shrub removal should be conducted annually to assure long-term protectiveness. Perimeter fencing is needed to prevent access to the cover area. Institutional controls should be formally established in order for the remedy to be protective in the long-term.
OU-L	Unknown	OU-L is not protective of human health and the environment because contaminants were detected in the sediment and surface water samples at concentrations exceeding screening criteria. Disruption of the existing sediment blanket and vegetation could also affect protectiveness. In order to make a statement regarding protectiveness, the following actions will need to be completed: an ecological and human health risk-based screening assessment; reevaluation of RAs to address contaminated material and disturbance of sediment blanket and vegetation; establishment of institutional controls.

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OU #	Protectiveness Determination	Protectiveness Statement
OU-M	Unknown	OU-M is not protective of human health and the environment because evidence of erosion through the contaminated delta sediments has been observed. In order to make a statement regarding protectiveness, the following actions will need to be completed: an ecological and human health risk-based screening assessment; reevaluation of RAs to address contaminated material and disturbance of sediment blanket and vegetation; establishment of institutional controls.
OU-N	Protectiveness Deferred	OU-N is currently being evaluated as a component of a sediment investigation. Protectiveness determinations will not be developed for OU-N during this Five-Year Review.
OU-O	Short-term Protective	OU-O is protective of human health and the environment in the short-term based upon existing restricted land use. Physical disruption of the spit of land would expose nonnative material in the delta area. Institutional controls should be formally established in order for the remedy to be protective in the long-term.
OU-P	Unknown	The OU-P remedy was completed as required but may not be protective of human health and the environment. Sheens were continually observed in the pond. The source of the oil sheens is not known and should be investigated. In order to make a conclusive statement regarding protectiveness, the following actions will need to be completed: identify the source of the oil sheens; an ecological and human health risk-based screening assessment; implementation of RAs; establishment of institutional controls.

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OU #	Protectiveness Determination	Protectiveness Statement
OU-Q	Not Protective	OU-Q is not protective of human health and the environment in the short-term because contaminants were detected in the soil, sediment and surface water at concentrations exceeding screening criteria. In addition, dredge spoils that do not support vegetation are present in this area and oil sheens were noted throughout the wetlands. In order to make a statement regarding protectiveness, the following actions will need to be completed: an ecological and human health risk-based screening assessment; implementation of RAs; establishment of institutional controls.
OU-R	Protectiveness Deferred	OU-R is currently being evaluated as a component of a sediment investigation. Protectiveness determinations will not be developed for OU-R during this Five-Year Review.
Soil Contaminated by Above and Below Ground Petroleum Storage Tanks	Short-term Protective	The RA protects human health and the environment in the short-term because the removal action was completed in accordance to the ROD. However, the ROD did not establish TCLS for soils. This remedial action included excavation of contaminated soil encountered when removing the petroleum storage tanks. In order to make a statement regarding protectiveness, an ecological and human health risk-based screening assessment will need to be completed.
Crushed Slag Disposal and High pH	Unknown	The presence of slag and elevated pH readings in soil and the upper portion of the Steel Creek basin indicate that there is a risk to human health and the environment and further evaluation and remedial action is recommended. In order to make a statement regarding protectiveness, the following actions will need to be completed: an RI; an ecological and human health risk-based screening assessment; implementation of RAs; establishment of institutional controls.

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OU #	Protectiveness Determination	Protectiveness Statement
Un-named Pond	Unknown	Analytical results identified the presence of contamination above screening criteria indicating that there is a risk to human health and the environment. In order to make a statement regarding protectiveness, the following actions will need to be completed: an RI; an ecological and human health risk-based screening assessment; implementation of RAs; establishment of institutional controls.
Coke Oven Battery Foundation	Unknown	The strong mothball odor encountered in this area indicates a possible source of contamination is present. Therefore, it is a potential risk to human health and the environment and further evaluation and possible remedial action is recommended. In order to make a statement regarding protectiveness, an investigation will need to be completed and possible follow-up actions including: an RI; an ecological and human health risk-based screening assessment; implementation of RAs; establishment of institutional controls.

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Table 0-2: Status of Recommendations from the 2008 FYR

OU #	Issue	Recommendations/ Follow-up Actions	Party Responsible	Oversight Party	Original Milestone Date	Current Status	Completion Date (if applicable)
n/a	1. Reuse of the Site.	Soil sampling and risk based analysis required before specific reuse is allowed.	USS	MPCA	On-going	On-going	n/a
n/a	2. Trespassing.	Develop/implement a plan of action to minimize trespassing. Signs shall be installed in accordance with MN Statute 97B.001, Trespass Law	USS	MPCA	August 2009	On-going; several improvements in barriers	n/a
n/a	3. Institutional Controls.	Establish Institutional Controls such as Deed Restrictions.	USS	MPCA	2011	No action	2016
n/a	4. Outdated or lack of TCLs for Site Media.	Review/update TCLs. Perform a site-wide risk evaluation to determine if RAs meet revised TCLs.	MPCA-TCLs; USS – Risk Assessment	MPCA	2011	TLCs will be established in ROD amendment for all sediment units; soil TLCs will also be selected.	2015
n/a	5. Inspection and Monitoring Program.	Develop/implement a O&M Plan that addresses: trespassing; semi-annual sampling of all impacted media, semi-annual site inspection including access, warning signs, fencing, OU Remedies, cap and cover inspection and maintenance.	USS	MPCA	June 2009	On-going; O&M activities are reported in annual report; pH monitoring was added	n/a
OU-A	6. OU-A (Tar and Tar-Contaminated Soil). 13 new tar seeps identified.	Conduct a complete investigation to identify extent and magnitude of tar-fuel seeps	USS	MPCA	2009	Removals began in 2010 and continue	n/a
n/a	7. Crushed Slag Disposal & high pH in the soil and drainage water in the Coke Plant Settling Basin Management Area. (Now OU-S)	Conduct a remedial investigation and risk evaluation.	USS	MPCA	2010	Completed. Now OU-S	2011
OU-J	8. OU-J (Tar & Tar-Contaminated Soil) Slumping of containment cell & gabion wall. Erosion at base of cell adjacent to Steel Creek. Beaver activity affecting containment cell.	Repair erosion, slumping and gabion wall. Install perimeter fence to protect cover.	USS	MPCA	2009	Future slope monitoring planned	On-going
n/a	9. Area Between OU-I & OU-J. Oil sheens/tar globules regularly observed. Approx. 85 gallons of tar & vegetation removed in 2007. Contaminants were detected	Conduct a remedial investigation, risk evaluation, and remediate.	USS	MPCA	2009	Completed	2011

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	in sediment & surface water samples at concentrations exceeding screening criteria.						
OU-I	10. Contaminants were detected in sediment samples at concentrations exceeding screening criteria	Conduct a remedial investigation, risk evaluation and remediate	USS	MPCA	2010	Completed	2011
OU-K	11. OU-K (Dredge Spoil Material). Trespassing still occurring, damage to cover from ATV use, and cover maintenance (tree removal) not maintained.	Complete maintenance activities semi-annually. Install perimeter fence to protect cover.	USS	MPCA	2008	On-going. Some vegetation and trespassing control completed.	n/a
OU-L	12. OU-L (Stream Channel). Contaminants detected in sediment & surface water samples at concentrations exceeding screening criteria.	Conduct a remedial investigation and risk evaluation	USS	MPCA	2011	Completed	2011
OU-M	13. OU-M (Delta and Stream Channel Area). New stream channels formed eroding through delta sediments.	Conduct a remedial investigation and risk evaluation	USS	MPCA	2011	Completed	2011
OU-P	14. OU-P (Wire Mill Pond). Sheens regularly observed in the pond.	Investigate source of sheens, including integrity of OU-P cap material.	USS	MPCA	2010	Completed	2012
OU-Q	15. OU-Q (Dredge Spoil Area). Contaminants detected in sediment & surface water samples at concentrations exceeding screening criteria.	Conduct a remedial investigation and risk evaluation	USS	MPCA	2010	Completed	2012
n/a	16. Un-named Pond. Contaminants detected in sediment & surface water samples at concentrations exceeding screening criteria.	Conduct a remedial investigation and risk evaluation	USS	MPCA	2011	Completed	2011
n/a	17. Coke Oven Battery Foundation.	Conduct a remedial investigation and risk evaluation	USS	MPCA	2009	On-going removals; considered part of OUA	n/a
n/a	17. Utility Vaults. Utility vaults were found during the Site Inspections. Additional vaults may exist in other areas of the Site.	Walk former mapped lines to identify any additional utility vaults, observe contents, evaluate, and remove contents. Abandon in accordance with previous actions.	USS	MPCA	2009	On-going; completed as found.	n/a

Remedy Implementation Activities

In 2009, approximately 820 yd³ of impacted soil impacted were excavated and removed from several tar seep areas. In addition, piping was removed from areas fuel storage area (T-4). Confirmation and/or additional test pit sampling indicated that additional excavation was necessary.

In 2010, a utility trench with asbestos covered piping was encountered near T-4; the trench also contained free product (possibly fuel oil #6). The piping was abated and six 55-gallon drums of product were removed. Approximately 370 yd³ of additional impacted soil were removed. Confirmation and/or additional test pit sampling indicated that additional excavation was necessary at several tar seeps. The fuel storage area was referred to the Petroleum Remediation Program.

In 2012, an additional 1,610 yd³ of impacted soil were excavated and removed from the Coke Oven Pad and tar seeps. A steel vault was also removed. Following this additional excavation, exceedances remain at three tar seeps.

In 2012, five new wells were installed in the petroleum source area and four wells at OU-S (Cement Slag Area). These wells are sampled quarterly. Two rounds of sampling results show impacted groundwater from petroleum (heavy fuel oil) in the fueling area and OU-S groundwater showed elevated naphthalene and lead as well as high pH (11-12) in one well.

In 2012, six utility structures, including sewer manholes (SM) SM-2, SM-3, SM-4, utility vaults (UV) UV-1 and UV-2, and one additional sewer manhole were abandoned in place. One manhole with product remains near the fuel storage area.

In 2012, three drums were encountered during a geophysical survey (as part of a Phase II Investigation). These drums were removed in accordance with the Drum Removal Work Plan.

System Operation/O&M Activities

The groundwater and surface water monitoring programs require semi-annual testing and reporting. For surface water, results since 2008 have showed PAHs detected above the Evaluation Criteria (TLC for surface water) for one monitoring station, CP-2, located near the OU-I and Tar Between OU-I&J. For groundwater, sampling showed a continued zinc exceedance at one monitoring well W-10 over the last five years.

US Steel continued to inspect and control sheens at OU-P and Tar Between OU-I&J area. Booms and absorbent pads are inspected and changed regularly. Also tar balls are recovered at the Tar Between OU-I&J area. Both of these areas are currently being considered in a feasibility study for a response action.

In June 2012, the Site received a rain event resulting in a record amount of precipitation over a 14-hour period (500 year storm event). Several slumps were found on the east side of the Site and along the north side of the Unnamed Creek by OU-K. Silt fencing was added to the slumped areas and continued inspections.

pH surface water monitoring for the Unnamed Creek and OU-S (Cement Slag Area) areas began in 2012 after a new culvert was installed on the northern edge of the property. High pH is associated with the cement slag material and several sampling locations are routinely between 11-12. Similar slag material is

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found on the adjacent property and is entering the site through Unnamed Creek and a tributary. This area is being evaluated in the feasibility study and offsite sources are being investigated.

FIVE-YEAR REVIEW PROCESS

Administrative Components

The Potentially Responsible Party (PRP) was notified of the initiation of the five-year review in October 2012. The USS Superfund Site Five-Year Review was led by Susan Johnson of the MPCA, Project Manager for the Site.

The review, which began in January 2013, consisted of the following components:

- Community Involvement;
- Document Review;
- Data Review;
- Site Inspection; and
- Five-Year Review Report Development and Review.

Community Notification and Involvement

Activities to involve the community in the five-year review process were initiated by publishing a notice in the local newspaper, the “Duluth News Tribune”, on April 22, 2013, stating that there was a five-year review and inviting the public to submit any comments to the MPCA. No comments were received. The results of the review and the report will be made available at the Site information repository located at the Duluth Public Library, West Duluth Branch, located at 5830 Grand Avenue, Duluth, Minnesota.

Document Review

This five-year review consisted of a review of relevant documents, including O&M records and monitoring data. Documents reviewed are presented in the following table (Table 3):

Table 0-3: Documents Reviewed

Date	Title	General Contents
February 2011	Quality Assurance Project Plan (QAPP)	Presents a QAPP for the sediment investigation
February 2011	Sediment Investigation Work Plan	Presents work plan to more fully characterize nature and extent of impacted sediments.
September 2011	Supplemental Five-Year Review Investigation Report	Summarizes investigation of issues that were identified during the Second Five-Year Review
March 2012	Draft Continued Upland Investigation Field Report	Presents additional information regarding issues identified during Second Five-Year Review
April 2012	Draft Sediment Remedial Investigation Report (Estuary Sediments)	Characterizes nature and extent of impacted sediments, performed in two phases
August 2012	Final Feasibility Study Work Plan	Presents the planned work for the Spirit Lake Sediment Site
10/11/12	Unnamed Creek pH Monitoring: September 2012	Presents eight weeks of creek monitoring results at 28 monitoring stations along Unnamed Creek, tributary upgradient of OU-K, and ponds within OU-S.
October 2012	Supplemental Investigation Sampling and Analysis Plan (SAP)	Presents the supplemental investigation work plan, summarizing rationale used to determine

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		proposed sediment boring and test locations, to further define the lateral and vertical extent of impacted sediment
October 11, 2012	Unnamed Creek pH Monitoring	Presents results of weekly pH monitoring.
October 19, 2012	Project 2.7: Sheltered Bays/Shallow Wetlands – Spirit Lake. Conceptual Restoration Plan	Lower St. Louis River Habitat Plan – Strategies Implementation Planning Worksheet
December 2012	Phase II Investigation Comprehensive Documentation Report: 132-Acre Target Property	Summarize implementation and findings of April 2011 and June 2012 Phase II Investigations. Goal: to de-list a portion of USS and obtain Certificate of Completion
February 27, 2013	2012 Annual Monitoring and Inspection Report	Summarizes semi-annual surface and groundwater and site inspection events for 2012.
March 2013	Sediment Remedial Investigation Report (Estuary Sediments)	Presents results of two phases of Sediment Investigation, post-flood bathymetric survey, and additional results from MPCA-led project

Data Review

A majority of the activities conducted since the last five year review have been previously summarized.

Site Inspection

The inspection of the Site was conducted on May 7, 2013. In attendance were Susan Johnson (MPCA Project Manager), Mike Bares (MPCA Hydrogeologist), Donovan Hannu, Brenda Winkler and Dan Musser (Bay West), Bruce Galer and Joe Peter (URS) and John Presiecki (US Steel). The purpose of this inspection was to assess the protectiveness of the remedy. In addition, the inspection followed up on issues identified during the 2008 Site Inspection.

A summary of key issues noted during the Site Inspection is as follows:

- Approximately three feet of slumping was identified along the sidewall of the OU-J containment cell nearest to the creek, which increased from only approximately six inches during the last site inspection. Survey points in this area have not been checked for several years. This slumping represents potential for rotational failure of the containment cell into the creek.
- While excavations for the numerous tar seeps and tar-contaminated soil were occurring, many excavations with exposed contaminated soil were left open, unfenced and unprotected. In addition, manholes with open covers were also found. These pose a risk to the frequent trespassers on the site. In addition, one of the open manholes contained product.
- Areas with lead and mercury-impacted soil were identified during a Phase II Investigation. Crushed drums were located near these areas. Investigation of these areas is on-going. These contaminants were identified after the ROD; these areas have been added to OU-A.
- A donut-shaped containment area containing a tank, with a pipe heading towards a nearby ditch, was identified during the inspection. No soil sampling in this area has occurred.
- Tar balls were noted in the booms surrounding the Area Between OU-I and OU-J. In addition, the boom along the creek did not extend to both sides of the creek.
- Tar Pit T-10 was covered with a piece of plywood; no additional activities regarding this tar pit have occurred.
- Significant evidence of trespassing, including motorcycle and four-wheeler tracks, were identified through OU-S.

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- Vegetation control attempts in OU-K have helped; however, several saplings still existed through the thin cap. The previously identified four-wheeler trail appeared grown over, showing that trespassing in this area has decreased.
- A trespasser walking a dog was identified in OU-I during the inspection.

Photographs taken during the Site Inspection that highlight these issues are located in **Appendix B**. A map depicting the photograph locations is presented by **Figure 3**. During a later site inspection, oils and sheens were noted throughout the surface of OU-P.

Interviews

During the FYR process, interviews were conducted with interested parties impacted by the Site, including nearby residents, owners of businesses located on the Site, and regulatory agencies involved in Site activities or aware of the Site. The purpose of these interviews was to document any perceived problems or successes with the remedy that has been implemented to date. Interviews were conducted between May 20, 2013, and June 13, 2013. Several attempts were made to interview City of Duluth planning personnel by telephone and e-mail; however, no response was received. Interviews are summarized in **Table 4**; documentation of the complete interviews is included in **Appendix C**.

Table 0-4: Interview Summary

Interviewee	Organization	Date	Key Comments
Bill Majewski	Former City Planner Nearby Resident	5/20/13	<ul style="list-style-type: none"> • Mixed feeling about upland investigation – still identifying new areas • Concerns about remedies at coke oven and wire mill settling ponds • Taking a long time to deal with sediments • Doesn't feel well-informed • Site has redevelopment potential; delays in the redevelopment are hurting community. • Extending trail through the site is now a priority • Site represents a huge deer refuge.
John Lindgren	MN Dept of Natural Resources	6/13/13	<ul style="list-style-type: none"> • Apprehension regarding the inconsistency of Great Lakes Legacy Act funding: RP at US Steel has received a lot of money, while RPs at SLRIDT have spent 70-80 million dollars with no funding. • This site is a huge opportunity for the future; cleanup is critical. • Aware of frequent trespassing.

TECHNICAL ASSESSMENT

Question A: Is the remedy functioning as intended by the decision documents?

No. The remedies are not functioning as intended at most OUs. Seven of nineteen OUs are considered protective. No ICs on the site.

General: Adequate access and institutional controls are not in place to prevent exposure. US Steel has attempted to tighten security by maintaining fences, patrolling, gates, blockades and changes to lessen the attraction to recreational activities. There is insufficient fencing or warnings to deter trespassing onto the Site, which affects all remedies.

Coke Plant Settling Basin Management Area: The ROD specified a no action response for OU-I, OU-L, OU-M, OU-N, OU-O, OU-K, OU-P, OU-Q, and OU-R, subject to the completion of the PAH Treatability Study examining implementation of alternative and innovative treatment technologies. The PAH treatability study consisted only of a literature search. The report concluded that the top-dressing at OU-K and no-action at the other OUs were the best alternatives, based upon the lack of demonstrated treatment technologies, adverse site conditions, high cost, lack of site characterization and because of the potential for the adverse environmental impacts associated with a remedial action. The PAH field treatability study was not completed in accordance with the ROD. Since the 1989 ROD, additional actions outside of the ROD were taken at OU-K (1998) and OU-P (1996) due to concerns regarding the ongoing releases to the St. Louis River. In addition, contaminated non-native sediments in both Steel Creek and Wire Mill Pond estuaries (OU-R and OU-N) are currently being evaluated for RAs. In summary, issues and concerns associated with OU-I, OU-L, OU-M, OU-N and OU-R lead to further investigation. The results exceeded the Level 2 Sediment Quality Guidelines (SQGs) which indicate an unacceptable risk to benthic communities.

Coke Plant Management Area: Evaluations of individual OUs within the Coke Plant Management Area are as follows:

- OU-B through OU-H within the Coke Plant Management Area are functioning as intended by the ROD; however, the remedy for OU-E calls for removal of contaminated soil associated with piping. As additional piping is removed, contaminated soil must be addressed.
- In OU-A, 15 separate areas of tar/fuel and tar contaminated soil have been noted across the Site. Others may exist in areas not traversed. In addition, lead and mercury contamination has been detected during a recent Phase II Investigation. Because impacted soil throughout the site is assigned to OU-A, these areas indicate that the RAs for OU-A have not been completed as intended by the ROD.
- OU-O: The remedy for OU-O is functioning as intended by the ROD.

Wire Mill Settling Basin Management Area: Evaluations of individual OUs within the Wire Mill Settling Basin Management Area are as follows:

- OU-P: Sheens were continually observed in the pond; one possible origin of these sheens was found along the sides of the pond. Underlying source materials in OU-P may also be producing sheens. The remedy is not functioning as intended.
- OU-Q: Oil sheens and free product have been noted throughout the wetlands of OU-Q. Contaminants were detected in the soil, sediment and surface water at concentrations exceeding sediment, soil and surface water and pose an unacceptable risk to human health and the environment. The remedy is not functioning as intended by the ROD.
- OU-R: see under Coke Plant Settling Basin Management Area.

Question B: Are the exposure assumptions, toxicity data, cleanup levels, and remedial action objectives (RAOs) used at the time of the remedy selection still valid?

Several concerns have been raised including current land use, new ARARs and TBCs. The MPCA is reviewing the exposure assumptions, toxicity data, and cleanup levels for all media at the Site for the purpose of a ROD Amendment. In summary, the following concerns have been raised:

- A site specific bioactive zone thickness has not been established for the river, creeks and wetland sediments included in the Site. Because these are shallow water environments where aquatic vegetation should grow and harbor a benthic community, an uncontaminated bioactive zone is necessary to be protective, which was not considered in the 1989 ROD. This affects OUs with aquatic environments.
- There were no TCLs developed for soil in the 1989 ROD. Previous Five-Year Reviews presented potential To-Be-Considered (TBCs) based on the MPCA ISRVs. TCLs should be developed for all contaminants of concern (COC) as high levels of soil contamination have been found. This issue was raised during the last Five-Year Review.
- Exposure to contaminants not addressed in the ROD in several OUs such as mercury, lead, zinc and pH. Non-tar related was not included in the ROD and TCLs will be proposed in the ROD amendment.
- Many surface water standards (ARARs) have changed since the 1989 ROD. These issues were raised during the last Five-Year Review.

Question C: Has any other information come to light that could call into question the protectiveness of the remedy?

The Crushed Slag Disposal and High pH Area has now been assigned OU-S. The presence of slag and elevated pH readings in soil and the upper portion of the Steel Creek basin indicate that there is a risk to human health and the environment. While some pH monitoring has been conducted, the risk associated with human contact with the high pH soil has not been evaluated for caustic effects. Based on other ARARs such as surface water standards, a remedy is required at this OU. Trespassers are frequently disturbing this soil and are in contact with it. Unacceptable risk to surface water and assumed risk to human health have resulted in this OU being included in the FS.

Technical Assessment Summary

The remedies for most OUs are not functioning as intended. Significant investigation has occurred associated with the estuary and upland sediments. Additional investigation and removal actions have also occurred associated with the contaminated soils (OU-A). A Feasibility Study for both upland and estuary sediment contaminants is reportedly being developed. Review, approval and implementation of these remedial actions will be necessary to provide short and long-term protectiveness. A ROD amendment is also anticipated to document the change in remedy for the sediment units and additional contaminants in OU-A.

The site location is depicted on **Figure 1**. The locations of the Operable Units and other features are depicted on the site map, **Figure 2**. Additional background information regarding the Site is contained in **Appendix A**.

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Issues/Recommendations and Follow-Up Actions

Table 0-5: Issues and Recommendations/Follow-Up Actions

OU #	Issue	Recommendations/ Follow-up Actions	Party Responsible	Oversight Agency	Milestone Date	Affects Protectiveness? (Y/N)	
						Current	Future
OU-A	While some excavation has occurred, there are still tar pits, tar seeps, tar-contaminated soil, areas with oily liquids, and areas with contaminants exceeding the Tier 2 ISRVs throughout the Site. In addition, mercury and lead have also been identified after the ROD at concentrations exceeding the Tier 2 ISRVs. All of these areas of soil contamination are designated as OU-A.	Complete assessment of these materials, then develop and implement a remedial action plan	RP	MPCA	2013 for acute releases 2018 for complete RI/RA	Yes	Yes
Site-Wide	Signage has improved; however, trespassing was noted during site inspection. Open excavations (especially those with contaminated soil exposed) and manholes represent significant safety issues to trespassers.	Install and maintain fencing around excavations that cannot be backfilled immediately. Replace covers on all open manholes. Improve trespassing controls and signs.	RP	MPCA	On-going	No	Yes
OU-E	A manhole was identified during site inspection with product in it; soil surrounding this piping has not been assessed.	Remove product and manhole, assess surrounding soil. For any future pipe excavations, evaluate soil to screening levels and remediate as necessary.	RP	MPCA	2014	No	Yes
OU-I	Contaminants exceed screening criteria; cover material thickness unknown.	Complete feasibility study; implement remedial action.	RP	MPCA	2020	Yes	Yes
Area Between OU-I and OU-J	Oil sheens and tar globules observed; contaminants exceed screening criteria.	Inspect and maintain booms. Complete feasibility study; implement remedial action.	RP	MPCA	2020	Yes	Yes
OU-J	Significant (more than 3') of slumping noted on sidewall of cell.	Develop additional cell stability plan for the side of OU-J adjacent to the creek.	RP	MPCA	2014	No	Yes
OU-K	Tree saplings are growing in the soil cover.	Improve vegetation control procedures. Complete feasibility study; implement remedial action.	RP	MPCA	2014	No	Yes
OU-L and OU-M	Contaminants present a risk to the benthic community.	Complete feasibility study; implement remedial action.	RP	MPCA	2020	Yes	Yes
OU-N, and OU-R	Contaminants present a risk to the benthic community.	Complete feasibility study; implement remedial action.	RP	MPCA	2020	Yes	Yes
OU-P	Oil sheens regularly observed in pond.	Complete feasibility study; implement remedial action.	RP	MPCA	2018	Yes	Yes

Third Five-Year Review Report 2013
St. Louis River Superfund Site – Duluth, Minnesota

OU #	Issue	Recommendations/ Follow-up Actions	Party Responsible	Oversight Agency	Milestone Date	Affects Protectiveness? (Y/N)	
						Current	Future
OU-Q	Free product and oil sheens visible throughout wetlands; contaminants present a risk to human health.	Complete feasibility study; implement remedial action.	RP	MPCA	2018	Yes	Yes
OU-S	Soil with high pH levels exists and evidence of trespassing, including dust-generating activities such as motorcycling and four-wheeling was noted.	Complete remedial investigation and risk assessment, including for soil with high pH levels, then develop and implement a remedial action plan for these materials as appropriate.	RP	MPCA	2020	Yes	Yes
Unnamed pond	Contaminants present a risk to the benthic community.	Complete feasibility study; implement remedial action.	RP	MPCA	2020	Yes	Yes
Utility structures	A manhole was identified during site inspection with product in it. Other utility structures remain on the site.	Evaluate, remediate and remove.	RP	MPCA	2014	Yes	Yes
Soils from tanks	Additional soil has been identified that is contaminated from storage tanks. These investigations are on-going.	Complete investigations; implement remedial action.	RP	MPCA	2014	Yes	Yes
Site-wide	Institutional controls have not been established to protect future users of the Site.	Establish ICs such as Deed Restrictions	RP	MPCA	2016	No	Yes

Protectiveness Statement(s)	
<i>Operable Unit:</i> OU-B, OU-C, OU-D, OU-F, OU-G, OU-H, OU-O	<i>Protectiveness Determination:</i> Protective
<i>Protectiveness Statement:</i> The remedies at OU-B, OU-C, OU-D, OU-F, OU-G, OU-H and OU-O are protective of human health and the environment, as intended by the ROD. The materials associated with these OUs were removed and disposed.	

Protectiveness Statement(s)	
<i>Operable Unit:</i> OU-A	<i>Protectiveness Determination:</i> Not Protective
<i>Protectiveness Statement:</i> The remedy at OU-A is not protective because of tar pits, tar seeps, tar-contaminated soil, areas with oily liquids, and areas with contaminants exceeding ISRVs throughout the Site (including areas around and under building foundations. In addition, mercury and lead were also identified after the ROD was enacted. Also ICs such as Environmental Covenants and ordinances to protect future users of Site.	

Protectiveness Statement(s)	
<i>Operable Unit:</i> OU-E	<i>Protectiveness Determination:</i> Short-term Protective
<i>Protectiveness Statement:</i> The remedy at OU-E currently protects human health and the environment because of the activities conducted to date; however, in order for the remedy to be protective in the long term, an investigation of pipeline and surrounding soils is needed and a response action plan. Also ICs area needed such as Environmental Covenants and ordinances to protect future users of Site	

Protectiveness Statement(s)	
<i>Operable Unit:</i> OU-I	<i>Protectiveness Determination:</i> Not Protective
<i>Protectiveness Statement:</i> The remedy at OU-I is not protective because of the contaminants present an unacceptable risk to benthic organisms and this area receives contaminants from upgradient sources.	

Protectiveness Statement(s)	
<i>Operable Unit:</i> Area Between OU-I and OU-J	<i>Protectiveness Determination:</i> Not Protective
<i>Protectiveness Statement:</i> The remedy at the Area Between OU-I and OU-J is not protective because of reoccurring oil sheens and tar globules are observed, contaminants found present an unacceptable risk to benthic community.	

Protectiveness Statement(s)	
<i>Operable Unit:</i> OU-J	<i>Protectiveness Determination:</i> Short-term Protective
<i>Protectiveness Statement:</i> The remedy at OU-J currently protects human health and the environment because the contamination remains sequestered; however, in order for the remedy to be protective in the long term, the cover requires monitoring and repair as needed. Also ICs such as Environmental Covenants and ordinances to protect future users of Site are needed.	

Protectiveness Statement(s)	
<i>Operable Unit:</i> OU-K	<i>Protectiveness Determination:</i> Short-term Protective
<i>Protectiveness Statement:</i> The remedy at OU-K currently protects human health and the environment because of the limited cover installed over the contaminated soil; however, in order for the remedy to be protective in the long term, vegetative control is needed. Also ICs such as Environmental Covenants and ordinances to protect future users of Site are needed.	

Protectiveness Statement(s)	
<i>Operable Unit:</i> OU-L and OU-M	<i>Protectiveness Determination:</i> Not Protective
<i>Protectiveness Statement:</i> The remedy at OU-L and OU-M is not protective because of the contaminants present an unacceptable risk to benthic organisms.	

Protectiveness Statement(s)	
<i>Operable Unit:</i> OU-N and OU-R	<i>Protectiveness Determination:</i> Not Protective
<i>Protectiveness Statement:</i> OU-N and OU-R are not protective as contamination presents an unacceptable risk to benthic organisms.	

Protectiveness Statement(s)	
<i>Operable Unit:</i> OU-P and OU-Q	<i>Protectiveness Determination:</i> Not Protective
<i>Protectiveness Statement:</i> The remedy at the OU-P is not protective because free product and oil sheens are visible throughout the wetlands, source material is uncontrolled and dredge material presents an unacceptable risk to human health.	

Protectiveness Statement(s)	
<i>Operable Unit:</i> OU-S	<i>Protectiveness Determination:</i> Not Protective
<i>Protectiveness Statement:</i> The remedy at the OU-S is not protective because soil with high pH levels exists in soils and surface water. The contamination presents an unacceptable risk to human health risk through contact, inhalation or ingestion of high pH soil. Water with high pH is running off into a stream. The source material is uncontrolled.	

Protectiveness Statement(s)	
<i>Operable Unit:</i> Other – Unnamed pond	<i>Protectiveness Determination:</i> Not Protective
<i>Protectiveness Statement:</i> The remedy at the Unnamed Pond is not protective because contaminants an unacceptable risk to benthic organisms and an oil sheen has been previously observed.	

Protectiveness Statement(s)	
<i>Operable Unit:</i> Other – soils contaminated by above and below ground petroleum storage tanks	<i>Protectiveness Determination:</i> Short-term Protective
<i>Protectiveness Statement:</i> Additional soil that is contaminated by above and below ground petroleum storage tanks has been identified at the site. Investigation of this soil is on-going; however, exposures have not been determined.	

NEXT REVIEW

The next five-year review report for the SLRIDT Superfund Site is required five years from the completion date of this review.

Figures

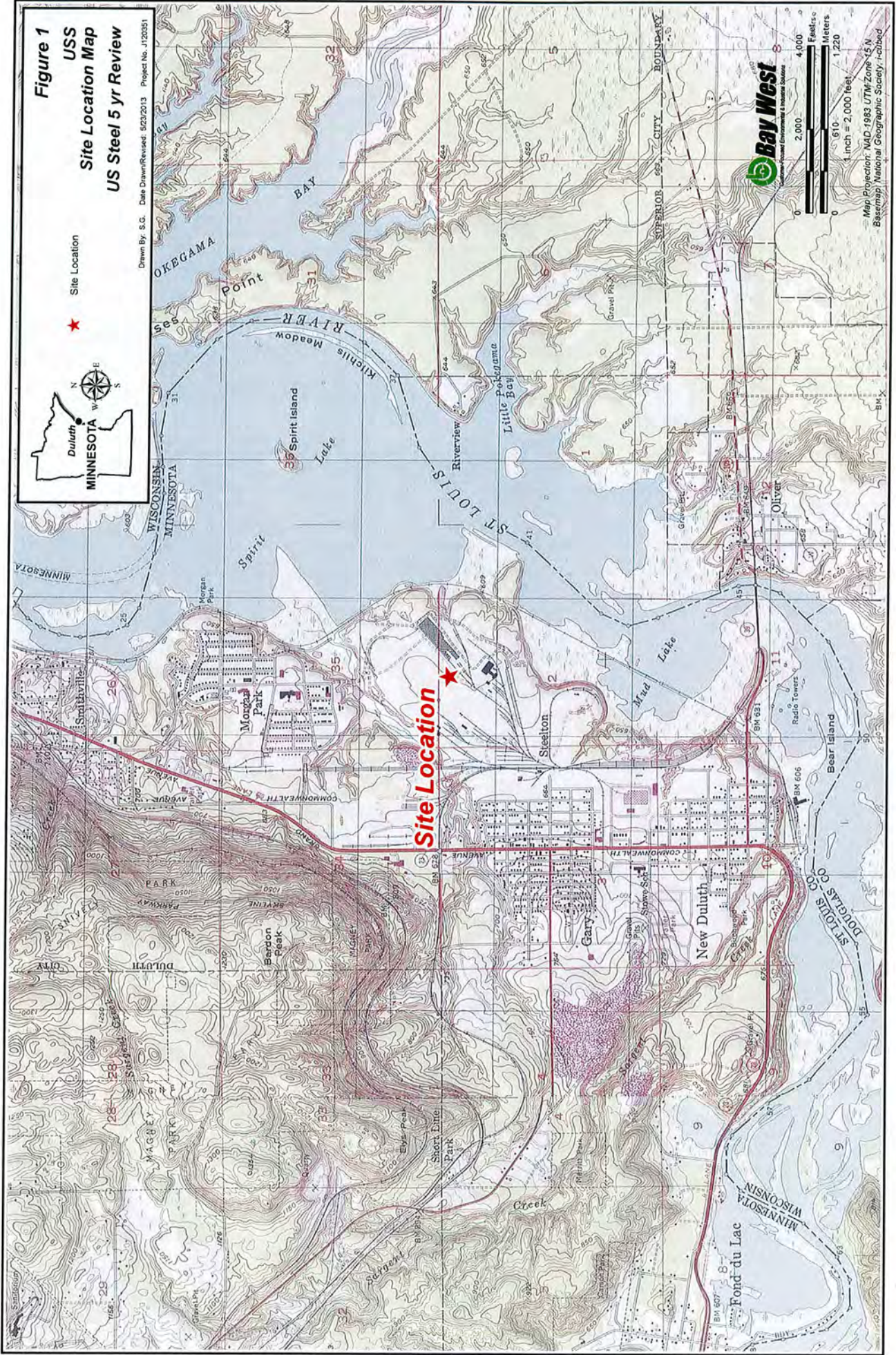
Figure 1

USS
Site Location Map
US Steel 5 yr Review

Site Location



Drawn By: S.G. Date Drawn/Revised: 5/23/2013 Project No. 1720551



0 2,000 4,000
Feet
0 610 1220
Meters
1 inch = 2,000 feet

Map Projection: NAD 1983 UTM Zone 15 N
Base Map: National Geographic Society, 1:250,000

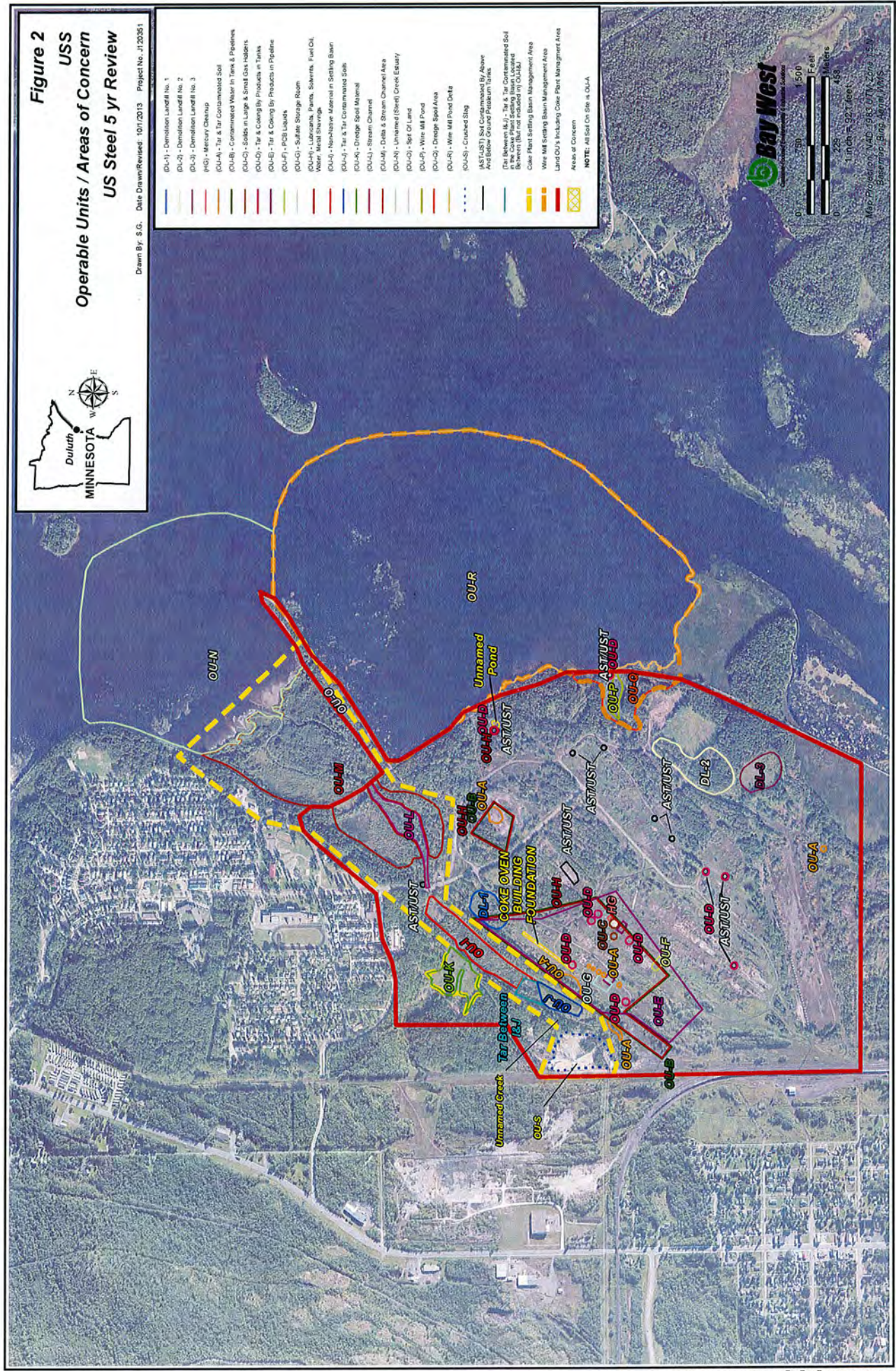
Figure 2 **USS** **Operable Units / Areas of Concern** **US Steel 5 yr Review**



Drawn By: S.G. Date Drawn/Revised: 10/1/2013 Project No.: J120351

- (OU-1) - Demolition Landfill No. 1
- (OU-2) - Demolition Landfill No. 2
- (OU-3) - Demolition Landfill No. 3
- (H2) - Mercury Cleanup
- (OU-4) - Tar & Tar Contaminated Soil
- (OU-5) - Contaminated Water in Tank & Pipelines
- (OU-6) - Solids in Large & Small Gas Holders
- (OU-7) - Tar & Coaling By Products in Tanks
- (OU-8) - Tar & Coaling By Products in Pipeline
- (OU-9) - PCB Loads
- (OU-10) - Sulfur Storage Room
- (OU-11) - Lubricants, Paints, Solvents, Fuel Oil, Waste Storage
- (OU-12) - Nonhazardous Material in Settling Basin
- (OU-13) - Tar & Tar Contaminated Soil
- (OU-14) - Drilled Spoil Material
- (OU-15) - Stream Channel
- (OU-16) - Ditch & Stream Channel Map
- (OU-17) - Unnamed (Steel) Creek Estuary
- (OU-18) - Spill of Land
- (OU-19) - Wire Mill Pond
- (OU-20) - Drilled Spoil Area
- (OU-21) - Wire Mill Pond Delta
- (OU-22) - Crushed Slag
- (ASTUST) - Soil Contaminated by Above and Below Ground Petroleum Lines (Tar Between (H2) - Tar & Tar Contaminated Soil in the Coke Plant Settling Basins Located in the Coke Plant Settling Basins Management Area)
- (OU-23) - Wire Mill Settling Basin Management Area
- (OU-24) - Land Oils Including Coke Plant Management Area
- (OU-25) - Areas of Concern

NOTE: All Soil On Site is OUA

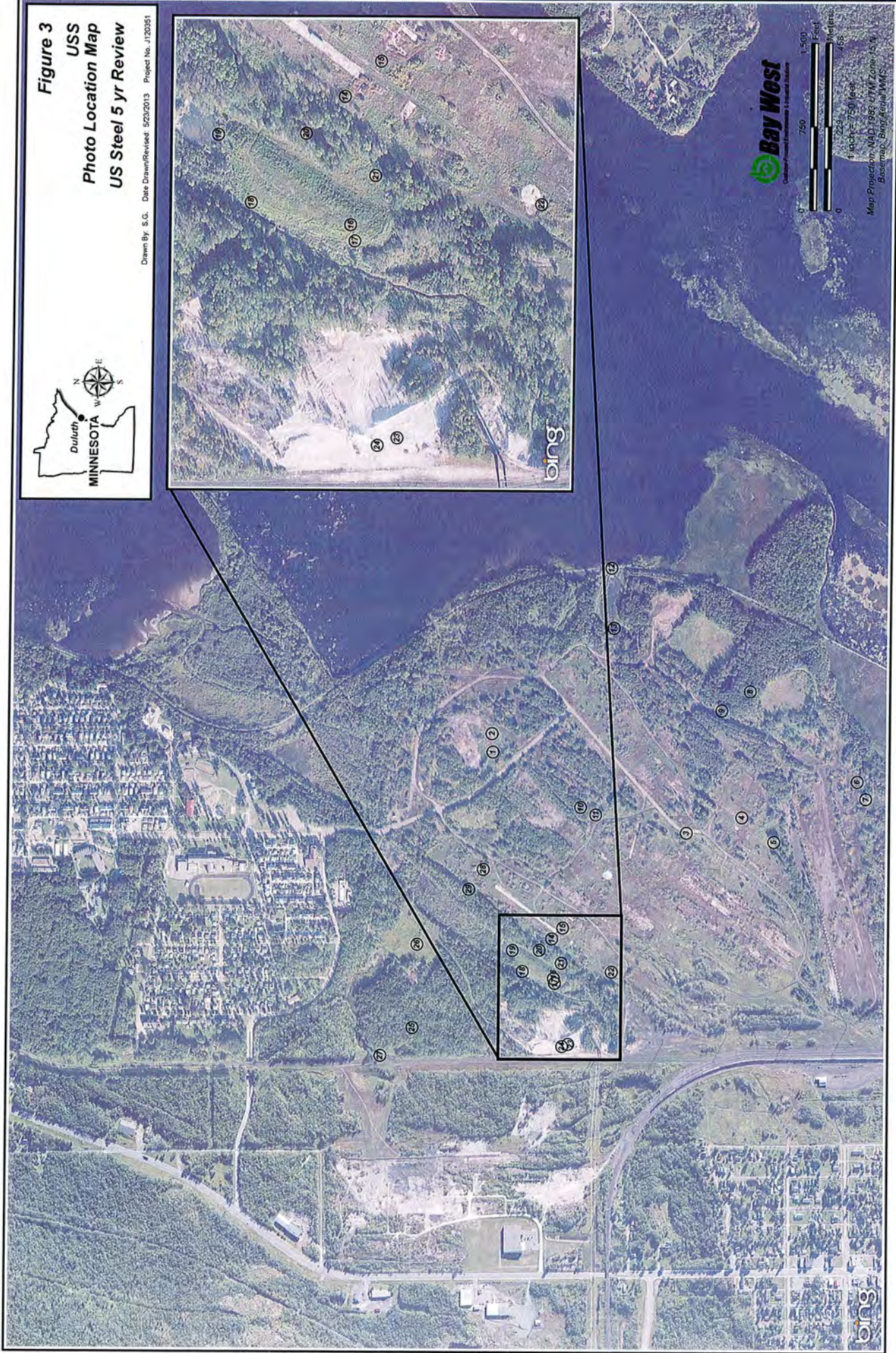


0 250 500 750 1000 1500
 Feet
 0 229 458
 Meters
 1 inch = 92.7 feet

Map Projection: NAD 1983 UTM Zone 15N
 Base Map: Bing Aerial 11/05

Figure 3
USS
Photo Location Map
US Steel 5 yr Review

Drawn By: S.G. Date Drawn/Revised: 5/23/2013 Project No. 1120251



Map Projection: NAD 1983 UTM Zone 15 N
 Base Map: Bing Aerial MMS

Appendix A

Existing Site Information

APPENDIX A – EXISTING SITE INFORMATION

A. SITE CHRONOLOGY

Event	Date
Beginning of US Steel operations	1915
Contaminants were found in the river during a survey was conducted by Minnesota State Board of Health, the Minnesota Commission of Game and Fish, and Wisconsin State Board of Health.	1929
Coke plant settling basin was constructed.	1954
Survey conducted by Minnesota Pollution Control Agency (MPCA) found high Biological Oxygen Demand, high pH, and high concentrations of phenols, cyanide, and ammonia in coke plant settling basin.	1973
Steel making discontinued operations.	1975
MPCA requested hydrogeological study of the USS site (Site).	1979
Coke plant discontinued operations.	1979
Old basement full of oily waste found and excavated disposed of out-of-state shortly after.	1981
Site was inspected by the United States Environmental Protection Agency (USEPA)	1982
Site was placed on the National Priorities List (NPL) under Comprehensive Environmental Response, Compensation and Liability Act (CERCLA).	1983
A Request for Response Action (RFRA) was issued.	1983
Site was placed on the Minnesota Permanent List of Priorities (PLP).	1984
Response Order By Consent (Consent Order) between USS and the State of Minnesota was approved by MPCA.	1985
Final phase of Remedial Investigation (RI) began.	1985
The wire mill discontinued operations.	1986
The Record of Decision (ROD) was issued.	1989
Remedial deconstruction began on the coke plant.	1989
Clean up and demolition of the coke plant and appurtenant facilities was completed.	1992
A free liquid mercury spill that was under a meter storage shed was reported and cleaned up.	1992
Response Action Plan (RAP) for implementing the remedy at OU-J and OU-P was submitted.	1996
Solidification of OU-J was completed.	1997
Response actions on the OU-P were completed.	1997
Underground coke oven gas lines were removed and remediated.	1999
Repair on the slumps that developed in OU-J perimeter berm adjacent to Steel Creek was completed.	2001
Estuary sediment investigations begin	2002
First Five-Year Review was completed.	2003
Five-Year Review Recommendation Implementation Report with initial investigation results.	2005
Minnesota Power installation of seven power line towers on-site.	2005
Second Five-Year Review was completed.	2008
Continued soil and tar removals at OU-A	2010-12
Supplemental Five-Year Review Investigation Report with upland sediment investigations was submitted	2011
Remedial Investigation completed for estuary sediments.	2012
Workplan for Final Feasibility Study for estuary sediments submitted.	2012
Phase II Investigation of 132 acres of upland property conducted.	2012
RI report for OU-P, OUQ, OU-S submitted	2013
Upland sediment FS work plan	2013
Upland sediments Treatability Study was conducted (landfill or CDF siting)	2013
Remedial Investigation report completed for estuary sediments. Several other reports for wetland delineation, sediment profile imaging, habitat characterization were submitted.	2013

B. BACKGROUND

General

The Site is bounded by the residential and light-industrial neighborhood of Morgan Park to the north, the St. Louis River (also called Spirit Lake in this area) to the east, and Duluth Missabe and Iron Range Railroad property to the west and south. The site covers approximately 500 acres of land and 200 acres of sediment. A stream drains the northern part of the site near the former coke plant and empties into the St. Louis River.

The St. Louis River and estuary is the largest tributary on the U.S. side of Lake Superior, the largest freshwater lake by area in the world, providing a wealth of natural resources. Resource management goals for the estuary are to protect, preserve, restore, and enhance natural resources, and to provide opportunities for public use for this and future generations. More specifically, natural resource managers have identified priority needs of conserving and enhancing near shore shallow water fishery habitat, nesting and rearing habitat for shorebirds, and wetlands.

Site Geology

A U.S. Geological Survey (USGS) topographic map (USGS – West Duluth, 1954 – Photo revised 1969) indicates the Site elevation ranges from 600 to 670 (National Geodetic Vertical Datum of 1929) feet above mean sea level (amsl). The majority of the Site is fairly flat, and sits on a bluff above the St. Louis River and Steel Creek. Surface storm water at the Site drains to Steel Creek and to the St. Louis River. Steel Creek flows in a northeasterly direction.

The majority of the Site rests on thick lacustrine silt and clay deposits associated with Glacial Lake Duluth (USGS, 1979; MGS, 1982). A subsequent period of lower lake levels in the ancestral Lake Superior resulted in deep incising of these lake deposits by both Steel Creek and St. Louis River. As lake levels rose to current surface elevations, approximately 200 feet of reworked glacial sediments were deposited under these surface water bodies. The bedrock geology of the Site consists of the Duluth Complex; a complex of early Precambrian rocks that include multiple intrusions of gabbroic anorthosite, troctolite, gabbro, anorthosite and felsic rocks (Sims, 1970).

Fill material encountered during subsurface investigation at the Site consists of sand, clay, gravel, cinders, fragments, and other materials. The characteristics and depth of the fill material vary throughout the Site. While fill depths are restricted to a few feet over most of the Site, portions of the bluff area south of Steel Creek have been historically extended with 30 to 40 foot layers of fill. The native soils present beneath the fill material generally consist of deposits of sandy and clayey soil layers.

The Site is underlain by two distinct Quaternary hydrogeologic units (Barr, 1981). Groundwater monitoring wells installed in the main upland area show the water table at elevations of 620 to 625 feet within 1000 feet of the riverbank, with the water table sloping steeply toward the river (Geraghty and Miller, 1995). An upward vertical hydraulic gradient exists at most areas of the Site. The upward vertical hydraulic gradient and Site-specific geological conditions cause seeps and artesian flow at several locations along the lower portion of the Site near the river. The upward vertical hydraulic gradient also creates the potential for groundwater to discharge into Steel Creek.

Land and Resource Use

The Site was an integrated steel mill (USX Duluth Works) consisting of coke production, iron and steel making, casting, primary rolling and roughing, hot and cold finishing, and galvanizing. The steel mill and coke production facility operated from 1915 until 1979 and made steel products such as nails, wire, and steel sign posts. In 1979, the blast furnaces, open hearth furnaces, fuel oil storage tanks, and a portion

of the rolling mill were demolished. By 1988, the material storage area and most of the remaining building were demolished.

The Site is currently owned and managed by US Steel Realty and remains unused. Access is marginally restricted by a main gate at the entrance to the property and a few posted no trespassing signs. The Site is bounded on the west by the CN Railroad. A former USS cement plant was located to the west of the Site which has recently been purchased and is under redevelopment. The area to the northwest is primarily industrial land use, which includes a gravel mining operation. Areas further northwest are primarily undeveloped due to steep grades. The area to the north is residential. Areas west and southwest of the Site are residential or undeveloped.

History of Contamination

In its 64 years of operation, the mill produced a variety of solid, semi-solid and liquid wastes. Contaminated areas associated with the coke plant are referred to as the Coke Plant Management Area.

The mill discharged a variety of wastes to portions of the surrounding land surface and into waterways. Steel Creek flows through the northern portion of the Site and discharges to the St. Louis River. During operations at the site, much of the waste from the coke plant and the "hot side" of the steel plant were discharged to a settling basin formed by a control structure in the stream. Contaminated water was routed from the settling basin on Steel Creek into the St. Louis River. The contaminated areas that were located within the watershed of Steel Creek were evaluated together and are referred to as the Coke Plant Settling Basin Management Area.

Wastes from the "cold side" of the steel plant were discharged directly to the river through a small basin located adjacent to the St. Louis River known as the Wire Mill Settling Basin. The contaminated areas that were located on the cold side were evaluated together and are referred to as the Wire Mill Settling Basin Management Area.

Initial Response Pre-Record of Decision

In 1979, the MPCA requested a hydrogeological study of the Duluth Works Site. In response to this request, USS submitted two reports - one titled "Soil and Ground Water Investigation," in 1981, and one titled "River Water Quality Impact Investigation", in 1983. In 1982, the USEPA Field Investigation Team inspected the Site. Based on the studies and inspection it was revealed that polycyclic aromatic hydrocarbons (PAH) compounds were moving toward and being discharged to the St. Louis River by the routes of both surface water drainage and ground water flowing beneath the Site.

The Site was placed on the National Priorities List (NPL) under Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) in 1983. On October 3, 1983, USS received a Request for Response Action (RFRA) from the MPCA for the Site. The Site was placed on the State of Minnesota's Superfund listing in 1984. The MPCA executed a Consent Order with US Steel Corporation, a division of USS Corporation, on March 26, 1985. During the summer of 1985, the final phase of the Remedial Investigation (RI) began. The RI included completion of more than 150 soil borings and test holes, chemical analysis of more than 50 soil and sediment samples, installation and monitoring of 13 piezometers and monitoring wells, and monitoring of two seeps and four surface water stations. The MPCA Commissioner signed a ROD in February 1989 that set forth the clean-up actions USS needed to take.

Basis for Taking Action

The RI characterized the contaminants and contaminated areas of the Site as identified in the Consent Order. The ROD delineated 18 Operable Units (OUs) for remediation, as well several other components that were not identified with those OUs. Since then, one additional OU has been established for the Site.

The primary potential impact of the on-site contamination, including PAH compounds, was to the St. Louis River. The most significant contaminant pathways were surface flow to the St. Louis River by Steel Creek flowing through the Coke Plant Settling Basin Management Area in the northern portion of the Site and/or flow from the Wire Mill Settling Basin Management Area in the southern portion of the Site.

C. REMEDIAL ACTIONS

The RA objectives in the ROD were as follows:

- Eliminate or minimize contaminant releases to the St. Louis River and Steel Creek flowing into the St. Louis River;
- Control and prevent contact with exposed tar, tar contaminated soils and nonnative material; and
- Eliminate contact with contaminants in drums, transformers and buildings.

The ROD presented a wide variety and large number of alternatives to deal with the various releases or potential releases. The alternatives were divided in the following categories:

- Coke Plant Management Area;
- Coke Plant Settling Basin Management Area; and
- Wire Mill Settling Basin Management Area.

The management areas will be presented in this report in a similar format.

Coke Plant Management Area:

The Coke Plant Management Area includes the following OUs:

- OU-A (Tar and Tar Contaminated Soil)
- OU-B (Contaminated Water in Tanks and Pipelines)
- OU-C (Solids in Large and Small Gas Holders)
- OU-D (Tar and Coking By-Products in Tanks)
- OU-E (Tar and Coking By-Products in Pipelines)
- OU-F (Polychlorinated Biphenyl [PCB] Liquids)
- OU-G (Ammonium Sulfate)
- OU-H (Lubricants, Paints, Solvents, Fuel Oils)

Previous Five-Year Review Reports provided a summary of each individual OU within the Coke Plant Management Area, including the remedy selection, remedy implementation and System Operation and Operation/Maintenance (O&M). The Remedial Action (RA) for many of these areas involved excavation/removal, which was completed in accordance with the ROD; however, the ROD did not establish TCLs for soils. There are also issues remaining for OU-A. The RA in the ROD for OU-A specified

the excavation/removal of the tar, tar-contaminated soil, and coking by-products for use as fuel; however, these materials are still present in several areas throughout the site.

Coke Plant Settling Basin Management Area:

The Coke Plant Settling Basin Management Area includes the following OUs:

- OU-I (Non-Native Material in Settling Basin): The Coke Plant Settling Basin was constructed directly in the channel area of Steel Creek. In the RI dated December 1986, it was estimated that there was approximately 140,000 cubic yards (yd³) of non-native material in the Coke Plant Settling Basin. The primary contaminant was PAH compounds with reported concentrations as high as 35,000 milligrams per kilogram (mg/kg). The thickness of the non-native material varied, but averaged approximately 10 feet in thickness. The native soils below the non-native material consisted of red-brown clay.
- OU-L (Creek Channel): OU-L is the creek channel located between the Coke Plant Settling Basin control structure (near the access road) and the railroad tracks that parallel the St. Louis River. The streambed and former open water area, as delineated in 1907, indicates approximately 10 acres have been impacted by non-native materials. The RI soil borings indicate 5-9 feet of non-native materials are present in the area. It was estimated that 82,000 to 148,000 yd³ of non-native material are present in the streambed and former open water area.
- OU-M (Delta and Creek Channel Area) and OU-N (Unnamed Creek Estuary): OU-M is the creek channel and delta area located riverward of the railroad tracks. This delta was created by flows carrying sediment from the Coke Plant Settling Basin into the St. Louis River estuary. A 1940 aerial photo shows that the St. Louis River estuary extends to the former Burlington Northern Railroad tracks, while the 1983 aerial photo shows a 28-acre land area between the railroad tracks and the estuary. Soil borings conducted as part of the RI showed approximately 10 feet of coke/flue dusts in most areas of the delta. It was estimated in the RI and stated in the ROD that the delta (OU-M) and estuary (OU-N) adjacent to the delta contain 600,000 to 900,000 cy (total for both OU-M and OU-N) of non-native material and contaminated soil. OU-N is now being managed as part of the estuary sediments, not as part of the Coke Plant Settling Basin Management Area.
- OU-O (Spit of Land): The Spit of Land was reportedly constructed to dispose of slag from operations at the Site. Coke was found to be at a maximum depth of 5 feet. Sediment samples taken adjacent to the Spit of Land and water samples taken from two temporary wells established in the auger borings did not reveal any contamination of concern.

The RA in the ROD for OU-I, OU-L, OU-M, OU-O specified no action, subject to the completion of a PAH-treatability study to examine implementation of alternative and innovative treatment technologies; however, the ROD did not establish TCLs for soils or sediments. No action includes periodic inspections to verify that no significant changes have occurred and routine water quality monitoring to verify the long-term effectiveness of the RAs. The ROD also called for appropriate institutional controls to be implemented to minimize future disturbance of the OUs.

- OU-J (Tar and Tar Contaminated Soil): OU-J has been estimated to contain about 10,000 yd³ of non-native material (tar and tar-contaminated soil containing coke fines, flue dust, and mill scales). The RA in the ROD for OU-J specified the construction of a containment (slurry) wall and capping the area of tar and tar-contaminated soil. In addition, water collected in a pump out

system was to be discharged to a sanitary sewer system for treatment. The ROD stated that this RA shall be taken only if it can be demonstrated that the quality, thickness and continuity of the underlying low permeability layer is acceptable. USS retained Geraghty & Miller, Inc. to re-evaluate four alternatives for OU-J, including a slurry wall containment system, a slurry wall system with in-situ treatment, in-situ cement stabilization, or a funnel and gate system. Stabilization/solidification was selected as the recommended RA for OU-J (Geraghty & Miller, 1995). In 1997, remedial actions for OU-J were completed. Contaminated material was consolidated, stabilized and protected from erosion. A surface water diversion structure was designed to withstand the 100-year, 24-hour recurrence storm event and a perimeter berm was built. Approximately 10,000 yd³ of coal tar and tar-contaminated soil were solidified in-place and an engineered cap with a thickness of seven feet was placed over the unit, designed to reject 90% of precipitation. The cap began slumping in 2000; some repair activities were conducted in 2001. Additional slumping was noted in the recent site inspection. The monitoring schedule and requirements for OU-J were updated in an April 2000 "Monitoring Plan" and approved with modifications by the MPCA on May 26, 2000. Current requirements call for visual inspections, semi-annual surface water sampling and annual groundwater sampling. Visual inspections are to be made of the berm and cap integrity, and for sheens at CP-3 and 4, the OU-J shoreline and the Coke Settling Basin area. Water quality is to be sampled at CP-3 and 4. No inspection reports were submitted during this reporting period.

- OU-K (Dredge Spoil Material): The Coke Plant Settling Basin was dredged at various times during coke plant operations and the dredge spoil material was placed in an area northwest of the Coke Plant Settling Basin. The non-native material identified in the dredge spoil material area consists of fine to coarse coke. The volumes of dredge spoil material in Cells A, B and C are estimated to be 62,000, 23,000 and 4,000 yd³, respectively. The RA in the ROD for OU-K specified top dressing of the dredge spoil in Cells A, B, and C, subject to the completion of a PAH-treatability study to examine implementation of alternative and innovative treatment technologies. In addition, the culvert beneath Cell A was to be rehabilitated as a preventative maintenance measure. A geotextile fabric and soil topdressing was placed over the dredge spoil area (Cells A, B and C); this work was summarized in the Final RAP (Barr, 1994)..
- Area between Operable Units I and J: Sheen and balls of tar-like substances have been observed in the southeast corner in the area identified as "Area between Operable Units I and J". The RA in the ROD stated that this contaminated material was to be excavated and used as fuel. Any tar or tar contaminated soil not suitable for use as a fuel will be placed in an on-site containment vault. It could also be included with the containment wall for OU-J. The First Five-Year Review concluded that it was not possible to verify if the tar and tar contaminated soils in this area were remediated. In addition, tar balls and oily sheens on the surface water have since been observed seasonally in this area. Institutional controls have not been implemented to date.
- OU-S (Crushed Slag Area): A crushed slag disposal and high pH area has been identified as an issue post-ROD. High pH values in surface water were recorded entering streams; an off-white precipitate was observed in a stream bed. Soil contamination was also identified also. Little to no vegetation exists in this area, which is designated as OU-S.

Wire Mill Settling Basin Management Area:

Wastes from the "cold side" of the steel plant were discharged directly to the river through a small basin located adjacent to the St. Louis River. The contaminated areas that were located on the cold side were evaluated together and are referred to as the Wire Mill Settling Basin Management Area. OUs associated with the Wire Mill Settling Basin Management Area are as follows:

- OU-P (Wire Mill Pond): During operations, the Wire Mill Pond was used as a treatment basin, holding wastewater to allow oil and greases to be removed prior to discharge to the St. Louis River. Heavy materials in the influent waste streams settled in the pond and lighter materials were captured with an active skimming process prior to discharge to the St. Louis River. The pond was estimated to contain 10,000 yd³ of non-native sediments containing PAHs, oil and grease. The RA in the ROD for OU-P (same remedy as for OU-Q and OU-R) was originally specified to be no-action. After additional concerns and investigation, an RA plan was approved and completed. Major components of the RA included: modification of watershed drainage patterns; gross pond dewatering and temporary water treatment; excavation, treatment (dewatering and drying), and disposal of 6,487 tons of non-native material; placement of geotextile filter above remaining contamination; site restoration including backfilling and wetlands construction. Additional inspections in OU-P continue to identify oil and sheens on the surface water.
- OU-Q (Dredge Spoil Area): A comparison of current aerial photographs and the 1907 topographic map of the Site suggest that the Wire Mill Settling Basin has changed shape since production began 1907. The basin was apparently dredged and reshaped between 1953 and 1969. Dredged materials from the settling basin were placed on both sides of OU-P. It was estimated there could be 40,000 yd³ of non-native material in the north pile and 19,000 yd³ in the south pile.
- OU-R (Wire Mill Pond Delta): Non-native sediments exist in the St. Louis River estuary adjacent to the outlet of the Wire Mill Settling Basin at thicknesses up to approximately seven feet. These materials are currently being investigated under sediments, not as part of the Wire Mill Settling Basin Management Area.

The RA in the ROD for the OU-P, OU-Q and OU-R specified no action, subject to the completion of a PAH-treatability study to examine implementation of alternative and innovative treatment technologies. No action includes periodic inspections to verify that no significant changes have occurred and routine water quality monitoring to verify the long-term effectiveness of the RAs. The ROD also called for appropriate institutional controls to be implemented to minimize future disturbance of the OU. Post-ROD sampling of estuary sediments showed that sediments were being re-worked by wave and storm events, resulting in a continuing source of contamination to the St. Louis River. USS agreed to address the non-native sediments in both Steel Creek and Wire Mill Pond estuaries. Significant investigation is occurring in these areas to determine the volume of impacted sediments and to develop a feasibility study for future remediation.

Sediments: OU-N and OU-R. USS agreed to address the non-native sediments in both Steel Creek and Wire Mill Pond estuaries. A Focused Feasibility Study (FFS) was submitted to the MPCA in July 1998. It was found that more information was required to determine extent and magnitude of contaminated sediments. In March 2002, a laser-induced fluorescence tool was used to survey sediments for coal tar. On March 11, 2008, USS submitted the Former Duluth Works Sediment Remedial Investigation and Tier I Risk Assessment. Significant investigation regarding OU-N and OU-R is currently on-going to determine the volume of impacted sediments and to develop a feasibility study for future remediation. The Feasibility Study is being prepared that will present remedial options; this FS is overdue.

Additional Components Not Identified by an Operable Unit:

Soils Contaminated by Above and Below Ground Petroleum Storage Tanks: This issue falls outside of the three general areas. The RA consisted of excavation and thin-spreading and/or land-farming

contaminated soil on-site. The work was completed in accordance with the work plans and subsequent sampling and headspace testing of the thin-spread soils indicated the soils were no longer contaminated. Further investigation has identified additional contaminated soil from petroleum storage tanks; this soil remains on site and was referred to the MPCA Petroleum Remediation Program for investigation and cleanup oversight.

On-site Demolition Landfills: MPCA issued Permit No. SW-201 on March 27, 1979 for the construction and operation of Demolition Landfills No. 1 and No. 2 at the Site. Demolition Landfill No. 1 was permitted to accept building masonry from the demolition of the Atlas Cement Plant. No map showing the permitted location of Demolition Landfill No. 1 could be found in the literature search. Plant Demolition Landfill No. 2 was permitted to accept building masonry from the demolition of the steel facility. Uncertainty regarding the location or existence of the demolition landfills remains such that a literature search was recommended during the last Five-Year Review.

In August 1982, a permit application was submitted to the MPCA for the construction and operation of Demolition Landfill No. 3 at the Duluth Works site. In response to the application, the MPCA replied, in a letter dated October 11, 1982, that the permit could not be issued until a few concerning issues were clarified. These concerns were due, in part, to a buried basement that contained oily waste. The material was eventually disposed of in an out-of-state facility. This area was never used as a demolition landfill. This area was investigated after the first 5YR and no contaminants were found at levels of concern.

Appendix B

Photograph Log from Site Inspections



1a: OU-A: Tar soil removal from T-1 through T-4 area; clay applied to prevent erosion.



1b: OU-A: Tar soil removal from T-1 through T-4 area; clay applied to prevent erosion.



1c: OU-A: Tar soil removal from T-1 through T-4 area; clay applied to prevent erosion.



2a: OU-A: Clay wall and bottom of from T-1 through T-4 area.



2b: OU-A: Manhole north of T-1 through T-4 area – no lid.



2c: OU-A: Product within manhole with no lid.



3: Utility Vaults: partially filled and open, another one adjacent.



4a: Other AOC: MW-23.



4b: Other AOC: Manhole.



5: OU-A: Lead drums on VIC property.



6: OU-A: Lead remediation area on VIC property.



7: OU-A: Animal burrow noted in area.



8: Other AOC: Pond feature from LIDAR



9: DL-2: Tank or process vessel and pipe within DL-2.



10a: Other AOC: Circle berm process vessel or tank.



10b: Other AOC: Circle berm feature from LIDAR.



10c: Other AOC: Pipe exiting the circle berm area.



11: Other AOC: Ditch near circle berm



12a: OU-P: Wire Mill Pond Exit, no sheen noted



12b: Wire Mill Pond Exit, no sheen noted



12c: OU-P: Wire Mill Pond



13a: OU-P: Oil sheen, oil and tar bubble at this location.



13b: OU-P: Oil sheen, oil and tar bubble at this location.



13c: OU-P: Oil sheen, oil and tar bubble at this location.



14a: Excavation of soils, fences down near Coke Oven Battery Foundation.



14b: Excavation of soils, fences down near Coke Oven Battery Foundation.



14c: Excavation of soils, fences down near Coke Oven Battery Foundation.



15: PAH Excavation near Coke Over Battery Foundation.



16: Top of OU-J



16: OU-J: Approximately 3' of slumping noted on cap/sidewall.



16: OU-J: Approximately 3' of slumping noted on cap/sidewall



17: OU-J: Slumping noted above gabion wall



19a: Area between I&J: tar balls and oil bloom



19b: Area between I&J: Sorbent boom prior to OU-I didn't fully extend across stream



20: OU-A: Tar pit TP-10 covered by sheet of plywood



21: Tar pit TP-11, one of 15 tar pits throughout the site.



22a: OU-A: T-12 Excavation done, needs fill, pipe unknown.



22b: OU-A: T-12 Excavation done, needs fill



23a: OU-S: No change from last inspection



23b: OU-S: No change from last inspection



23c: OU-S: No change from last inspection



24: OU-S: Trespassing noted: dirt bike tracks.



25: Other AOC: LIDAR non-native soils, nothing unusual noted.



26a: OU-K: Trespassing reduced from last 5-year review.



26b: OU-K: Erosion mat visible; trespassing decreased



26c: OU-K: Chemical treatment was performed but some live saplings still present.



27a: Other AOC: Erosion of stream channel



27b: Other AOC: Erosion of stream channel



28: Manhole: electrical conduit travels in multiple directions.



29a: Other AOC: Coke plant settling basin, sewer outfall history unknown, upright clay duct. (Not pictured: trespasser and dog noted in background during inspection)



29b: Other AOC: Coke plant settling basin, sewer outfall history unknown, upright clay duct

Appendix C
Interview Documentation

INTERVIEW RECORD	
Site Name: USS	Site ID Number:
Subject: <i>3rd Five-Year Review</i>	Date: <i>May 20, 2013 (phone)</i>
Type: <i>Phone</i>	
Contact Made By:	
Name: <i>Daniel Musser</i>	Organization: <i>Bay West, Inc.</i>
Title: <i>Associate Engineer</i>	Telephone Number: <i>651-291-3457</i>
Individual Contacted:	
Name: Bill Majewski	Organization: <i>Morgan Park Resident</i>
Title: <i>Former Duluth City Planner</i>	
Telephone Number: <i>218-626-2638</i>	Street Address: <i>834 87th Avenue West</i>
E-Mail Address: <i>bsmajewski@aol.com</i>	City, State, Zip: <i>Duluth, MN 55808</i>
Summary of Conversation	
<p>1. What is your overall impression of the project? (general sentiment)</p> <p>For the upland part, I have mixed feelings, because they've had to come back in a few times and perform additional work. It wasn't thoroughly cleaned up as they keep finding more items. I have concerns based on the failure of encapsulated by the coke oven ponds. Also, they did take out material at wire mill settling pond but something is not right there yet, there scum on the water and it is not very clear.</p> <p>The sediment portion is taking a long to time to get going. I understand that the MPCA staff is shorthanded and cannot focus solely on this project, however it has taken a long time to characterize the sediment and develop a plan to deal with it.</p> <p>2. What effects have site operations had on the surrounding community?</p> <p>No direct effects, however the site has the potential to be redeveloped, and given the long cleanup time, it is delaying the benefits the redeveloped property could provide the surrounding community.</p> <p>3. Are you aware of any community concerns regarding the site or its operation and administration? If so, please give details?</p> <p>No.</p>	

- 4. Are you aware of any events, incidents, or activities at the site such as vandalism, trespassing, or emergency responses from local authorities? If so, please give details.**

No.

- 5. Do you feel well informed about the site's activities and progress?**

No, there could be some interim mailings, at least to the work group to keep them informed and subsequently those that may have questions of the work group. That would keep people informed in-between the long spaces between public discussions.

- 6. Do you have any comments, suggestions, or recommendations regarding the site's management or operation?**

None, other than get the site cleaned up and determine what parts can be used.

- 7. Do you have any other concerns or comments about the site?**

There have been plans that date back to 1979 that would extend the Western Waterfront Trail (WWFT) though the railroad bed that extends through a portion of the USS site. Environmental concerns have halted progress previously, however there is a push from the current mayor on trail progress.

Another concern is that the site is a great deer refuge, and I don't believe that people are allowed to hunt on the site during the city hunt. While the properties around USS may be hunted, it isn't enough to reduce the deer population that are eating scrubs, gardens, etc. in Morgan Park.

INTERVIEW RECORD	
Site Name: <i>USS</i>	Site ID Number:
Subject: <i>3rd Five-Year Review</i>	Date: <i>6/13/13</i>
Type: <i>In person</i>	
Contact Made By:	
Name: <i>Donovan Hannu</i>	Organization: <i>Bay West, Inc.</i>
Title: <i>Senior Engineer</i>	Telephone Number: <i>(651) 291-3424</i>
Individual Contacted:	
Name: <i>John Lindgren</i>	Organization: <i>Dept of Natural Resources</i>
Title: <i>Fisheries Biologist</i>	
Telephone Number: <i>(218) 525-0853 (ext 209)</i>	Street Address: <i>5351 North Shore Drive</i>
E-Mail Address: <i>john.lindgren@dnr.state.mn.us</i>	City, State, Zip: <i>Duluth, MN 55804</i>
Summary of Conversation	
<p>1. What is your overall impression of the project? (general sentiment)</p> <p><u>Apprehension</u> – <i>it's the last huge site along the St. Louis River corridor = he wants to see it to completion. He is nervous about the inconsistency between the RPs at SLRIDT spending millions of their own dollars on cleanup of that site vs. US Steel (a similar RP) obtaining millions of dollars of Great Lakes Legacy Act funds for cleanup activities.</i></p> <p>Also, <u>Opportunity</u> – <i>clean up of this site will be extremely beneficial.</i></p> <p>2. What effects have site operations had on the surrounding community?</p> <p><i>Similar to SLRIDT, the site has been a hurdle to LINKING lots of various trails and the entire riverfront (creeks, grassy point, waterfront trail, etc); however, the impact is greater due to its size.</i></p> <p><i>Cleanup of this site is the key to future revitalization, redevelopment, restoration, etc.</i></p> <p>3. Are you aware of any community concerns regarding the site or its operation and administration? If so, please give details?</p> <p><i>Bottom line – this site is a huge opportunity for the future; cleanup is critical.</i></p>	

4. Are you aware of any events, incidents, or activities at the site such as vandalism, trespassing, or emergency responses from local authorities? If so, please give details.

Aware of frequent trespassing by area residents, using for recreational purposes.

5. Do you feel well informed about the site's activities and progress?

Not as well as SLRIDT, because the DNR is not yet officially involved, but feels the MPCA keeps him pretty informed when he needs to know. There is probably no real reason for continual updates. Pretty confident that, if something important happened, Mike B and Susan J would keep him informed.

6. Do you have any comments, suggestions, or recommendations regarding the site's management or operation?

No.

7. Do you have any other concerns or comments about the site?

No.

Volume 2.

**FIVE-YEAR REVIEW REPORT FOR
ST. LOUIS RIVER/INTERLAKE/DULUTH TAR SUPERFUND SITE
DULUTH, MINNESOTA**



**Minnesota Pollution
Control Agency**

Prepared by

**Minnesota Pollution Control Agency
Site Remediation and Redevelopment Section**

SUPERFUND SITE DULUTH, MINNESOTA 2-1

Tables

Figures

Appendices

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PROGRESS SINCE THE LAST REVIEW

Table 0-1: Protectiveness Determinations/Statements from the 2008 FYR

OU #	Protectiveness Determination	Protectiveness Statement
TSOU	Protective	The TSOU remedial action is complete and is protective of human health and the environment, as intended by the ROD.
SOU	Not Protective	The SOU remedy is not protective of human health and the environment in the short term due to the following issues: tar layer near the Radio Tower on the west side of Stryker Bay, oil sheen near Area E storm sewer outfall, and tar residual and erosion at Areas B and C. The SOU remedy is not protective in the long term until the following issues are addressed: the short-term issue noted above, an updated risk assessment is completed to determine the long-term protectiveness of RAs, particularly with respect to indoor air quality concerns and updated cleanup goals and To Be Considered (TBC), characterization and property disposal of waste (i.e. miscellaneous stockpiled soils, drums, tires, etc.); completed and/or updated restrictive covenants for all properties on the Site.
SedOU	Protectiveness Deferred	The protectiveness of the SedOU remedy will be established once the remedy implementation is complete.

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Table 0-2: Status of Recommendations from the 2008 FYR

OU #	Issue	Recommendation #	Recommendations/ Follow-up Actions	Party Responsible	Oversight Party	Original Milestone Date	Current Status	Completion Date (if applicable)
SOU	Tar layer near Radio Tower and residents of Stryker Bay	1	Characterize and Remediate	RP's	MPCA	2009	See below	See below
SOU	EBI Stockpile Soil in Area E	2	Sample and dispose properly	Land Owner/RP's	MPCA	2008	See below	n/a
SOU	Monitoring wells	3	Abandon	RP's	MPCA	2009	complete	2010
SOU	Residual soil contamination; Indoor air quality	4	Investigate, including sample collection. Update risk assessment	RP's	MPCA	2009	Data collected in VOC area was not a risk	2013
SOU	Residual operational material in Area E	5	Investigate, including sample collection. Remediate if necessary	RP's	MPCA	2009	See below	n/a
SOU	Oil sheen from Area E Storm Sewer Outfall	6	Determine origin and evaluate risk	RP's	MPCA	2009	See below	2013
SOU	Tar residual and erosion at Area B and C	7	Address in Shoreline Buffer Zone Plan	RP's	MPCA	2010	See below	n/a
SOU	Restrictive Covenants and Institutional Controls	8	Complete/Update for all Land Owners	RP's draft language; Land Owners file	MPCA	2009	See below	n/a
SOU	Outdated Risk Evaluation and cleanup criteria	9	Update risk evaluation	RP's	MPCA	2009	Redevelopment issue	n/a
SOU	Drums and Tires	10	Remove and dispose Properly	Land Owner	MPCA	2008	See below	n/a
SOU	Stockpiled Soil in Area A	11	Determine origin	Land Owner	MPCA	2009	complete	2010
SOU	Waste Materials Stockpiled in Area F	12	Remove and Dispose Properly	Land Owner	MPCA	2009	See below	2010

Recommendations 1 and 10 (Tar Layer/Drums & Tires):

- The portion of the tar layer located within the Site, near the residents along the west side of Stryker Bay and as originally designated in the ROD, has been either capped or removed. The tires near the Radio Tower have also been removed.
- The approximate extent of the tar layer near the Radio Towers adjacent to the Southwest shoreline of Stryker Bay was defined in 2007; however, no remedial actions associated with this material have occurred. Three drums also remain in this area.

Recommendation 2 (Soil Stockpile):

- No action has been taken regarding the stockpile on EBI property in Area E; however, during the recent site inspection and interviews, it was clarified that this material is not soil, but is nearly all tar. This tar was encountered and stockpiled during a utility excavation by the land owner.

Recommendation 5 (Residual Operational Material in Area E):

- No action has been taken regarding the residual operational material on EBI property in Area E; however, during the recent site inspection and interviews, it was clarified that there is one pit that appears to contain approximately nine feet of tar.

Recommendation 6 (Oil Sheen from Area E Outfall):

- During the recent site inspection, no oil sheen was identified in this area; however, significant bacterial sheen was noted. The origin of this sheen appears to be identified; no additional work is necessary for this issue.

Recommendation 7 (Tar Residual/Erosion at Areas B & C):

- During the recent site inspection, tar seeps were identified near the northwest corner of Slip 6, within Area B. Tar residual was previously identified in a similar area. Tar near the shoreline was addressed during the Sed OU construction.
- Riprap was installed where erosion channels were previously identified near the northeast corner of Slip 6, within Area C; however, a large erosion channel formed around the riprap. Additional erosion control mitigation is needed in this area and in an additional location along the west side of Slip 6.

Recommendation 8 (Restrictive Covenants/Institutional Controls):

AECOM prepared a summary of all Restrictive Covenants/Institutional Controls for the Site on January 28, 2013. Copies of the letter report, tables and figures from this summary are included in **Appendix B**. Based upon AECOM's report and this FYR, key findings regarding Restrictive Covenants/Institutional Controls are as follows:

- Institutional Controls (ICs) should be applied to the capped aquatic areas to restrict sediment and cap disturbance, limiting activities such as anchoring, dredging or docking. The Conservation/buffer zones also need to be recorded on deeds.
- ICs are required for the EBI property.

Recommendation 9 (Updated Risk Evaluation):

The current soil risk values are TBCs and are more conservative than the Soil OU ROD cleanup criteria. The MPCA has determined that the Soil OU ROD criteria are protective the current land use as industrial. ICs are in place throughout most of the site limiting land use activities (with the exception of one parcel, see Recommendation #8). Any new owners of property are encouraged (or required by lenders) to apply for liability assurances from the State. Specific site conditions and future property use will then be evaluated for protectiveness using the Soil OU ROD cleanup criteria or will require additional response actions.

Recommendation 11 and 12 (Stockpiled soils in Areas A and F):

- The stockpile in Area A was not located in the 2013 site inspection. A very small pile (less than 1 yd³) on and covered with plastic was found from recent geotechnical investigation activities through the voluntary investigation program.
- The stockpile in Area F was determined to be broken and crushed cement and yard scrapings from the adjacent bulk material storage area. No investigation was required.

Remedy Implementation Activities

Remedial activities for the SedOU were in progress during the last FYR. These activities were completed in 2010 and will now be summarized in this FYR.

In 2004, it was determined that the proposed plan for the SedOU would be the Dredge/Cap Hybrid (Alternative 3) in accordance with the ROD. The ROD presented the Dredge/Cap Hybrid alternative as the remedial action for the SLRIDT site in order to protect public health and the environment by minimizing exposure to the SLRIDT site contaminants. The ROD presents information about the SLRIDT site background and characterization including the areas of contaminated sediment and summary of human health and ecological risks, Response Action Objectives (RAOs) and cleanup levels, and other requirements in accordance with the selected remedy.

In 2005, in accordance with the ROD, a Remedial Design/Response Action Plan (RD/RAP) was prepared and submitted to the MPCA for review and approval. The RD/RAP specified the RA work required, in accordance with the ROD RAOs and cleanup levels, to successfully complete the remediation of the SLRIDT site in accordance with the ROD. The MPCA approved the Final RD/RAP in 2005. The SLRIDT Site RA construction activities were conducted in 2004, 2006, 2007, 2008, 2009, and 2010.

In 2004, Erie Pier capping material and maintenance dredging sand from the lower harbor of St. Louis Bay was delivered to the SLRIDT site. This material was used as capping material in Slip 7 for a pilot capping project during the fall of 2004.

In 2006, a temporary sheet pile containment wall was installed, and cap/surcharge sand along with an activated carbon mat was placed in Stryker Bay. In addition, a confined aquatic disposal (CAD) end dike was constructed at the southern boundary of Slip 6 to separate contaminated dredge sediments and overlying water from the St. Louis River.

In 2007, an on-site water filtration plant was constructed and operated to filter excess water in the CAD prior to discharge. Approximately 122,600 yd³ of contaminated sediments were mechanically dredged from portions of Stryker Bay, transported, and placed in the CAD. A minimum of six inches of cover sand were then placed in Stryker Bay. In addition, approximately 14,000 yd³ of impacted sediments were excavated from two wetland work areas along the 54th Ave peninsula.

In 2008, a series of push cores were advanced to determine previously dredged areas of Stryker Bay that did not receive placement of cover sand. The tar layer and approximately 500 yd³ of associated sediments on the west side of Stryker Bay, near the residences, were dredged and disposed in the CAD. Additional aggregate material was delivered and blended for Stryker Bay, then placed in multiple areas within Stryker Bay. A cap was also placed in a portion of the 54th Ave peninsula. Dredging and/or capping occurred on portions of Slip 6 and in the Minnesota Channel. The CAD end dike was inspected and repaired.

In 2009, Response Action construction activities included additional south wetland dredging, Minnesota Channel dredging, Slip 7/Minnesota Channel aggregate material placement, CAD leveling, Stryker Bay aggregate material placement, Stryker Bay sheet pile wall removal, Stryker Bay cap/surcharge excavation, Stryker Bay (SB-7) armor sand placement, and CAD isolation zone sand placement.

In 2010 to 2011, Response Action construction activities included Tallas Island Winter Work, CAD capping using an activated carbon (ACM) mat and a minimum thickness of 4.5 feet of aggregate material, environmental media (EM) placement in upland work areas, Tallas Island EM dredging and placement, CAD end dike modification, Riparian Buffer Zone earthwork designated into four areas with a width of approximately 200 feet from the shoreline (including the Wisconsin portion), and SLRIDT site restoration activities.

Operation and Maintenance Activities

In August 2013, a Long Term Monitoring and Maintenance (LTM&M) Plan for the SedOU was approved that identifies monitoring and maintenance requirements, and presented within the ROD, RD/RAP and the Minnesota Army Corp of Engineers/Department of Natural Resources (MDNR) Permit. The intent of this plan is to provide defensible data to confirm that the constructed caps are properly containing the contaminants of concern (COCs) at the SLRIDT site and that the aquatic plant and benthic communities at the SLRIDT site (and from Tallas Island, where the EM for Stryker Bay was obtained) have recovered to be consistent with other areas within the St. Louis River estuary. This plan is in the process of being implemented; however two annual vegetation monitoring reports have been generated.

No other O&M active tasks are required at the site.

Five-Year Review Process

Administrative Components

The Potentially Responsible Party (PRP) was notified of the initiation of the five-year review in December 2012. The SLRIDT Superfund Site Five-Year Review was led by Susan Johnson of the MPCA, Project Manager for the Site.

The review, which began January 2013, consisted of the following components:

- Community Involvement;
- Document Review;
- Data Review;
- Site Inspection; and
- Five-Year Review Report Development and Review.

Community Notification and Involvement

Activities to involve the community in the five-year review process were initiated by publishing a notice in the local newspaper, the “Duluth News Tribune”, on April 22, 2013, stating that there was a five-year review and inviting the public to submit any comments to the MPCA. The results of the review and the report will be made available at the Site information repository located at the Duluth Public Library, West Duluth Branch, located at 5830 Grand Avenue, Duluth, Minnesota

Document Review

This five-year review consisted of a review of relevant documents, including O&M records and monitoring data. Documents reviewed are presented in the following table (**Table 3**):

Table 0-3: Documents Reviewed

Date	Title	General Contents
6/24/11	Draft SLRIDT Project Completion Report	Draft Final Close Out Report summarizing RAs for SedOU.
December 2011, 2012	Vegetation Monitoring Report Year One and Year Two – SLRIDT Project Area	Presents results of vegetation monitoring and sampling, per Public Waters Restoration Permit
1/28/13	Institutional Control Study	Present a database with property information for ICs
3/4/13	Long Term Monitoring and Maintenance Plan	Identify LTM&M requirements for SedOU.
3/18/13	Phase II Investigation – Former Maurice’s Building	Evaluate soil, groundwater and soil-gas impacted from historical usage.

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Applicable soil cleanup standards, as listed in the 1995 ROD and the 2004 ROD Amendment, were also reviewed.

Data Review

A majority of the activities conducted since the last five year review has been previously summarized. Based upon the Draft SLRIDT Project Completion Report and the Year One and Two Vegetation Monitoring Report, the RAs completed for the SedOU appear to be in accordance with the ROD.

Site Inspection

The inspection of the Site was conducted on May 8, 2013. In attendance were Susan Johnson (MPCA Project Manager), Mike Bares (MPCA Hydrogeologist), Donovan Hannu, Brenda Winkler and Dan Musser (Bay West, Inc. [Bay West]), and Guy Partch (Barr). The purpose of this inspection was to assess the protectiveness of the remedy. In addition, the inspection followed up on issues identified during the 2008 Site Inspection.

An additional follow-up Site inspection was conducted on June 13, 2013. In attendance were Susan Johnson (MPCA Project Manager), Mike Bares (MPCA Hydrogeologist), Donovan Hannu (Bay West), Guy Partch (Barr), and John Lindgren (Minnesota Department of Natural Resources). The purpose of this inspection was to assess vegetation, especially in the Riparian Buffer Zones, and to follow up on one issue from the 2008 Site Inspection that was missed on May 8, 2013.

A summary of key issues noted during the Site Inspection is as follows:

- RAs conducted for the SedOU appeared to be short-term protective; however, erosion channels forming in the native materials at the northeast corner of Stryker Bay and along the east side of Slip 6 may jeopardize future cap integrity. In addition, riprap was installed in the northeast corner of Slip 6, where previous erosion was occurring; however, erosion channels are forming around the riprap and additional control measures are required.
- Tar seeps, tar stockpiles and a pit reportedly containing approximately nine feet of tar were identified on the EBI property in Area E.
- Previous monitoring wells appear to have been abandoned.
- The Area E Storm Sewer Outfall, where an oil sheen was previously noted, displayed a significant bacterial sheen. No oil sheens were noted in this area.
- A tar seep was identified near the northwest corner of Slip 6, within Area B.
- The tar layer near the Radio Towers was identified and is still exposed in areas along the Southwestern shore of Stryker Bay; however, these areas no longer include the beaches directly adjacent to the residences. The previously identified tires were removed; however, four drums were still identified on the Radio Tower property.

Photographs taken during the two Site Inspections that highlight these issues are located in **Appendix C**. A map depicting the photograph locations is presented by **Figure 3**.

Interviews

During the FYR process, interviews were conducted with interested parties impacted by the Site, including nearby residents, owners of businesses located on the Site, and regulatory agencies involved in Site activities or aware of the Site. The purpose of these interviews was to document any perceived problems or successes with the remedy that has been implemented to date. Interviews were conducted between May 20, 2013, and June 28, 2013. Interviews are summarized in **Table 4**; documentation of the complete interviews is included in Appendix D.

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Table 0-4: Interview Summary

Interviewee	Organization	Date	Key Comments
Bill Majewski	Former City Planner Nearby Resident	5/20/13	<ul style="list-style-type: none"> Impressed by outreach by MPCA, contractor and RP
Mike McCoshen	President Hallet Dock Company, located on Site	6/3/13	<ul style="list-style-type: none"> Took 1-2 years longer than expected Two copper stealing incidents from contractors and Hallet Dock Co. Dock 7 water is now 15-16'. Would like to purchase property along Dock 7, but is unsure if there is water/room for dock and vessel
John Lindgren	MN Dept of Natural Resources	6/13/13	<ul style="list-style-type: none"> Happy project is on tail end, but it's been slow (15+ years) Wished there was room to remove all sediments from Stryker Bay. Concerned about future bubbling of Light Non-Aqueous Phase Liquid (LNAPL) through (or lifting) cap Excited for future restoration/revitalization of river corridor
Tim Leland	Resident on West side of Stryker Bay	6/13/13	<ul style="list-style-type: none"> Happy project is on tail end, but it's been slow New rock crib protecting Stryker Bay has severely limited size and type of boats that can enter Stryker Bay. He was promised boat traffic/access would be same as before – promise not kept. Lots of restrictions placed on Stryker Bay users – he used to water ski in Stryker Bay. Trespassing much better than it used to be
Terry Anderson	Owner – Earth Burners Inc, located on Site.	6/28/13	<ul style="list-style-type: none"> During Site Inspection, clarified that the stockpile is all tar, helped identify a tar seep on his property, and pointed out the pit reportedly containing 9' of tar.

TECHNICAL ASSESSMENT

Question A: Is the remedy functioning as intended by the decision documents?

Yes for TSOU and SEDOU, no for SOU. The Soil OU has several issues that are not protective of human use.

TSOU: Previous FYRs concluded that TSOU remedial action is complete and is protective of human health and the environment as intended by the ROD.

SOU: The remedial action components of the selected remedy were excavation, treatment, and removal of contaminated soils and tar-impacted soils to cleanup levels, air sparging for the Area C naphthalene deposit, and bioventing for Maurice's Parking Lot. Due to the results of a later pilot study, the Area C pond naphthalene deposit was left in place and covered with a minimum of 8 feet of clean fill. According to the First Five-Year Review, the excavation of soil as specified by the ROD has been completed. At that time, all known soil contamination above action levels, that was within 12 feet of the ground surface was removed or treated, with the exception of the inaccessible soil underlying two existing buildings in Area D and the Duluth Auto Wrecking Garage in Area E. This soil could not be removed without damage to the structures. If these structures were demolished, remediation of the soil to the cleanup levels stated in the ROD would be necessary.

The following issues/concerns were identified during the Third Five-Year Review that calls into question the protectiveness of the SOU RA.

- There is a tar seep, a stockpile of tar/soil generated during a utility excavation, and a tar-filled pit remaining on the EBI property in Area E. There is also a tar seep located near the northwest corner of Slip 6, within Area B. These issues all represent potential risks to human health and the environment.
- The EBI property does not have an environmental restrictive covenant on record; however, they are interested in the placement of restrictive covenants on their property, if they are developed by the MPCA and do not incur additional costs.
- Dredging operations performed in 2007 identified a layer of tar extending into the upland near the radio towers on the southwestern side of Stryker Bay. This tar layer was not identified until after the ROD was implemented. The tar layer near the western shore of Stryker Bay residences was included in the SedOU remediation activities and has been addressed. The tar layer near the Radio Towers represents a potential risk to human health and the environment; further evaluation and remedial action is recommended.

SedOU: The remedial actions taken for the SedOU are generally functioning as designed. Some erosion in native materials is occurring near Area C, Stryker Bay, and Slip 6; continued erosion could affect the protectiveness of remedial actions taken in these areas. Appropriate erosion controls for the northeast corner of Stryker Bay, the northeast corner of Slip 6, and the west side of Slip 6 to provide long-term protection of cap integrity.

ICs should be applied to the capped aquatic areas to restrict sediment and cap disturbance, limiting activities such as anchoring, dredging or docking, to provide long-term protection of cap integrity. The Conservation/buffer zones also need to be recorded on deeds.

Question B: Are the exposure assumptions, toxicity data, cleanup levels, and remedial action objectives (RAOs) used at the time of the remedy section still valid?

Inhalation of particulate or vapors was not addressed in the 1993 Baseline Risk Assessment. (This was previously discussed in the First and Second FYRs.) In 2013, a soil vapor assessment was conducted in the VOC area where the highest soil vapors would be expected. The soil vapor levels were below the risk value guidelines used by the MPCA. Therefore, soil vapors at levels of concern are not expected elsewhere on the Site. Further assessment maybe required by future landowners in order to receive liability assurances.

Question C: Has any other information come to light that could call into question the protectiveness of the remedy?

No new information has come to light since the last FYR; however, there are still previously discussed issues that have not been addressed. These issues have already been presented in previous portions of this remedy evaluation.

Technical Assessment Summary

The TSOU remedy as specified by the ROD is complete. The tar seeps identified by the ROD were location specific and have been removed.

Because of the issues noted above (tar layer near radio towers, contaminated stockpiled soil, and operation waste) additional investigation and RAs are recommended for the SOU in order for it to remain protective in the short-term.

Several land use/environmental covenant issues were identified. One property does not have a restrictive covenant in place, and another does not include a water well installation restriction. Site inspection observations demonstrate the need for stricter enforcement of institutional controls including no excavation without an MPCA approved work plan and possible restrictions on the types of industrial activities operating on Site.

The locations of the Operable Units and other site features are depicted on the site map, **Figures 1 and 2**. Additional site information is contained in **Appendix A**.

Issues/Recommendations and Follow-Up Actions

Table 0-5: Issues and Recommendations/Follow-Up Actions

OU #	Issue	Recommendations/ Follow-up Actions	Party Responsible	Oversight Agency	Milestone Date	Affects Protectiveness? (Y/N)	
						Current	Future
SOU	There is a tar seep, a stockpile of tar/soil generated during a utility excavation, and a tar-filled pit remaining on the EBI property in Area E. There is also a tar seep located near the northwest corner of Slip 6, within Area B	Asses these materials, then develop and implement a remedial action plan.	RP's	MPCA	2015	Yes	Yes
SOU	Institutional controls exist for a majority of the site; however, no ICs have been developed for the EBI property within Area E.	Develop and execute ICs for the EBI property.	MPCA and Land Owner	MPCA	2016	No	Yes
SOU	A tar layer and miscellaneous drums exist west of Stryker Bay near the Radio Tower. Because these materials were identified after ROD, they were not included in the original OUs. The tar layer has been delineated; however, remedial action is needed.	Develop and implement a remedial action plan for these materials.	RP's	MPCA	2015	No	Yes
SedOU	Erosion channels have formed and are worsening in the northeast corner of Stryker Bay, in the northeast corner of Slip 6, and along the east side of Slip 6. The channels primarily exist in the native materials, but are beginning to impact the surface of the caps in these areas.	Develop and implement appropriate erosion controls for these areas to provide long-term protection of cap integrity.	RP's	MPCA	2014	No	Yes
SedOU	ICs are not in place for capped aquatic areas or for conservation/buffer zones.	Develop and execute ICs to the capped aquatic areas to restrict sediment and cap disturbance, limiting activities such as anchoring, dredging or docking. Record conservation/buffer zones on appropriate deeds.	RP's	MPCA	2016	No	Yes

Protectiveness Statement

The protectiveness statements for each OU are as follows:

Protectiveness Statement(s)	
<i>Operable Unit:</i> TSOU	<i>Protectiveness Determination:</i> Protective
<i>Protectiveness Statement:</i> The remedy at TSOU is protective of human health and the environment, as intended by the ROD. The material from four tar seeps was removed and disposed. At that time, additional tar seep material was determined to be associated with the SOU. This remedy is complete and applies to the current use of the property; future development may require additional work as documented in the ICs.	

Protectiveness Statement(s)	
<i>Operable Unit:</i> SOU	<i>Protectiveness Determination:</i> Not Protective
<i>Protectiveness Statement:</i> The remedy at SOU is not protective because of the tar seeps and tar contaminated soils found in several areas across the site. Remedial investigations and response actions are required. ICs exist for all but one parcel and are effective.	

Protectiveness Statement(s)	
<i>Operable Unit:</i> SedOU	<i>Protectiveness Determination:</i> Short-term Protective
<i>Protectiveness Statement:</i> The remedy at SedOU currently protects human health and the environment because of the activities conducted to date; however, in order for the remedy to be protective in the long term ICs and erosion control is needed.	

Next Review

The next five-year review report for the SLRIDT Superfund Site is required five years from the completion date of this review.

Third Five-Year Review Report 2013
St. Louis River Superfund Site – Duluth, Minnesota

Figures

Figure 1
SLRIDT
Site Location Map
Five-Year Review

Drawn By: S.G. Date Drawn/Revised: 9/18/2013 Project No. J120351

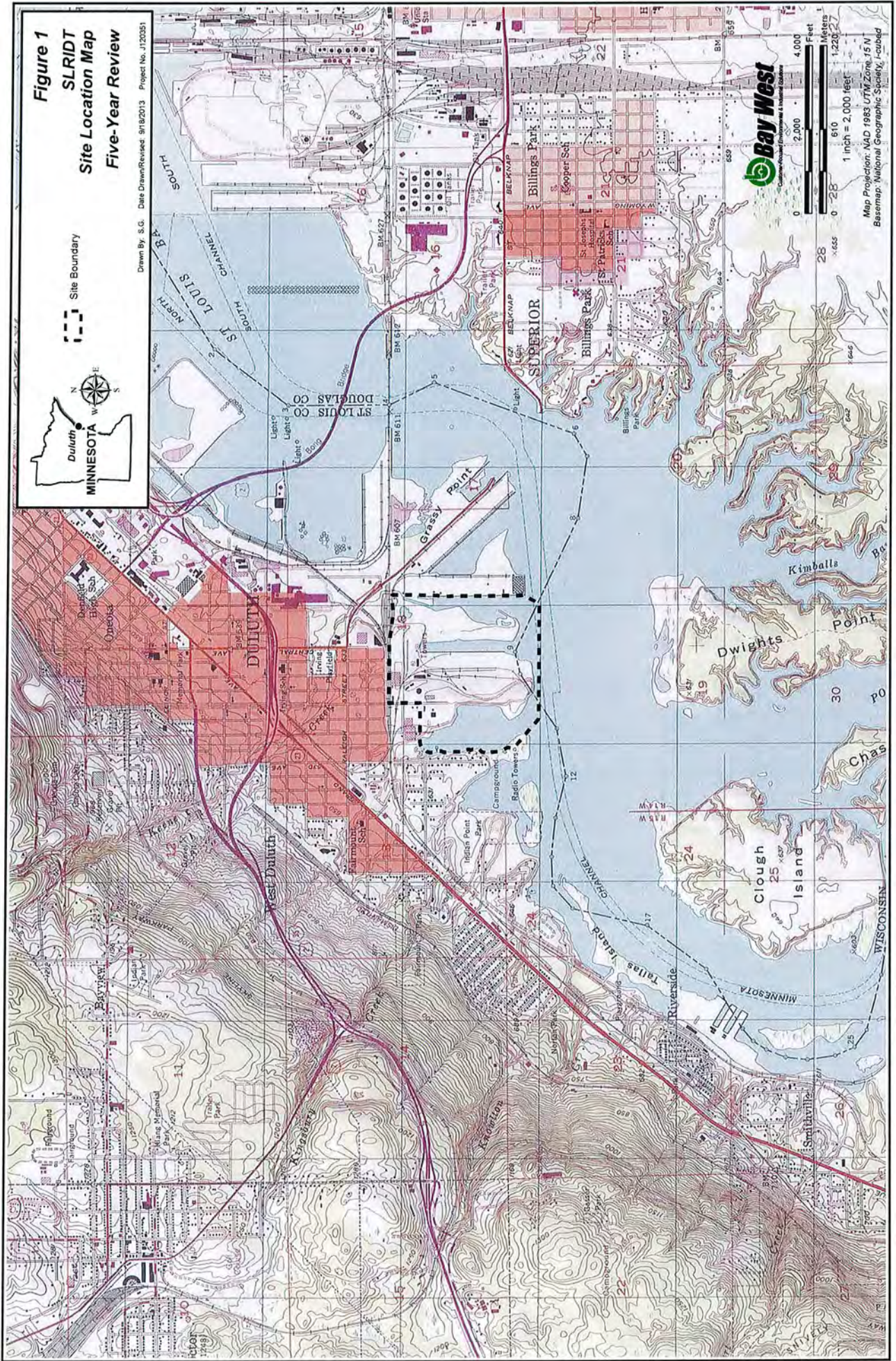
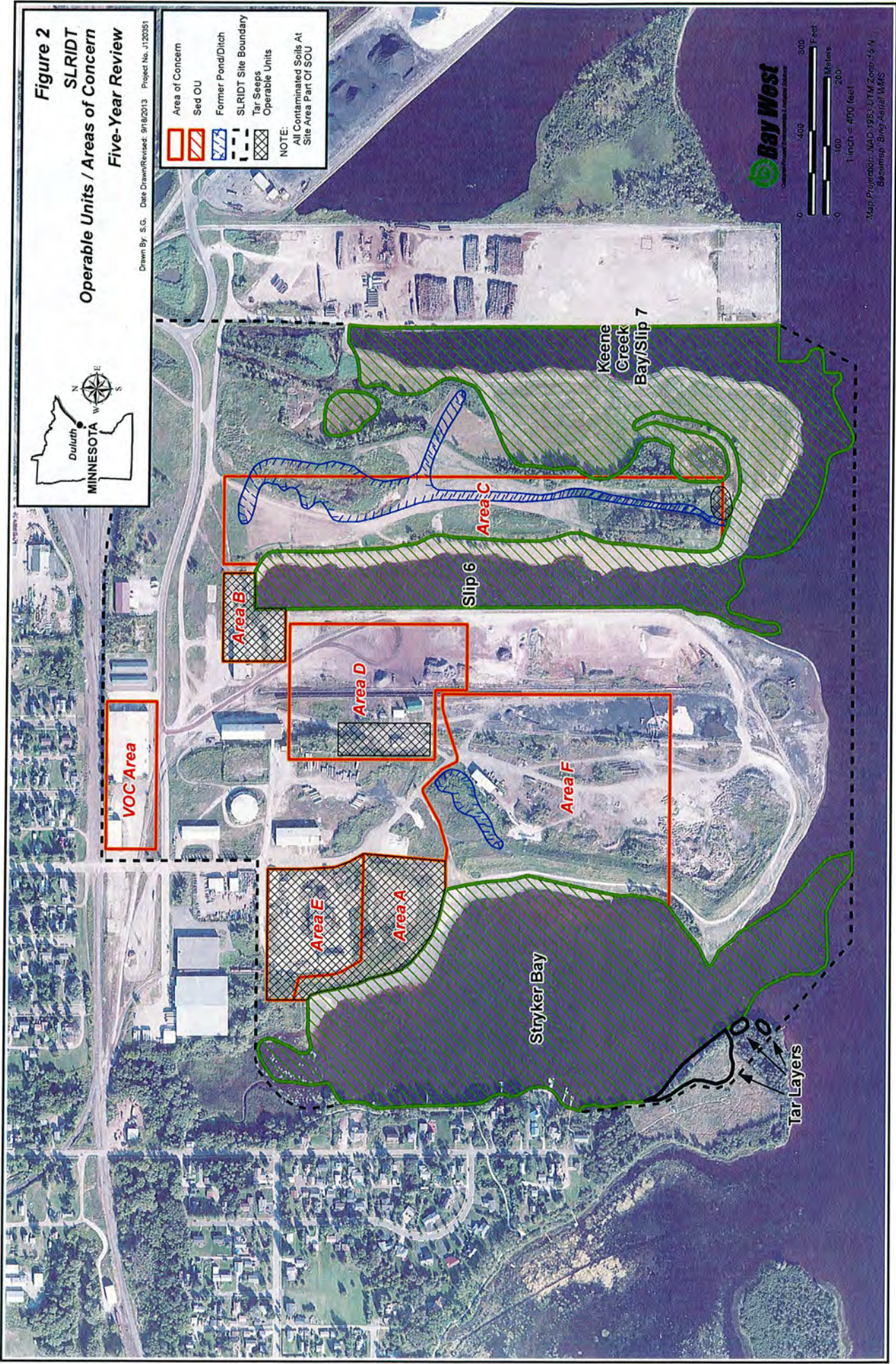


Figure 2
SLRIDT
Operable Units / Areas of Concern
Five-Year Review



Drawn By: S.G. Date Drawn/Revised: 9/18/2013 Project No.: J120351

- | | |
|--|----------------------|
| | Area of Concern |
| | Slip OU |
| | Former Pond/Ditch |
| | SLRIDT Site Boundary |
| | Tar Seeps |
| | Operable Units |
- NOTE:
 All Contaminated Soils At
 Site Area Part Of SOU



Bay West
 Environmental Remediation Services, Inc.

0 400 800 Feet
 0 100 200 Meters
 1 inch = 400 feet

Map Projection: NAD 1983 UTM Zone 15 N
 Base Map: Bing Aerial MMS



Appendix A

Existing Site Information

APPENDIX A – EXISTING SITE INFORMATION

A. SITE CHRONOLOGY

Event	Date
Site Discovery when polycyclic aromatic hydrocarbons (PAH) contamination was detected in Stryker Bay sediments and later surface water by Minnesota Pollution Control Agency (MPCA).	1979
Local resident reported oil rising to the surface of Stryker Bay.	1981
Preliminary Assessment by United States Environmental Protection Agency (USEPA).	1983
Listing on USEPA National Priorities List (NPL) in combination with US Steel Site.	1983
Listing on the MPCA Permanent List of Priorities (PLP).	1984
Remedial Investigation Completed.	1990
ROD selecting TSOU remedy and deferring remediation of all other contamination to the SOU is signed on October 19.	1990
Request for Response Action (RFRA) issued to three Potential Responsible Parties (PRPs) for implementation of the TSOU remedy and investigation and remediation of the SOU.	1991
MPCA approves RD/RAP with modifications.	1992
TSOU Explanation of Significant Difference (ESD) to address changes in Resource Conservation and Recovery Act (RCRA) regulations was signed.	1993
TSOU remedial action completed.	1994
On March 22, an RFRA issued to Interlake for the RI/FS and RD/RA of the SedOU.	1994
On June 20 USEPA and MPCA enter into MPCA Enforcement Deferral Pilot Project.	1995
ROD selecting the remedy for soil and deferring the sediment and groundwater remedy is signed.	1995
RFRA issued to Allied, Beazer, and Domtar for the RI/FS and RD/RA of the SedOU on March 26.	1996
Air Sparge Pilot Test for Area C naphthalene deposit of SOU determined air sparging was not a viable option.	1996
RA for the SOU began.	1996
SOU ESD is signed that modifies the area C naphthalene deposit remedy from air sparging to leaving the contamination in place.	1997
SOU excavation portion of RA is completed.	1997
Sediment RI/FS and Remedy Selection Agreement Between the Companies and the MPCA, February 22	2000
SOU bioventing RA at Maurice's parking lot is completed.	2001
First Five-Year Review.	2003
ROD selecting the RA for SedOU is signed, August 24.	2004
Erie Pier capping material and maintenance dredging sand used as capping material in Slip 7	2004
RD/RAP was prepared for SedOU and approved by the MPCA	2005
Temporary sheet pile containment wall was installed; cap/surcharge sand was placed in Stryker Bay. End dike for CAD was constructed at the southern boundary of Slip 6.	2006
Borings near Radio Tower on Western shore of Stryker Bay to delineate tar layer.	2007
On-site water filtration plant (WFP) was constructed and operated to filter excess water in the CAD. Contaminated sediments mechanically dredged from portions of Stryker Bay, transported, and placed in CAD. Impacted sediments excavated from two wetland work areas along 54th Ave peninsula.	2007
Second Five-Year Review	2008
Tar layer and associated sediments on the west side of Stryker Bay, near the residences, were dredged and disposed in the CAD.	2008
Additional aggregate material delivered, blended, placed in multiple areas within Stryker Bay. A cap was also placed in a portion of the 54th Ave peninsula. Dredging and/or capping occurred on portions of Slip 6 and in Minnesota Channel. CAD end dike was inspected and repaired.	2008
South wetland dredging, Minnesota Channel dredging, Slip 7/Minnesota Channel aggregate material placement, CAD leveling, Stryker Bay aggregate material placement, Stryker Bay sheet pile wall removal, Stryker Bay cap/surcharge excavation, Stryker Bay (SB-7) armor sand placement, and CAD isolation zone sand placement.	2009
Tallas Island Winter Work, CAD capping using an activated carbon (ACM) mat and a minimum thickness of 4.5 feet of aggregate material, environmental media (EM) placement in upland work areas, Tallas Island EM dredging and placement, CAD end dike modification, Riparian Buffer Zone earthwork designated into four areas with a width of approximately 200 feet from the shoreline, and SLRIDT site restoration	2010
Buffer zone work in Wisconsin portion of the Site completed	2011
MPCA approves the Long Term Monitoring and Maintenance (LTM&M) Plan that identifies monitoring and maintenance requirements, and presented within the ROD, RD/RAP and the MDNR Permit	2013
Phase II Investigation indicates that vapor intrusion pathway does not represent significant risk at Former Maurice's Building, where vapor extraction previously occurred.	2013

B. BACKGROUND

General

The St. Louis River/ Interlake/ Duluth Tar Site (Site) is within the West Duluth neighborhood of the city of Duluth, on the north bank of the St. Louis River, approximately four river miles upstream of Lake Superior. The Site includes approximately 255 acres of land and river embayments, wetlands, and boat slips.

The land includes the 59th Avenue Peninsula (Hallett Peninsula), the 54th Avenue Peninsula, and is bounded on the north by the Burlington Northern right-of-way. The two peninsulas consist largely of fill material. The topography of the Site is uneven, and slopes slightly toward the St. Louis River. Portions of the Site are located within the 100-year floodplain. The Site is zoned for industrial land use.

There are three geographically separated areas of concern in the river within the Site. Stryker Embayment (approximately 35 acres and defines the western boundary) is a shallow water embayment with emergent wetlands at the north end. Boat Slip 6 (about 23 acres located in the middle of the Site) is a shallow water and deep water environment. The 48 Inch Outfall Area and Keene Creek Bay/Boat Slip 7 (about 27 acres and defines the eastern boundary) are emergent wetlands and shallow water environments grading into deepwater environment.

The St. Louis River and estuary is the largest tributary on the U.S. side of Lake Superior, the largest freshwater lake by area in the world, providing a wealth of natural resources. Resource management goals for the estuary are to protect, preserve, restore, and enhance natural resources, and to provide opportunities for public use for this and future generations. More specifically, natural resource managers have identified priority needs of conserving and enhancing near shore shallow water fishery habitat, nesting and rearing habitat for shorebirds, and wetlands.

Site Geology

In general, the Site consists of two types of geologic areas. A portion of the Site consists of native (natural) materials which includes interbedded clay, silty clay, silty sand and sand. The area of native materials is located on the northern approximately one third of the Site north of the original St. Louis River shoreline. Areas A, B, E, and Maurice's parking lot are, for the most part, composed of native material. In general, the stratigraphy in these areas consists of an upper clay layer of varying thickness (average ten feet) that overlies a silty sand layer (approximately 15 feet thick) and a lower red clay layer that is over 150 feet thick. Both the upper and lower clay layers have a relatively low permeability, which tends to inhibit the migration of water and chemical compounds. The upper clay layer has been penetrated by building foundations and other structures, and contains fractures and silt stringers which can increase the permeability. The lower clay is a confining layer. Varying thicknesses of fill material have also been deposited upon areas of native materials north of the original shoreline. The other areas of the Site, including most of the 54th and 59th Avenue Peninsulas south of the original shoreline, consist primarily of industrial and other fill material. Slag from pig iron operations, dredge spoils, solid by-products, and wastes were used as fill.

The most permeable materials present at the Site consist of the silty sand and sand layers found in the native materials. Some of the granular fill materials are also permeable. Groundwater flows, under water table conditions, from the upland portions of the Site towards the embayments and the St. Louis River. Flow is generally to the south from the natural upland areas and from the center of the peninsulas radially outward where the groundwater discharges to surface water of the St. Louis River. The depth to groundwater varies at the Site as does the surface topography. In general, the depth to groundwater is greater in the northern portion of the Site (approximately 15 feet) and is closer to the surface in the lower areas which are near the St. Louis River.

Groundwater occurs within the gabbroic bedrock at depths greater than 200 feet. The potentiometric surface of the bedrock groundwater is estimated to be higher than the ground surface at the Site. The bedrock aquifer is isolated from the shallow unconfined groundwater by the thick regional red clay present. In addition, an upward potentiometric gradient exists from the bedrock into the red clay interval.

Land and Resource Use

The Site has been used for industrial purposes since the late 1800s. From the 1880s to the early 1960s the operations included coal tar refining, tar product manufacturing, coking and by-product recovery, iron making, and gas making.

Iron manufacturing operations were conducted from the 1880s to the early 1960s. The Zenith Furnace Company built the first coke plant and a water gas manufacturing plant in approximately 1905. This coke plant operated until approximately 1929 when the Zenith facilities were dismantled and partially removed. The Interlake Iron Company was built about this time, including a second coke plant. The Interlake Iron Co. continued to operate the coke plant and the water gas manufacturing plant until 1961. During the years of operation, filling of the river was conducted to create the land on the 59th Avenue Peninsula. Fill was also used to form the 54th Avenue Peninsula. Discharges from the coking and pig iron operations flow from the outfall pond/ditch of the Keene Creek Bay to a southerly ditch and finally to a 48-inch pipe at the southern end of the 54th Avenue Peninsula. The filling activities that have since been conducted on the 54th Avenue Peninsula have covered the former pond/ditch.

Between 1961 and 1966, the Site was not in use. In 1966, Hallett Dock Company (Hallett) purchased the former Interlake portion of the Site. Since that time, the Hallett property has been used primarily for bulk storage and handling of bentonite, coal, coke and other industrial materials. Hallett currently owns most of the Site and leases certain buildings and property on the Site to others. In the late 1970s Hallett sold a portion of the northern most part of the Site to Maurices', Inc. and in 1999 sold a portion of the Site south of Fremont St. and west of 59th Avenue to Cedar Bay Partners, LLC. Hallett later sold 54th Avenue Peninsula and 59th Avenue Peninsula shoreline to GKN for the establishment of a Shoreline Buffer Zone as part of the SedOU RA.

The Duluth Tar and Chemical Company, who used the by-products of the iron companies coking operations to manufacture products such as shingles and tarpaper, operated from approximately 1920 to 1927. The company was located on the eastern portion of the Site along what was the 1905 shoreline. During the 1930s another company, American Tar and Chemical Company, began operating a plant immediately north of the Duluth Tar and Chemical Plant. An underground pipeline directly supplied the tar plant with dehydrated coal tar from the neighboring coke plant. This area later became an automobile salvage yard that operated from 1963 until approximately 1998, when Earth Burner Inc. (EBI) purchased it. EBI operated a contaminated soil thermal treatment facility until approximately 2001, when it discontinued the soil treatment operations and is now called EBI, Drilling Inc. EBI home office is located on-site and they lease or use the site land and structures for storage of materials.

A horsemeat packing plant operated from 1929 through 1975 on the western edge of the Site, south of the tar company operations. The buildings on the property were destroyed by fire on February 20, 1975 and the area remains vacant.

History of Contamination

The coking and pig iron industrial operations produced waste products. These products include coke, pig iron, coal tar, slag, sodium nitrate, and coal gas. The tar waste products included coal tar, pitch, and oils. In 1979 the MPCA staff detected the PAHs in samples collected from Stryker Embayment sediments. Subsequent analysis of embayment surface water samples, by MPCA staff in 1980, showed the presence of PAH compounds. In 1981, a local resident reported oil rising to the surface of Stryker Embayment, apparently from the slow release of oil from the sediments.

Based on the industrial operations and waste products, distinct areas of contamination were identified. These area designations, used throughout the Site documentation, are shown in Attachment 1, Figure 2.

- Areas A and E were the locations of former tar distillation operations.
- Area B included the waste liquor settling basin, naphthalene sump, discharge sewer line structures, and surrounding soil that were associated with the iron manufacturing and waste handling.
- Area C included the ditches, pipes, lift station, and settling pond contaminated from Interlake's waste handling. These areas contained tarry wastes and naphthalene deposits.
- Area D included soil impacted by tarry wastes from the water gas plant and coking ovens.
- Area F contained several areas of soil contamination as a result of discharges to a crescent shaped pond and disposal of contaminated dredge spoils located near the western edge of the 59th Avenue peninsula.
- Maurice's' Parking Lot was an area of visually stained soil observed during the original re-medial investigation. The source of the volatile organic compounds (VOCs and naphthalene contamination were unknown.

Initial Response Pre-Record of Decision

No clean-up activities were performed prior to issuing the first ROD (for the Tar Seep OU). As part of the initial investigations, the MPCA staff identified four Responsible Parties (RPs), three of which agreed to undertake remedial actions for various portions of the Site. These include the Interlake Corporation (Interlake), Allied Signal Inc. (Allied) and Domtar Inc. (Domtar). The fourth, Beazer East Inc. (Beazer), had not participated.

The MPCA requested the RPs to conduct remedial actions in accordance with the following RFRA for the TSOU and SOU:

- The March 26, 1991, RFRA was issued to Interlake, Domtar and Allied for RD/RA of the TSOU and the RI/FS and RD/RA of the SOU.
- The May 25, 1993, RFRA was issued to Interlake for the RI/FS and RD/RA of additional areas of the SOU and to Beazer for the RI/FS and RD/RA of the TSOU and SOU.

The 1991 and 1993 RFRA's allocate responsibility to TSOU and SOU by area. Domtar and Beazer are responsible for Area E and tar seeps on the border of Areas A and E. Allied is responsible for Area A and tar seeps on the border of Areas A and E. Interlake is responsible for Areas and sub-Areas of B, C, D, F, and Maurice's' Parking Lot and the 48-Inch Outfall.

Basis for Taking Action

The contaminated environmental media at the Site includes soil, groundwater, sediment and surface water. PAHs were detected in surface and subsurface soils during investigation of the peninsulas and in sediments from the embayment, boat slip, and outfall areas.

- Waste discharged from the outfall spread and hardened resulting in a tar blanket extending across a considerable area into the open waters of the St. Louis River.
- Large tar seeps were present on the 59th Avenue Peninsula in Area A, Area B near the north end of the Hallett Boat Slip, and Northern Area D.
- Black contaminated native sand and clay were present north of the peninsulas (Maurice's' parking lot).
- Elevated concentrations of inorganics were identified in groundwater, sediment and soil samples collected at the Site.

- Groundwater contamination appeared to be localized and correlated to the contamination seen in soils in the vicinity of the monitoring wells.
- VOCs were detected in groundwater, in outfall sediments and in the boat slip sediments.
- Floating wastes were periodically present in the open waters as a hydrocarbon sheen or solid material composed of compounds associated with coal tar wastes.

The Human Health Risk Assessment, developed in 1993 by the MPCA, identified the following Contaminants of Concern (COCs): the carcinogenic PAHs: benz[a]anthracene, ben-zo[b]fluoranthene, benzo[k]fluoranthene, benzo[a]pyrene, chrysene, dibenzo[a,h]anthracene, and indeno[1,2,3]pyrene; the noncarcinogenic PAHs: acenaphthene, anthracene, fluoranthene, fluorine, naphthalene, pyrene, 2,4dimethylphenol, 2-methylphenol, 4-methylphenol, phenol; the VOCs: acetone, benzene, ethylbenzene, styrene, toluene, and xylenes; and the inorganics: cyanide and lead. Potential pathways for human exposure to Site contaminants include inhalation, ingestion, and skin contact.

The RIs indicated that PAHs were found in every sample taken at the Site (Retec 1993). Of the 278 samples collected and analyzed for Total cPAHs and EnSys field screening, 237 (85 percent) were higher than the MPCA preliminary cleanup goal of 0.8 parts per million (ppm) Total cPAHs. Non-cPAH compounds were always detected in association with cPAHs. In all areas, if the preliminary clean-up goal was exceeded for any compound, it was also exceeded for Total cPAHs. VOCs were found only in association with high concentrations of PAHs.

Samples have been collected from areas of the Site that have fill but no specific history of tar disposal or process operations. The fill consists of slag, silt with debris, general fill material, and maintenance debris from the current owner's operations. The cPAH concentrations of these samples ranging from detection levels to 86 ppm are lower than areas impacted by tarry material. These concentrations may be representative of levels found throughout the industrial fill not directly associated with tar contamination.

Previous investigations indicated that groundwater contamination does not represent a risk pathway at this site.

C. REMEDIAL ACTIONS

TSOU:

The tar seeps can be defined as amorphous, black residues from the coking process and other industrial activities characterized by high concentrations of PAHs. The selected remedy for the TSOU targeted four large tar seeps and was completed in March 1994. The remedy included excavation of approximately 192 tons of fuel-grade tar waste and transportation of the wastes to be burned off-site for energy recovery at the Missouri Fuel Recycler/Continental Cement Company of Hannibal, Missouri. However, 14 rolloff boxes of nonfuel-grade material were stored at the SLRIDT site and subsequently addressed along with the remediation of the SOU. In addition, the tar associated with the TSOU in Areas A and E was not of a quality to allow its use as a recyclable/burnable fuel. Therefore, remediation of tar in Areas A and E was deferred for treatment in the SOU.

The First Five-Year Review provided a detailed summary of the ROAs, Selected Remedy, Remedy Implementation, and System Operations/O&M.

SOU:

The ROAs, as summarized in the September 27, 1995, ROD for the SOU, are to prevent current or future exposure to the contaminated soils and reduce the contaminant migration to groundwater. To achieve this objective, the ROD established soil clean-up levels based on contaminant leachability to groundwater and

direct exposure to contaminant residue in the soil. These clean-up levels were included in the First Five-Year Review Report.

The SOU ROD specified the following RAs:

1. Excavation of tarry soils and tar impacted soils to a maximum depth of 12 feet below the ground surface or to the water table to satisfy the soil clean-up levels established in the ROD. The excavated material will be treated by on-site thermal treatment of the tarry soils in combination with off-site landfill disposal that includes the tar-impacted soils excavated during the TSOU remediation. As an added precaution, any area where contamination is left in place below groundwater and the water table is less than 8 feet below ground surface; clean fill will be added to a depth of 8 feet above the water table.
2. Structure decontamination. Structures above the water table that will be decontaminated by scraping contaminated material from the surface include but are not limited to: piping, sumps, tanks, footings, building foundations, settling basins, and lift stations.
3. Air Sparging for Area C naphthalene to remediate the entire thickness to the soil clean-up levels presented in Table 1 of the ROD.
4. Bioventing for Maurice's Parking Lot to achieve the soil clean-up levels in the ROD.
5. Groundwater monitoring. Two rounds of monitoring will be performed prior to implementation of the soil remedy to establish a baseline to evaluate the remedy performance. The monitoring network existing at the time of the ROD and the ten new wells proposed as part of the SedOU work will be monitored in accordance with a MPCA staff approved plan on a quarterly basis.
6. Institutional Controls, as follows:
 - Zoning designation. This Site will be used for industrial development only.
 - Excavation will not occur below twelve feet or groundwater, whichever is most shallow. In addition, any soil removed below a depth of 3.5 feet must be placed back below 3.5 feet or disposed of in accordance with a MPCA staff approved plan.
 - Wells will not be constructed within the uppermost aquifer at the Site.

In 1996, the Area C pilot study demonstrated that air sparging would not effectively remediate the Area C naphthalene deposit that is present below the water table. Based on this information, the MPCA staff recommended that the contamination be left in place. This recommendation is consistent with the SOU ROD that allows contamination to remain in place below the water table. An ESD, dated February 10, 1997, documents this significant change from the September 1995 ROD. The ESD specified:

1. Additional groundwater monitoring wells will be installed and groundwater monitoring will be conducted to determine groundwater and surface water impacts.
2. The contaminated area will be covered with a minimum of eight feet of clean soil above the water table to allow for future industrial development.
3. Institutional controls will be used to minimize risk to human health and the environment.

Interlake, Domtar, and Allied excavated soil from their respective areas to meet the soil clean-up levels presented in the SOU ROD. Verification of soil excavation completeness was determined using an iterative sampling procedure from a Michigan Department of Natural Resources guidance document modified to reflect the two-layered Clean-up Levels and heterogeneous nature of the deposits. Samples were collected and analyzed from the bottom and sidewalls of the excavation. The data set for each excavation was compared to the ROD clean-up levels with final approval by the on-site MPCA inspector prior to backfilling. In Areas A and E

it was also noted that the native red clay soil underlying the contaminated soil provided a visual reference to contrast the contaminated soil.

Excavation of contaminated material could not be completed under existing operational structures without damaging the structures. Therefore, soil contamination above the subsurface clean-up levels remains under these structures. Contaminated material that exceeded the clean-up levels specified in the ROD, but which is either beneath the water table or deeper than 12 feet, also remains in place at the Site. This information is provided in a Technical Memorandum on Residuum in Appendix A to the "Documentation of Operable Unit Completion, Soil Operable Unit, St. Louis River/Interlake/Duluth Tar Site, Duluth, MN, October 1997."

The MPCA concurred with the remedy completions in the document, "Documentation of Operable Unit Completion, Soil Operable Unit, St. Louis River/Interlake/Duluth Tar Site, Duluth, MN, October, 1997" and the addendum "Addendum to the Documentation of OU Completion Report, Soil Operable Unit, St. Louis River/Interlake/Duluth Tar Site, Duluth, MN, December 2002."

The RA also included the decontamination of structures that were uncovered during excavation. All structures encountered were scraped clean and, when possible, removed. The specific RAs for each area are presented below:

Areas A and E

Domtar and Allied implemented the soil excavation for Areas A and E in August 1996 and completed it in January 1997. Approximately 14,711 cubic yards (cy) of contaminated soil were excavated from a series of sixteen areas. The excavated soil was transported to the Minnesota Industrial Containment Facility in Rosemount, Minnesota for disposal.

The steel tank base from the former 860,000-gallon tank in the southeast corner of Area E and the steel in-ground vessel from the central portion of Area E were removed, scraped clean and transported to a scrap yard. The foundations and footings left in place were scraped clean. In general, piping was excavated for off-site disposal. The MPCA inspected the Site on August 7, 1997 and noted three areas requiring additional work. A small gully that had formed near the toe of the re-vegetated bank of excavation area 16 was filled and stabilized. A sump in the northwest corner of the concrete pad in Area A was determined to be a safety hazard and was filled to grade with sand and gravel. A small amount, approximately one quart, of black tarry material was observed near this sump and was removed.

Areas, B, C, D, F and Maurice's Parking Lot

The Interlake Corporation implemented the selected remedies, summarized below, for Areas B, C, D, and F in May 1996 and for Maurice's Parking lot in September 1996. The soil excavation portion of the remedy was completed in August 1997 and the bioventing system remediation at Maurice's Parking Lot was completed in December 2001.

Approximately 30,441 cy of soil and debris were excavated and remediated from Areas B, C, D, and F.

Simultaneous to the soil remediation, an Interim Response Action was implemented to remove and treat approximately 4,400 cy of contaminated sediments dredged from the north end of Slip 6.

Buried drums discovered in Area C2, determined to be nonhazardous, were disposed of off-site at Lake Area Landfill.

The one-half acre area of VOC soil contamination in Maurice's Parking Lot including benzene, toluene, ethylbenzene, xylene, and styrene was treated with a six-vent bioventing system. The system operated during the non-winter months until the blower failed in September 1997. The soil was sampled at this time to determine if clean-up levels had been met. The sampling demonstrated that the soil still exceeded the clean-up levels, so a new blower was installed and the system was restarted in October 1997. The system continued

to operate until December 2001. Soil samples collected in 2000 detected only one VOC, ethyl benzene at 1.6 mg/kg, at concentrations exceeding clean-up levels (0.06 mg/kg for ethyl benzene). Groundwater was sampled several times between August 2000 and June 2001 at two water table wells located down gradient from Maurice's' Parking Lot to monitor water quality between the Site and the river. None of the Site contaminants have been detected in the groundwater samples. The MPCA concurred that the RA was complete based on the decrease of all contaminants except ethyl benzene to below clean-up levels, that the low levels of contamination remaining are at depth, and contamination was not detected in the groundwater.

SedOU:

Remedial actions for the SedOU were part of the current FYR and are discussed in the document; additional discussion was not included for this appendix.

Appendix B

Institutional Control Summary

Duluth SLRIDT IC Study

The contents include the following:

- Letter Report
- Figures
 - Figure 1 – Former VIC Sites
 - Figure 2 – Site Areas
 - Figure 3 – Capped Containment
 - Figure 4 – Residual Contaminant
 - Figure 5 – Railroad Easement
 - Figure 6 – Street Easement
 - Figure 7 – Utility Easement
 - Figure 8 – Riparian Buffer Zone
 - Figure 9 – Land Use
 - Figure 10 – Parcels
 - Figure 11 – Environmental Covenants
 - Figure 12 – Zoning
- Complete IC Documents Master Table
- Appendix A – Supporting Documents
- Appendix B – Capped Containment Figures
- Appendix C – Residual Contaminant Figures



AECOM
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218.625.2201 fax

January 28, 2013

Ms. Susan Johnson
Project Leader
Minnesota Pollution Control Agency
525 Lake Ave. South, Suite 400
Duluth, MN 55802

Subject: Institutional Control Study for St. Louis River/Interlake/Duluth Tar Superfund Site in Duluth, Minnesota; AECOM Project # 60279079

Dear Ms. Johnson:

AECOM is pleased to present our Institutional Control (IC) Study geodatabase for the St. Louis River/Interlake/Duluth Tar (SLRIDT) site located in Duluth, Minnesota. The proposed study area for the SLRIDT IC Study was defined by 63rd Avenue West, railroad property to the north, Slip #7 to the east and Wisconsin to the south. The general purpose of the IC Study was to develop a Geographic Information System (GIS) data base with property information and to identify areas where ICs exist and where ICs do not exist or may not be adequate.

The GIS structure which is attached to this letter identifies the information to be included and the individual layers.

SCOPE

AECOM used a City of Duluth GIS air photograph as the base map for this database. The study area boundaries are defined by a yellow border in the attached database. AECOM first developed the GIS database outline and then submitted this outline to the MPCA for approval in May 2011. After the GIS outline was approved, the information contained within the database was obtained through city, county and government sources.

The database identifies the current parcel and property ownership boundaries within the study area. Zoning, current land use and City ordinances that apply to the study were obtained from the City of Duluth.

Locations of known existing soil and sediment contamination were documented in the GIS system along with areas of contained (capped) contamination. Contaminants of concern were also included for these areas. Properties that are currently or formerly enrolled in the MPCA Volunteer Investigation and Cleanup (VIC) program were identified. The MPCA provided this information through existing files, documents and the MPCA VIC online database. Existing Assurance Letters and Environmental Covenants recorded on the property deeds are included for the identified VIC properties. Individual site areas (Area A through Area F) recorded on the site's Record of Decision (ROD) are also identified in the database.

A files and records search was performed at the St. Louis County Recorder's Office to identify current ICs known to exist in the study area. Utility easements, railroad, street and riparian easements recorded on the deeds are also contained within the database.

RESULTS

The study area for this database consists of 153 separate parcels (Figure 10) with each titleholder (at the time data were collected) identified in the database. There are four zoning designations (Figure 12) within the database boundaries consisting of residential, industrial, mixed use and open space/undeveloped designations. Land use varies within the study boundaries and consists of nine land use designations (Figure 9):

- Harbor
- High Density Residential
- Light Industrial
- Manufacturing Industrial
- Miscellaneous
- Medium Density Residential
- Open Space Undeveloped
- Park
- Railroad Yard

Known areas of contamination (Figure 11) were identified in the database including containment areas (Figure 3) and impacted soil and sediment areas. Soil contamination areas are located on upland areas of:

- 54th Avenue West peninsula (naphthalene, PAHs),
- Hallett Dock 6 peninsula (PAHs and black tar layers) and
- Communication tower peninsula west of Stryker Bay (black tar layer).

54th Avenue West peninsula is currently owned by XIK Corporation which is a responsible party for the site. The area is zoned industrial and designated as open space undeveloped land use. A riparian buffer zone is identified on Figure 2 of the site's Response Action Plan; however a recorded easement was not identified during the records search. The site has restricted access from land (fence) and current ICs exist in the form of Environmental Covenants restricting soil disturbance and utilizing the property for industrial purposes.

Hallett Dock 6 peninsula is owned by the Hallett Dock Company and is used for bulk storage of materials. The area is zoned industrial and is designated as harbor land use except for a small western portion of the site that is designated as open space undeveloped. A riparian buffer zone is also identified on Figure 2 of the site's Response Action Plan along the western and southern shorelines; however a recorded easement was not identified during the records search. It is no longer used for shipping and receiving from vessels as the incorporation of Slip 6 as a Contained Aquatic Disposal (CAD) effectively ended the use for vessel traffic. Current ICs exist in the form of Environmental Covenants restricting soil disturbance and utilizing the property for industrial purposes.

Communication Tower peninsula west of Stryker Bay is zoned industrial and designated land use is open space undeveloped. It is currently owned by Midwest Communications and no known environmental covenants are recorded on the property deed.

Areas of contained (capped) contamination were identified in the database and shown as Figure 3. These areas include both upland and aquatic areas. Upland areas are located on the 54th Avenue West peninsula and have recorded Environmental Covenants. Aquatic areas include Stryker Bay, Slip 7 and adjacent areas, and Slip 6. Slip 6 was utilized as the CAD facility receiving contaminated dredging materials that were deposited within and capped with aggregate materials. The parcels surrounding aquatic capped areas all contain recorded Environmental Covenants restricting land use.

Former VIC Properties - Five former VIC properties are identified on the database (Figure 1), four of which currently contain Environmental Covenants recorded on the property deeds. These properties include:

- Former Maurices site (Inactive),
- Moline Machinery (Inactive), and
- Western National Bank (former Kemp's Fisheries - Inactive) property.
- Hallett Dock Scalehouse

The Hallett Dock 7 parcel is the only inactive VIC property with no current Environmental Covenant as the covenant was terminated in late 2010. All of these properties are zoned industrial and land use designation varies. The inactive former Maurices site has the land use designation light industrial, Moline Machinery is designated as manufacturing industrial and the Western National Bank land use is open space undeveloped. Both Hallett Dock properties land designations are harbor use. The Environmental Covenants restrict soil disturbance and uses for industrial purposes.

CONCLUSIONS

Institutional controls exist within certain parcels of the site as Environmental Covenants recorded on the property deeds. The majority of property areas within the study boundary contain Environmental Covenants recorded on the property deeds. Remaining soil contamination on the former 54th Avenue West peninsula and the Hallett Dock peninsula have Environmental Covenants recorded on the deeds restricting soil disturbance and restricting land use to industrial. These ICs appear to be adequate for these areas and property uses. Hallett Dock does utilize its property for industrial purposes and they do not ship or receive materials via vessels.

The "DRAFT Project Completion Report" shows, on Figure 1-2, a conservation /buffer zone owned by XIK Corporation on the western and southern shoreline of the Hallett Dock 6 peninsula; however, it is not recorded on the property deed. The 54th Avenue West peninsula is open space and access is restricted from land. "The Draft Project Completion Report" Figure 1-2 also shows a conservation /buffer zone that exists on this property. This conservation/buffer zone is also not recorded on the property deed. There are no restrictions recorded on the deed for the remaining contamination (tar layer) on the communication tower peninsula owned by Midwest Communications. It appears from "The DRAFT Project Completion Report" that this area was investigated but not remediated.

Institutional controls are not present in parceled land areas of capped contamination in aquatic areas of Stryker Bay. Environmental Covenants are recorded on the property deeds adjacent to these areas and on capped aquatic area of Slips 6 and 7 that restrict soil disturbance but there are no apparent anchoring, dredging or docking restrictions that exist.

RECOMMENDATIONS

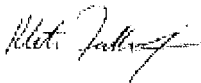
Institutional Controls seem warranted for the communication tower peninsula property (black tar layer) along the western shoreline of Stryker Bay. The existing tar layer identified in the database should be addressed through additional actions. Institutional controls should then be applied to this location if deemed appropriate.

Capped aquatic areas of remaining contamination on parceled lands identified in the "DRAFT Project Completion Report" should have ICs applied that restrict sediment disturbance that could pose a health risk. This could include anchoring, dredging restrictions or docking limitations.

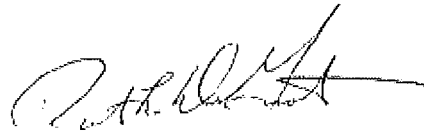
This database is based upon information referenced within. Changes can be expected to occur to the information base with time. The database must be updated to stay current.

If you have questions concerning the project, please contact Klete Fallowfield of AECOM by calling 218-625-8766 to discuss.

Sincerely,

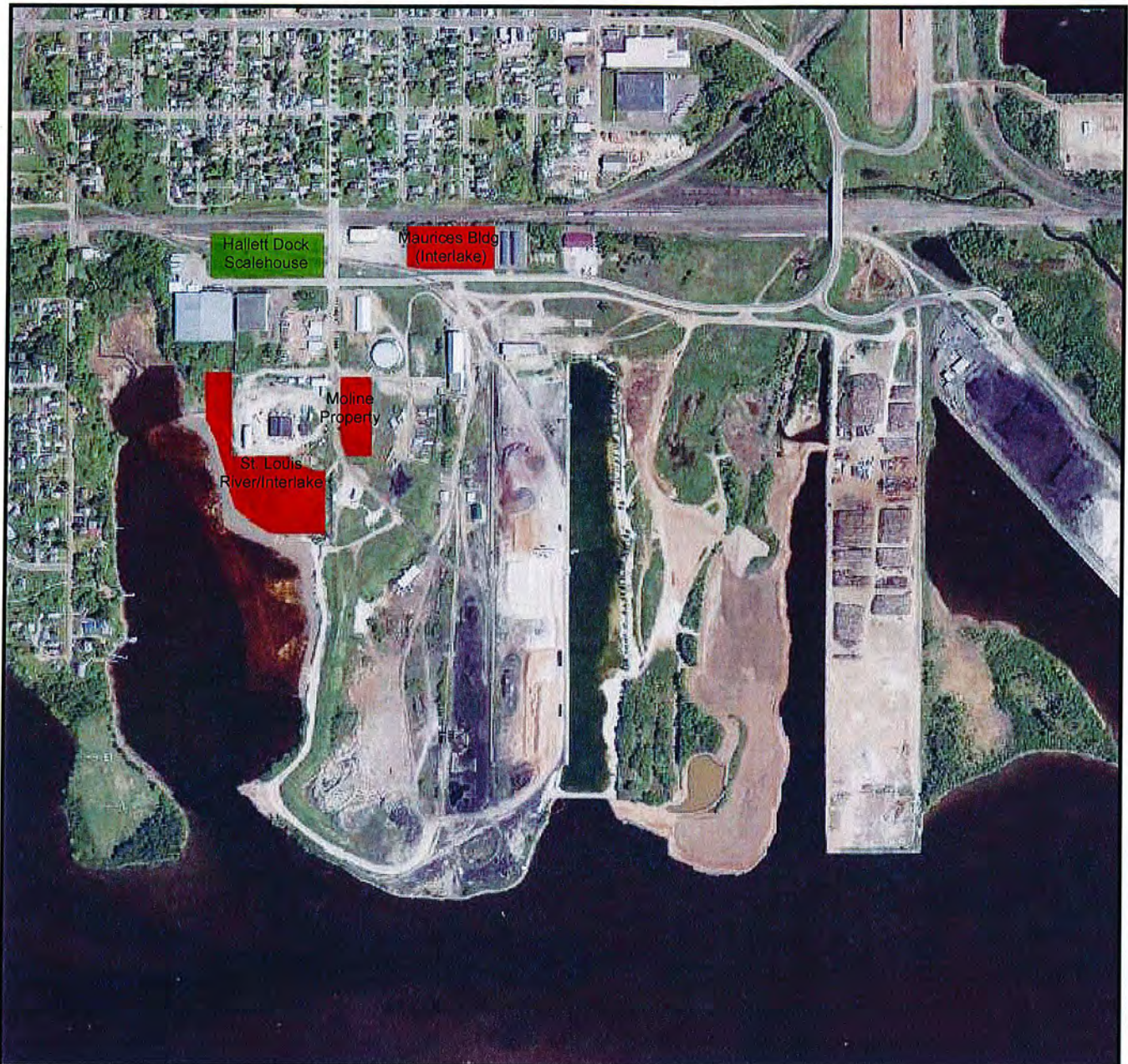


Klete Fallowfield
Project Manager



Robert L. DeGroot, PG PE
Principal Engineer

Figures



Legend

- Active VIC Sites
- Inactive VIC Sites



0 750 1,500 Feet

Source: Aerial photograph from Bing Maps 2010

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VIC SITES

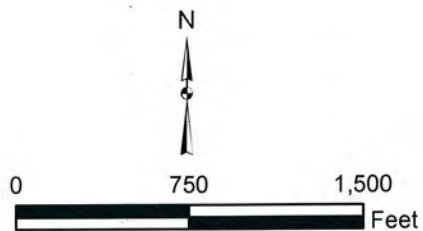
SLRIDT SITE
CITY OF DULUTH
DULUTH, MN

Drawn:	KLM	10/08/2012
Approved:	KF	10/08/2012
Scale:	1" = 750'	
PROJECT NUMBER	60197726	
FIGURE NUMBER	1	



Legend

Site Areas



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SITE AREAS

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FIGURE
NUMBER 2



Legend

Capped Containment



0 750 1,500
Feet

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CAPPED CONTAINMENT

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Scale: 1" = 750'

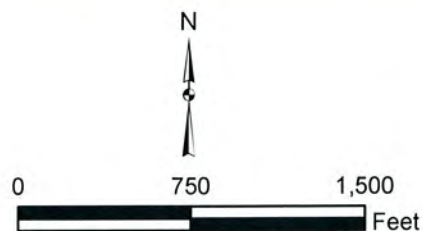
PROJECT
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FIGURE
NUMBER 3



Legend

Residual Contaminant



Source: Aerial photograph from Bing Maps 2010

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RESIDUAL CONTAMINANT

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FIGURE
NUMBER 4



Legend

Railroad Easement



0 750 1,500
Feet

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RAILROAD EASEMENT

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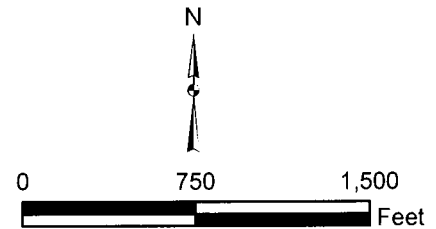
PROJECT
NUMBER 60197726

FIGURE
NUMBER 5



Legend

 Street Easement



Source: Aerial photograph from Bing Maps 2010

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STREET EASEMENT

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FIGURE
NUMBER 6



Legend

 Utility Easement



0 750 1,500
Feet

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UTILITY EASEMENT

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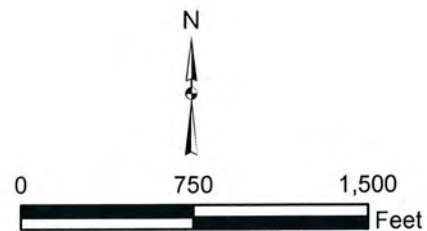
PROJECT
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FIGURE
NUMBER 7



Legend

 Riparian Buffer Zone



Source: Aerial photograph from Bing Maps 2010

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RIPARIAN BUFFER ZONE

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Scale: 1" = 750'

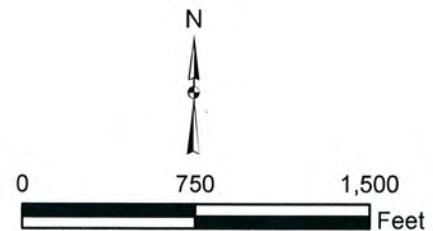
PROJECT
NUMBER 60197726

FIGURE
NUMBER 8



Legend

- Harbor
- High Density Residential no alley
- Light Industrial
- Manufacturing Industrial
- Medium Density Residential no alley
- Miscellaneous
- Open Space Undeveloped
- Park
- Railroad Yard



Source: Aerial photograph from Bing Maps 2010

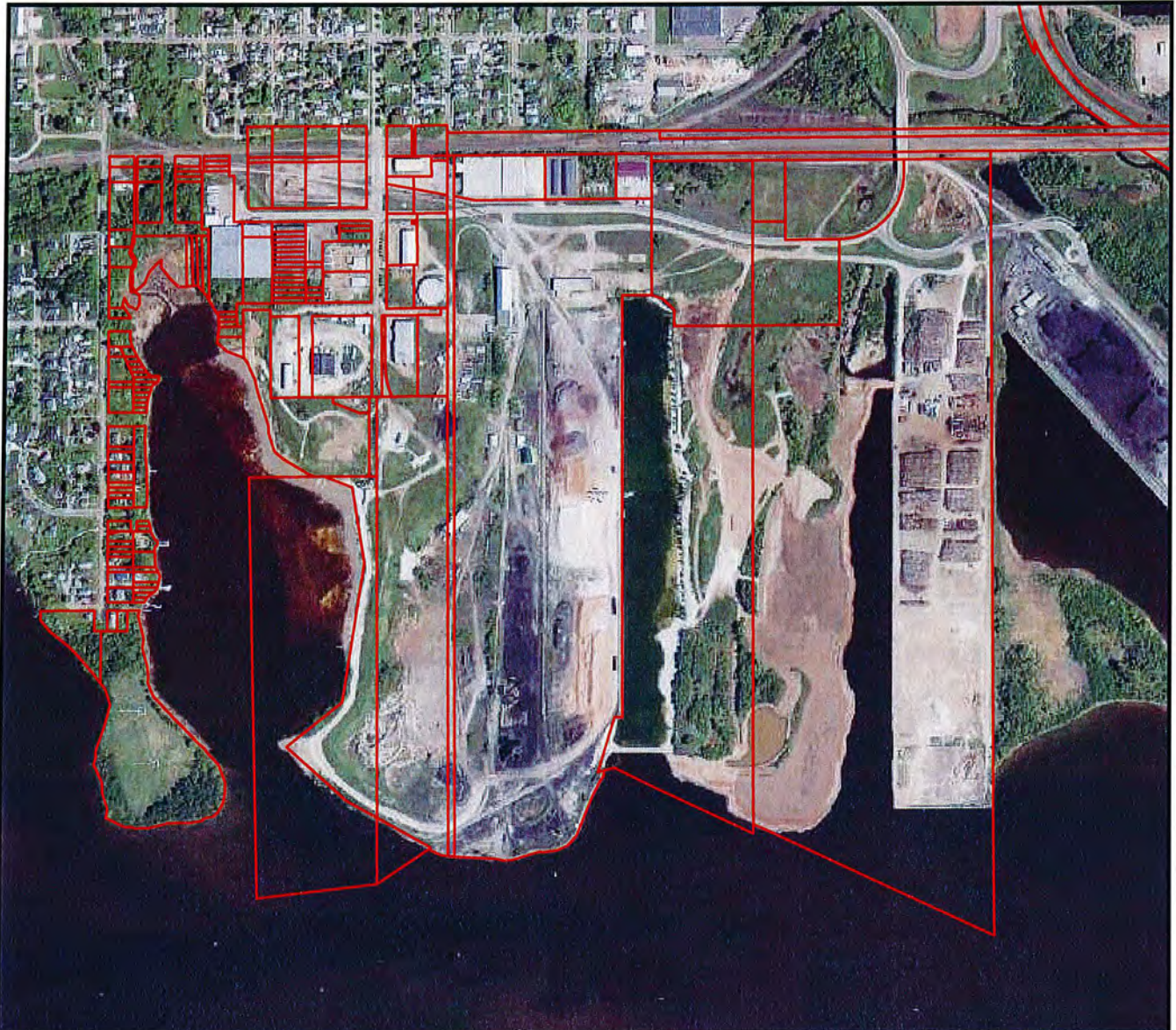
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LAND USE

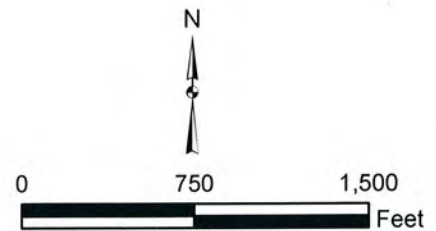
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FIGURE NUMBER	9	



Legend

Parcels



Source: Aerial photograph from Bing Maps 2010

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PARCELS

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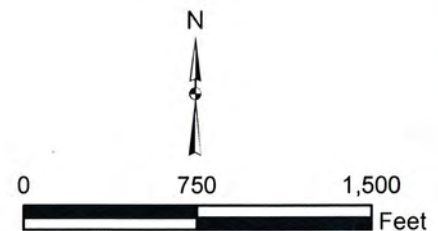
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FIGURE
NUMBER 10



Legend

Environmental Covenants



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ENVIRONMENTAL COVENANTS

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PROJECT NUMBER	60197726	
FIGURE NUMBER	11	



Legend

- I-G
- I-W
- MU-B
- R-1



0 750 1,500 Feet

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ZONING

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Scale:	1" = 750'	
PROJECT NUMBER	60197726	
FIGURE NUMBER	12	

Complete IC Documents Master Table

AECOM ID	PARCEL No.	EXISTING ICs?	TYPE of IC	DOCUMENT ID	COMMENTS
1	010-2320-02970*	Y	Environmental Restrictive Covenants	See Documents # 674811, 674812, and 675203	
2	010-2320-03030*	Y	Environmental Restrictive Covenants	See Documents # 674811, 674812, and 675203	See Document# 429714 for property description for Lots 7-14
3	010-2320-03130*	Y	Environmental Restrictive Covenants	See Documents # 674811, 674812, and 675203	
4	010-2320-03210*	Y	Environmental Restrictive Covenants	See Documents # 674811, 674812, and 675203	
5	010-2320-03220*	Y	Environmental Restrictive Covenants	See Documents # 674811, 674812, and 675203	
6	010-2320-03240*	Y	Environmental Restrictive Covenants	See Documents # 674811, 674812, and 675203	
7	010-2320-03230*	Y	Environmental Restrictive Covenants	See Documents # 674811, 674812, and 675203	
8	010-2320-03020	Y	Environmental Restrictive Covenants	See Documents # 674811, 67812, and 675203, 888385	Document 88835 refers to the Termination of this Parcel ID from the restrictive covenant
9	010-2320-03010	Y	Environmental Restrictive Covenants	See Documents # 674811, 674812 and 675203, 888385	Document 88835 refers to the Termination of this Parcel ID from the restrictive covenant
10	010-2320-03000	N			
11	010-2390-00130	N			
12	010-2390-00170	N			
13	010-2390-00200	N			
14	010-2390-00240	N			
15	010-2390-00260	N			
16	010-2390-00270	Y	Street easements	See Document# 0460808	
17	010-2390-00280	N			
18	010-2390-00290	N			
19	010-2390-00300	N			
20	010-2390-00310	N			
21	010-2390-00350	N			
22	010-2390-00340	N			
23	010-2390-00330	N			
24	010-2380-00340	N			
25	010-2350-00010	N			
26	010-2350-00045	N			
27	010-2350-00040	N			
28	010-2350-00070	Y	Street easements	See Documents# 1134733 and 1138039	
29	010-2350-00080	Y	Street easements	See Documents# 1134733 and 1138039	
30	010-2350-00090	Y	Street easements	See Documents# 1134733 and 1138039	
31	010-2350-00100	Y	Street easements	See Documents# 1134733 and 1138039	

32	010-2350-00110	Y	Street easements	See Documents# 1134733 and 1138039	
33	010-2350-00120	Y	Street easements	See Documents# 1134733 and 1138039	
34	010-2360-00010	N			
35	010-2360-00170	N			
36	010-2360-00190	N			
37	010-2360-00200	N			
38	010-2360-00210	N			
39	010-2360-00220	N			
40	010-2360-00240	N			
41	010-2360-00260	N			
42	010-2360-00280	N			
43	010-2360-00290	Y	Ordinance	See Document# 560800	
44	010-2390-00010	N			
45	010-2390-00020	N			
46	010-2390-00030	Y	Ordinance and Railroad easement	See Document# 560800 and 198273	
47	010-2390-00070	N			
48	010-2390-00100	Y	Street easements	See Document# 0460808	
49	010-2390-00110	Y	Street easements	See Document# 0460808	
50	010-2390-00160	Y	Street easements	See Document# 0460808	
51	010-2390-00150	Y	Street easements	See Document# 0460808	
52	010-2390-00140	Y	Street easements	See Document# 0460808	
53	010-2340-00050	Y	Environmental Restrictive Convenants	See Documents # 674811, 674812, and 675203	
54	010-2340-00040	Y	Environmental Restrictive Convenants	See Documents # 674811, 674812, and 675203	
55	010-2340-00030	Y	Environmental Restrictive Convenants	See Documents # 674811, 674812, and 675203	
56	010-2340-00020	Y	Environmental Restrictive Convenants	See Documents # 674811, 674812, and 675203	
57	010-2320-02780	Y	Environmental Restrictive Convenants	See Documents # 674811, 674812, and 675203	
58	010-2320-02750	Y	Environmental Restrictive Convenants	See Documents # 674811, 674812, and 675203	
59	010-2320-02730	Y	Environmental Restrictive Convenants	See Documents # 674811, 674812, and 675203	
60	010-2320-02940	Y	Environmental Restrictive Convenants	See Documents # 674811, 674812, and 675203	
61	010-2330-00190	Y	Environmental Restrictive Convenants	See Documents # 674811, 674812, and 675203	

62	010-2340-00010	Y	Environmental Restrictive Covenants	See Documents # 674811, 674812, and 675203	
63	010-2330-00010	Y	Environmental Restrictive Covenants	See Documents # 674811 and 675203	
64	010-2330-00020	Y	Environmental Restrictive Covenants	See Documents # 674811, 674812, and 675203	
65	010-2330-00030	Y	Environmental Restrictive Covenants	See Documents # 674811, 674812, and 675203	
66	010-2330-00200	Y	Environmental Restrictive Covenants	See Documents # 674811, 674812, and 675203	
67	010-2330-00210	Y	Environmental Restrictive Covenants	See Documents # 674811, 674812, and 675203	
68	010-2330-00220	Y	Environmental Restrictive Covenants	See Documents # 674811, 674812, and 675203	
69	010-2330-00230	Y	Environmental Restrictive Covenants	See Documents # 674811, 674812, and 675203	
70	010-2330-00240	Y	Environmental Restrictive Covenants	See Documents # 674811, 674812, and 675203	
71	010-4500-04710	Y	Restrictions, covenants, easement, and Affidavit concerning property contaminated with hazardous substances	See Documents # 768014, 768015, 408018, 674811, 674812, and 675203	
72	010-4500-04770	Y	Restrictions, covenants, easement, and Affidavit concerning property contaminated with hazardous substances	See Documents # 768014, 768015, 408018, 674811, 674812, and 675203	
73	010-4500-04775	Y	Restrictions, covenants, easement, and Affidavit concerning property contaminated with hazardous substances	See Documents # 768014, 768015, 408018, 674811, 674812, and 675203	
74	010-4500-04780	Y	Restrictions, covenants, easement, and Affidavit concerning property contaminated with hazardous substances	See Documents # 768014, 768015, 408018, 571146, 785035, 674811, 674812, and 675203	
75	010-4500-04785	Y	Restrictions, covenants, easement, and Affidavit concerning property contaminated with hazardous substances	See Documents # 768014, 768015, 408018, 674811, 674812, and 675203	
76	010-4500-04870	Y	Restrictions, covenants, easement, and Affidavit concerning property contaminated with hazardous substances	See Documents # 768014, 768015, 408018, 674811, 674812, and 675203	

77	010-4500-04940	Y	Restrictions, covenants, easement, and Affidavit concerning property contaminated with hazardous substances	See Documents # 768014, 768015, 408018, 571146, 785035, 674811, 674812 and 675203	
78	010-4500-04970	Y	Restrictions and covenants, Affidavit concerning property contaminated with hazardous substances	See Document# 768014, 768015, 675203, and 674811, 674812	
79	010-4500-05030	Y	Environmental Restrictive Covenants	See Documents # 674811, 674812 and 675203	
80	010-4500-05100	Y	Agreement for Covenants, Restrictions, Easements and Licenses	See Document# 904091, 571146, 785035, 674811, 674812, and 675203	Active VIC Hallett Dock Scalehouse
81	010-4500-05190	Y	Environmental Restrictive Covenants	See Documents # 674811, 674812, and 675203	
82	010-4500-05250	Y	Agreement for Covenants, Restrictions, Easements and Licenses	See Document# 785035, 674811, 674812, and 675203	
83	010-4500-05260	Y	Agreement for Covenants, Restrictions, Easements and Licenses	See Document# 904091, 571146, 785035, 674811, 674812, and 675203	Active VIC Hallett Dock Scalehouse
84	010-4500-05350				
85	010-4500-05410	Y	Agreement for Covenants, Restrictions, Easements and Licenses	See Document# 785035, 674811, 674812, and 675203	
86	010-4500-05420	Y	Agreement for Covenants, Restrictions, Easements and Licenses	See Document# 904091, 571146, 785035, 674811, 674812, and 675203	Active VIC Hallett Dock Scalehouse
87	010-4500-05570	Y	Agreement for Covenants, Restrictions, Easements and Licenses	See Document# 785035, 674811, 674812, and 675203	
88	010-4500-05510	Y	Environmental Restrictive Covenants	See Documents # 674811, 674812 and 675203	
89	010-4500-05580	Y	Agreement for Covenants, Restrictions, Easements and Licenses	See Document# 904091, 571146, 785035, 674811, 674812, and 675203	Active VIC Hallett Dock Scalehouse
90	010-4500-05670	Y	Environmental Restrictive Covenants	See Documents # 674811 674812, and 675203	
91	010-4500-05700	Y	Environmental Restrictive Covenants	See Documents # 674811 674812, and 675203	
92	010-4500-05990	Y	Environmental Restrictive Covenants	See Documents # 674811 674812, and 675203	

93	010-4500-06035	Y	Environmental Restrictive Covenants	See Documents # 674811 674812, and 675203	
94	010-4500-06075	Y	Environmental Restrictive Covenants	See Documents # 674811 674812, and 675203	
95	010-4500-06085	Y	Environmental Restrictive Covenants	See Documents # 674811, 674812 and 675203	
96	010-4500-06090	Y	Environmental Restrictive Covenants	See Documents # 674811, 674812 and 675203	
97	010-4500-06125	Y	Environmental Restrictive Covenants	See Documents # 674811, 674812, and 675203	
98	010-4500-06135	Y	Environmental Restrictive Covenants	See Documents # 674811 674812, and 675203	
99	010-4500-06145	Y	Environmental Restrictive Covenants	See Documents # 674811 674812, and 675203	
100	010-4500-06170	Y	Environmental Restrictive Covenants	See Documents # 674811 674812, and 675203	
101	010-4500-06150	Y	Environmental Restrictive Covenants	See Documents # 674811 674812, and 675203	
102	010-4500-06160	Y	Environmental Restrictive Covenants	See Documents # 674811 674812, and 675203	
103	010-4500-06310	Y	Restrictions and covenants, Affidavit concerning property contaminated with hazardous substances	See Document# 768014, 768015, 785035, 674811, 674812, 675203, 571146	
104	010-4500-06312	Y	Restrictions and covenants, Affidavit concerning property contaminated with hazardous substances	See Documents# 768014, 768015, 674811, 674812, 571146, and 675203	
105	010-4500-06470	Y	Restrictions and covenants, Affidavit concerning property contaminated with hazardous substances	See Document# 768014, 768015, 785035, 674811, 674812, 675203, 571146	
106	010-4500-06630	Y	Restrictions and covenants, Affidavit concerning property contaminated with hazardous substances	See Document# 768014, 768015, 785035, 674811, 674812, 675203, 571146	See "Moline Property" Document for Restrictions and Covenants under the Voluntary Investigation and Cleanup (VIC) program
107	010-4500-06632	Y	Restrictions and covenants, Affidavit concerning property contaminated with hazardous substances	See Documents# 571146, 768014, 768015, 674811, and 675203	See "Moline Property" Document for Restrictions and Covenants under the Voluntary Investigation and Cleanup (VIC) program
108	010-4500-06950	Y	Restrictions, covenants, easement, and Affidavit concerning property contaminated with hazardous substances	See Document# 768014, 768015, 785035, 674811, 674812, 675203, 571146	

109	010-4500-06790	Y	Restrictions and covenants, Affidavit concerning property contaminated with hazardous substances	See Document# 768014, 768015, 785035, 674811, 674812, 675203, 571146	See "Moline Property" Document for Restrictions and Covenants under the Voluntary Investigation and Cleanup (VIC) program
110	010-0130-00250	Y	Agreement for Covenants, Restrictions, Easements and Licenses	See Document# 571146, 785035, 674811, 674812, and 675203	
111	010-2700-00550	Y	Agreement for Covenants, Riparian buffer, Restrictions, Easements and Licenses	See Document# 785032, 571146, 785035, 674811, 674812, and 675203	
112	010-0130-00256	Y	Dredging, Anchoring, Riparian buffer, Structure, Restrictions and covenants	See Document# 785032, 785035, 674811, 674812, 675203, 888385 and Figure 4-6	Inactive VIC Hallett Dock 7
113	010-0130-00255	Y	Agreement for Covenants, Restrictions, Easements and Licenses	See Document# 571146, 785035, 675203, 674811, 674812, and	
114	010-0130-00257	Y	Environmental Restrictive Covenants	See Documents # 674811, 674812, and 675203	
115	010-0130-00280	Y	Agreement for Covenants, Restrictions, Easements and Licenses	See Documents # 785035, 675203, 674811, 674812	
116	010-0130-00291	Y	Dredging, Anchoring, Riparian buffer, Structure, Restrictions and covenants	See Document# 785032, 785035, 674811, 674812, 675203, and Figure 4-6	
117	010-0130-00290	Y	Agreement for Covenants, Riparian buffer, Restrictions, Easements and Licenses	See Documents # 785032, 571146, 785035, 675203, 674811, 674812, and 675204	
118	010-0130-00292	Y	Environmental Restrictive Covenants	See Documents # 674811, 674812 and 675203	See Document# 1101836 for the Release of Lien
119	010-0130-00293	Y	Environmental Restrictive Covenants	See Documents # 674811, 674812 and 675203	
120	010-0130-00294	Y	Environmental Restrictive Covenants	See Documents # 674811, 674812 and 675203	
121	010-2700-00551	Y	Environmental Covenants and Swampland Patent (MDNR)	See Document# 571146, 00748110, 675203, and 674811, 674812	
122	010-2700-00560	Y	Environmental Covenants and Swampland Patent (MDNR)	See Document# 571146, 00748110, 675203, and 674811, 674812	

123	010-2700-00570	Y	Environmental Convenants and Swampland Patent (MDNR)	See Document# 571146, 00748110, 675203, 70023, 674811, and 674812	
124	010-2700-00580	Y	Environmental Convenants and Swampland Patent (MDNR)	See Document# 571146, 00748110, 675203, and 674811, 674812	
125	010-2700-00591	Y	Environmental Convenants Swampland Patent, Dredging, Anchoring, Structure, Restrictions	See Document# 5471146, 00748110, 785035, Figure 4-6, 674811, 674812, 675203	
126	010-2700-00590	Y	Environmental Convenants, Riparian buffer, and Swampland Patent (MDNR)	See Document# 785032, 571146, 00748110, 675203, and 674811, 674812	Tar seeps
127	010-0130-00300	Y	Restrictions, covenants, Riparian buffer, easement, and Affidavit concerning property contaminated with hazardous substances	See Documents # 785032, 768014, 768015, 408018, 785035, 674811, 674812 and 675203	
128	010-0130-00410	Y	Environmental Restrictive Convenants	See Documents # 674811, 674812 and 675203	
129	010-0130-00420	Y	Environmental Restrictive Convenants	See Documents # 674811, 674812 and 675203	
130	010-4500-05840	Y	Environmental Restrictive Convenants	See Documents # 674811, 674812 and 675203	
131	010-4500-05850	Y	Environmental Restrictive Convenants	See Documents # 674811, 674812 and 675203	
132	010-4500-05860	Y	Environmental Restrictive Convenants	See Documents # 674811, 674812 and 675203	
133	010-4500-05870	Y	Environmental Restrictive Convenants	See Documents # 674811, 674812 and 675203	
134	010-4500-05880	Y	Environmental Restrictive Convenants	See Documents # 674811, 674812 and 675203	

135	010-4500-05980	Y	Environmental Restrictive Covenants	See Documents # 674811, 674812 and 675203	
136	010-4500-05970	Y	Environmental Restrictive Covenants	See Documents # 674811, 674812 and 675203	
137	010-4500-05960	Y	Environmental Restrictive Covenants	See Documents # 674811, 674812 and 675203	
138	010-4500-05950	Y	Environmental Restrictive Covenants	See Documents # 674811, 674812 and 675203	
139	010-4500-05940	Y	Environmental Restrictive Covenants	See Documents # 674811, 674812 and 675203	
140	010-4500-05930	Y	Environmental Restrictive Covenants	See Documents # 674811, 674812 and 675203	
141	010-4500-05920	Y	Environmental Restrictive Covenants	See Documents # 674811, 674812 and 675203	
142	010-4500-05910	Y	Environmental Restrictive Covenants	See Documents # 674811, 674812 and 675203	
143	010-4500-05900	Y	Environmental Restrictive Covenants	See Documents # 674811, 674812 and 675203	
144	010-4500-05890	Y	Environmental Restrictive Covenants	See Documents # 674811, 674812 and 675203	
145	010-4500-07270	Y	Environmental Covenants and Easement	See Document# 101372, 674811, 674812 and 675203	
146	010-2350-00060	Y	Street easements	See Documents# 1134733 and 1138039	
147	010-2350-00065	Y	Street easements	See Documents# 1134733 and 1138039	
148	010-2350-00115	Y	Street easements	See Documents# 1134733 and 1138039	
149	010-2350-00125	Y	Street easements	See Documents# 1134733 and 1138039	
150	010-2350-00130	Y	Street easements	See Documents# 1134733 and 1138039	
151	010-2350-00140	Y	Street easements	See Documents# 1134733 and 1138039	
152	010-2350-00150	Y	Street easements	See Documents# 1134733 and 1138039	
153	010-2350-00160	Y	Street easements	See Documents# 1134733 and 1138039	

Notes: *=Register of Deeds Office has Parcel No. as 010-2370

Appendix C

Photograph Log from Site Inspections



1: Old office Location, site visit start, all structures have been removed. (Bing Aerial WMS)



2a: SedOU: Stryker Bay cap



2b: SedOU: Stryker Bay cap



2c: SedOU: Stryker Bay cap, towards radio towers.



3a: SedOU: Mild erosion noted on Stryker Bay cap



3b: SedOU: Significant erosion noted in native material near cap



4: SedOU: Trespassing evidence (four-wheeler tracks) noted on Stryker Bay cap.



5: SedOU: Erosion of native material near Stryker Bay cap.



6a: SedOU: Iron bacteria sheen in water flowing near northeast corner Stryker Bay cap.



6b: SedOU: Erosion noted in water channel flowing onto Stryker Bay cap - riprap needed.



7: SedOU: City storm water diversion channel near NE corner of Stryker Bay cap, good condition.



8a: SedOU: Arrowhead Point, good condition.



8b: SedOU: Arrowhead Point, good condition.



9a: SOU Area C: Looking across Slip 6 at Area C and 54th Ave peninsula, good condition.



9b: SOU: Looking down slip 6, minor slumping



9c: SOU Area C: Looking across Slip 6 at Area C and 54th Ave peninsula, good condition.



10a: SOU Area D: Pipe on west side of slip 6, oily residue.



10b: SOU Area D: Pipe on west side of slip 6



11a: SOU Area B/C: Some erosion noted end of slip 6.



11b: SOU Area B/C: Erosion noted at end of slip 6.



12a: SedOU: Wetland area at end of Slip 7.



12b: SedOU: Wetland area on Slip 7.



13a: SedOU: Slip 7, wetland area, good condition.



14: Mild erosion noted.



15: SedOU: Wildlife, frog in vegetation along shore of Slip 7.



16: SOU Area A: Soil spoils pile, covered by plastic.



17a: SOU Area E: Terry Andersen encountered coal tar when installing a gas line.



17b: SOU Area E: Coal tar pile on EBI property generated during gas line installation.



18: SOU Area E: Pit inside Terry Andersen building filled with up to 9' of tar.



19a: SOU Area E: Tar seep on EBI property.



19b: SOU Area E: Coal tar pile on EBI property.



19c : SOU Area E: Coal tar pile on EBI property.



20a: Radio Tower (west side of Stryker Bay): four drums still remain on this property.



20b: Radio Tower (west side of Stryker Bay): drums.



21a: Radio Tower (west side of Stryker Bay): Tarballs and tar layer noted on edge of beach area.



21b: Radio Tower (west side of Stryker Bay): Tarballs noted on beach area.



22a: SedOU: East side of slip 7 facing site



22b: SedOU: East side of slip 7 facing site



22c: SedOU: Facing north down slip 7.



23: SedOU: Slumping of dock wall on slip 7.



24: Stryker Bay cap, during green inspection.



25 : Near Arrowhead Point. Some greenery, but larger bushes and trees did not survive.



26: Tar seeps noted in Area B, near NW corner of Slip 6.



27: Repairs noted of previous erosion near Area B/C



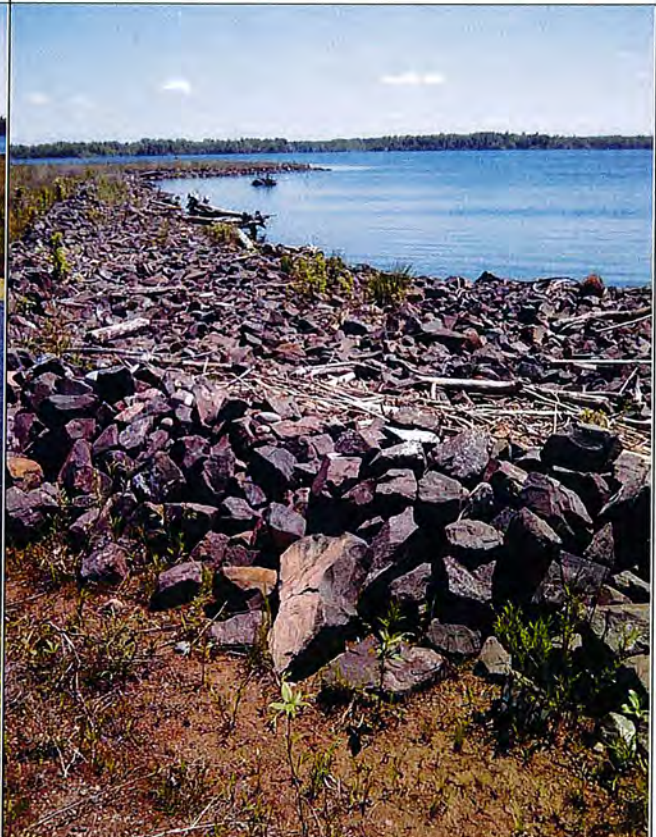
28: New erosion channel forming around repairs at NE corner of Slip 6.



29: Erosion into cap along east side of Slip 6 (Area C).



30: Pond in good condition on 54th Ave peninsula



31: Riprap (good condition) on end 54th Ave peninsula

Appendix D

Interview Documentation

INTERVIEW RECORD	
Site Name: SLRIDT	Site ID Number:
Subject: <i>3rd Five-Year Review</i>	Date: <i>May 20, 2013 (phone)</i>
Type: <i>Phone</i>	
Contact Made By:	
Name: <i>Daniel Musser</i>	Organization: <i>Bay West, Inc.</i>
Title: <i>Associate Engineer</i>	Telephone Number: <i>651-291-3457</i>
Individual Contacted:	
Name: Bill Majewski	Organization: <i>Morgan Park Resident</i>
Title: <i>Former Duluth City Planner</i>	
Telephone Number: <i>218-626-2638</i>	Street Address: <i>834 87th Avenue West</i>
E-Mail Address: <i>bsmajewski@aol.com</i>	City, State, Zip: <i>Duluth, MN 55808</i>
Summary of Conversation	
<p>1. What is your overall impression of the project? (general sentiment)</p> <p>I haven't been there and had a close look since the sediment work was declared done. During the sediment work I was impressed with the contractor and impressed with the outreach by the MPCA, contractor and responsible party.</p> <p>2. What effects have site operations had on the surrounding community?</p> <p>Haven't heard anything from anyone on concerns to date.</p> <p>3. Are you aware of any community concerns regarding the site or its operation and administration? If so, please give details?</p> <p>None.</p> <p>4. Are you aware of any events, incidents, or activities at the site such as vandalism, trespassing, or emergency responses from local authorities? If so, please give details.</p> <p>None.</p> <p>5. Do you feel well informed about the site's activities and progress?</p>	

Since the sediment work closure, hasn't been anything going on for a year, haven't had any meetings that I am aware of.

6. Do you have any comments, suggestions, or recommendations regarding the site's management or operation?

Not at this time.

7. Do you have any other concerns or comments about the site?

I remember there being some talk about trails being developed, not currently aware of any activities to that end, or who is responsible for making that happen.

INTERVIEW RECORD	
Site Name: SLRIDT	Site ID Number:
Subject: <i>3rd Five-Year Review</i>	Date: <i>June 3, 2013</i>
Type: <i>Phone</i>	
Contact Made By:	
Name: <i>Steve Head</i>	Organization: <i>Bay West, Inc.</i>
Title: <i>Associate Engineer</i>	Telephone Number: <i>651-291-3467</i>
Individual Contacted:	
Name: Mike McCoshen	Organization: <i>Hallet Dock Co.</i>
Title: <i>President</i>	
Telephone Number: <i>218-628-2281</i>	Street Address: <i>PO Box 16447</i>
E-Mail Address: info@halletdock.com	City, State, Zip: <i>Duluth, MN 55816</i>
Summary of Conversation	
<p>1. What is your overall impression of the project? (general sentiment)</p> <p>I do not have a good feel for the project, although, it took 1-2 years longer than I expected. The clean-up was sufficient.</p> <p>2. What effects have site operations had on the surrounding community?</p> <p>Haven't heard anything from anyone on concerns to date.</p> <p>Not sure about the community, but we lost capacity and docking space.</p> <p>3. Are you aware of any community concerns regarding the site or its operation and administration? If so, please give details?</p> <p>No</p> <p>4. Are you aware of any events, incidents, or activities at the site such as vandalism, trespassing, or emergency responses from local authorities? If so, please give details.</p> <p>In 2009 and 2011, "copper thieves" stripped copper wire of within property from contractors and Hallet Dock Co.</p>	

5. Do you feel well informed about the site's activities and progress?

Yes, was kept fairly up to date, the contractors onsite provided good communication.

6. Do you have any comments, suggestions, or recommendations regarding the site's management or operation?

None.

7. Do you have any other concerns or comments about the site?

Dock 7 property was impacted, which contains 15-16 ft of water depth. The edge of dock 7 is in disrepair, and wanted to re-purchase the property for additional dock capacity. However, does not have an whether that property is sufficient enough to place a dock and vessel.

INTERVIEW RECORD	
Site Name: <i>SLRIDT</i>	Site ID Number:
Subject: <i>3rd Five-Year Review</i>	Date: <i>6/13/13</i>
Type: <i>In person</i>	
Contact Made By:	
Name: <i>Donovan Hannu</i>	Organization: <i>Bay West, Inc.</i>
Title: <i>Senior Engineer</i>	Telephone Number: <i>(651) 291-3424</i>
Individual Contacted:	
Name: <i>Tim Leland</i>	Organization: <i>(Area resident)</i>
Telephone Number: <i>(218) 391-2398</i>	Street Address: <i>824 South 63rd Ave West</i> City, State, Zip: <i>Duluth, MN 55807</i>
Summary of Conversation	
<p>1. What is your overall impression of the project? (general sentiment)</p> <p><i>Happy that project is supposedly done, but it took a LONG time. He feels bad that, after all that work and money, a few things on the "finishing" end really were done poorly. These include the limited access for boats to his property and the organic material brought in from Tallis Island (discussed later).</i></p> <p><i>The bottom line is that Mr. Leland wishes he had sold his property when he had the chance - keeping his property while dealing with the cleanup, coupled with key broken promises, made the entire process too much of a hassle. It wasn't worth it.</i></p> <p>2. What effects have site operations had on the surrounding community?</p> <p><i>#1) The new rock crib (with an approximate width of 100-200 feet), formed near the outer bay edge with sharp rocks to protect the cap from water movement, has severely limited the size and type of boats that can enter Stryker Bay. Mr. Leland can no longer use his 38' boat due to the rock crib and struggles to use his smaller boat. Mr Leland says that he was promised that, at the end of this project, boat traffic/access would return to what he had before and that <u>this promise was not kept.</u></i></p> <p><i>#2) Lots of sticks, wood chips, and other organic material came along with the materials pumped into the bay from Tallis Island. These materials made a mess of the bay and covers his beach, especially in certain wind conditions. (Note: we noticed this material during the site inspection.)</i></p> <p><i>#3) During operations, lots of restrictions were placed on residents. No swimming; no "stirring up" of water. Before this project, Mr. Leland could water ski in the bay. Now, he can barely use a smaller boat in there.</i></p>	

3. Are you aware of any community concerns regarding the site or its operation and administration? If so, please give details?

Again, the rock crib at the entrance of the bay is the key issue. It limits the size of boats and the type of motors. In addition, the sharp rocks are hazardous. WHY COULDN'T ROUND ROCKS HAVE BEEN USED???

Mr. Leland clearly stated that he was promised a good boat route in and out of the bay, like he had before this project. This route no longer exists.

4. Are you aware of any events, incidents, or activities at the site such as vandalism, trespassing, or emergency responses from local authorities? If so, please give details.

While trespassing used to be a bigger problem, especially four-wheelers and scooters, this is much less of an issue now.

5. Do you feel well informed about the site's activities and progress?

Mr. Leland was very involved and felt well informed. He doesn't hear much now, but that's probably OK since he assumes there is less to hear about.

6. Do you have any comments, suggestions, or recommendations regarding the site's management or operation?

Dream scenario – sharp rock wall replaced with round rock, with a large channel.

Realistic scenario: Create a decent channel through the rock crib wall that is big enough for larger boats to enter the bay, with one set of decent markers. If the markers were placed once, the residents would then learn for following years themselves. Again, he says he was promised as good or better than originally existed and this simply didn't happen.

7. Do you have any other concerns or comments about the site?

He expected that, by hanging in there through this long process, something decent would happen at the end and he would still be in his dream location. Instead, it was a huge hassle and all he received was a new dock, but one that he can't even use for his favorite boat because the boat cannot get to it. Mr. Leland wishes he had sold his place when he had the chance and never dealt with this mess. – it simply was not worth it.

INTERVIEW RECORD	
Site Name: <i>SLRIDT</i>	Site ID Number:
Subject: <i>3rd Five-Year Review</i>	Date: <i>6/13/13</i>
Type: <i>In person</i>	
Contact Made By:	
Name: <i>Donovan Hannu</i>	Organization: <i>Bay West, Inc.</i>
Title: <i>Senior Engineer</i>	Telephone Number: <i>(651) 291-3424</i>
Individual Contacted:	
Name: <i>John Lindgren</i>	Organization: <i>Dept of Natural Resources</i>
Title: <i>Fisheries Biologist</i>	
Telephone Number: <i>(218) 525-0853 (ext 209)</i>	Street Address: <i>5351 North Shore Drive</i>
E-Mail Address: <i>john.lindgren@dnr.state.mn.us</i>	City, State, Zip: <i>Duluth, MN 55804</i>
Summary of Conversation	
<p>1. What is your overall impression of the project? (general sentiment)</p> <p><i>Happy that project is on the tail end, but it's been slow. (John has been involved with SLRIDT for over 15 years.) Did feel that it's unfortunate that XIK spent so much – a previous plan they considered may have been cheaper.</i></p>	
<p>2. What effects have site operations had on the surrounding community?</p> <p><i>The site has been a hurdle to LINKING lots of various trails and the entire riverfront (creeks, grazzy point, waterfront trail, etc)</i></p>	
<p>3. Are you aware of any community concerns regarding the site or its operation and administration? If so, please give details?</p> <p><i>Restoration/revitalization of river corridor. Outcome ended up pretty good – aquatic environment appears to be restoring itself. Wishes – they could have had room to remove sediments from Stryker Bay and place them somewhere (instead of capping).</i></p>	

4. Are you aware of any events, incidents, or activities at the site such as vandalism, trespassing, or emergency responses from local authorities? If so, please give details.

Not aware of any of these issues.

5. Do you feel well informed about the site's activities and progress?

Feels the MPCA keeps him pretty informed when he needs to know. No real reason for continual updates.

6. Do you have any comments, suggestions, or recommendations regarding the site's management or operation?

Need to resolve the Buffer Strip issues and get them into some kind of long-term preservation.

There is some talk of a conservation easement – John is unsure if that's what the DNR would want to do. It's a tricky issue to resolve.

7. Do you have any other concerns or comments about the site?

Worries about bubbling LNAPL through the cap (or lifting the cap) in the future.

INTERVIEW RECORD	
Site Name: SLRIDT	Site ID Number:
Subject: <i>3rd Five-Year Review</i>	Date: <i>June 26, 2013 (phone)</i>
Type: <i>Phone</i>	
Contact Made By:	
Name: <i>Daniel Musser</i>	Organization: <i>Bay West, Inc.</i>
Title: <i>Associate Engineer</i>	Telephone Number: <i>651-291-2457</i>
Individual Contacted:	
Name: Terry Anderson	Organization: <i>EBI</i>
Title: <i>Land/Business Owner</i>	
Telephone Number: <i>218-348-4571</i>	Street Address: <i>5910 Fremont Street</i>
E-Mail Address: <i>earthbrn@cpinternet.com</i>	City, State, Zip: <i>Duluth, MN 55807</i>
Summary of Conversation	
<p>1. What is your overall impression of the project? (general sentiment)</p> <p>It's not finished.</p> <p>2. What effects have site operations had on the surrounding community?</p> <p>None, that I'm aware of.</p> <p>3. Are you aware of any community concerns regarding the site or its operation and administration? If so, please give details?</p> <p>No.</p> <p>4. Are you aware of any events, incidents, or activities at the site such as vandalism, trespassing, or emergency responses from local authorities? If so, please give details.</p> <p>No.</p> <p>5. Do you feel well informed about the site's activities and progress?</p> <p>Yes.</p>	

6. Do you have any comments, suggestions, or recommendations regarding the site's management or operation?

No.

7. Do you have any other concerns or comments about the site?

No.

