Ten-Mile Drain Superfund Site

St. Clair Shores, Michigan

Interim Record of Decision

Prepared by
U.S. Environmental Protection Agency
Region 5

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LIST OF ACRONYMS AND ABBREVIATIONS

ARARs	Applicable or Relevant and Appropriate Requirements
bgs	below ground surface
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CIPP	Cured-In-Place Pipe
COC	Contaminant of Concern
CSM	Conceptual Site Model
ECT	Environmental Consulting & Technology
EPA	U.S. Environmental Protection Agency
FS	Feasibility Study
MDCH	Michigan Department of Community Health
MDEQ	Michigan Department of Environmental Quality
MCPW	Macomb County Public Works Office
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NPL	National Priorities List
O&M	Operation and Maintenance
PCB	Polychlorinated Biphenyl
ppm	parts per million
PRP	Potentially Responsible Party
RI/FS	Remedial Investigation/Feasibility Study
ROD	Record of Decision
TMD	Ten Mile drain
TSCA	Toxic Substances Control Act
ug/L	micrograms per liter

This Record of Decision (ROD) documents the second interim remedy selected for the Ten-Mile Drain site in St. Clair Shores, Macomb County, Michigan. The ROD is organized in three sections: Part I contains the *Declaration* for the ROD, Part II contains the *Decision Summary*, and Part III contains the *Responsiveness Summary*.

PART I: DECLARATION

This section summarizes the information presented in the interim ROD and includes the authorizing signature of the U.S. Environmental Protection Agency (EPA) Region 5 Superfund Division Director.

SITE NAME AND LOCATION

The Ten-Mile Drain site is located northeast of the City of Detroit and on the western shores of Lake St. Clair in St. Clair Shores, Macomb County, Michigan (see Figure 1). As of the 2010 Census, St. Clair Shores had a total population of 59,715. The site includes a portion of the Ten Mile drain storm sewer system, which consists of the concrete sewer pipes and soil surrounding the pipes in an underground storm utility corridor where contamination has come to be located. This area presently encompasses several blocks in a mixed commercial/residential area generally bounded by Bon Brae Street on the north, Harper Avenue on the west, 10 Mile Road on the south, and Jefferson Avenue on the east. The site also includes the Lange and Revere Street canals where polychlorinated biphenyls (PCBs) are known to have migrated through the TMD system and discharged into the canals. The CERCLIS ID for the site is MIN000510063.

STATEMENT OF BASIS AND PURPOSE

This decision document presents the second interim remedy selected for the Ten-Mile Drain site, which was chosen in accordance with the Comprehensive Environmental, Response, Compensation, and Liability Act (CERCLA) of 1980, as amended, 42 U.S.C. § 9601 *et seq.* and, to the extent practicable, the National Oil and Hazardous Substances Pollution Contingency Plan (NCP), 40 CFR Part 300. This decision is based on the Administrative Record file for this site. The Administrative Record Index included as Appendix A identifies each of the items comprising the Administrative Record upon which the selection of the interim remedial action is based.

The State of Michigan has indicated its intention to concur with the selected remedy. The State's concurrence letter will be added to the Administrative Record upon receipt.

ASSESSMENT OF SITE

The response action selected in this interim ROD is necessary to mitigate the continued migration of contaminants, to protect the public health or welfare and the environment from actual or threatened releases of hazardous substances into the environment.

DESCRIPTION OF SELECTED REMEDY

The selected interim action addresses the PCB contamination in the bedding and backfill materials at the base of vaulted manholes M7179 and J01 in the Ten Mile drain (TMD) storm sewer system. The selected action leaves the PCB concentrations adjacent to the two downgradient vaulted manholes, M4335 and M7183, as well as other contamination within the TMD system, to be addressed as part of a future decision document for the Ten-Mile Drain site.

The major components of the selected interim remedy for the Ten-Mile Drain site include the following:

- Excavation and removal of the vaulted manholes and surrounding impacted backfill materials at M7179 and J01, and proper off-site disposal of the contaminated materials.
- Prior to excavation, the vaulted manholes will be dewatered and flow in the TMD system will be temporarily rerouted with pumps.
- Two new vaulted manholes will be installed to replace the excavated vaulted manholes, including new stone bedding and backfill materials.
- Prior to installing the new vaulted manholes, a flexible synthetic liner will be installed on the open excavation surface to separate the existing soils from the new clean bedding and backfill materials.
- The flexible synthetic liner will be affixed to the outside of each new manhole vault using batten strips.
- Treatment of excavated impacted soils through solidification will occur prior to disposal by mixing a reagent (such as cement kiln dust) to convert the sludge to a granular solid and improve the handling characteristics of the waste.
- The PCB contamination at the base of the two downgradient vaulted manholes, M4335 and M7183, will be left in place at this time. Any contamination located in the trench backfill materials between one vaulted manhole location and another will also be left in place.
- Monitoring of trench water will be accomplished through monitoring and recovery wells placed in the utility trench adjacent to the newly installed manholes and through wipe samples taken within the vaulted manholes. Two wells will be placed on either side of the two manholes for a total of four monitoring and recovery wells. Sampling of the wells and the wipe samples from the vaults will occur quarterly. EPA will evaluate the effectiveness of the wipe sample collection method and adjust it as necessary. EPA will also adjust the frequency of the monitoring and sampling events as necessary.
- The monitoring and recovery wells outside the manhole vaults will be used to extract PCB oil if build up of oil against the new liner of the replaced vaulted

manhole is observed. The monitoring and recovery wells will also provide data to support future decisions about a site-wide remedial action.

- Monitoring inside the drain will be performed in order to assess if free oil build up has been reduced or eliminated compared to the conditions that existed prior to replacement of the two vaults.
- Institutional controls will include both deed restrictions and assigning permit restrictions to accompany the deed restrictions. Deed restrictions are necessary to restrict land use in order to ensure that the new vaults and liners and clean backfill are not compromised during excavation or other intrusive activities causing contaminated media from the adjacent pipe runs to enter the clean backfill and/or new vault.

The response actions selected in this interim ROD are intended to address the highly-impacted backfill and bedding materials at vaulted manholes M7179 and J01 that EPA believes are serving as a continued source of PCBs to the rest of the TMD system and the Lange and Revere Street canals. These interim response actions will serve as source control actions while EPA continues through the remedial process and until a final long-term remedial action is selected and implemented at the site.

STATUTORY DETERMINATIONS

This second interim action is intended to reduce infiltration of PCB oil and contaminated utility trench water into the TMD storm sewer pipe by removing the high concentrations of PCBs at valuated manholes M7179 and J01, thereby preventing these high concentrations from moving through the TMD system to the canals. This action is a protective interim action that provides adequate steps to reduce the volume of PCBs discharged into the canals until a final remedy addressing all site risk is implemented; it complies with those federal and state requirements that are applicable or relevant and appropriate for this limited-scope action; it is cost effective; and it utilizes permanent solutions and alternative treatment technologies to the maximum extent practicable. This interim remedy also satisfies the statutory preference for treatment as a principal element of the remedy.

The first interim remedy selected in September 2011 resulted in hazardous substances remaining on-site above levels that allow for unlimited use and unrestricted exposure, thereby triggering statutory five-year reviews to evaluate whether the remedy is, or will be, protective of human health and the environment. Because this second interim also will result in hazardous substances remaining on-site above levels that allow for unlimited use and unrestricted exposure, statutory five-year reviews are still required.

ROD DATA CERTIFICATION CHECKLIST

The following information is included in the Decision Summary section of this ROD. Additional information can be found in the Administrative Record for this site.

- *Contaminants of concern (COCs) and their respective concentrations:* See Section 2 and Section 5.
- *Risk presented by the COCs:* See Section 7. A baseline risk assessment was not conducted for this interim action due to the immediate need to take action based upon results from analyses for PCBs conducted to date and the potential threats posed to human health and the environment.
- *Cleanup levels established for the COCs and the basis for these levels:* Numeric cleanup levels are not appropriate for this interim remedy; cleanup levels for the COCs will be established as part of the final selected remedy. Section 12.3 describes performance standards that will be used during this interim remedy.
- *How source materials constituting principal threats are addressed:* See Section 11.
- *Current and reasonably anticipated future land use assumptions:* See Section 6.
- *Potential land and groundwater use that will be available at the site as a result of the selected remedy:* There will be no changes to land use as a result of the remedy, and this interim action does not address groundwater.
- *Estimated capital, annual operation and maintenance (O&M), and total present worth costs, discount rate, and the number of years over which the remedy cost estimates are projected:* See Section 12.4 and Table 1.
- *Key factors that led to selecting this interim remedy:* See Section 10 and Section 12.

SUPPORT AGENCY ACCEPTANCE

The State of Michigan has indicated that it will concur with the selected remedy. The State of Michigan's concurrence letter will be added to the Administrative Record upon receipt.

AUTHORIZING SIGNATURE

Jon Ganaha

for Richard C. Karl, Director
Superfund Division
U.S. Environmental Protection Agency
Region 5

5/16/14
Date

PART II: DECISION SUMMARY

1.0 Site Name, Location, and Description

The Ten-Mile Drain site (MIN000510063) is located northeast of the City of Detroit and on the western shores of Lake St. Clair in St. Clair Shores, Macomb County, Michigan (see Figure 1).

The site is located in a mixed commercial/residential area and is near the intersection of Bon Brae Street and Harper Avenue. It includes a portion of the Ten Mile drain storm sewer system, which consists of concrete sewer pipes and soil surrounding the pipes in a utility corridor 15 feet below ground surface (bgs). The site is currently known to encompass several blocks where PCBs have been found in the storm sewer system in significant concentrations, as well as areas where the PCBs are known to have migrated through the storm sewer and discharged into the Lange and Revere Street canals connected to Lake St. Clair (see Figures 2 and 3). These canals, which provide recreational boating access to Lake St. Clair for approximately 125 homes, are private property and are used for recreational boating, swimming, and fishing.

In September 2010, EPA placed the Ten-Mile Drain site on the National Priorities List (NPL). EPA is currently working on the site-wide remedial investigation/feasibility study (RI/FS). EPA is the lead agency for this site and the Michigan Department of Environmental Quality (MDEQ) is the support agency.

2.0 Site History and Enforcement Activities

Several removal actions and associated investigations have taken place since PCBs were first discovered in the drain in 2001. This section of the ROD provides the history of the site and a brief discussion of the various removal, remedial, and enforcement activities and associated investigations that have been conducted at the site.

2.1 History of Removal Activities and Investigations (2001-2006)

In July 2001, sediment samples were collected by the Macomb County Public Works Office (MCPW) as part of a permit application process for a proposed dredging project in the Lange and Revere Street canals. The analytical results were submitted to the U.S. Army Corps of Engineers, who then notified MDEQ based on the elevated levels of PCBs in the sediment. In December 2001, MDEQ conducted an investigation of the Ten Mile drain storm sewer system and confirmed there was an upstream source of PCB contamination in the drain. As a result of MDEQ's investigation, MCPW sampled and confirmed the presence of PCBs in both the Lange and Revere Street canals and Ten Mile drain storm sewer system.

EPA's removal program initiated a time-critical removal action at the site in August 2002 and completed the work in July 2004. During the removal action, high concentrations of PCB-contaminated sediments were removed from the Ten Mile drain storm sewer

system, the Lange Street canal, the connecting channel between the Revere and Lange Street canals, and a segment of the western end of the Revere Street canal. All waste was transported for disposal at approved off-site facilities. Specifically, the following activities were completed:

- Development and implementation of a site-specific Health and Safety Plan and Air Monitoring Plan;
- Development and implementation of a Site Security Plan including guard services, installation of signs on gates, and temporary fencing;
- Dewatering the Ten Mile drain storm sewer system and removal of all sediments via confined space entry and high-pressure jet-vacuum truck;
- Construction of an on-site water treatment system and treatment of approximately 2.5 million gallons of water. Water treatment system operations included the dewatering of the Wahby Park Pond and sampling of the sediments;
- Installation of sheet piling to create excavation cells, and replacement of any sections of sea walls that failed after dewatering due to removal activities;
- Excavation of all sediments with total PCB concentrations exceeding 10 parts per million (ppm) from the Lange Street canal, the connecting channel between the Lange and Revere Street canals, and a segment of the western end of the Revere Street canal, with the goal of achieving an average sediment concentration of 1 ppm;
- Development and implementation of a confirmation sampling plan during the excavation phase of the project. In the event that the confirmatory sampling demonstrated that the 1 ppm goal was not met, additional excavation and confirmatory sampling was required;
- Off-site disposal of all PCB-contaminated sediments at an EPA-approved disposal facility in accordance with the EPA Off-Site Rule (40 CFR § 300.440); and
- Restoration of any areas damaged due to EPA's actions.

In total, EPA disposed of approximately 5,900 tons of PCB-contaminated materials and 18,000 tons of non-hazardous materials. Post-removal site controls were agreed to by MCPW. In April 2004, MCPW completed the re-cleaning of the drain and the outfall area where the sewer lines empty into the canals.

In June 2004, MCPW initiated quarterly PCB sampling in the drain. Based on the results, PCBs were still present at levels as high as 1.3 ppm in the drain water. At the time, such concentrations were believed to be residual contamination. In July 2004, MCPW initiated an assessment of the Harper Avenue and Bon Brae Street area. In September

2004, MCPW completed the second round of quarterly PCB sampling and detected PCBs in sediment at the outfall of the drain at 770 ppm. In December 2004, MCPW conducted the third round of PCB sampling in the drain and detected PCB concentrations as high as 17,000 ppm. After the third round of sampling, MCPW initiated soil boring sampling of the backfill surrounding the drain to attempt to determine if a source of PCBs was re-contaminating the drain. Results indicated that PCBs were present in backfill surrounding the drain at levels as high as 41,000 ppm. In January 2005, MCPW collected sediment samples from inside the drain near the intersection of Harper Avenue and Bon Brae Street and detected PCBs at extremely high total concentrations, up to 200,000 ppm.

In May 2005, EPA's removal program and MDEQ installed 64 additional soil borings in the suspected source area to attempt to better define the extent of PCB contamination. PCBs were detected in the sand and gravel backfill surrounding the drain and appeared centered in the area near the intersection of Harper Avenue and Bon Brae Street. The May 2005 investigation also revealed one surface soil area contaminated with PCBs at approximately 800 ppm (total PCBs). In the spring and summer of 2006, EPA conducted another removal action to address this area of surface soil contamination. Specifically, the following activities were completed:

- Excavation of shallow surface soils that contained total PCB concentrations above the MDEQ Part 201 Residential/Commercial Direct Contact criterion of 4 ppm, and restoration of the excavated areas;
- Repair of sea walls;
- Installation of monitoring wells and a large sediment trap to collect contaminated sediment in the drain at the outfall;
- Dewatering and jet-washing the targeted portion of the TMD system to remove sediment; and
- Installation of a cured-in-place pipe (CIPP) liner in a portion of the sewers along Bon Brae Street and Harper Avenue to attempt to mitigate PCB infiltration from the backfill materials into the sewers.

2.2 City of St. Clair Shores and EPA Removal Activities (2007-2011)

In the fall of 2007, MDEQ provided a $500,000 grant to the City of St. Clair Shores for further investigation and cleanup efforts. The City hired Environmental Consulting & Technology (ECT) as its contractor for this work. Four main tasks were performed under this grant: environmental sampling to monitor the conditions in and around the drain; installation and maintenance of monitoring wells along the drain; cleaning contaminated sediment from portions of the drain; and installation of two weirs within the drain to slow the migration of PCBs to the canals and Lake St. Clair. Weirs are half-circle metal structures approximately two feet high that act like small dams to collect PCB oil and contaminated sediment before the contaminants move into the canals.

In late 2009, ECT discovered oil inside the CIPP-lined portion of the sewer located at the Bon Brae Street and Harper Avenue intersection that contained concentrations of more than 80 percent total PCBs (i.e., more than 800,000 ppm). The City and ECT asked for assistance from EPA in addressing this almost-pure chemical waste in the drain. EPA and the City identified immediate and time-critical concerns for the need to eliminate the potential for PCBs to migrate down the storm sewer and threaten the Lange and Revere Street canals. In March 2010, EPA mobilized its removal action contractors to the site to initiate removal action activities, which included the following:

- Dewatering and high-pressure jet-vacuuming of the sewer along Bon Brae Street and down Harper and Jefferson Avenues to remove PCB oil and sediment;
- Stabilization, transportation, and off-site disposal of the PCB-contaminated materials;
- Installation of temporary weir structures in 15 manhole locations to allow sediment collection points (see Figure 4). The 15 weirs joined the two weirs previously installed in the drain system by the City of St. Clair Shores; and
- A geophysical survey of the area near the sewer where contamination was present, and advancement of soil borings and collection of soil samples from suspected source areas.

Based on subsequent environmental sampling results collected by the City, EPA conducted another removal action at the site in late February 2011 to remove PCB oil from the drain. Absorbent snares were used to swipe and soak up the oil that had collected behind the weirs. A total of six of the seventeen weir locations required cleanout and one 55-gallon drum of soiled absorbent snares was collected for disposal. Clean snares were then attached to weighted chains and left directly upgradient of selected weirs to allow any new incoming oil to collect on them and to support future sample collection and removal efforts. Because PCB oil continued to infiltrate the drain and as part of its environmental monitoring activities, in April 2011 the City inspected the absorbent snares, removed soiled snares, and placed clean snares behind the weirs where needed. MDEQ's grant to fund the City of St. Clair Shores' investigations and cleanup efforts at the Ten-Mile Drain site expired in September 2011.

2.3 EPA and MDEQ Remedial Activities (2008-Present)

MDEQ conducted a Site Investigation in July 2008 to document and obtain sufficient data to support listing the site on the National Priorities List. EPA proposed the site for the NPL in March 2010 and finalized the site on the NPL in September 2010.

In September 2011, EPA selected an interim remedial action to address the high concentrations of PCB oil and contaminated sediments that continued to accumulate behind the 17 weirs and in the sediment trap at the outfall. The interim action selected in September 2011 consists of monthly source control activities to handle the accumulation of PCB contamination behind the weirs and at the outfall of the Ten-Mile Drain site, in

an effort to prevent additional PCB contamination from reaching the canals. Source control activities include monitoring, placement of absorbent snares to soak up oil and slow or stop the movement of contamination, and periodic removal and proper disposal of saturated snares and PCB-contaminated sediment, if needed. These interim source control activities are ongoing and will continue for as long as necessary until a final remedial action for the site is selected and implemented.

In August 2011, as part of the site-wide RI/FS, EPA designed and conducted a sediment sampling project in the Lange and Revere Street canals to delineate the nature and extent of PCB contamination in the canal sediments. Approximately 100 samples collected from the surface of the sediments and 40 samples collected from deeper sediments were analyzed for PCBs by an EPA mobile laboratory to characterize the contamination in the canals and provide information to explain the elevated PCB levels found in fish caught in the canals. Based on the findings of the 2011 sediment sampling event, the highest total PCB concentrations (100 ppm to 570 ppm) are located near the outfall of the Ten Mile drain storm sewer system. Overall, EPA found that PCB concentrations decrease with depth and distance from the outfall. PCB concentrations are significantly lower in the deeper, clay sediment materials than the surficial, silty sediment materials. EPA found the highest PCB concentrations on the western ends of the canals, which indicates that PCBs continued to discharge out of the Ten Mile drain outfall into the Lange and Revere Street canals following the 2002-2004 removal action that excavated contaminated sediments from the canals.

In April 2011, EPA conducted source area investigation fieldwork in an attempt to find the source of the high PCB concentrations that continue to infiltrate the Ten Mile drain storm sewer system. The investigation focused on the sanitary sewer, gas, and water main utility corridors that crossed the TMD utility corridor, which potentially could provide preferential pathways for PCB contamination to migrate into the drain. Utility lines are typically set in corridors backfilled with stone and other "loose" materials through which contamination could easily migrate. The native materials at the Ten-Mile Drain site are generally very tight clays which do not allow easy migration of contamination. EPA believed that if contamination was present within these other utility corridors that cross the TMD system, the contamination could then be traced back to the potential source area. The source area investigation fieldwork also included additional sampling within the TMD utility corridor.

EPA finalized its *Source Area Investigation Report* in January 2012. The results of the extensive investigation found significant concentrations of PCB-impacted soil within the TMD utility corridor backfill materials adjacent to four vaulted manhole locations: J01, M7179, M4335, and M7183. Also, PCB oil droplets were observed in core samples collected adjacent to vaulted manholes J01 and M7179. Importantly, only very low PCB concentrations were found in the backfill materials of the other utility corridors, ruling out the sanitary sewer, gas, and water main utility corridors as a source or conduit for the high PCB concentrations found at the Ten-Mile Drain site. Additionally, PCBs were found in all depth intervals of the backfill materials near the intersection of Bon Brae Street and Harper Avenue, between Bon Brae and Lakeland Streets. The information

gained during the investigation lead EPA to believe that a historical release (or releases) of PCBs entered the storm sewer system, either from a surficial spill or illegal dumping activities, and that the PCBs, which are denser than water, ended up sinking to the lowest points in the system – the vaulted manhole locations. Based on all the information available at this time, EPA believes that these PCBs in the stone bedding and backfill materials at the base of the vaulted manholes appear to be serving as the current source of contamination to the Ten Mile drain storm sewer system and the Lange and Revere Street canals. The cause of the initial release(s) of PCBs into the system is not currently known. At this time, EPA does not believe there is an ongoing surficial source of PCB contamination that continues to enter into the drain. EPA continues to follow all leads and critically examine all data gathered during its investigation work at the site.

In April 2013, EPA began its site-wide RI field work. EPA collected samples from all other areas potentially impacted by the site, including soils from residential and commercial properties along the canals and near the intersection of Bon Brae Street and Harper Avenue. On April 16, 2014, EPA signed an Action Memorandum to conduct a time-critical removal action at ten properties, including eight public rights-of-way, one residential yard, and part of a commercial property. Soil samples results showed elevated levels of PCB contamination at or near the surface above EPA's removal management levels. Cleanup is scheduled to occur in May and includes removing trees and vegetation, digging up contaminated soil, taking the soil to an approved disposal facility, and restoring the excavated areas. All properties are located on Lakeland Street and the east side of Harper Avenue. The site-wide RI is ongoing.

2.4 Enforcement Activities

EPA has been unable to identify a Potentially Responsible Party (PRP) linked to the PCB contamination at the site, but the search is ongoing. Between 2002 and 2005, EPA conducted a variety of civil investigation activities. EPA located and interviewed various individuals, as well as reviewed documents, plats, aerial overviews, building permits, and on-line databases. EPA sent an information request letter to DTE Energy in October 2003 as part of its PRP search activities. A follow-up information request letter was sent to DTE Energy in May 2011. EPA has prepared additional information requests for former operators of facilities at or near the TMD site. During public meetings, EPA has also encouraged the public to come forward with any information that might provide useful clues as to what may have caused the PCB release at the site. EPA civil investigators continue to follow up on all information identified during the field investigation work and/or brought forward by the public.

3.0 Community Participation

The Proposed Plan and other relevant and supporting documents for the Ten-Mile Drain site, including the interim source control result maps, the *Source Area Investigation Report*, and removal reports, were made available to the public in December 2013. Copies of all the documents supporting the interim remedy outlined in the Proposed Plan and contained in the Administrative Record file were made available to the public at the

St. Clair Shores Library, where an information repository has been set up. A notice of the availability of these documents was published in the St. Clair Shores Sentinel, a weekly newspaper, on December 4, 2013. A 30-day public comment period on the Proposed Plan was held from December 4, 2013, to January 6, 2014. EPA held a public meeting on December 12, 2013, to present the Proposed Plan to community members. At this meeting, EPA representatives presented information and answered questions about the remedial alternatives and solicited community input on the proposed interim action. EPA's responses to the comments received during the public comment period are included in the Responsiveness Summary, which is included as Part III of this ROD.

4.0 Scope and Role of Operable Unit or Response Action

EPA is managing the contamination at the Ten-Mile Drain site through a phased approach. A phased approach to site cleanup is appropriate when site characterization is not yet completed, or when site data are not sufficient to develop and evaluate cleanup alternatives to address risks posed by the entire site, but when action clearly needs to be taken to prevent further migration of contaminants or further environmental degradation.

In September 2011, EPA issued an Interim ROD for the first interim remedial action at the site. That interim action addresses the accumulation of PCB contamination behind the weirs that were installed inside portions of the Ten Mile drain storm sewer system during a prior EPA removal action. The monthly source control activities required by the first interim remedial action are ongoing and necessary, but only address the PCB materials that have already entered inside the pipe and accumulated behind the weirs; they do not address the source materials located in the backfill materials beneath the vaulted manholes and do not prevent those source materials from infiltrating into the TMD storm sewer pipe.

This ROD selects a second interim remedial action at the site that is intended to address the high concentrations of PCBs in the backfill and vault bedding materials that EPA believes are serving as the current source of PCBs to the rest of the TMD system and the Lange and Revere Street canals. This interim action is intended to mitigate the infiltration and migration of that contamination into the TMD storm sewer pipe and the canals until such time as EPA selects and implements a final remedy for the site. This interim action will neither be inconsistent with, nor preclude, implementation of a final site remedy.

5.0 Site Characteristics

This section summarizes the current information available about site characteristics. EPA is currently working on the site-wide RI, so the nature and extent of contamination, potential transport pathways, and environmental receptors have not yet been fully characterized. This information will be provided in the RI report for the site, when it becomes available.

5.1 Physical Characteristics

The Ten-Mile Drain site is located 13 miles northeast of downtown Detroit in St. Clair Shores, Michigan. The site includes a portion of the Ten Mile drain storm sewer system near the intersection of Bon Brae Street and Harper Avenue where elevated levels of PCBs have been documented in the drain and the soil surrounding the drain since 2001. The TMD storm sewer, located approximately 15 feet bgs, is a network of storm sewers and catch basins constructed in 1967 that collect and manage storm water runoff. The drain pipe is an average of 6 feet wide (8 feet wide at the outfall) and empties into the Lange and Revere Street canals, which are connected to Lake St. Clair (see Figure 2). The Lange and Revere Street canals are also part of the Ten-Mile Drain site.

5.1.1 Site Geology

Available information indicates the primary presence of fine grained deposits with thin, infrequent, interbedded lenses of coarser grained materials comprising the native soils surrounding the TMD utility corridor. In general, the TMD utility corridor is set within the dense, semi-impermeable native clay or silty clay soils and is comprised of an enclosed concrete storm sewer system set within fill materials of varying composition including disturbed native soils and imported backfill materials. Geological materials around the drain are comprised of sand fill, clay, silty clay, sandy clay, and clayey sand zones extending to a depth of approximately 15 feet.

5.1.2 Hydrological Conditions

Groundwater monitoring wells were installed during the 2005 removal site investigation and as part of the City of St. Clair Shores' environmental monitoring plans. During EPA's source area investigation and previous investigations, borings installed in the native clay soils located outside the TMD system and other utility corridors determined that no groundwater aquifer is present within 20 feet of ground surface. Groundwater is not hydraulically connected to the TMD system and therefore has no influence on water levels either within the drain or within the backfill materials surrounding the drain. Available information indicates that the native hydrogeologic materials are comprised of fine-grained aquitard materials with poorly connected, thin, interbedded water-bearing coarse-grained units encountered at varying depths.

5.1.3 Storm Drain Hydraulics

There is low topographic relief in the vicinity of the TMD system and water is continually present within the TMD system, including the backfill materials surrounding the drain. The TMD system outfall is 8 feet in diameter, is located in the Lange Street canal, and is always partially submerged in the canal. Wind direction causes water level fluctuations (seiches) along the shoreline of Lake St. Clair. The changes in water levels along the Lake St. Clair shoreline directly affect the water levels within the TMD system. Under normal conditions, water within the TMD system flows from inland areas to the east, out into the Lange and Revere Street canals. However, on-shore winds can cause the water levels to increase in the

canals, causing water flow in the TMD system to reverse. Under these conditions, water flows from the canals into the TMD system.

The TMD system is constructed with jointed reinforced concrete pipe 4 to 6 feet in diameter, and is located between 6 and 12 feet bgs. The concrete pipe is set within a utility corridor that was dug out of the dense native clay, and the native clay serves as an impermeable barrier separating the utility corridor from the nearest groundwater aquifer. The disturbed soils and imported fill materials that surround the concrete pipe within the utility trench are permeable and water bearing. The jointed concrete construction appears to allow water – both from Lake St. Clair as well as storm water in the TMD system – to pass through the joints of the drain. This allows both infiltration and exfiltration of water to and from the pipe; in other words, water can flow from the surrounding backfill materials into the pipe, and water can also flow out of the pipe into the surrounding backfill materials. As a result, water levels in the transmissive sand and gravel backfill equalize with the water levels inside the drain. The average water level within the TMD backfill material is between 5 and 8 feet bgs depending on the water levels in Lake St. Clair.

5.1.4 Vaulted Manholes

The vaulted manholes were installed as cast-in-place concrete (location J01) or precast concrete (locations M7179, M4335, and M7183) and finished to surface grade with bricks. It should be noted that J01 is actually a junction box with manhole access that is situated to the "side" of the junction box and not directly over the line of flow. The reason for the J01 junction box is that several lines feed into the box from various angles not allowing the point to be constructed with a traditional vaulted manhole. For simplicity, J01 is referred to as a vaulted manhole throughout this document.

5.2 Contaminants of Concern

PCBs are the COCs in soil, sediment, and water. Since 2001, PCBs have been known to contaminate the TMD system, the soils and water immediately surrounding the TMD storm sewer pipe in the utility corridor, and the sediments in the Lange and Revere Street canals at the outfall of TMD system. PCBs are a group of fabricated chemicals originally used in industrial processes and products such as coolants and lubricants. In 1977, PCB production was banned in the United States, but PCB mixtures remain in old electrical equipment and other items, and there is also substantial PCB contamination in landfills and rivers. PCBs can pose potential health risks through eating contaminated food, soil, or water, through direct contact, or through breathing PCB-contaminated air or particles. One of the main exposure pathways of concern at sites with PCB contamination in sediments is human ingestion of PCB-contaminated fish. EPA considers PCBs as possible cancer-causing chemicals.

5.2.1 Extent of PCB Contamination

EPA is currently conducting the site-wide RI, so the nature and extent of PCB contamination at the site has not yet been fully characterized. Therefore, there is limited information available regarding the nature and extent of soil, sediment, and groundwater contamination at the site. Historical releases of PCBs into the TMD system likely resulted in the current secondary source areas of PCBs within the backfill material around certain vaulted manholes within the TMD system. Potential source areas other than the impacted fill material around the TMD vaults were not identified during the source area investigation. Based on the fact that PCBs were found at all depth intervals in the fill materials near the intersection of Bon Brae Street and Harper Avenue, as well as between Bon Brae and Lakeland Streets, it appears that the initial release of PCBs into the TMD system was due to a surficial spill or illegal dumping activities near that area. EPA will continue to investigate the nature and extent of contamination during the site-wide RI.

5.2.2 Conceptual Site Model

A conceptual site model (CSM) has been developed for the Ten-Mile Drain site based on site characteristics and results from the previous investigations. The CSM is used to organize and communicate information about site characteristics. The CSM tells the story of how and where the PCB contamination is expected to move and what impacts such movement may have.

Once in the ground, the PCBs at the site follow a preferential pathway through the TMD utility corridor. Native soils in the area are dense, semi-impermeable clay to silty clay that does not readily transmit water or other liquids. The soils observed in the utility corridor borings were either disturbed native soils or imported backfill materials until the native soils beneath the utility corridors were encountered. PCBs were not detected in any samples collected from within the native clay. Therefore, the most likely migration pathway for the PCB contamination is the more transmissive, disturbed native soils and/or imported fill materials in the backfilled utility corridors. The bottoms of the vaulted manhole structures are lower in elevation than the concrete pipe portions of the TMD system, which creates a low point for contaminants and water to accumulate around the base of the vaults. As a result, PCBs, which are denser than water, have accumulated on the outside of the TMD storm sewer pipe around the bottom of four vaults: J01, M7179, M4335, and M7183.

Due to the hydraulic connectivity between the TMD storm sewer pipe and the TMD utility corridor, PCBs are re-impacting the sediment and water inside the pipe. The movement of water in and out of the TMD utility corridor through the joints in the piping along Bon Brae Street and Harper Avenue causes the PCB oil or highly-impacted backfill materials beneath the vaulted manholes to continue to re-enter the drain. During storm events, flow turbulence is increased in the vaulted manholes, causing sediment and other organic particles impacted with PCBs to mobilize within the TMD system. Figures 5a and 5b depict this movement of PCBs from the vault areas in and out of the TMD system.

6.0 Current and Potential Future Land and Resource Uses

The site is currently known to encompass several blocks where PCBs have been found in the storm sewer system in significant concentrations, as well as the Lange and Revere Street canals where PCBs have been discharged after migrating through the storm sewer. The portion of the site addressed by this response action is located in a mixed commercial/residential area near Harper Avenue and Bon Brae Street. It is anticipated that the land usage in the immediate vicinity of the area addressed by this response action, as well as in the immediate vicinity of other areas of the site, will remain unchanged for the foreseeable future. Groundwater is not within the scope of this interim remedy and will be discussed and addressed, as needed, in a future decision document.

7.0 Site Risks

The remedy selected in this ROD is an early interim action, taken early in the remedial investigation process to prevent further migration of site contaminants and environmental degradation. Neither a formal RI/FS report nor a human health or ecological risk assessment are available. Ecological and human health risks associated with the site, as well as the ultimate cleanup objectives, will be further evaluated and addressed in a future decision document. High concentrations of PCBs that have accumulated in the backfill and vault bedding materials at the base of certain manhole vaults continue to re-enter the TMD storm sewer pipe. The contaminated bedding and backfill materials act as a continuing source of contaminants to the drain and, ultimately, the Lange and Revere Street canals.

PCBs can pose potential health risks through incidental ingestion of contaminated soil or water, consumption of contaminated fish, by direct skin contact, or through breathing PCB-contaminated air or particles. Although recent sediment sampling data shows that the canal sediments have already been re-contaminated by PCBs since the 2002-2004 removal action, EPA believes it is imperative to prevent further environmental degradation. If left unaddressed, the PCB source materials beneath the manhole vaults could continue to enter the TMD storm sewer pipe and migrate to the canals, creating even more widespread contamination of the canal sediments and higher PCB concentrations in fish, and leading to significantly more expensive costs for the final site remedy.

This section summarizes the data currently available, based on EPA's *Source Area Investigation Report* and monthly source control activities.

The 2012 *Source Area Investigation Report* indicated that the high PCB concentrations in samples collected from the backfill materials of the TMD utility corridor are capable of re-impacting the sediment and water inside the TMD storm sewer pipe. An oily sheen was observed on samples collected adjacent to four vaulted manholes. During soil

sampling at depths 10 to 15 feet bgs, total PCBs exceeding 1,000 ppm[1] were detected in samples from the backfill and bedding materials adjacent to the four vaulted manholes as follows:

Location	Concentration
M7179	66,000 ppm
J01	39,000 ppm
M4335	1,500 ppm
M7183	3,500 ppm

Two of the vaulted manholes (M7179 and J01) are located near the intersection of Bon Brae Street and Harper Avenue, and the other two vaulted manholes (M4335 and M7183) are located east of Harper Avenue on Bon Brae Street (see Figure 6).

Monthly source control activities include not only *monitoring* for PCB oil and contaminated sediment behind the 17 weirs within the TMD storm sewer pipe and at the outfall, but *removal* of the contamination that is found. Sediment removal is generally conducted behind any weir or at the outfall sediment trap if the depth of the sediment is sufficient that it is recoverable. If visual observation reveals the presence of oil behind the weirs, absorbent snares are used to wipe up and absorb the oil, and the soiled snares are removed. After the oil is removed, clean absorbent snares are placed in the drain directly upgradient of the selected weir or the sediment trap at the outfall.

As shown in Figures 7a and 7b, monitoring data collected from behind the 17 weirs inside the TMD storm sewer pipe between January 2013 and February 2014 tracked sediment concentrations and tested for the presence of PCB oil.[2] If either sediment or oil was present, it was sampled and analyzed for PCBs, and all samples were found to contain PCBs. Total PCB concentrations found in the sediment collected from behind the weirs ranged from less than 10 ppm to the highest concentration of 210,000 ppm in M7179 at the intersection of Bon Brae Street and Harper Avenue (Figure 7a). Overall, less than two inches of sediment has accumulated behind the weirs since the April 2010 removal action when the drain was last dewatered and cleaned. The PCB oil caught in snares placed behind the weir at M7179 has tested as high as 390,000 ppm (Figure 7a), and a swipe sample from the bottom of the pipe behind the weir tested as high as 550,000 ppm (Figure 7b) for total PCBs. These concentrations were removed as soon as they were discovered. PCB oil is consistently found at eight weirs along Bon Brae Street and Harper Avenue.

There is no current human exposure to the PCB oil or contaminated sediment in the TMD system, which is located approximately 15 feet bgs. However, sediments in the Lange and Revere Street canals are contaminated with PCBs from past releases from the drain.

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[1] Based on professional, technical judgment, EPA decided to use a PCB concentration threshold of 1,000 ppm as an indicator of materials that could act as a continuing source to the rest of the TMD system.

[2] J01 is not included in the monthly source control activities results because J01 is actually a junction box with manhole access that is situated to the "side" of the junction box and not directly over the line of flow, and a weir was not installed at J01.

EPA conducted sediment sampling in the Lange and Revere Street canals from August 23 to September 1, 2011. The results showed that the highest total PCB concentrations in the canal sediments (100 ppm to 570 ppm) are located near the Ten Mile drain storm sewer outfall at the western ends of the canals. Overall, total PCB concentrations decreased with depth and distance from the outfall. EPA found that concentrations are significantly lower (10 ppm to 34 ppm) in the deeper sediment (usually comprised of clay materials) than the surficial sediment (usually comprised of silty, organic-rich materials). The fact that the highest PCB concentrations are located on the western ends of the canals near the outfall indicates that PCBs continued to discharge out of the Ten Mile drain storm sewer outfall into the canals following the 2002-2004 removal action that excavated contaminated sediments from the canals.

In May 2011, the Michigan Department of Community Health (MDCH) issued a "do not eat" advisory for fish taken from the Lange and Revere Street canals. As a further precaution, MDCH recommends that no one eat carp or catfish caught from Lake St. Clair. These advisories are listed in the *2011 Michigan Fish Advisory* and can be accessed at www.michigan.gov/eatsafefish. PCBs are a concern because they concentrate in the environment and the food chain, resulting in health hazards to humans, fish and wildlife.

This interim action does not directly address the sediments or fish in the canals, but is intended to help prevent further environmental degradation by removing the high-concentration PCB source materials adjacent to the manhole vaults.

7.1 Basis for Second Interim Response Action

The response action selected in this interim ROD is necessary to mitigate the continued migration of contaminants and prevent further environmental degradation from actual or threatened releases of hazardous substances into the environment.

As noted above, source area investigation sampling results showed total PCB concentrations in the backfill and bedding materials adjacent to vaulted manhole M7179 as high as 66,000 ppm and adjacent to J01 as high as 39,000 ppm. These concentrations are several orders of magnitude higher than a number of PCB-related regulatory levels, such as the federal Toxic Substances Control Act (TSCA) Subpart D cleanup standard of 1 ppm, the MDEQ Part 201 Residential/Commercial Direct Contact criterion of 4 ppm, and the TSCA Waste Characterization Level of 50 ppm, to name just a few. It is important to implement this interim action to mitigate the infiltration and migration of PCB source materials into the TMD storm sewer pipe and the canals until such time as EPA selects and implements a final remedy for the site.

8.0 Remedial Action Objective

The high concentrations of PCBs in the backfill and bedding materials adjacent to certain vaulted manhole locations appear to be serving as the current source of PCB contamination to the TMD system. EPA believes that source control actions need to be

taken to prevent further migration of the contaminants and environmental degradation. EPA has therefore identified the following remedial action objective for this interim remedial action:

- Mitigate the migration of PCB contamination and prevent further environmental degradation of the Lange and Revere Street canal sediments by reducing the infiltration of PCB oil, contaminated utility trench water, and impacted backfill and vault bedding materials into the TMD storm sewer pipe.

This remedy is termed an interim remedial action under CERCLA because EPA has not fully determined the nature and extent of contamination at the site. The interim remedy selected in this ROD is necessary to prevent further PCB migration to the Lange and Revere Street canals and further environmental degradation until such time as EPA selects and implements a final remedy for the site.

9.0 Description of Alternatives

This section provides a narrative summary of each alternative evaluated to address the highly-impacted backfill and bedding materials within the TMD utility corridor adjacent to four vaulted manhole locations. The alternatives are numbered to correspond with the numbering system used in September 2013 Focused Feasibility Study (FS) Report. Additional details about the alternatives are provided in the Focused FS Report.

9.1 Remedial Alternatives

The following seven interim remedial alternatives were evaluated in the Focused FS Report:

- **Alternative 1 - No Action**
- **Alternative 2 - Grouting of Backfill Materials and Installation of a Liner in Each of the Four Vaulted Manholes**
- Alternative 3 - Abandonment-in-Place of a Section of the Existing TMD System and Installation of a New Line
- **Alternative 4 - Excavation, Removal, and Replacement of Four Vaulted Manholes**
- Alternative 5 - Excavation, Removal, and Replacement of Four Vaulted Manholes and a Section of the Existing TMD System
- Alternative 6 – Use of VeruTEK Surfactant to Mobilize, Extract, and Remove PCBs, and Installation of a Cured-in-Place Lining in the Four Vaulted Manholes
- **Alternative 7 - Excavation, Removal, and Replacement of Two Vaulted Manholes, M7179 and J01**

In accordance with EPA guidance, the potential remedial alternatives identified in the Focused FS and listed above were screened against three broad criteria: effectiveness (both short-term and long-term), implementability (including technical and administrative feasibility), and relative cost (including capital and O&M costs). The purpose of the screening evaluation was to reduce the number of alternatives chosen for a more thorough analysis. As a result of this screening process, EPA eliminated several alternatives from further consideration. Alternative 3 and Alternative 5 were eliminated because they are not considered cost-effective for the limited scope of this interim action. Alternative 6, which included the injection of a VeruTEK surfactant, a relatively new technology, was eliminated after the results of a bench study indicated that this in-situ treatment technology would not be effective for the particular situation that needs to be addressed at this site.

The four remedial alternatives highlighted in bold in the bulleted list above were retained for detailed analysis. These four alternatives for managing the highly-impacted backfill and bedding materials at the base of the vaulted manholes were evaluated against the nine criteria required by Superfund law. Section 10 of this ROD includes an explanation of the nine evaluation criteria and an evaluation of the alternatives against those criteria.

The four alternatives that were retained for detailed analysis are summarized below.

Alternative 1: No Action

Regulations governing the Superfund program require that the "no action" alternative be evaluated to generally establish a baseline for comparison. Under this alternative, EPA would take no further action at the site (besides the ongoing interim actions selected by the September 2011 Interim ROD). There would continue to be contact between the water within the TMD system and the source materials below the vaulted manholes, and high concentrations of PCBs would continue to infiltrate into the TMD storm sewer pipe.

Estimated Capital Cost: $0
Estimated Annual O&M Cost: $0

Alternative 2: Grouting of Backfill Materials and Installation of a Liner in Each of the Four Vaulted Manholes

Alternative 2 would decrease the mobility of the PCBs through the use of solidification, and would mitigate the migration of the PCBs by eliminating contact between the water within the TMD system and the source materials below the vaulted manholes through containment. A sketch depicting Alternative 2 (at a single vaulted manhole) is shown in Figure 8. The major elements of Alternative 2 include the following:

- The backfill materials at each of the four vaulted manholes (M7179, J01, M4335, and M7183) would be solidified by grouting. The grout would be applied in the backfill on all sides and beneath the manhole vaults to sufficient depths above and

below the source material in order to significantly reduce the PCB mobility. This technology is not reversible as it results in a solidified mass.

- A shotcrete liner or cured-in place liner would be installed in each of the four vaulted manholes in order to eliminate contact between water within the TMD system and the source materials below the vaulted manholes. The liners would not only reline the vaulted manholes, but also would extend laterally 10 feet into each pipe that enters into each of the vaulted manholes.
- Prior to installing the liner, the vaulted manholes would be dewatered, and stormwater would be temporarily rerouted.
- Each vault would be power-washed and cleaned prior to shotcrete application.
- Any contamination located in the trench backfill materials between one vaulted manhole location and another would be left in place.
- Monitoring of trench water would be accomplished through monitoring and recovery wells placed in the utility trench adjacent to the newly grouted manholes and through wipe samples taken within the vaulted manholes. Two wells would be placed on either side of the four manholes for a total of eight monitoring and recovery wells. Sampling of the wells and the wipe samples from the vaults would occur quarterly. EPA would evaluate the effectiveness of the wipe sample collection method and adjust it as necessary. EPA would also adjust the frequency of the monitoring and sampling events as necessary.
- The monitoring and recovery wells outside the manhole vaults would be used to extract PCB oil if build up of oil against the solidified backfill materials was observed. The monitoring and recovery wells would also provide data to support future decisions about a site-wide remedial action.
- Monitoring inside the drain would be performed to assess if free oil had been reduced or eliminated compared to the conditions that existed prior to grouting.
- Institutional controls would include both deed restrictions and assigning permit restrictions to accompany the deed restrictions. Deed restrictions would be necessary to restrict land use in order to ensure that source area grouted soils are not brought to the surface during future excavation activities or grout being damaged below grade without adequate safeguards.

Estimated Capital Cost (Design, Geotechnical Investigation and Construction): $1,800,000

Estimated Construction Time: 3 weeks

Estimated Time to Achieve Remedial Objectives: Immediately upon completion of construction

Estimated Truck Trips: No excavation or clean-fill truck trips required

Estimated Annual O&M Cost (30 years): $111,504

Total Present Value: $3,700,000

Alternative 4: Excavation, Removal, and Replacement of Four Vaulted Manholes

Alternative 4 would reduce the volume of contamination and mitigate contaminant migration through excavation and removal of source materials and through infrastructure modifications at each of the four vaulted manholes. A sketch depicting Alternative 4 (at a single vaulted manhole) is shown in Figure 9. The major elements of Alternative 4 include the following:

- Excavation and removal of the four vaulted manholes (M7179, J01, M4335, and M7183) and the surrounding impacted backfill materials, and proper off-site disposal of the contaminated materials.
- Prior to excavation, the vaulted manholes would be dewatered, and flow in the TMD system would be temporarily rerouted with pumps.
- Four new vaulted manholes would be installed to replace the excavated vaulted manholes, including new stone bedding and backfill materials.
- Prior to installing the new vaulted manholes, a flexible synthetic liner would be installed on the open excavation surface to separate the existing soils from the new clean bedding and backfill materials.
- The flexible synthetic liner would be affixed to the outside of each new manhole vault using batten strips.
- Treatment of excavated impacted soils through solidification would occur prior to disposal by mixing a reagent (cement kiln dust) to convert the sludge to a granular solid and improve the handling characteristics of the waste.
- Any contamination located in the trench backfill materials between one vaulted manhole location and another would be left in place.
- Monitoring of trench water would be accomplished through monitoring and recovery wells placed in the utility trench adjacent to the newly installed manholes and through wipe samples taken within the vaulted manholes. Two wells would be placed on either side of the four manholes for a total of eight monitoring and recovery wells. Sampling of the wells and the wipe samples from the vaults would occur quarterly. EPA would evaluate the effectiveness of the wipe sample collection method and adjust it as necessary. EPA would also adjust the frequency of the monitoring and sampling events as necessary.
- The monitoring and recovery wells outside the manhole vaults would be used to extract PCB oil if build up of oil against the new liner of the replaced vaulted manhole was observed. The monitoring and recovery wells would also provide data to support future decisions about a site-wide remedial action.
- Monitoring inside the drain would be performed to assess if free oil build had been reduced or eliminated compared to the conditions that existed prior to replacement of the vaults.

- Institutional controls would include both deed restrictions and assigning permit restrictions to accompany the deed restrictions. Deed restrictions would be necessary to restrict land use in order to ensure that the new vaults and liners and clean backfill are not compromised during excavation or other intrusive activities causing contaminated media from the adjacent pipe runs to enter the clean backfill and/or new vault.

Estimated Capital Cost (Design, Geotechnical Investigation and Construction): $3,600,000

Estimated Construction Time: 8 weeks

Estimated Time to Achieve Remedial Objectives: Immediately upon completion of construction

Estimated Truck Trips: 10 excavation trucks, 10 clean fill trucks, and 1 asphalt truck

Estimated Annual O&M Cost (30 years): $93,150

Total Present Value: $5,200,000

Alternative 7: Excavation, Removal, and Replacement of Two Vaulted Manholes, M7179 and J01

Alternative 7, like Alternative 4, would reduce the volume of contamination and mitigate contaminant migration through excavation and removal of source materials and through infrastructure modifications. Under Alternative 7, only the two most highly-contaminated vaulted manhole locations (M7179 and J01) would be addressed. A sketch depicting Alternative 7 (at a single vaulted manhole) is shown in Figure 9. The major elements of Alternative 7 include the following:

- Excavation and removal of the vaulted manholes and surrounding impacted backfill materials at M7179 and J01, and proper off-site disposal of the contaminated materials.
- Prior to excavation, the vaulted manholes would be dewatered and flow in the TMD system would be temporarily rerouted with pumps.
- Two new vaulted manholes would be installed to replace the excavated vaulted manholes, including new stone bedding and backfill materials.
- Prior to installing the new vaulted manholes, a flexible synthetic liner would be installed on the open excavation surface to separate the existing soils from the new clean bedding and backfill materials.
- The flexible synthetic liner would be affixed to the outside of each new manhole vault using batten strips.
- Treatment of excavated impacted soils through solidification would occur prior to disposal by mixing a reagent (cement kiln dust) to convert the sludge to a granular solid and improve the handling characteristics of the waste.

- The PCB contamination at the base of the two downgradient vaulted manholes, M4335 and M7183, would be left in place at this time. Any contamination located in the trench backfill materials between one vaulted manhole location and another would also be left in place.

- Monitoring of trench water would be accomplished through monitoring and recovery wells placed in the utility trench adjacent to the newly installed manholes and through wipe samples taken within the vaulted manholes. Two wells would be placed on either side of the two manholes for a total of four monitoring and recovery wells. Sampling of the wells and the wipe samples from the vaults would occur quarterly. EPA would evaluate the effectiveness of the wipe sample collection method and adjust it as necessary. EPA would also adjust the frequency of the monitoring and sampling events as necessary.

- The monitoring and recovery wells outside the manhole vaults would be used to extract PCB oil if build up of oil against the new liner of the replaced vaulted manhole was observed. The monitoring and recovery wells would also provide data to support future decisions about a site-wide remedial action.

- Monitoring inside the drain would be performed to assess if free oil build up had been reduced or eliminated compared to the conditions that existed prior to replacement of the two vaults.

- Institutional controls would include both deed restrictions and assigning permit restrictions to accompany the deed restrictions. Deed restrictions would be necessary to restrict land use in order to ensure that the new vaults and liners and clean backfill are not compromised during excavation or other intrusive activities causing contaminated media from the adjacent pipe runs to enter the clean backfill and/or new vault.

Estimated Capital Cost (Design, Geotechnical Investigation and Construction): $2,600,000

Estimated Construction Time: 6 weeks

Estimated Time to Achieve Remedial Objectives: Immediately upon completion of construction

Estimated Truck Trips: 4 excavation trucks, 4 clean fill trucks, and 1 asphalt truck

Estimated Annual O&M Cost (30 years): $76,866

Total Present Value: $3,900,000

9.2 Discussion of Performance Standards for Remedial Alternatives

The high concentrations of PCB source materials that have accumulated around the base of the vaulted manholes, and that continue to migrate into the TMD storm sewer pipe, far exceed the typical range of PCB health-based cleanup standards. However, due to the interim nature and the objective of the intended action, none of the remedial alternatives include numeric cleanup standards for soil or any other media. This interim action is intended to serve as a source control action. The objective of the action is not to clean up

soils (or other media) to specified health-based cleanup levels, but rather to mitigate contaminant migration and prevent further environmental degradation by addressing the high-concentration PCB source materials. For this reason, performance standards will be used during the remedial action instead of numeric cleanup standards.

Under Alternatives 4 and 7, performance standards for the excavation and removal of source materials adjacent to the vaulted manholes include but are not limited to:

1) *visual standards* – i.e., excavation of materials based on the observation of oily and/or impacted backfill and bedding materials beneath and adjacent to the vaults;

2) *depth standards based on lithological characteristics* – i.e., excavation up to 2 feet into the undisturbed native clay below the manhole vault and bedding materials. The native materials at the site are described as dense, semi-impermeable clay or silty clay. The soils observed in the utility corridor borings are either disturbed native soils or imported backfill materials, until the native soils beneath the utility corridors are encountered. During site characterization activities, low to no detections of PCBs were found in samples collected from within the undisturbed native clay.

3) *lateral-distance standards* – i.e., excavation of impacted materials located laterally from the vaulted manholes for a minimum of 5 feet in each direction outside the vaulted manhole or as otherwise necessary, as determined during remedial design, to properly connect the new manhole and the piping and for excavation bracing/safety.

Performance standards under Alternative 2 for solidification of source materials are *engineering performance standards* – i.e., to apply the grout in the backfill on all sides and beneath the vaulted manholes to sufficient depths above and below the source materials in order to significantly reduce the PCB mobility. The source materials adjacent to the vaulted manholes would be immobilized by injection of a grout mixture defined in the remedial design. Long-term monitoring of the presence of oil in the manholes would occur to measure the reduction in oils entering the drain.

10.0 Summary of Comparative Analysis of Alternatives

Section 121(b)(1) of CERCLA presents several factors that EPA is required to consider in its assessment of alternatives. Building upon these specific statutory mandates, the NCP articulates nine evaluation criteria to be used in assessing the individual remedial alternatives. The purpose of this evaluation is to promote consistent identification of the relative advantages and disadvantages of each alternative, thereby guiding selection of remedies offering the most effective and efficient means of achieving site cleanup goals. While all nine criteria are important, they are weighed differently in the decision-making process depending on whether they evaluate protection of human health and the environment or compliance with federal and state requirements, standards, criteria, and limitations (threshold criteria); consider technical or economic merits (primary balancing

criteria); or involve the evaluation of non-EPA reviewers that may influence an EPA decision (modifying criteria). Each of these nine criteria are described below.

Threshold Criteria

1. **Overall Protection of Human Health and the Environment** addresses whether a remedy provides adequate protection of human health and the environment and describes how risks posed by the site are eliminated, reduced or controlled through treatment, engineering, or institutional controls.
2. **Compliance with Applicable or Relevant and Appropriate Requirements (ARARs)** addresses whether a remedy will meet the applicable or relevant and appropriate federal and state requirements.

Primary Balancing Criteria

3. **Long-Term Effectiveness and Permanence** refers to expected residual risk and the ability of a remedy to maintain reliable protection of human health and the environment over time, once cleanup levels have been met.
4. **Reduction of Toxicity, Mobility, or Volume Through Treatment** addresses the statutory preference for selecting remedial actions that employ treatment technologies that permanently and significantly reduce toxicity, mobility, or volume of the hazardous substances as their principal element. This preference is satisfied when treatment is used to reduce the principal threats at the site through destruction of toxic contaminants, reduction of the total mass of toxic contaminants, irreversible reduction in contaminant mobility, or reduction of total volume of contaminated media.
5. **Short-Term Effectiveness** addresses the period of time needed to implement the remedy and any adverse impacts that may be posed to workers, the community and the environment during construction of the remedy until cleanup levels are achieved. This criterion also considers the effectiveness of mitigative measures and time until protection is achieved through attainment of the remedial action objectives.
6. **Implementability** addresses the technical and administrative feasibility of a remedy from design through construction, including the availability of services and materials needed to implement a particular option and coordination with other governmental entities.
7. **Cost** includes estimated capital costs, annual operation and maintenance costs, and net present value of capital and operation and maintenance costs, including long-term monitoring.

Modifying Criteria

8. **State Agency Acceptance** considers whether the state support agency concurs with the selected remedy for the site.
9. **Community Acceptance** addresses the public's general response to the remedial alternatives and the preferred alternative presented in the Proposed Plan.

Each of the nine evaluation criteria are discussed below with respect to the alternatives under consideration for this interim action.

10.1 Overall Protection of Human Health and the Environment

It is important to note that none of the potential remedial alternatives fully reduce the risks to human health and the environment that may already exist due to the known recontamination of the sediments in the Lange and Revere Street canals. The objective of this interim action is to mitigate contaminant migration and prevent further environmental degradation – in other words, to keep the contamination in the canal sediments from getting worse. This interim action will contribute to the long-term protection of human health and the environment.

Alternative 1, the "No Action" alternative, would not provide interim protective source control measures to mitigate the migration of PCB contamination and prevent further environmental degradation because it would continue to allow the infiltration and ongoing release of high-concentration PCB source materials from the subsurface soils near and around the bottom of the vaulted manholes into the TMD system and, ultimately, the canals.

In terms of this interim action, Alternatives 2, 4, and 7 would provide interim source control measures to mitigate the migration of PCB contamination and prevent further environmental degradation. Alternative 2 would prevent the high-concentration PCB source materials beneath the vaulted manholes from infiltrating into the TMD system and would reduce future contaminant migration by encapsulating the source materials. Alternatives 4 and 7 would prevent infiltration into the TMD system and reduce contaminant migration by excavating and removing the vaulted manhole structures along with the PCB source materials beneath them, although Alternative 7 would excavate and remove only the two most highly-contaminated locations compared to Alternative 4, which would excavate and remove all four. Alternatives 2, 4 and 7 would be interim actions only and would provide adequate steps to reduce the volume of PCBs discharged into the canals until a final remedy is implemented.

10.2 Compliance with Applicable or Relevant and Appropriate Requirements

Section 121(d) of CERCLA requires that remedial actions at CERCLA sites at least attain legally applicable or relevant and appropriate federal and state requirements, standards, criteria, and limitations which are collectively referred to as "ARARs," unless such ARARs are waived under CERCLA Section 121(d)(4). Applicable requirements are those cleanup standards, standards of control, and other substantive requirements, criteria, or limitations promulgated under federal environmental or state environmental or facility siting laws that specifically address a hazardous substance, pollutant, contaminant, remedial action, location, or other circumstances found at a CERCLA site. Relevant and appropriate requirements are those cleanup standards, standards of control, and other substantive requirements, criteria, or limitations promulgated under federal

environmental or state environmental or facility siting laws that, while not "applicable" to a hazardous substance, pollutant, contaminant, remedial action, location, or other circumstances at a CERCLA site, address problems or situations sufficiently similar to those encountered at the CERCLA site that their use is well-suited to the particular site. Only those state standards that are identified in a timely manner, and that are more stringent than federal requirements, may be relevant and appropriate.

In accordance with the NCP (40 CFR 300.430(f)(l)(ii)(C)(l), interim actions such as this are not required to comply with ARARs as long as the final remedial action at the site will attain them. Alternative 1 does not meet ARARs. Alternatives 2, 4, and 7 are expected to comply with the state and federal ARARs that are specific to the limited scope of the proposed action. The primary ARARs to be met relate to federal requirements under TSCA, erosion controls during excavation, compliance with hazardous waste transportation and disposal requirements, and air pollution emission requirements. A list of the federal and state ARARs for the limited scope of this interim action can be found in Tables 2 and 3, respectively. Upon the completion of the site-wide RI/FS, EPA will propose a remedial action to address the entire site. The interim action selected in this ROD may become part of the site-wide remedial action, which will attain ARARs.

10.3 Long-Term Effectiveness and Permanence

The long-term effectiveness and permanence of the alternatives are evaluated in terms of how well an option will work over the long term, including how safely remaining contamination can be managed. Alternatives 4 and 7 are considered to have the greatest degree of long-term effectiveness and permanence because the source materials beneath the vaulted manholes would be removed. Alternative 4 would remove and replace all four vaulted manholes, while Alternative 7 would remove and replace only the two most highly-contaminated vaulted manholes. Source materials at those vaulted manhole locations would be removed and monitoring and recovery wells would be installed in the utility trench adjacent to the newly installed vaults. The monitoring and recovery wells would be used to extract PCB oil if build up of oil against the new liners of replaced vaulted manholes was observed. Compared to Alternatives 4 and 7, the degree of long-term effectiveness and permanence of Alternative 2 is not as great, since solidification is the primary component of the action and the source materials would not be removed. Institutional controls would be required for Alternatives 2, 4, and 7 to restrict future land use activities that would interfere with or adversely affect the integrity or protectiveness of the remedial action. Alternative 1 would not achieve or contribute to long-term effectiveness and permanence.

For all action alternatives, evaluation of long-term monitoring results would be required after construction to evaluate if the RAO was achieved.

10.4 Reduction in Toxicity, Mobility, or Volume through Treatment

Alternative 1 would not utilize treatment to reduce the toxicity, mobility, or volume of the contaminants. The NCP preference for treatment would be met with Alternatives 2,

4, and 7. Alternative 2 utilizes in-situ treatment through solidification of impacted soils. Alternatives 4 and 7 utilize ex-situ treatment by mixing a reagent (cement kiln dust) with the impacted soils, converting the sludge to a granular solid to improve the handling characteristics of the waste. Immobilization of the impacted soils through solidification reduces mobility of waste, but does not significantly reduce toxicity or volume of wastes.

10.5 Short-Term Effectiveness

Short-term impacts of the alternatives increase as more source area soils around the vaulted manholes are excavated and as more clean soil must be brought to the site. Longer construction times and greater amounts of off-site soil disposal will result in greater potential for worker injury and greater amounts of community disturbance related to transporting contaminated soil off site.

Alternative 1 has no action associated with it so would have no associated short-term impacts.

Alternative 2 has the shortest construction period (3 weeks) and the least amount of truck traffic since excavation or clean-fill trucks are not required. Dust generated during construction activities would be from clean materials and particulates could be readily monitored and controlled through dust suppression methods.

Alternative 4 has the greatest short-term impacts because it has the longest construction period (8 weeks) and requires the largest number of trucks to transport materials to and from the site and through populated areas. Alternative 4 would require an estimated 10 excavation trucks, 10 clean fill trucks, and 1 asphalt truck, while Alternative 7 would take 6 weeks to construct and would require 4 excavation trucks, 4 clean fill trucks, and 1 asphalt truck. The exposures associated with Alternatives 4 and 7 could be addressed through proper decontamination procedures and properly functioning tarp systems on trucks, dust monitoring and suppression during construction, and appropriate erosion control measures.

10.6 Implementability

Alternative 1 has no actions that would be implemented. All of the other alternatives could be implemented with readily available materials and methods. The main technical challenge for Alternative 4 and Alternative 7 is deep excavation and the need for sheet piling and shoring. The main technical challenge for Alternative 2 is the selection of the proper grouting technique. These challenges could be overcome through effective planning and design.

10.7 Cost

This criterion evaluates the capital costs (design, geotechnical investigation, and construction costs) and O&M costs of each alternative. Present-worth costs have been calculated to help compare costs among alternatives with different implementation times.

Alternative 1 would cost nothing. Alternative 2 is the least expensive action alternative ($3.7 million present worth cost) with a capital cost of $1.8 million. Alternative 7 is the next most costly alternative ($3.9 million present worth cost) with a capital cost of $2.6 million. Alternative 4 is the most costly alternative ($5.2 million present worth cost) with a capital cost of $3.6 million. A final cost estimate for the selected interim action will be developed and refined during the remedial design process.

10.8 State Acceptance

The Michigan Department of Environmental Quality has indicated that it supports the selection of Alternative 7. MDEQ's concurrence letter will be added to the Administrative Record upon receipt.

10.9 Community Acceptance

During the public comment period, the community indicated acceptance of the concept of removing and replacing the vaulted manholes and the contamination around them. In general, the community expressed strong support for Alternative 4 over Alternative 7 because under Alternative 4 the contamination at the base of all four vaulted manholes would be removed. EPA has prepared a Responsiveness Summary that summarizes the public comments and EPA's responses to those comments. The Responsiveness Summary is included in Part III of this ROD.

11.0 Principal Threat Waste

The NCP establishes an expectation that EPA will use treatment to address the principal threats posed by a site, wherever practical. The principal threat concept is applied to the characterization of "source material" at a Superfund site. Source material is material that includes or contains hazardous substances, pollutants or contaminants that act as a reservoir for migration of contaminants to groundwater, surface water or air, or acts as a source for direct exposure. EPA has defined principal threat wastes as those source materials considered to be highly toxic or highly mobile that generally cannot be reliably contained or would present a significant risk to human health or the environment should exposure occur.

The high concentrations of PCBs present in the backfill and bedding materials surrounding the manhole vaults, as well as the PCB oil that was found, are considered principal threat wastes. PCB oils are dense non-aqueous phase liquids, are highly mobile, and are considered a highly hazardous substance.

The NCP preference for treatment of principal threat wastes would be met with Alternatives 2, 4, and 7. Alternative 2 utilizes in-situ treatment through solidification of impacted soils. Alternatives 4 and 7 utilize ex-situ treatment by mixing a reagent (cement kiln dust) with the impacted soils, converting the sludge to a granular solid to improve the handling characteristics of the waste.

12.0 Selected Remedy

EPA is selecting Alternative 7 as the second interim remedy for the Ten-Mile Drain site. Alternative 7 will address the highly-impacted bedding and backfill materials at the base of vaulted manholes M7179 and J01, leaving the PCB concentrations adjacent to the two downgradient vaulted manholes, M4335 and M7183, to be addressed as part of the final site-wide remedy.

12.1 Summary of Rationale for the Selected Remedy

EPA believes that Alternative 7 represents the best balance of the evaluation criteria and that this alternative will be a protective interim action that provides adequate steps to reduce the volume of PCBs discharging into the canals. Alternative 7 will remove the PCB source materials and the highly-impacted bedding and backfill materials at vaulted manholes M7179 and J01, leaving the PCB contamination at the base of the two downgradient vaulted manholes, M4335 and M7183, to be addressed as part of the final site-wide remedy. Alternative 7 will comply with those federal and state requirements that are applicable or relevant and appropriate for this limited-scope action, will be cost effective, utilize treatment permanent solutions and alternative treatment technologies to the maximum extent practicable, and satisfy the preference for treatment as a principal element.

Alternative 7 is expected to meet the RAO of mitigating the migration of PCB contamination and preventing further environmental degradation of the Lange and Revere Street canal sediments immediately upon completion of the construction work. The infiltration of PCB oil and contaminated utility trench water into the TMD storm sewer pipe is expected to be reduced by removing the high concentrations of PCBs at M7179 and J01, thereby preventing these high concentrations from moving through the TMD system to the canals.

A variety of factors go into EPA's decision to select Alternative 7 over the other interim alternatives that were evaluated, including Alternative 4, which the community preferred. Based on the information available at this time, EPA believes that the highest concentrations of PCBs have accumulated around the base of vaulted manholes M7179 and J01, and that this is the source material that continues to release into the TMD system. Furthermore, EPA believes that the continued release of this material is the cause of the contamination present at the base of the downgradient vaulted manholes, M4335 and M7183, as well as the residual contamination found throughout the TMD system. In addition, removing and replacing only the two most highly-contaminated vaults instead of all four vaults will reduce the construction period, the number of truckloads, and create less traffic disturbance.

The source area investigation results from 15 feet bgs discussed in Section 7 of this ROD show an order of magnitude difference in the PCB concentrations found adjacent to vaulted manholes M7179 and J01 (66,000 and 39,000 ppm, respectively) compared to the concentrations found adjacent to M4335 and M7183 (1,500 and 3,500 ppm, respectively).

Additionally, during monthly source control activities, the snares inside the pipe at M7179 are routinely found to be saturated with PCB-contaminated oil, and the snares are routinely removed and replaced. PCB oil concentrations on the snares at M7179 have been found as high as 390,000 ppm, and swipe samples from the bottom of the pipe at that location have tested as high as 550,000 ppm. EPA believes that the removal and replacement of vaulted manholes M7179 and J01 will ultimately remove the major source materials and that, over time, monitoring results will reveal a reduction in the presence of PCB oil within the TMD system.

EPA also believes that the information obtained during the construction and implementation of Alternative 7, which deals with only two of the four vaulted manhole locations considered for action, will continue to solidify the conceptual site model for the Ten-Mile Drain site and will provide valuable information to inform EPA's future decision-making at this site. As noted earlier, EPA is managing the contamination at the Ten-Mile Drain site through a phased approach. Each phase or interim action provides valuable information that increases decisional flexibility and allows EPA to adapt future decisions based on the new information gained. This adaptive management approach is expected to result in cost savings and operational efficiencies over the long term, and to decrease uncertainties associated with remedy selection for later phases of the project.

This interim action will not address vaulted manhole locations M4335 or M7183, nor will it address the lower-level PCB concentrations known to exist at other locations in and around the TMD storm sewer pipe 15 ft bgs, such as the PCB concentrations in the backfill and bedding materials along the pipe that connects the vaulted manholes. Those lower PCB concentrations are not believed to be serving as source materials. Targeting the two most highly-impacted vaulted manholes in this interim action is expected to immediately reduce the volume of PCB oil that continues to release into the TMD system, allowing EPA to ultimately focus on selecting a remedy to address the lower-concentration PCB materials known to exist at the site.

12.2 Description of Remedial Components

The selected interim action – Alternative 7 – will remove the highly-impacted backfill and bedding materials from the TMD system adjacent to manhole vaults M7179 and J01. The major elements of the selected interim remedy include the following:

- Excavation and removal of the vaulted manholes and surrounding impacted backfill materials at M7179 and J01, and proper off-site disposal of the contaminated materials;
- Dewatering and temporary rerouting of the flow in the TMD system prior to excavation work;
- Installation of two new vaulted manholes at M7179 and J01, including replacement of the stone bedding and backfill materials. During the design of the selected action, EPA will evaluate whether it is possible and cost-effective to construct J01 with manhole access directly above the vault and the line of flow.

A weir will be installed inside the new vault at M7179, and at J01 if the design of that vaulted manhole allows, to facilitate monitoring;

- Installation of a flexible synthetic liner on the open excavation surfaces prior to installation of the new vaulted manholes, to separate the existing soils from the new clean bedding and backfill materials;
- After installation of the new vaulted manholes, a flexible synthetic liner will be affixed to the outside of each new manhole vault and the piping using batten strips;
- Treatment of excavated impacted soils through solidification prior to disposal by mixing a reagent (cement kiln dust) to convert the sludge to a granular solid and improve the handling characteristics of the waste;
- Installation of two monitoring and recovery wells on either side of the two new vaulted manholes for a total of four monitoring and recovery wells. The monitoring and recovery wells will be placed in the utility trench adjacent to the newly installed structures.
- Quarterly monitoring of both the utility trench water outside the drain through the monitoring and recovery wells and the water inside the drain, and extraction of PCB oil using the monitoring and recovery wells if build up of oil occurs against the new liners of the replaced vaulted manholes. EPA will evaluate the effectiveness of its sample collection methods as well as the frequency of the monitoring and sampling events and adjust them as necessary; and
- Use of institutional controls to prevent actions that compromise the remedy.

The selected action leaves the PCB concentrations adjacent to the two downgradient vaulted manholes, M4335 and M7183, as well as other PCB contamination within the TMD system, to be addressed as part of a future decision document for the Ten-Mile Drain site.

12.3 Performance Standards

Due to the interim nature and the objective of the selected remedial action, numeric cleanup standards will not be used for soil or any other media. This interim action is intended to serve as a source control action. The objective of the action is not to clean up soils (or other media) to specified health-based cleanup levels, but rather to mitigate contaminant migration and prevent further environmental degradation by addressing the high-concentration PCB source materials. For this reason, performance standards will be used during the remedial action instead of numeric cleanup standards.

The performance standards for the selected remedial action include but are not limited to:

1) *visual standards* – i.e., excavation of materials based on the observation of oily and/or impacted backfill and bedding materials beneath and adjacent to the vaults;

2) *depth standards based on lithological characteristics* – i.e., excavation up to 2 feet into the undisturbed native clay below the manhole vault and bedding materials. The native materials at the site are described as dense, semi-impermeable clay or silty clay. The soils observed in the utility corridor borings are either disturbed native soils or imported backfill materials, until the native soils beneath the utility corridors are encountered. During site characterization activities, low to no detections of PCBs were found in samples collected from within the undisturbed native clay.

3) *lateral-distance standards* – i.e., excavation of impacted materials located laterally from the vaulted manholes for a minimum of 5 feet in each direction outside the vaulted manhole or as otherwise necessary, as determined during remedial design, to properly connect the new manhole and the piping and for excavation bracing/safety.

12.4 Summary of Estimated Remedy Costs

The estimated costs for the selected remedy – Alternative 7 – are summarized as follows:

Estimated Capital Cost (Design, Geotechnical Investigation and Construction): $2,600,000

Estimated Annual O&M Cost (30 years): $76,866

Total Present Value: $3,900,000

A detailed cost estimate for Alternative 7 can be found in Table 1. The information in the cost estimate summary table is based on the best available information regarding the anticipated scope of the remedial alternative. This is an order-of-magnitude engineering cost estimate that is expected to be within +50 to -30 percent of the actual project cost.

12.5 Expected Outcome(s) of the Selected Remedy

This second interim action for the Ten-Mile Drain site will remove the PCB source materials and the highly-impacted bedding and backfill materials at vaulted manholes M7179 and J01, thereby preventing the continued migration of these PCB source materials to the rest of the TMD system and reducing environmental degradation of the sediment in the canals.

13.0 Statutory Determinations

Under CERCLA Section 121 and the NCP, the lead agency must select remedies that are protective of human health and the environment, attain federal and state requirements that are applicable or relevant and appropriate to the remedial action (or invoke an appropriate waiver), are cost-effective, and utilize permanent solutions and alternative treatment technologies (or resource recovery technologies) to the maximum extent practicable. In addition, CERCLA includes a preference for remedies that employ treatment that permanently and significantly reduces the volume, toxicity, or mobility of hazardous

wastes as a principal element and a bias against off-site disposal of untreated wastes. The following subsections discuss how the selected remedy addresses these statutory requirements.

13.1 Protection of Human Health and the Environment

The selected remedy is a protective interim action only and is not intended to be protective of human health and the environment for all site risks. The selected remedy will provide adequate steps to reduce the volume of PCBs discharged into the TMD system and ultimately the canals until a final remedy is implemented. The selected interim action will remove high concentrations of PCBs that have accumulated adjacent to two vaulted manholes and that are believed to be the source materials that continue to release into the TMD system. This interim action will abate the potential risk of further migration to the canals. The selected remedy will not pose unacceptable short-term risk or cross-media impacts.

13.2 Compliance with ARARs

The selected remedy is expected to comply with the state and federal ARARs that are specific to the limited scope of this interim action, including federal TSCA regulations. Upon the completion of the RI/FS, EPA will propose a remedial action to address the entire site. This interim remedial action may become part of the site-wide remedial action, which will attain ARARs. The federal and state ARARs for this interim action are listed in Tables 2 and 3, respectively. All federal and state ARARs identified for this interim remedial action will be met, unless, due to the interim nature of this remedy, they cannot be met.

13.3 Cost-Effectiveness

EPA has determined that the selected remedy is cost-effective and represents a reasonable level of protectiveness (in this case, prevention of further environmental degradation) for the money to be spent, especially considering the objectives of the interim action. In making this determination the following definition was used: "A remedy shall be cost-effective if its costs are proportional to its overall effectiveness." (NCP Section 300.430(f)(1)(ii)(D)). "Overall effectiveness" was evaluated by assessing three of the five balancing criteria (long-term effectiveness and permanence; reduction in toxicity, mobility, and volume through treatment; and short-term effectiveness). Overall effectiveness was then compared to costs to determine cost-effectiveness. The relationship of the overall effectiveness of this second interim remedial action was determined to be proportional to its costs and hence the remedy represents a reasonable level of protectiveness for the money spent. The estimated cost of the selected interim remedial action is a capital cost of $2.6 million, with a total present value over 30 years of $3.9 million.

13.4 Utilization of Permanent Solutions and Alternative Treatment Technologies (or Resource Recovery Technologies) to the Maximum Extent Practicable/ Preference for Treatment as a Principal Element

This interim action uses permanent solutions and treatment to the maximum extent practicable. The NCP preference for treatment of the principal threat waste will be met by this interim action, which utilizes ex-situ treatment by mixing a reagent (cement kiln dust) with the impacted soils, converting the sludge to a granular solid to improve the handling characteristics of the waste.

13.5 Five-Year Review Requirements

The first interim remedy selected in September 2011 resulted in hazardous substances remaining on-site above levels that allow for unlimited use and unrestricted exposure, thereby triggering statutory five-year reviews to evaluate whether the remedy is, or will be, protective of human health and the environment. Because this second interim also will result in hazardous substances remaining on-site above levels that allow for unlimited use and unrestricted exposure, statutory five-year reviews are still required.

14.0 Documentation of Significant Changes

The Proposed Plan identified Alternative 7 as the preferred interim remedial action alternative for the Ten-Mile Drain site. The Proposed Plan public comment period ran from December 4, 2013, through January 6, 2014. CERCLA Section 117(b) and NCP Section 300.430(f)(5)(iii) require an explanation of significant changes from the remedy presented in the Proposed Plan that was published for public comment. Based upon its review of the written and oral comments submitted during the public comment period, EPA has determined that no significant changes to the remedy, as originally identified in the Proposed Plan, are necessary or appropriate.

PART III: RESPONSIVENESS SUMMARY

In accordance with CERCLA Section 117, 42 U.S.C. Section 9617, EPA released the Proposed Plan and Administrative Record on December 4, 2013, and the public comment period ran through January 6, 2014, to allow interested parties to comment on the Proposed Plan. EPA held an open house and public meeting regarding the Proposed Plan on December 12, 2013, at the City of St. Clair Shores Council Chambers, St. Clair Shores, Michigan. Approximately 30 people attended both the meeting and open house. Representatives from EPA, MDEQ, Macomb County Health Department, and the City of St. Clair Shores were present at the public meeting.

This Responsiveness Summary provides both a summary of the public comments EPA received regarding the Proposed Plan and EPA's responses to those comments. EPA received written comments (via regular and electronic mail) and verbal comments (at the public meeting) during the public comment period. Copies of all the comments received (including the verbal comments reflected in the transcript of the public meeting) are included in the Administrative Record for the site. EPA, in consultation with MDEQ, carefully considered all comments prior to selecting the interim remedy documented in this ROD. A complete copy of the Proposed Plan, Administrative Record, and other pertinent documents are available at the St. Clair Shores Public Library, 22500 E 11 Mile Road, St. Clair Shores, Michigan.

EPA received comments from community members and the City of St. Clair Shores. For purposes of this Responsiveness Summary, most comments are repeated here "as received" by mail or as recorded during the public meeting, although a few comments are summarized. As necessary, where similar comments were received, those comments were consolidated in order to avoid duplication in terms of EPA's response. Comments in their entirety can be found in the Administrative Record.

The comments are categorized as follows:

- General Comments from the Community
- Comments from the Community in Support of Alternative 4
- Comments from the City of St. Clair Shores

General Comments from the Community:

Comment:

A community member suggested an idea for the final site-wide cleanup plan: installing a catch basin with a filter at the outfall to trap any remaining PCBs that may be left in the storm drain or PCBs that may continue to migrate into the storm drain.

Response:

Installing a catch basin with a filter at the outfall of the drain is outside the scope of this interim action, but EPA will keep this comment in mind while evaluating options for the final site-wide remedy. EPA is currently conducting the site-wide remedial investigation and working towards a final cleanup decision for the site. The final site-wide remedy selection process will include a variety of alternatives to address the remaining contamination within the Ten Mile drain storm sewer system.

Comment:

An engineer/concerned homeowner provided both written and verbal comments at the public meeting. The homeowner prefers Alternative 4 and suggests that EPA remove as much contaminated soil surrounding the manhole vaults as possible. "Replace them with "baffled" vaults." (A hand drawn diagram was included with this comment and can be found in the Administrative Record.)

"If we do all four vaults each one will capture a percentage of PCBs naturally and the last one before the canals will have minimal concentration. We could put a fifth one in West Marine parking lot. I am interested in helping to resolve this issue."

"I'm on the affected canals. We did the comment sheet here that you guys sent out on the flyer, and I don't see how you can fix two of the bad manholes and not all four of them, and per this comment sheet, from an engineering standpoint, I'm showing a redesigned manhole, not the same one that's in there now, but deeper one with a baffle in it that would stop the traveling of the PCBs as they travel toward the lake. The first one would catch some of the PCBs, the second one would catch more, the third one would catch more, and fourth would catch more, so basically trying to filter out the system. Do you clean it up the best you can and come up with a natural filtration system that would hopefully make it null and void by the time it gets to canal?"

"My comment says, redesign, make a deeper manhole so that there's a place for the PCBs to fall underneath the traveling water, stop the traveling at that. So the water's got to travel down, turn around, come back up, dropping PCBs every time it does that. Every time it does that and goes back, it's going to have less PCBs in the water that continues to travel. Fixing two and not four just seems like you've got a fix here that's one-thirds, two-thirds or an all-the-way fix. That is the way it looks, so that is my comment."

Response:

The selected interim action focuses on removing and replacing only two of the vaulted manholes, J01 and M7179. EPA will take the baffle suggestion into consideration during the final remedial design phase and will consider the implementability of installing deeper and larger vaults. The vault structures are currently as deep as 14 feet below ground surface without a sump at the bottom of the vault configuration. The storm water line enters each vault near the vault's base. In order to include a baffle within the vaults

to aid in the fall-out of impacts within the water, the new vault installation would require substantially larger vaults at deeper depths than the current configuration of 14 feet bgs.

Comment:

A community member asked if contaminants could be in other canals that have not been tested. "I think my main concern here for my neighbors and myself, I would like to see Bayview Canal if possible, to be inspected and tested, and I believe there are probably other ones also that could be involved."

"There have been three people on our street that have died of cancer and PCBs are definitely something that can cause that."

Response:

This comment relates to the site-wide remedial investigation. Sampling the Bayview Canal is outside the scope of this interim action. However, in response to the question, during MDEQ's site assessment investigation in 2008, 6 sediment samples and 1 surface water sample were collected from the Bayview Canal. All sample results were below 1 ppm. This value is very low compared to the highest PCB concentrations (100 ppm to 570 ppm) located near the outfall of the drain in the Lange and Revere Street canals. Refer to MDEQ's *Site Inspection Report* located at the local information repository for additional details on the samples collected from Lake St. Clair and other canals. EPA is designing the next phase of the remedial investigation field work, which may include additional sediment sampling from other canals, but exact locations have not been decided.

In response to the concern about cancer and PCBs, the main way a person can be exposed to PCBs is by eating contaminated fish. Other ways that people can be exposed to PCBs at the Ten-Mile Drain Superfund site include direct consumption of and contact with contaminated soil and sediments. According to the Michigan Department of Community Health, PCBs tend to stick to sediment rather than float in the water so concentrations would be much lower in the water. There are many different causes to cancer, and PCBs are known to be associated with liver cancer in humans.

Comment:

A community member who lives on the Lange Street canal asked a question about why there's never been a positive connection with Detroit Edison in this. "In that area where we've been talking about, where the highly contaminated area is, Detroit Edison or its subcontractors, north of the car wash, people testified -- stated that they saw on that property that there was transformers laying on the ground and that there was trucks parked there, either Edison or their subcontractors, and why hasn't there been a connection tied to them so that they can participate in this cleanup? Thank you."

Response:

EPA has been unable to identify a Potentially Responsible Party (PRP) linked to the PCB contamination at the site, but the search is ongoing. Soon after the discovery of the contamination in the Lange and Revere Street canals, EPA collected samples based on the suggestions or tips provided by the community only to find low to non-detect PCB concentrations in the suggested locations. Most recently, soil samples were collected adjacent to the Detroit Edison substation just north of Harper Avenue during the 2011 source area field investigation, again finding low-level or non-detect PCB concentrations. In addition, EPA sent an information request letter to DTE Energy in October 2003 as part of its PRP search activities. A follow-up information request letter was sent to DTE Energy in May 2011 to which DTE provided information in reponse. At this point in the PRP search, DTE Energy has not been linked to the PCB contamination at the Ten-Mile Drain site.

Comment:

A community member commented that the RITE AID parking lot at the corner of 10 Mile Drive and Harper Avenue was previously owned by Detroit Edison. "Transformers were stored at this location, lying on their sides and leaking. This was a number of years ago."

Response:

The storm water runoff from the RITE AID parking lot does not connect into the TMD system; it would travel to a separate storm system just north of the site, therefore the RITE AID parking lot is outside the scope of the site investigations for this site and will not be included in the site-wide remedial investigation.

Comment:

A community member who lives close to manhole vault J01 is concerned about EPA's statement that PCBs will not travel through clay. "My reason for that is literally the year before the PCBs were discovered in the sewers, the leaking underground storage tank that had leaked many years before -- I was living there about 10 years at that point. The contaminants from that had migrated a fairly substantial distance, and the site where the tank was had 160 cubic yards of mostly clay pulled out to deal with that contamination, and this is right at the corner of Bon Brae and Harper. And this is also a fairly built area, so I don't think -- I'm not sure that calling this native clay is quite accurate. I'm not going to claim to be an expert. This is just a comment based on no preparation, but I would encourage you to make sure that the clay is truly in the state that you think it is and the PCBs are truly not migrating further because there is a history of contamination migrating from this immediate area."

Response:

The community member brings up a valuable point. Understanding the nature of the native soils and the impermeability of the clayey soils in the area is vital to the success of implementing a cleanup plan at the Ten-Mile Drain site. The details about the leaking underground storage tank as mentioned by the community member are unknown. Most likely, the native clayey soils were removed and replaced with more porous backfill materials prior to the installation of the underground storage tank, creating a pathway for the contaminants to move through. It is likely that when the tank and surrounding contaminated soils were removed, a certain amount of native clay soils was also dug up.

Based on the data collected over the past thirteen years at the Ten-Mile Drain site, a conceptual site model has been developed, which tells the story of how and where the PCB contamination is expected to move and what impacts such movement may have. Once in the ground, the PCBs at the site follow a preferential pathway through the TMD utility corridor. Native soils in the area are dense, semi-impermeable clay to silty clay that does not readily transmit water or other liquids. The soils observed in the utility corridor borings were either disturbed native soils or imported backfill materials until the native soils beneath the utility corridors were encountered. PCBs were not detected in any samples collected from within the native clay. Therefore, the most likely migration pathway for the PCB contamination is the more transmissive, disturbed native soils and/or imported fill materials in the backfilled utility corridors.

Comment:

A community member asked if a liner would be installed in the entire drain or just at the four vaults. "We have potential leak at every joint of the drain unless you line the entire pipe you are still going to have PCBs bleeding into the system."

Response:

Installing a liner inside the entire pipe system is outside the scope of this interim action. The selected interim remedy specifies the installation of a flexible synthetic liner on the open excavation surfaces prior to installation of the new vaulted manholes J01 and M7179, to separate the existing soils from the new clean bedding backfill materials. A liner will not be installed inside the new vaults or the connecting drain pipes. The PCB contamination at the base of the two downgradient vaulted manholes, M4335 and M7183, and along the pipe between the four vaults is not being addressed as part of this interim action.

Comment:

A community member asked a variety of questions about the site investigation activities, the Superfund process and funding, including the following:

- How many years have we known about the problem?
- How much money do we have to work with now?

- Who has final say to cleanup alternatives?
- Last year I made a suggestion to close the drain outlet in the Lange and Revere Canal and join it to 9 mile treatment settlement very large dams at different levels that settlement can be cleaned out as needed much more effective then the steel weirs now being to catch small amount of PCB oil. I received no answer why this could not be done. It is a no brainer to do Alternative 4 if money is available.
- If not what would my suggestion cost?

Response:

In response to these questions EPA has the following responses: PCB contamination was discovered in the Lange and Revere Street canals in 2001; EPA does not have a particular amount of money set aside for this or any other fund-lead cleanups, but has to present the selected remedies for such sites to an EPA national remedial action prioritization panel. The panel makes recommendations to senior level managers at EPA headquarters based on ranking information of all sites that are ready for cleanup, and then those senior managers make decisions about funding; EPA, in consultation with MDEQ, carefully considered all comments prior to selecting the interim remedy documented in this ROD. The suggestion to close the outlet of the drain is outside the scope of this interim action, and the remaining PCB contamination not addressed by this interim action will be addressed as part of the final site-wide remedy. EPA selected Alternative 7 over Alternative 4 for the reasons described in Section 12.1 of the ROD

Comment:

A community member appreciates the effort of cleaning up PCBs. "It is cheaper to cleanup PCBs then pay for future cancer problems in the population. In this time, we need a healthy population for our defense of the United States of America. We also need to be a caring country for ourselves and beautiful Canada our beautiful neighbor."

Response:

EPA appreciates the support of this community member.

Comments from the Community in Support of Alternative 4:

Several residents expressed support for *Alternative 4: Excavation, Removal and Replacement of Four Vaulted Manholes* over EPA's selected interim action, *Alternative 7: Excavation, Removal, and Replacement of Two Vaulted Manholes, M7179 and J01.* The comments included the sentiments that Alternative 4 was a "wiser choice" and "better use of time and funds for the long term." Some people added that the difference in capital cost between Alternative 4 and 7 was minor and ultimately Alternative 4 would be more cost-effective in the long term. They favored a cleanup plan that would cost more now, but would "capture all the contamination possible" and "treat all the contaminated sites so future action should not be needed and funds that are probably needed for future cleanup would be saved" therefore saving money in the future. They

also expressed the sentiment, "if they're already there, just have them do all four." Overall, people expressed the willingness to endure greater short-term impacts to clean up all the contaminants at the four vaults: "Let's save some money for our kids and grand kids by spending 35% more now to do it right and completely." One community member preferred Alternative 4 and explained that short-term convenience should not be a high priority because the community has lived through road construction and repairs for decades; Alternative 7 trades the lower cost of removing two vaults for a higher degree of performance, which would be removing all four vaults. Even though Alternative 4 has a higher capital cost, in the long term it is in the best interest of safety, habitability, and preservation of real estate values (and taxable value) for the City of St. Clair Shores. No one expressed support for any of the other alternatives that EPA evaluated for this interim action.

Response:

EPA understands that there is strong community support for the removal and replacement of all four vaults. An important factor that went into the selection of the interim action is the fact that PCB concentrations found in the borings adjacent to the two downgradient vaults are much lower compared to J01 and M7179, with 66,000 ppm adjacent to vaulted manhole M7179 compared to 1,500 ppm at vaulted manhole M4335. EPA believes that removal and replacement of J01 and M7179 will ultimately remove the major source materials that continue to release into the TMD system, and that those source materials are the reason why the two downgradient vaults – as well as other areas with residual contamination in and around the pipe – are contaminated today. Over time, EPA expects that monitoring results will reveal a reduction of PCB oil and PCB contamination in general within the TMD system. The selected interim action is expected meet the remedial action objective – to mitigate the migration of contamination and prevent further environmental degradation – upon construction completion.

Even though replacing two of the most highly-contaminated vaults instead of all four vaults would reduce the construction period, the number of truckloads, and create less traffic disturbance, EPA recognizes that several residents preferred to accept greater short-term impacts for the removal and replacement of all four vaults. However, it is important to note that removing all four vaults will not remove all of the PCB contamination in the TMD system. The 2012 *Source Area Investigation Report* revealed PCB contamination at the selected manhole vaults as well as in the backfill and bedding materials along the pipe that connect the vaults. The final site-wide remedy will address the remaining PCB contamination associated with the TMD system, including the contamination adjacent to the two downgradients vaults, along the pipe itself that connects the vaults, in the sediments in the Lange and Revere Street canals, and at additional locations guided by the information obtained during the site-wide remedial investigation. The lessons learned during implementation of the selected interim action, which deals with two of the vaulted manhole locations, will provide valuable information that will inform EPA's future decisions about these other locations.

Several residents mentioned the minimal cost savings when comparing the cost of addressing two versus four vaults and emphasized the long-term benefits of removing and replacing all four vaults. It is important to recognize that the selected action is an interim action and a final site cleanup plan has not been selected for the site. As noted above, this interim action will provide valuable information to inform EPA's future decisions about the final site-wide remedy. The new information gained is expected to result in cost savings and operational efficiencies over the long term, and to decrease uncertainties associated with the remedy selection for future actions at the site.

Comments from the City of St. Clair Shores:

Comment:

Kip Walby, the mayor of St. Clair Shores, supports Alternative 4, the replacement of four vaulted manholes. "What I heard is that all of them are over 1,000 ppm and it seems that we should replace all four of those manholes, which is alternative four."

Response:

EPA agrees that in soil samples collected at depths 10 to 15 feet bgs during the 2011 Source Area field investigation, total PCBs exceeding 1,000 ppm were detected in samples from the backfill and bedding materials adjacent to the four vaulted manholes as follows:

Location	Concentration
M7179	66,000 ppm
J01	39,000 ppm
M4335	1,500 ppm
M7183	3,500 ppm

EPA believes that removal and replacement of M7179 and J01, the two most highly-contaminated vaults, will ultimately remove the major source materials that continue to release into the TMD system. EPA believes that the source materials at M7179 and J01 are the reason that the two downgradient vaults are contaminated today, as well as the reason for the residual contamination found throughout the drain. Over time, EPA expects that monitoring results will reveal a reduction of PCB oil and PCB contamination in general within the TMD system. The selected interim action is expected to mitigate the migration of contamination and prevent further environmental degradation, and is expected to meet this remedial action objective upon construction completion.

Comment:

Chris Vitale, City of St. Clair Shores City Council Member, supports Alternative 4.

Response:

See the response to the comment above. EPA, in consultation with MDEQ, carefully considered all comments prior to selecting the interim remedy documented in this ROD. The selected interim ROD will not address all 4 vaulted manholes, although the PCB source material and the highly-impacted bedding and backfill materials at vaulted manholes M7179 and J01 will be removed, leaving the PCB contamination at the base of the two downgradient vaulted manholes as well as other residual contamination throughout the Ten Mile storm drain system to be addressed as a part of the final site-wide remedy.

Comment:

Ron Frederick, City of St. Clair Shores City Council member, supports Alternative 4 and commented that the main concern is the contamination level at the very first one, the one that is right at Bon Brae, the farthest from the outfall. "And even by replacing that one, are we actually fixing the problem of where the PCBs are coming from in the first place? That is the key thing, and I just want to make sure that you know, let's replace all four. I am for that, but let's make sure we take care of why the problem exists in the first place. I know we've done the borings and we've kind of isolated that to a certain area, so I'm hoping that not only the replacement, but maybe even a wider circle or something bigger to find out if there's anything else in there."

Response

In response to the question about whether EPA is fixing the problem of where the PCBs are coming from in the first place, EPA acknowledges that we do not currently know what initially caused the PCB contamination. The information gained during the investigation leads EPA to believe that a historical release (or releases) of PCBs entered the storm sewer system, either from a surficial spill or illegal dumping activities, and that the PCBs, which are denser than water, ended up sinking to the lowest points in the system – the vaulted manhole locations. The cause of the initial release(s) of PCBs into the system is not known at this time, but EPA does not currently believe there is an ongoing surficial source of PCB contamination that continues to enter into the drain. EPA believes that removal and replacement of the two most highly-impacted vaulted manholes will remove the major source materials that continue to leak into the drain. PCBs are coming into the TMD system via the movement of water in and out of the TMD utility corridor through the joints in the piping along Bon Brae Street and Harper Avenue, causing the PCB oil that has accumulated at the bottom of the vaulted manholes to continue to re-enter the drain. Monitoring results following implementation of the selected interim action will either confirm or alter the current understanding of how PCB contamination is moving through the TMD system. EPA expects to see a reduction in the presence of PCB oil within the drain and the future monitoring results will help guide future decisions about the final site-wide remedy.

Comment:

The Director of Public Works for the City of St. Clair Shores commented during the public meeting that in the responsiveness summary "it would be important to note that even if the four vaulted manholes were removed and cleaned up, the sediment around it, that the PCB oils are able to travel even outside the pipe or outside the vaults. There is a sand backfill along all the pipes in the system that allows natural groundwater to move back and forth towards the lake and then back."

"So if people feel that ultimately removing the four vaulted manholes would clean up the PCBs, which may not be the final action. It may be to remove the entire drain system and all the sand backfill that's around all the pipes and the manholes. I believe the proposal right now is an interim cleanup plan that would allow the EPA to continue to sample around the vaults and see if the levels of PCBs continue to rise and to monitor, 'Okay. Are they flowing between the vaults and the backfill material?' Because it just doesn't travel on the inside, in my opinion. So I think that would be an important point to discuss in the response to these comments."

Response:

EPA concurs that removing and replacing all four vaults will not remove all of the PCB contamination from the TMD system and this early interim action is not the final cleanup plan for the Ten-Mile Drain site. As mentioned in the response to the previous comment, monitoring results following implementation of the selected interim action will either confirm or alter the current understanding of how PCB contamination is moving through the TMD system and guide future decisions on the final site-wide remedy. EPA is managing the contamination at the Ten-Mile Drain site through a phased approach. Each phase or interim action provides valuable information that increases decisional flexibility and allows EPA to adapt future decisions based on the new information gained.

FIGURES

Attachment A

FIGURE 1
Ten-Mile Drain Site Location

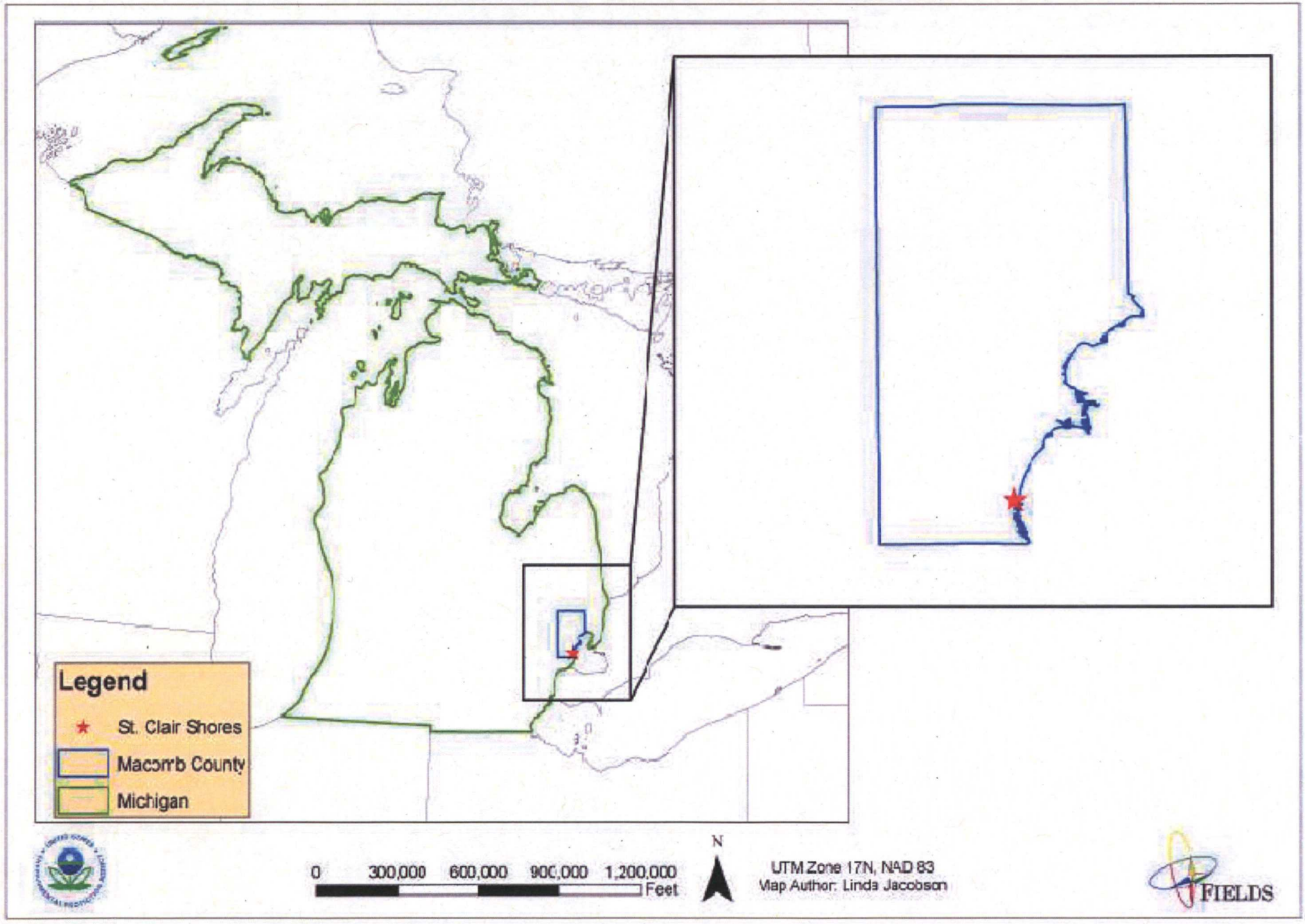

FIGURE 2
Ten Mile Drain Storm Sewer System

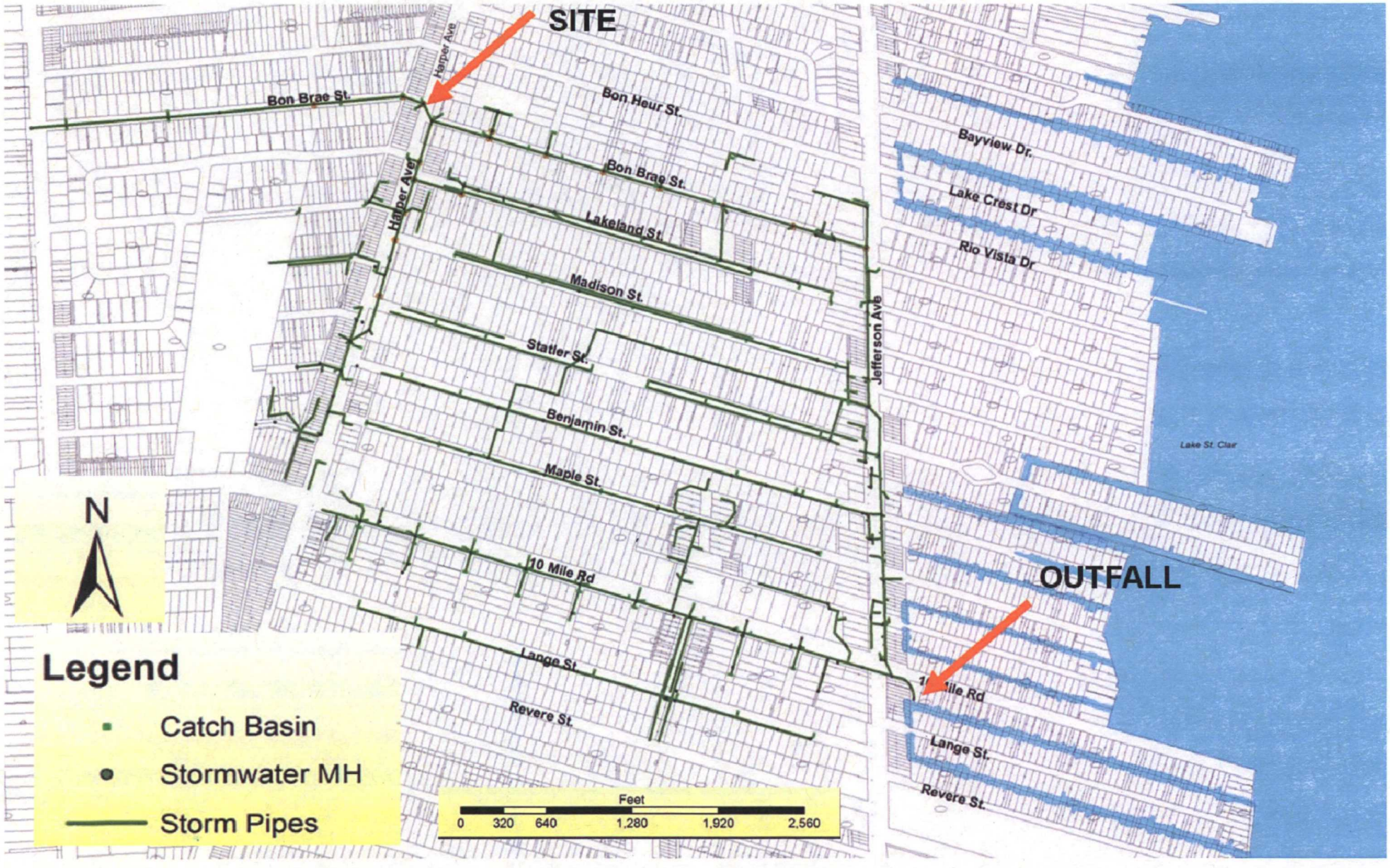

FIGURE 3
Lange and Revere Street Canals (outfall)

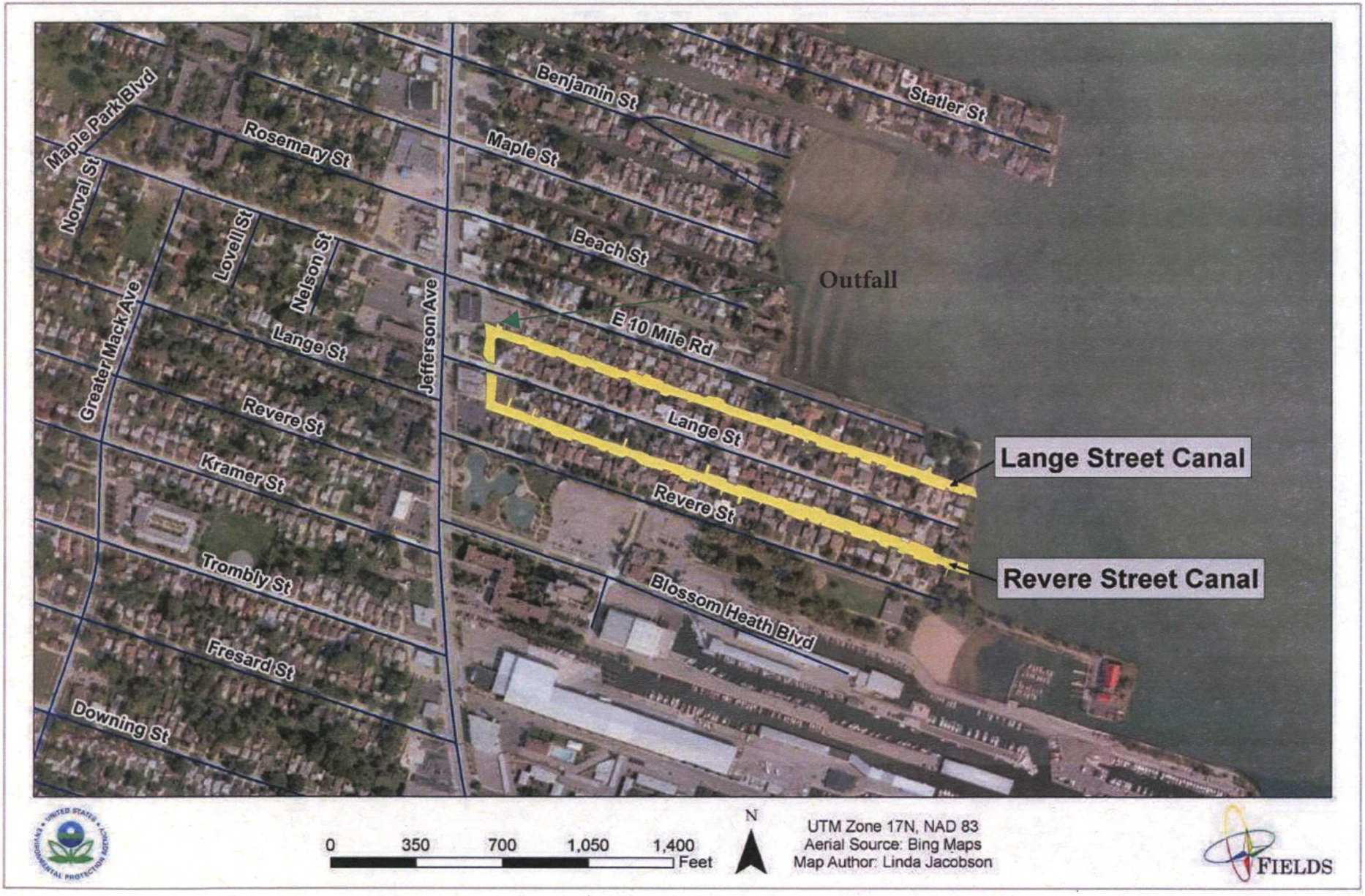

FIGURE 4
Weir Location Map

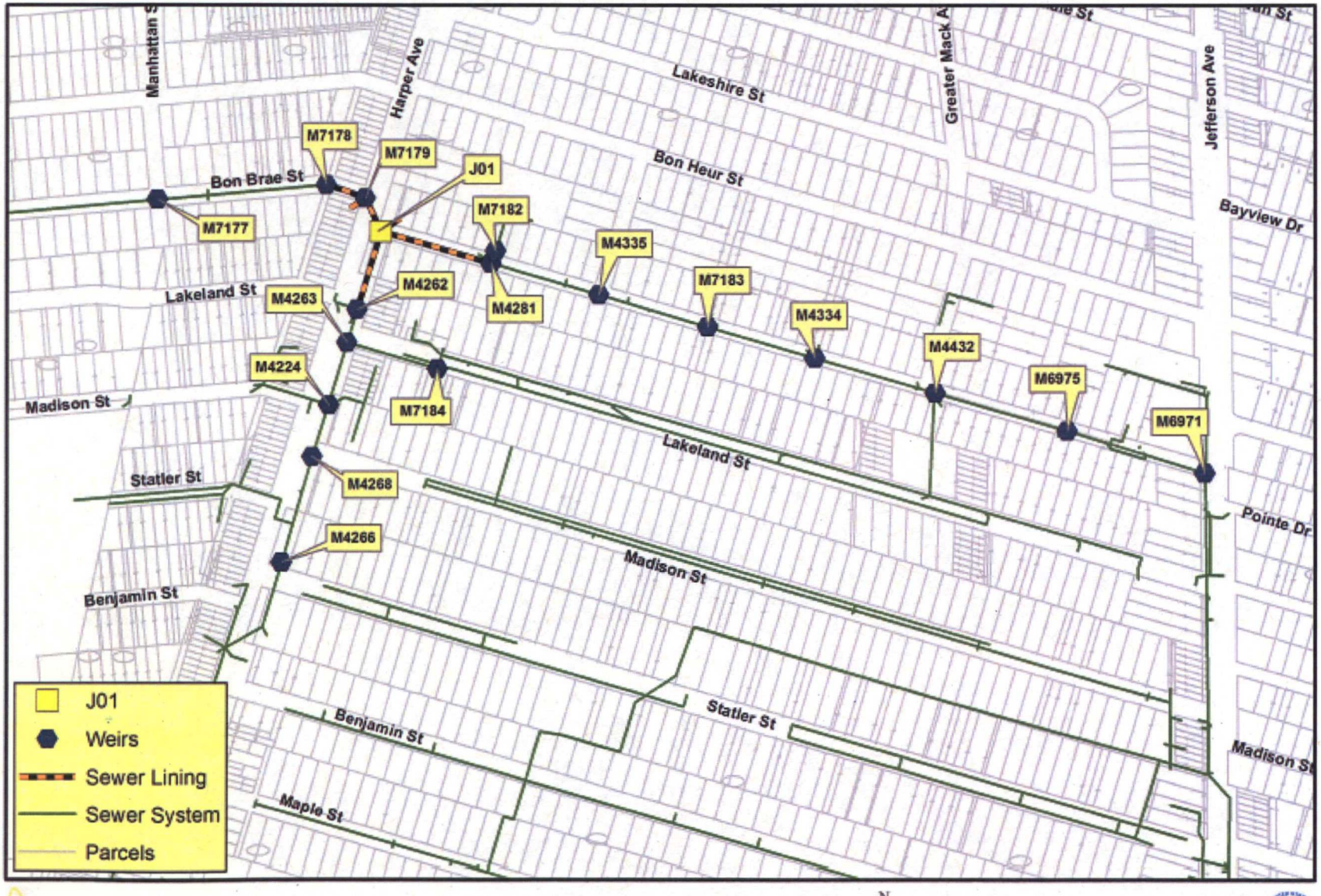

Figure 5a
Conceptual Site Model

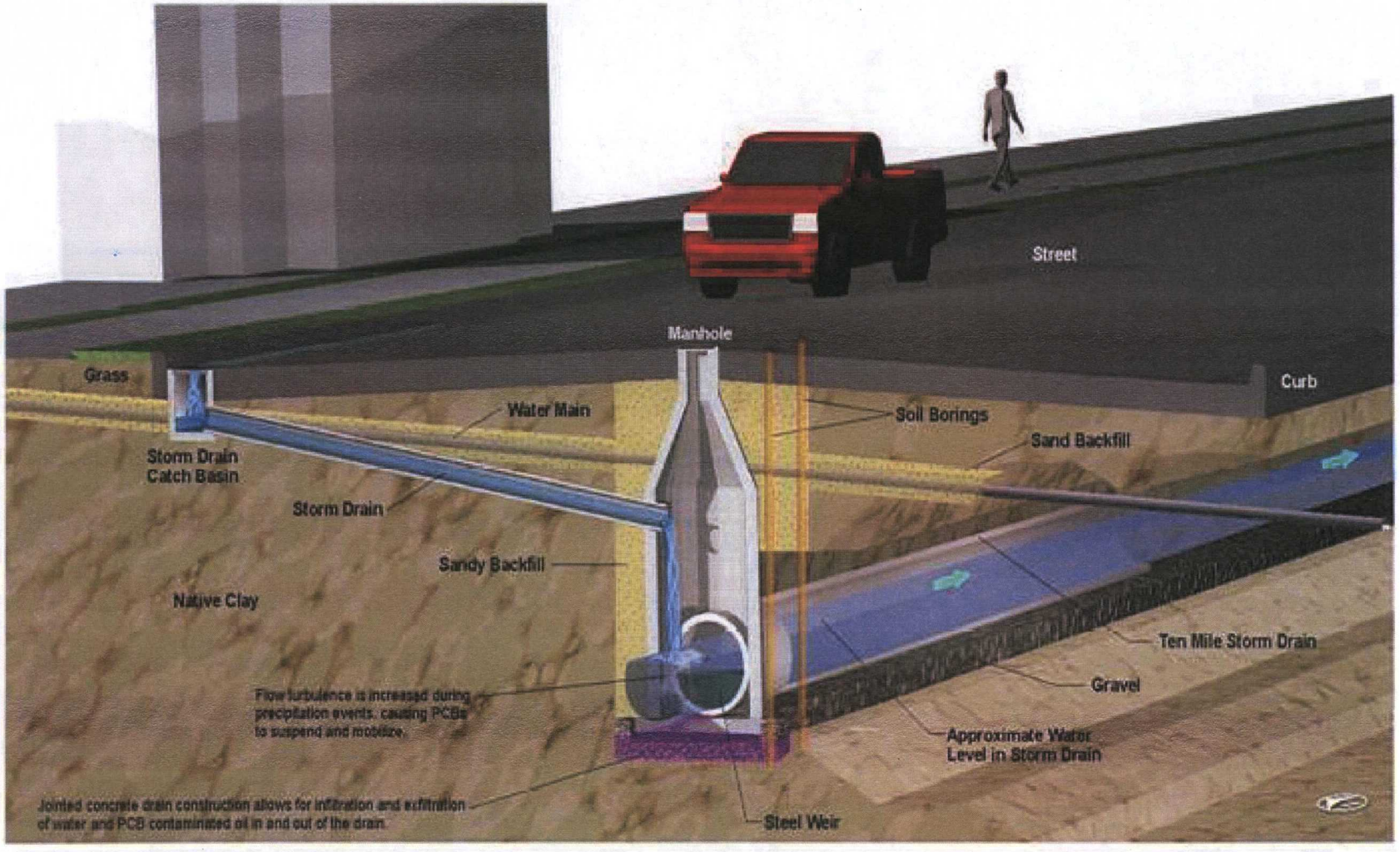

FIGURE 16—PCB Migration Model
Ten Mile Drain Site
St. Clair Shores, Michigan

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FIGURE 5b
Conceptual Site Model

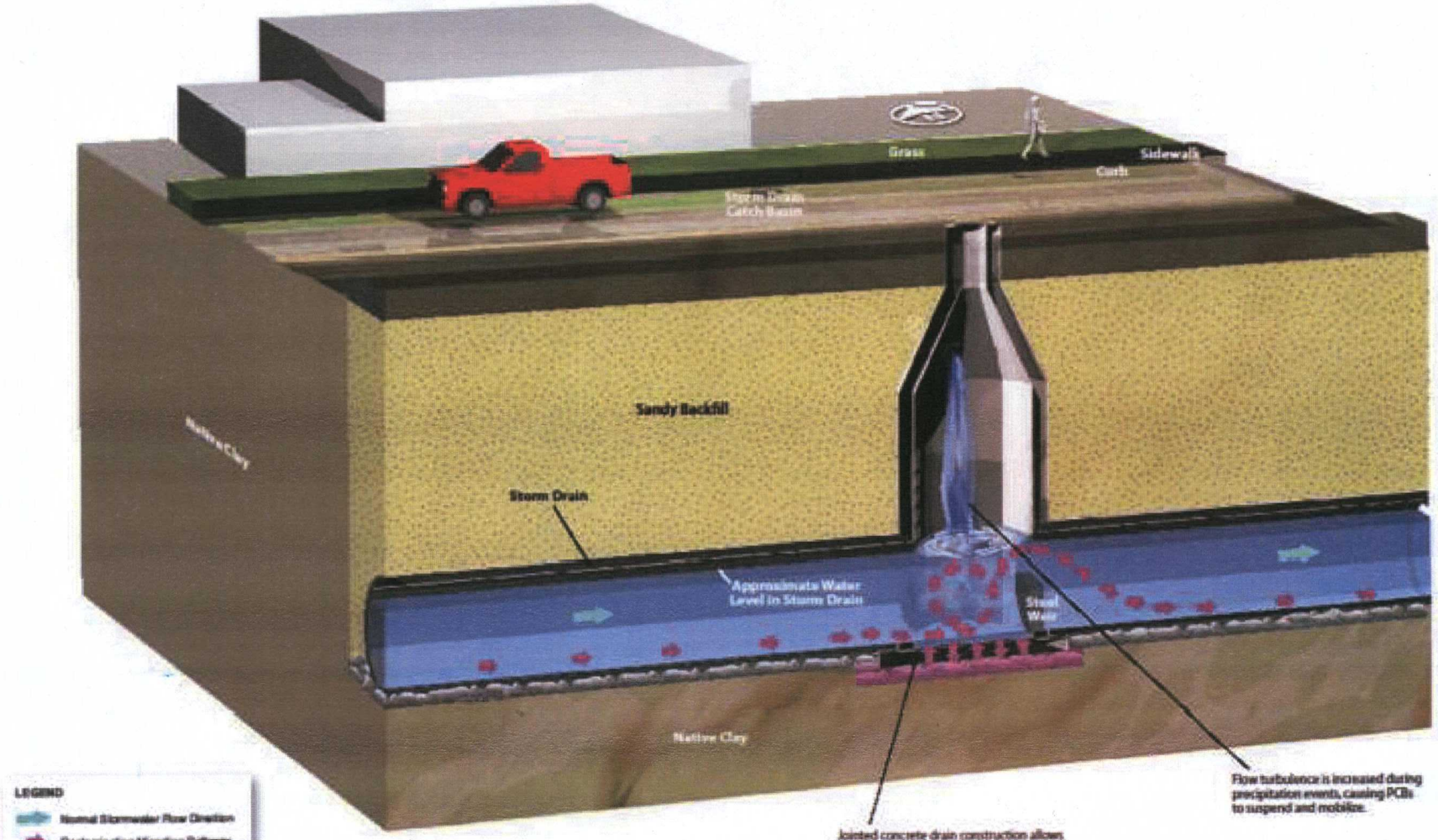

FIGURE 1-4—PCB Migration Model
Ten-Mile Drain Site
St. Clair Shores, Michigan

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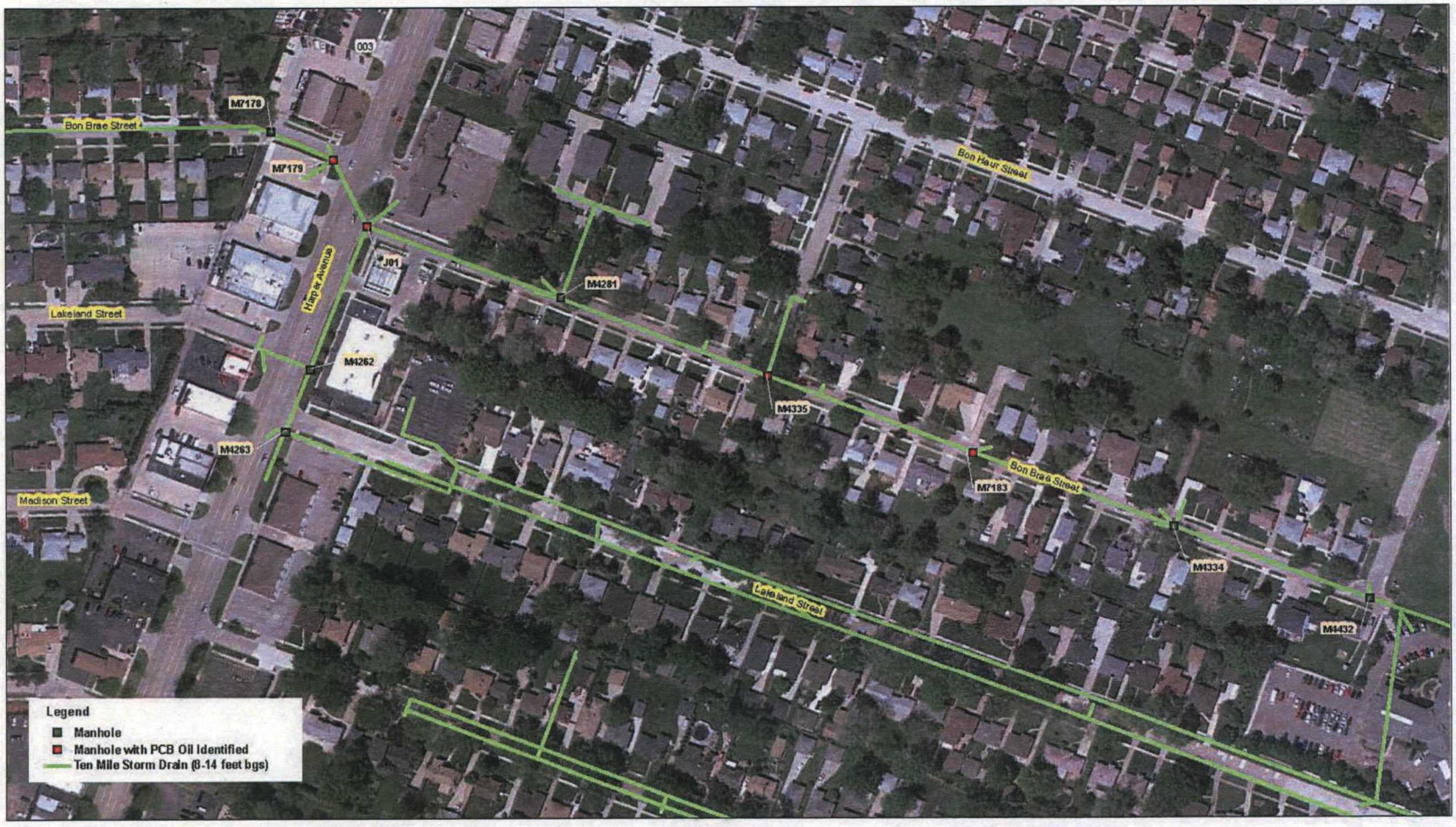
Figure 6
Location of Vaulted Manholes



N

0 55 110

Approximate scale in feet

Note:
1. Imagery Date - May 9, 2010
2. bgs = below ground surface

Manhole Vault Locations
Ten-Mile Drain Source Area Investigation
Saint Clair Shores, Michigan

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Figure 7a
January 2013 – December 2013 Source Control Sampling Results

NOTE: THE OUTFALL LOCATION IS OFF THE MAP. ITS SAMPLE RESULTS ARE:

JAN-2013: NS	JUL-2013: 1
FEB-2013: NS	AUG-2013:30
MAR-2013: 330	SEP-2013: 2
APR-2013: 5.6	OCT-2013: 4
MAY-2013: 29	NOV-2013: 7.4
JUN-2013: 46	DEC-2013: NS

LEGEND

- WEIRS WITH SNARE PRESENT
- WEIRS
- TEN-MILE DRAIN STORM SEWER SYSTEM
- OIL SAMPLE AT LOCATION
- ND NOT DETECTED
- NS NOT SAMPLED DUE TO INSUFFICIENT SEDIMENT
- * BULK SAMPLE, COLLECTED WITH SNARE
- SWIPED BOTTOM OF WEIR WITH CLEAN SNARE
- SEDIMENT COLLECTION POINT
- SNARE INSTALLED @ M6969, NO WEIR PRESENT

NOTE : SAMPLE RESULTS ARE IN mg/kg

SCALE IN FEET
0 125 250 500

NORTH

REV	DESCRIPTION	DATE	APPROVED

REVISIONS

ENVIRONMENTAL QUALITY MANAGEMENT, INC.
1800 CARILLON BLVD., CINCINNATI, OHIO 45240
PHONE 513.825.7500 | FAX 513.825.7485
WWW.EQM.COM

DRAWN	R. RUSSELL	01-09-2014
CHECKED	E. CORBIN	01-09-2014
APPROVED	E. CORBIN	01-09-2014
SCALE	AS SHOWN	

TEN-MILE DRAIN SUPERFUND SITE
SOURCE CONTROL ACTIVITIES
OIL AND SEDIMENT RESULTS
DECEMBER 17, 2013

SIZE	PROJECT NO.	DWG NO.	REV
B	030281.0100		0

Figure 7b
January 2014 – February 2014 Source Control Sampling Results

LEGEND

- WEIRS WITH SNARE PRESENT
- WEIRS
- TEN-MILE DRAIN STORM SEWER SYSTEM
- OIL SAMPLE AT LOCATION
- ND — NOT DETECTED
- NS — NOT SAMPLED DUE TO INSUFFICIENT SEDIMENT
- * — BULK SAMPLE, COLLECTED WITH SNARE
- SWIPED BOTTOM OF WEIR WITH CLEAN SNARE
- SEDIMENT COLLECTION POINT
- SNARE INSTALLED @ M6969, NO WEIR PRESENT

NOTE : SAMPLE RESULTS ARE IN mg/kg

SCALE IN FEET

0 125 250 500

NORTH

NOTE: THE OUTFALL LOCATION IS OFF THE MAP. ITS SAMPLE RESULTS ARE:

JAN-2014: NS
FEB-2014: NS

REV	DESCRIPTION	DATE	APPROVED

REVISIONS

ENVIRONMENTAL QUALITY MANAGEMENT, INC.
1800 CAMELLON BLVD., CINCINNATI, OHIO 45240
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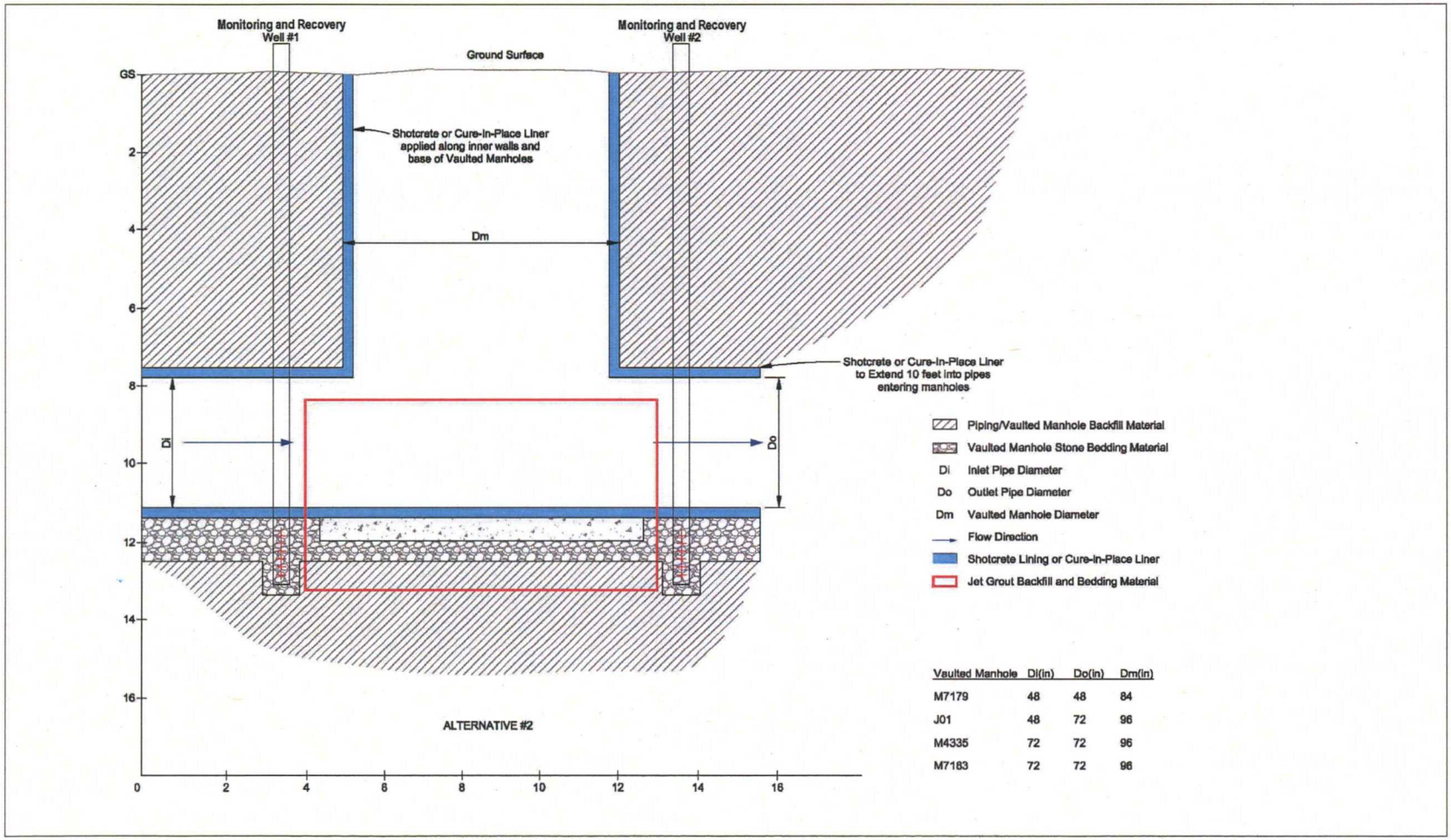
DRAWN	R. RUSSELL	03-11-2014
CHECKED	E. CORBIN	03-12-2014
APPROVED	E. CORBIN	03-12-2014
SCALE:	AS SHOWN	

TEN-MILE DRAIN SUPERFUND SITE
SOURCE CONTROL ACTIVITIES
OIL AND SEDIMENT RESULTS
FEBRUARY 18, 2014

SIZE	PROJECT NO.	DWG NO.	REV
B	030281.0100		0

Figure 8
Alternative 2



Vaulted Manhole	Di(in)	Do(in)	Dm(in)
M7179	48	48	84
J01	48	72	96
M4335	72	72	96
M7183	72	72	96

Alternative 2 - Grouting of Backfill Materials and Installation of a Liner in Each of the Four Vaulted Manholes
Focused Feasibility Study
Ten-Mile Drain
Saint Clair Shores, Michigan

\\cypress\proj\army corp\Saint Clair Shores\MXDs\Feasibility Study\Ten-Mile Drain Figure 3.dwg 11/13/2013

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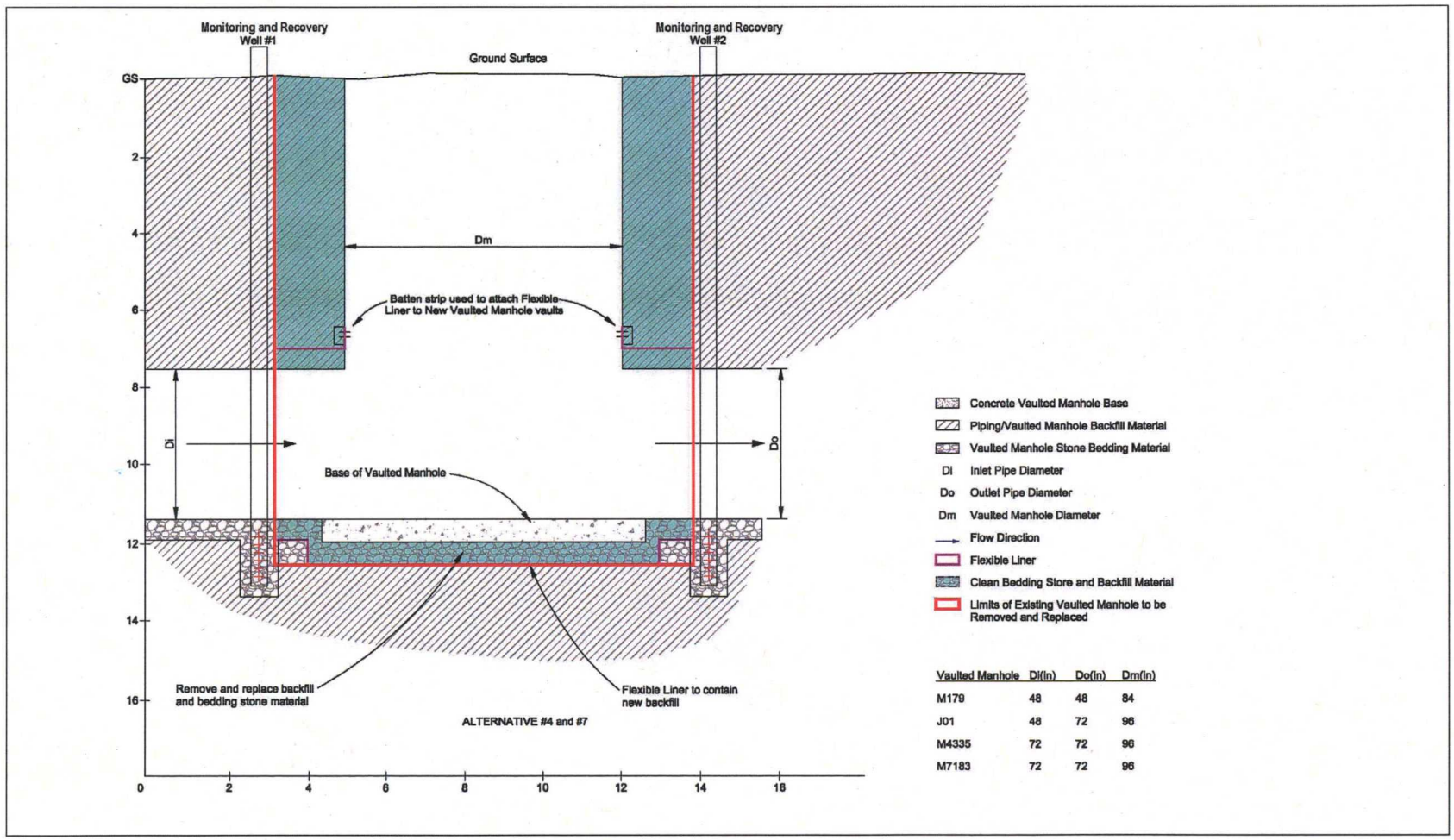
Figure 9
Alternative 4 and 7 Installation Details



Vaulted Manhole	Di(in)	Do(in)	Dm(in)
M179	48	48	84
J01	48	72	96
M4335	72	72	96
M7183	72	72	96

Alternative 4 and 7 - New Vaulted Manhole Installation Detail
Focused Feasibility Study
Ten-Mile Drain
Saint Clair Shores, Michigan

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\\cypress\proj\army corp\Saint Clair Shores\MXDs\Feasibility Study\Ten-Mile Drain Figure 9_Alternative 4and7.dwg 10/25/2013

TABLES

Table 1 Cost Estimates for Alternative 7

Alternative: Alternative 7
Name: Removal of Vaulted Manholes 7179 and J01, and No Action at M7178 and M4334

COST ESTIMATE SUMMARY

Site: Ten Mile Drain - Vaulted Manholes
Location: St Clair Shores, MI
Phase: Focused Feasibility Study Supplement
Base Year: 2014
Date: 10/25/13

Description: Remove Vaulted Manholes 7179 and J01 and No Action at M7178 and M4334

CAPITAL COSTS

DESCRIPTION	QTY	UNIT	UNIT COST	TOTAL	NOTES
Institutional Controls					
Site Development Plan	1	LS	$20,000	$20,000	Institutional Control Drafting
SUBTOTAL				$20,000	
Predesign Investigations					
None				$0	
SUBTOTAL				$0	
Site Preparation					
Silt Fencing	320	FT	$3.45	$1,104	Recent 2012 Supply and Install Quotations
Manhole Vault Cleaning	2	LS	$15,000	$30,000	2 vaults, cleaning and disposal
Security Fencing/Barricades	320	FT	$10.50	$3,360	Assume 20'x20'area arbund each manhole
				$34,464	
Mobilization/Demobilization	5%			$1,723	
Subcontractor General Conditions	15%			$5,170	
SUBTOTAL				$41,357	
Immobilization					
None					
SUBTOTAL				$0	
Mobilization/Demobilization	5%			$0	
Subcontractor General Conditions	15%			$0	
SUBTOTAL				$0	
Grouting and Lining					
Water Diversion	30	Day	$25,000.00	$750,000	Assumed one laborer to manage one 6-inch pump with flex hose directing water to manhole on street to the South
LLDPE Lining of Excavation	2,200	SF	$7.25	$15,950	40-mil LLDPE supply and install (higher rate due to smaller quantity)
SUBTOTAL				$765,950	
Mobilization/Demobilization	5%			$38,298	
Subcontractor General Conditions	15%			$114,893	
SUBTOTAL				$919,140	
Excavation, Installation, Disposal					
Well Installation	4	Each	$6,000.00	$24,000	2 Per manhole Vault
PPE and Misc Waste Disposal	1	LS	$20,000 00	$20,000	PPE, misc waste, non-haz
Saw cut asphalt pavement	160	LF	$6.12	$979	RS MEANS 2012 - 02411 925 0015
Demo asphalt pavement	89	SY	$8.70	$773	RS MEANS 2012 - 02411 317 5050
Excavation	120	CY	$20 64	$2,477	RS MEANS 2012 - 02561 310 0110
Disposal of Excavated Soil Subtitle C	120	CY	$300.00	$36,000	Assumed Contaminated - transport & disposal at EQ
Sheet piling for Excavation of Vaults	1,920	SF	$85.00	$163,200	Lakes & Rivers
New Vault Installation	2	LS	$25,000.00	$50,000	Supply and Place
Backfill of new vaults (MDOT Class II Sand)	120	CY	$37.50	$4,500	RS MEANS 2012 - 04051 395 0250
Vault Bedding	6	CY	$100 00	$600	RS MEANS 2012 - 31232 316 0050 - $500 Min
Asphalt Hauling	8	CY	$12 55	$100	RS MEANS 2012 - 31232 320 1069
Asphalt Sub-base Aggregate	6	CY	$100.00	$600	$500 min
Roadway repair	8	CY	$45 30	$362	RS MEANS 2012 - 32121 613 0200
Traffic Diversion and Control	30	Days	$1,250.00	$37,500	Assumes 2 flaggers and barricades
SUBTOTAL				$341,092	
Mobilization/Demobilization	5%			$17,055	
Subcontractor General Conditions	15%			$51,164	
SUBTOTAL				$409,311	
Contractor Oversight					
EPA Oversight of RA	30	Day	$1,500.00	$45,000	Assumed 10 hours per day at $300 per day including per diem, lodging and vehicle
Field Inspections of Soil, Gravel and Asphalt	80	Hours	$85.00	$6,800	
Geotechnical Laboratory Testing	1	LS	$15,000	$15,000	
SUBTOTAL				$66,800	
Soil/Residue Verification Sampling					
Verification Sampling (Post extraction sampling)	80	HR	$100	$8,000	Engineer's Estimate
Analytical Laboratory (including QA/QC)	25	EA	$160	$4,000	Engineer's Estimate
Reporting	60	HR	$100	$6,000	Engineer's Estimate
SUBTOTAL				$18,000	
SUBTOTAL				$1,470,000	
General Contractor	17.2%			$252,840	
Contingency	25%			$367,500	10% Scope + 15% Bid
Escalation 2014	3.5%			$73,797	
SUBTOTAL				$2,164,137	
Project Management	5%			$108,207	USEPA 2000, p. 5-13, $2M-$10M
Remedial Design	8%			$173,131	USEPA 2000, p. 5-13, $2M-$10M
Construction Management	6%			$129,848	USEPA 2000, p. 5-13, $2M-$10M
SUBTOTAL				$411,186	
TOTAL CAPITAL COST				**$2,600,000**	

Alternative: **Alternative 7** — **COST ESTIMATE SUMMARY**

Name: **Removal of Vaulted Manholes 7179 and J01, and No Action at M7178 and M4334**

OPERATIONS AND MAINTENANCE COST

DESCRIPTION	QTY	UNIT	UNIT COST	TOTAL	NOTES
Inspection and Repair					
Annual Manhole Inspection	4	Hr	$100	$400	
Misc Repairs	1	LS	$1,000	$1,000	
SUBTOTAL				$1,400	
Water Sampling/Event					
2 wells at Each Vault PCB Analysis	4	EA	$160	$640	MEANS 33-02-1701; 2 per each manhole
QC Samples	2	EA	$160	$320	MEANS 33-02-1701
GW, SW and Sediment Sampling, Level D					
Labor	48	HRS	$110	$5,280	2 person crew
Equipment - meters	1	LS	$1,200	$1,200	
Consumables	1	LS	$350	$350	
Travel	1	LS	$500	$500	
Data Validation	10	HRS	$100	$1,000	
Reporting	15	HRS	$100	$1,500	
SUBTOTAL				$10,790	
SUBTOTAL FOR YEARS 1 & 2				$44,560	Inspect/Repair, Yrs 1 & 2- quarterly.
SUBTOTAL FOR YEARS 3 - 30				$22,980	Inspect/Repair, Yrs 3 to 30- semiannual
Allowance for Misc. Items (Years 1 & 2)	20%			$8,912	
Allowance for Misc. Items (Years 3 - 30)	20%			$4,596	
SUBTOTAL FOR YEARS 1 & 2				$53,472	
SUBTOTAL FOR YEARS 3 - 30				$27,576	
Contingency (Years 1 & 2)	25%			$13,388	10% Scope + 15% Bid
Contingency (Years 3 - 30)	25%			$6,894	10% Scope + 15% Bid
SUBTOTAL FOR YEARS 1 & 2				$66,840	
SUBTOTAL FOR YEARS 3 - 30				$34,470	
Project Management & Technical Support (Years 1 & 2)	15%			$10,026	
Project Management & Technical Support (Years 3 - 30)	15%			$5,171	
TOTAL ANNUAL O&M COST (Years 1-2)				$76,866	Reflects quarterly sampling 2 years
TOTAL ANNUAL O&M COST (Years 3-30)				$39,641	Reflects semiannual sampling Year 3 to 30

PERIODIC COSTS

DESCRIPTION	YEAR	QTY	UNIT	UNIT COST	TOTAL	NOTES
5 year Review	5	1	LS	$15,000	$15,000	
5 year Review	10	1	LS	$15,000	$15,000	
5 year Review	15	1	LS	$15,000	$15,000	
5 year Review	20	1	LS	$15,000	$15,000	
5 year Review	25	1	LS	$15,000	$15,000	
5 year Review	30	1	LS	$15,000	$15,000	
				Total	$90,000	
TOTAL ANNUAL PERIODIC COST					$90,000	

PRESENT VALUE ANALYSIS

Discount Rate = 2.0%

COST TYPE	YEAR	TOTAL COST	TOTAL COST PER YEAR	DISCOUNT FACTOR	PRESENT VALUE	NOTES
CAPITAL COST	0	$2,600,000	$2,600,000	1.000	$2,600,000	
ANNUAL O&M COST	1 to 2	$153,732	$76,866	1.9	$149,240	
ANNUAL O&M COST	3 to 30	$1,109,934	$39,641	31.4	$1,096,407	
PERIODIC COST	5	$15,000	$15,000	0.91	$13,586	
PERIODIC COST	10	$15,000	$15,000	0.82	$12,305	
PERIODIC COST	15	$15,000	$15,000	0.74	$11,145	
PERIODIC COST	20	$15,000	$15,000	0.67	$10,095	
PERIODIC COST	25	$15,000	$15,000	0.61	$9,143	
PERIODIC COST	30	$15,000	$15,000	0.55	$8,281	
		$4,000,000			$3,910,202	
TOTAL PRESENT VALUE OF ALTERNATIVE					$3,900,000	

SOURCE INFORMATION

1. United States Environmental Protection Agency. July 2000. A Guide to Preparing and Documenting Cost Estimates During the Feasibility Study. EPA 540-R-00-002. (USEPA, 2000). This is an order-of-magnitude cost estimate that is expected to be within -30 to +50 percent of the actual project costs.

TABLE 2
Federal ARARS
Ten-Mile Drain Superfund Site

Regulation/Citation	Description	Rationale
Toxic Substances Control Act (TSCA)/ 15 USC §§2601 to 2692	TSCA addresses the production, importation, use, and disposal of specific chemicals including PCBs.	PCBs are the major contaminant at the site
TSCA Polychlorinated Biphenyls (PCB) Regulations 40 CFR 761	This regulation establishes prohibitions of, and requirements for, the manufacture, processing, distribution in commerce, use, disposal, storage, and marking of PCBs and PCB Items.	Provides clean up levels and disposal requirements at Superfund sites with PCBs.
Criteria for Classification of Solid Waste Disposal Facilities and Practices/ (RCRA Regulations) 40 CFR 257	Establishes standards for the management and disposal of solid waste, including: 1) Facility or practices in floodplains will not restrict the flow of base flood, reduce the temporary water storage capacity of the floodplain, or otherwise result in a washout of solid waste; 2) Facility or practices shall not cause discharge of dredged or fill material into waters of the United States; 3) Facility or practice shall not allow uncontrolled public access so as to expose the public to potential health and safety hazards; 4) Covers groundwater monitoring and corrective action requirements under Subpart E and closure and post closure care under Subpart F	May be considered as it offers guidance on management of waste.
Resource Conservation and Recovery Act (RCRA) (see Solid Waste Disposal Act)/ 42 USC §§ 6901 to 6992k	RCRA addresses solid wastes and hazardous wastes in or on the land; requires the conversion of existing open dumps to facilities which do not pose a danger to the environment or to health.	Provides guidance on management of solid waste.
USDOT Placarding and Handling 40 CFR 264.227 49 CFR 171	Transportation and handling requirements for materials containing PCBs with concentrations of 20 mg/kg or more.	This would apply to transportation of PCB contamination removed from the drain.
Occupational Safety and Health Act – Hazardous Waste Operations and Emergency Response 29 CFR 1910.120	Establishes health and safety requirements for cleanup operations at sites on the National Priorities List.	Applies to any action alternative for protection of onsite workers.

TABLE 3 – Michigan ARARs

Ten-Mile Drain Superfund Site

Regulation/Citation	Description	Rationale
Part 17, Michigan Environmental Protection Act, of The Natural Resources and Environmental Protection Act, 1994 PA 451, as amended (NREPA). (MCL 324.1701, *et seq.*) Michigan Administrative Code: R 324.1701-1706. Formerly known as Act 127 (1970)	Provides for the protection of natural resources. The protection of state resources prohibits any action that pollutes, impairs, or destroys the state's natural resources, due to any activities conducted at a site of environmental contamination.	**Applicable** to remedial investigation, remedial design, response activity and remedial action activities.
Part 31, Water Resources Protection, of The Natural Resources and Environmental Protection Act, 1994 PA 451, as amended (NREPA). (MCL 324.3104-3117*et seq*) Michigan Administrative Code: R 324.3103, *et seq.* • Part 4: Michigan water quality standards for surface waters to protect public health and welfare, enhance and maintain water quality, and protect the state's natural resources (R 323.1041-1117); • Part 8: Water quality based effluent limits for toxic chemicals (R 323.1201-1221); • Part 21: Wastewater discharge permits identifies NPDES and State groundwater discharge requirements, including procedures for permit application, permit issuance, and denial (R 323.2101-2192); • Part 22: Groundwater quality rules R 323.2201-2240); and • Part 23: Pretreatment (R 323.2301*et seq.*). Formerly known as Act 245 (1929)	These statutory and rule requirements address discharges to both surface waters and groundwater of the State. Part 31 prohibits direct or indirect discharge to ground or surface waters of the state that are or may become injurious to the environment or public health. Regulates water and wastewater discharges with standards for discharge to groundwater. Defines effluent guidelines based on actual water quality, receiving stream properties, and other appropriate water quality criteria. Provides criteria and standards for the National Pollutant Discharge Elimination System (NPDES) and effluent standards for toxic pollutants. This is the implementing statute for the federally delegated NPDES program.	Remedial action may result in the discharging of remediated and unremediated contaminated groundwater into waters of the state, i.e., groundwater, surface water, or any other water course. Substantive requirements are **applicable** for remedial alternatives which will treat and/or discharge wastes or wastewater to waters of the state; standards are applicable to venting groundwater, storm water, and discharges associated with the response action. Regulates discharges to waters of the State or onto the ground or groundwater if uses are potentially injured. Cites specific requirements for the discharge of bioaccumulative chemicals. Discharge requirements can be identified through a substantive requirements document (SRD). Prevents concentrations in surface water of taste and odor producing substances. Prevents acutely and chronically toxic substances from entering surface water based on the LC50 toxicity criteria. Prevents degradation of water quality. Restricts levels of turbidity, color, oil films, floating solids, foams, settling and suspended solids, and deposits.
Michigan Motor Carrier Safety Act of 1963 Public Act 181 of 1963, as amended. (MCL 480.11-480.25 *et seq*)	Requirements for transporters of hazardous materials.	Used to protect the public, first responders to hazardous incidents and the environment from hazardous materials. Placarding and container safety requirements may apply to shipments or loads that originate on-site, and the Act 181 requirements would be **applicable.**
Part 115, Solid Waste Management, of The Natural Resources and Environmental Protection Act, 1994 PA 451, as amended (NREPA). (MCL 324.11501 *et seq.*) Michigan Administrative Code: R 299.4101-4122. Formerly known as Act 641 (1978)	Addresses solid waste management including general landfill design requirements as promulgated in the administrative rules of the Michigan Solid Waste Management Regulations. Regulates the construction and operation of sanitary landfills, solid waste transfer facilities, and solid waste processing plants. Specifies liner and capping requirements for solid waste landfills. Requirements for the operation and closure of non-hazardous waste treatment, storage, and disposal and groundwater quality performance standards. Also imposes geographic limitations on where non-hazardous solid waste can be disposed.	Regulates the disposal of non-hazardous solid waste. Provides requirements for closure and post-closure of non-hazardous solid waste treatment, storage, and disposal facilities. Provides groundwater quality performance standards. Remedial action may produce non-hazardous solid waste, and substantive requirements of Part 115 are **relevant and appropriate**. Used for determining the process and type of disposal facility that solid waste or contaminated media may be removed to. May apply to closure (capping) of a landfill. May serve as a basis of design for containment of non-hazardous solid waste on-site. Substantive requirements of permits and the terms of the applicable county solid waste management plans must be followed.

TABLE 3 – Michigan ARARs

Ten-Mile Drain Superfund Site

Regulation/Citation	Description	Rationale
Part 121, Liquid Industrial Wastes, of The Natural Resources and Environmental Protection Act, 1994 PA 451, as amended (NREPA). (MCL 324.12101-12118) Formerly known as Act 136 (1969)	Regulates liquid industrial waste generators, transporters and designated facilities. Transporters are required to be registered and permitted in accordance with the hazardous materials transportation act. Requires a registered and permitted liquid industrial waste transporter to remove any liquid waste off-site. Records are required to be kept by those who generate such waste, under Section 3a. Liquid industrial waste is defined as "any liquid waste, other than unpolluted water."	Remedial action may require the storage, transportation and disposal of liquid industrial wastes. **Relevant and appropriate** for the on and off-site management of liquid industrial wastes.
Part 201, Environmental Remediation, of The Natural Resources and Environmental Protection Act, 1994 PA 451, as amended (NREPA). (MCL 324.20101-20142 *et seq.*) Michigan Administrative Code: R 299.1-299.50. Formerly known as Act 307 (1982)	Part 201 provides for the identification, risk assessment, evaluation, remediation, and long-term management of contaminated sites within the State of Michigan. Part 201 provides that response actions shall be protective of human health, safety, welfare and the environment of the State and identifies risk levels to be used in the development of those response actions at MCL 324.20120a and 324.20120b.	Establishes screening levels and generic cleanup criteria for sites of environmental contamination based on current and future land use. Site-specific cleanup criteria can be developed if such criteria, in comparison to generic criteria, better reflect best available information concerning the toxicity or exposure risk posed by the hazardous substance or other factors. **Applicable** to cleanup of releases of hazardous substances in concentrations that constitute a facility as that term is defined in the NREPA.
Part 365, Endangered Species Protection, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended (NREPA), (MCL 324.36501-36507). Michigan Administrative Code R. 299.1021-1028	Establishes requirements for conservation, management, enhancement, and protection of species either endangered or threatened with extinction.	**Relevant and appropriate** for actions that are likely to jeopardize fish, wildlife, or plant species or destroy or adversely modify critical habitat. Would not be considered applicable unless Federal endangered species law is less stringent.
Part 401, Wildlife Conservation, of The Natural Resources and Environmental Protection Act, 1994 PA 451, as amended (NREPA). (MCL 324.40101-40120)	Regulates wildlife conservation.	**Relevant and appropriate** - May be applied to identifying wildlife habitat near environmental sites of contamination where an ecological risk assessment(s) may be conducted. May be used in conjunction with the Michigan Features Inventory List to identify habitat where an environmental site of contamination may impact wildlife.
Part 411, Protection and Preservation of Fish, Game, and Birds, of The Natural Resources and Environmental Protection Act, 1994 PA 451, as amended (NREPA). (MCL 324.41101-41105)	Regulates the protection and preservation of fish, game, and birds.	**Relevant and Appropriate** - May be applied to site remediation to protect and preserve fish, game and birds; substantive requirements of Orders issued by the Natural Resources Commission or the Department of Natural Resources would apply to the taking or killing of regulated fish, game or birds..

APPENDIX A

U.S. Environmental Protection Agency
Remedial Action

Administrative Record
For
Ten Mile Drain
St. Clair Shores, Macomb County, Michigan

Supplement 4
November 22, 2013
SEMS ID: 910260

NO.	SEMS ID	DATE	AUTHOR	RECIPIENT	TITLE/DESCRIPTION	PAGES
1	407524	2/1/11	CH2M Hill	U.S. EPA	Health and Safety Plan	150
2	407523	3/1/11	CH2M Hill	U.S. EPA	Sampling and Analysis Plan	221
3	423797	1/1/12	CH2M Hill	U.S. EPA	2011 Source Area Investigation Report	401
4	434534	4/1/12	Environmental Quality Management	U.S. EPA	Field Sampling Plan and Quality Assurance Project Plan for Source Control Activities	174
5	906789	5/22/12	Environmental Quality Management	U.S. EPA	May 2012 Oil and Sediment Results	1
6	906788	5/31/12	Doan, J., Environmental Quality Management	Moynihan, C., U.S. EPA	April 2012 Inspection and Sampling Report	47
7	906797	11/20/12	Environmental Quality Management	U.S. EPA	November 2012 Oil and Sediment Results	1
8	906798	12/20/12	Environmental Quality Management	U.S. EPA	December 2012 Oil and Sediment Results	1
9	906808	1/21/13	Corbin, E., Environmental Quality Management	Moynihan, C., U.S. EPA	Quarterly Inspection Report for July through September 2012	113
10	906800	1/28/13	Environmental Quality Management	U.S. EPA	January 2013 Oil and Sediment Results	1

NO.	SEMS ID	DATE	AUTHOR	RECIPIENT	TITLE/DESCRIPTION	PAGES
11	906801	2/13/13	Environmental Quality Management	U.S. EPA	February 2013 Oil and Sediment Results	1
12	906802	3/13/13	Environmental Quality Management	U.S. EPA	March 2013 Oil and Sediment Results	1
13	906803	4/13/13	Environmental Quality Management	U.S. EPA	April 2013 Oil and Sediment Results	1
14	906805	5/23/13	Environmental Quality Management	U.S. EPA	May 2013 Oil and Sediment Results	1
15	906804	6/18/13	Environmental Quality Management	U.S. EPA	June 2013 Oil and Sediment Results	1
16	460908	7/3/13	Corbin, E., Environmental Quality Management	Moynihan, C., U.S. EPA	Quarterly Inspection and Sampling Report for October through December 2012	139
17	907163	8/1/13	Corbin, E., Environmental Quality Management	Moynihan, C., U.S. EPA	Quarterly Inspection and Sampling Report for January through March 2013	157
18	910257	8/15/13	Environmental Quality Management	U.S. EPA	July 2013 Oil and Sediment Results	1
19	910258	9/11/13	Environmental Quality Management	U.S. EPA	August 2013 Oil and Sediment Results	1
20	909029	10/1/13	CH2M Hill	U.S. EPA	Final Focused Feasibility Study for Vaulted Manholes	74
21	910259	10/21/13	Environmental Quality Management	U.S. EPA	September 2013 Oil and Sediment Results	1

U.S. Environmental Protection Agency
Remedial Action

Administrative Record
for the
Ten-Mile Drain Site
St. Clair Shores, Macomb County, Michigan

Supplement 5
April 11, 2014
SEMS ID: 911828

NO.	SEMS ID	DATE	AUTHOR	RECIPIENT	TITLE/DESCRIPTION	PAGES
1	910156	11/1/13	U.S. EPA	Public	Proposed Plan for Cleanup at the Ten-Mile Drain Site	41
2	910155	11/2/13	U.S. EPA	Public	Fact Sheet: Interim Plan Proposed for Cleanup of PCBs	8
3	467809	12/12/13	Jensen Litigation Solutions	U.S. EPA	Transcript of Public Meeting for Proposed Plan	45
4	467808	1/1/14	Public	U.S. EPA	Public Comment Sheets for the Proposed Plan	9

U.S. Environmental Protection Agency
Remedial Action

Administrative Record
for the
Ten-Mile Drain Site
St. Clair Shores, Macomb County, Michigan

Supplement 6
April 16, 2014
SEMS ID:

NO.	SEMS ID	DATE	AUTHOR	RECIPIENT	TITLE/DESCRIPTION	PAGES
1	912276	12/17/13	Environmental Quality Management	U.S. EPA	Source Control Activities: Oil and Sediment Results	1
2	912277	2/18/14	Environmental Quality Management	U.S. EPA	Source Control Activities: Oil and Sediment Results	1