

## GENERAL SITE INFORMATION, CHARACTERISTICS, AND STATUS

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<b>Project Name</b>	<b><u>TEN-MILE/LANGE/REVERE CANAL (St. Clair Shores)</u></b>	<b>ProjectID:</b> 05-44
<b>Last Updated:</b>	07/13/04	
<b>City:</b>	St. Clair Shores	
<b>County:</b>	Macomb	
<b>State:</b>	MI	
<b>Country:</b>	USA	
<b>Bodies of Water:</b>	Ten-Mile/Lange/Revere Canal; Wahby Park Pond; Lake St. Clair	
<b>US EPA Region:</b>	V	
<b>Status (Active, Complete, or Monitoring Only):</b>	Complete	
<b>Date On NPL:</b>	N/A	
<b>ROD/ESD Date:</b>	N/A	
<b>Operable Unit:</b>	N/A	
<b>Areas of Concern (length or acres):</b>	The entire length, about 4,400 feet, of the Ten-Mile/Lange/Revere Canal and the entire Wahby Park Pond	
<b>Other Characteristics of Water Body:</b>	The Ten-Mile/Lang/Revere Canal is located in the eastern section of the City of St. Clair Shores located on the western shore of Lake St. Clair. The Ten-Mile/Lang/Revere Canal comprises two parallel canals that are connected at their western ends by a small length of canal (creating essentially a U-shaped canal), each leg approximately 40 feet wide by 2,200 feet long and bordered by Ten-Mile Road/Lange Avenue/Revere Avenue. Water depth within the canal is generally less than five feet.	
<b>Contaminants of Concern:</b>	PCBs; also heavy metals, VOCs, SVOCs	
<b>Source of Contamination:</b>	The source of contamination in the canal is believed to be the result of a single event, either accidental spill or illegal dumping of PCB-contaminated material into the Ten-Mile Drain (TMD) system. The TMD system comprises storm water sewers and catch basins that discharge to the head of the Ten-Mile/Lange/Revere Canal. The TMD system drains approximately 260 acres within St. Clair Shores. Results of investigations of the TMD indicate that the discharge occurred at the intersection of two roads near the western end of the storm sewer system. PCB concentrations in sediment from this area of the TMD system were found to be as high as 121,000 ppm. Results of investigations performed in the TMD system conclude that these materials migrated over time through the TMD system and discharged into the Ten-Mile/Lange/Revere Canal. The water in Wahby Park Pond was found to contain elevated levels of PCBs as well, as a result of receiving periodic overflow discharges from the canal.	
<b>Contaminated Area Physical Characteristics:</b>	Approximately 320 sediment, water, and wipe samples were collected as part of the TMD system investigation that included the sampling from three separate areas: TMD system, sanitary sewers, and catch basins. PCB results for each area and media are: <ul style="list-style-type: none"><li>• TMD System: (1) Sediment: ND - 121,000 ppm; (2) Water: ND - 510 ppb; (3) Wipe: ND -480 µg/16in<sup>2</sup></li><li>• Sanitary Sewers: (1) Sediment: 3.9 - 48 ppm; (2) Water: ND - 4.1 ppb; (3) Wipe: ND - 189 µg/16in<sup>2</sup></li><li>• Catch Basins: (1) Sediment: 0.02 - 28.5 ppm; (2) Water: 0.61 - 12.5 ppb; (3) Wipe: 2.3 - 158 µg/16in<sup>2</sup></li></ul>	

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Sediment from the canal and water from both the canal and Wahby Park Pond were also sampled. Thirty-three two-foot sediment cores were collected that yielded 82 individual six-inch samples. Results indicated that elevated levels of PCBs and metals existed in the sediment. PCB results were:

- Sediment: (1) 0 – 6": 1.4 - 150 ppm; (2) 6 – 12": ND - 4,900 ppm; (3) 12 - 18": 0.36 - 140 ppm; (4) 18-24": 1.5 - 140 ppm
- Water: (1) Canal: ND - 5.8 ppb; (2) Wahby Park Pond: 52 ppb (one sample)

In general, the highest concentrations of contaminants in canal sediment were found in the upper six inches of sediment at the western end of the canals, which is nearest the discharge point for the TMD System. In addition to PCBs, elevated levels of heavy metals, VOCs, and SVOCs were also measured in sediment samples.

**Type of Regulatory Action:** Time-critical Removal Action

**Overall Status Summary:** In October 2001, routine sediment sampling was performed in two canals that are connected to each other at their western ends by a small length of canal (creating essentially a single U-shaped canal), each leg approximately 40 feet wide by 2,200 feet long and bordered by Ten-Mile Road/Lange Avenue/Revere Avenue (Ten-Mile/Lange/Revere Canal). The collection of sediment samples was required by the U.S. Army Corps of Engineers as part of the permitting process in preparation for maintenance dredging of the canal. The results of the sediment sampling indicated the presence of elevated levels of PCBs. The source of the PCB contamination was believed to be the Ten-Mile Drain (TMD) system that comprises storm water sewers and catch basins and discharges to the head of the Ten Mile/Lange/Revere Canal. The TMD system drains approximately 260 acres within St. Clair Shores.

As a result of finding elevated PCB levels in the canal sediments, an emergency investigation was initiated in Spring 2002 to determine the extent of PCB contamination within the TMD system and the canal sediments, and was followed by implementation of a time-critical removal action (TCRA) from July 2002 to March 2003. The TCRA involved (a) the cleaning of TMD system piping (b) removal of PCB-contaminated sediment from the TMD, and (c) removal of PCB-contaminated sediment from the Ten-Mile/Lange/Revere Canals. The investigation and TCRA was funded and headed by USEPA with support from Michigan DEQ, Macomb County, and the City of St. Clair Shores.

For the TCRA, sediment removal areas were delineated to 10 ppm PCBs and the removal target was all sediment containing greater than 1 ppm PCBs. Sediment removal was to a visually clean, or native, clay substrate, followed by the collection of confirmation samples. A combined total of about 24,000 tons of soil and sediment was removed from the TMD system and target areas within the canal, which was transported by truck for offsite disposal at a commercial landfill. Total cost of the TCRA was \$7 million (\$292 per ton).

The TCRA was followed by implementation of a remedial action from October 18 to mid-December 2003 to remove the remaining sediment originally targeted for maintenance dredging. Dredging was halted in early December 2003 due to weather. As of that time, the total volume of sediment removed was about 16,500 cy with about another 1,000 cy remaining to be removed from around existing in-water structures (e.g., boat slips). The removed sediment was barged to the USACE Pointe Mouillee, MI facility for disposal; transport and disposal costs for this sediment were estimated at \$7.50 per cy. The remaining dredging was to be performed in Spring 2004, followed by the completion of restoration activities that are part of the TCRA. The

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estimated total cost for the remedial action is \$1 million (about \$57 per cubic yard).

Substantial community interest has been generated as a result of the discovery of the PCB contamination. A community action group collected sediment samples from the canal areas where sediment was removed during the TCRA and found elevated PCB levels in small, localized areas. USEPA believes these are in areas where sand bags were left behind on the canal floor.

The local community collected sediment samples from within a TMD system sediment trap. PCB levels were shown to be as high as 2,000 ppm in the samples. Additionally, PCB levels in the water being discharged to the canals through the TMD were shown to be 3.4 ppb in the most recent sampling event. The USEPA acceptable level is 3.0 ppb and the MDEQ acceptable level is 0.0026 ppb. The community would like the TMD system piping replaced or lined to attempt to meet the MDEQ acceptable PCB-in-water discharge level. The County, which has authority over the TMD system, has selected to clean the interior of the TMD system a second time and then to periodically remove sediment from the TMD sediment trap as their preferred method of controlling the long-term release into the canal of PCBs that remain in the TMD system.

**Remedial Action Planned:** ☒

**Risk Assessment:** ☐

**Remedial Action Implemented:** ☒

**Status of Dredging** ☐

**PRPs:** ☐

**Contacts:** ☒

**References:** ☒

**Modeling:** ☐

**Fishing Advisory:** ☐

**Key Conditions:** commercial landfill, dredging, navigational dredging component, post monitoring, property access issues, solidification/stabilization

## REMEDIAL ACTION PLANNED

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**Target Sediment Cleanup Standards (TSCS):** 1 ppm

**How TSCS Established:**

**Target Bank and Floodplain Cleanup Levels (if applicable):** N/A

**Other Target:** Sediment removal areas were delineated to 10 ppm PCBs

**Environmental Sample Data**

**References:**

- **Sediment:**
- **Water:**
- **Fish:**

**Estimated Target Volume:**

**Planned Disposal Method:**

**Estimated Calendar Time to Implement Remedy:**

**Estimated Time to Implement Remedy:**

**Estimated Cost to Implement Remedy:**

**Stated Remedial Action Objectives (and Source):**

**Measures of Success to be Used:**

**Planned Monitoring and Restoration:**

**Agency Position on Sediment Removal (and Source):**

## ***RISK ASSESSMENT***

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<b><i>Project Name</i></b>	<b><i>TEN-MILE/LANGE/REVERE CANAL (St. Clair Shores)</i></b>	<b><i>ProjectID:</i></b> 05-44
<b><i>Last Updated:</i></b>	07/13/04	
<b><i>RA Type:</i></b>	Human Health	
<b><i>RA Status:</i></b>	Complete	
<b><i>RA Objectives:</i></b>	"To assess the public health implications associated with the PCB contamination of the sanitary and storm sewer systems of, and the canal connected to, the Ten-Mile/Lange/Revere Drainage System (Ten-Mile Drainage System)."	
<b><i>Company Performing RA:</i></b>	Michigan Department of Community Health Under a Cooperative Agreement with the Agency for Toxic Substances and Disease Registry	
<b><i>RA Reference Report:</i></b>	Final Health Consultation, Ten Mile/Lange/Revere Drainage System, Response to Public Comments, St. Clair Shores, Macomb County, Michigan, EPA Facility ID: MIN000508305	
<b><i>RA Summary and Conclusions:</i></b>	CONCLUSIONS	
	(1) Water	
	"The main chemicals of interest in the water samples from the Ten Mile Drainage System and the Canal are PCBs and lead. The other chemicals evaluated (calcium, potassium, silicon, and titanium) do not pose a health hazard primarily because these chemicals were present only in the sewers and exposure is not expected to occur."	
	"The levels of PCBs and lead found in the storm and sanitary sewers and catch basins do not pose an apparent health hazard because only utility workers wearing appropriate personal protective equipment should have access to these areas and would not be exposed. In homes where sanitary drains are cleaned by professional drain cleaners or the homeowner, any chemicals returning up the pipe on the plumbing snake should not pose a health threat because the person cleaning the drain would likely be wearing rubber gloves, at the very least, when performing this job and would not be exposed dermally. Any inhalation exposure occurring in this scenario would be brief and insignificant."	
	"The level of PCBs in the Canal water poses no apparent public health hazard to those persons swimming in the Canal. While combined oral and dermal exposures would increase the total dose of PCBs, the exposures would be infrequent and would not be expected to cause adverse health effects."	
	"The concentration of PCBs in the water of Wahby Pond poses no apparent public health hazard because the likelihood of a child's having regular access to the pond water and sediments is remote."	
	"Any PCBs in fish taken from the Canals could have originated from the contaminated sediments in the Canal or elsewhere in the Great Lakes system, as PCBs are ubiquitous in the environment. Because the fish can enter and leave the Canal at any time, it cannot be determined if or to what extent the contamination of the sediments might have contributed to a fish's contaminant load."	
	"The level of lead in the Canal water poses no apparent health hazard."	
	(2) Sediments	
	"The main chemicals of interest in the sediment samples from the Ten Mile Drainage System and the Canal are PCBs and lead. The other chemicals evaluated (benzo(a)pyrene, calcium, dibenzofuran, p-isopropyltoluene, potassium, silicon, and titanium) do not pose a health hazard because these chemicals were present only in the sewers and exposure is not expected to occur."	

## ***RISK ASSESSMENT***

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"As discussed for water above, the levels of PCBs and lead found in the sediments of the storm and sanitary sewers and catch basins do not pose an apparent health hazard because only utility workers should have access to these areas and would not be exposed. Similarly, no apparent health hazard exists for those persons cleaning residential sanitary drains."

"The concentration of PCBs in the Canal sediments poses no apparent public health hazard. Exposure would be infrequent and would not be expected to cause adverse health effects."

"The lead levels in the Canal sediments pose no apparent health hazard. It is not likely that the sediments would adhere to the skin long enough to be transferred to the mouth. Dermal absorption of lead is not likely."

### **(3) Air**

"Only one air sample of eight taken exceeded the ATSDR CREG for PCBs. As discussed earlier, one data point is not sufficient to conclude that negative health effects will occur. Therefore, the air concentrations of PCBs pose no apparent health hazard."

### **(4) Soils**

"The levels of arsenic found in soil samples of a residential yard along the Canal pose an indeterminate health hazard. It is possible that high concentrations are in areas where exposure is not expected to occur."

## **RECOMMENDATIONS**

- "The contamination of sediments and water in the storm and sanitary sewers, the Canal, and Wahby Pond should be addressed. At the very least, the sediments in the sewers should be removed to prevent further contamination of the Canal, in order that adverse public health effects do not become possible."
- "Discrete soil samples should be collected from residential areas to determine the levels and extent of arsenic contamination."
- "To reduce the likelihood of potential exposure, residents should avoid boating, fishing, or swimming in the Canal or using the Canal water for irrigation until the contamination has been addressed. If the regulatory agencies choose to remediate the Canal, disturbing of the sediments should be minimized. After any remediation of the Canal is complete, people fishing in the Canal should follow the advice provided in the Michigan Family Fish Consumption Guide."
- "Information regarding the progress of the investigation and any remediation should continue to be shared with the community via the public repository and the City's website, with public meetings or informational forums being conducted as necessary."

### **Public Health Action Plan**

- "EPA should take measures to address the contamination, such as removing the sediments and treating the water. EPA should coordinate efforts with MDEQ, PWO, and the City of St. Clair Shores. (A removal action was begun August 14, 2002 and completed in April 2003.)"
- "The MDEQ should continue the Fish Contaminant Monitoring Program and provide the data collected to MDCH so that fish advisories, including that for Lake St. Clair, can be updated as necessary."

## ***RISK ASSESSMENT***

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- "The MDEQ should ascertain whether the soils in yards of homes built along the Canal contain levels of arsenic above the local background. If any levels exceed the local background concentration, MDEQ should address those levels, as mandated by state law. (The MDEQ has completed the first phase of its investigation and is continuing the evaluation of one yard.)"
- "The Macomb County Health Department and MDCH should continue to provide health-related information to the community regarding the PCBs and other chemicals in the sewers, the Canal, and the soil."
- "Several concerned citizens have requested that the health department conduct a health study of people residing next to the affected canals. At the current time, there is no plan for a health study to be performed. While it is likely that persons in the Ten Mile Drainage System area have been exposed to the chemicals of interest, the likely dose, considering exposure frequency and route, is not considered to be sufficient to cause adverse health effects."

## REMEDIAL ACTION IMPLEMENTED

<b>Project Name:</b>	<b><u>TEN-MILE/LANGE/REVERE CANAL (St. Clair Shores)</u></b>	<b>ProjectID:</b> 05-44
<b>Last Updated:</b>	07/13/04	
<b>Physical Target:</b>	Canal sediment removal areas were delineated to 10 ppm PCBs	
<b>Goals:</b>	Remove all sediment containing greater than 1 ppm PCBs	
<b>Primary Contractor:</b>	TCRA: Environmental Quality Management, Inc. was the USEPA Emergency and Rapid Response Services contractor.  Remedial Action: Malcolm Marine, Inc., St. Clair, MI.	
<b>Other Contractors:</b>	TCRA: Tetra Tech EM Inc. was the USEPA Superfund Technical Assessment and Response Team (START) contractor.  Remedial Action: Anderson, Eckstein & Westrick, Inc., Shelby Township, MI was consulting design engineer.	
<b>Generic Remediation Method:</b>	Mechanical for canal sediments	
<b>Equipment:</b>	Barge-mounted excavator; receiving barge; long-reach excavator; Moxy truck	
<b>Material Handling:</b>	(1) TCRA	

The TCRA involved excavation and disposal of sediment from the Ten-Mile Drain system (storm water piping) and the western end of the canals (addressing about one-third of the total canal length). The canals were remediated by first installing a sheetpile "seawall" to isolate a target area, draining the water from the isolated area, and then removing the PCB-contaminated sediment down to visually clean, or native clay substrate, by dry excavation using an excavator. Sediment was removed from the two canals using two approaches as follows:

1. Sediment from one of the canals was removed by isolating 20- to 30-foot sections of the canal at a time, removing the water from the isolated section, and then using a barge-mounted excavator to remove the sediment. The excavator discharged the sediment to a receiving barge and, once full, the receiving barge was moved to a sediment processing area (nearby parking lot) for unloading. The sediment was unloaded into a mixing cell where a bentonite-polymer mixture (purchased in 2-ton poly bags) was added using an excavator.

2. Sediment from the second canal was removed by isolating the entire section of canal containing targeted sediments. The section of canal was isolated using a sheetpile wall and then the water was removed. A gravel access ramp was built into the canal allowing access to the canal by the removal equipment. A long-reach excavator was used to remove the sediments. A single Moxy truck was used (due to space limitations within the canal) to transport the removed sediment to a mixing cell where the bentonite-polymer mixture was added. The majority of the sediment was removed in a single pass working from west (near the head of the canal) to the east (toward Lake St. Clair). After reaching the sheetpile wall, a cleanup pass was performed working east to west. Confirmation samples were collected as areas were completed.

The MDEQ allowed USEPA to discharge the water initially removed from each isolated dredge area directly over the sheetpile wall and back into the canal without treatment. A silt curtain was required to be installed downstream, with turbidity monitoring. The discharge was required to stop if turbidity levels downstream of the silt curtain reached twice background, which never occurred.

Once each isolated area was dewatered and the sheetpile wall stabilized, excavation would begin. Groundwater or infiltration water that continued to enter the cell after the start of excavation



## REMEDIAL ACTION IMPLEMENTED

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<b>Last Updated:</b>	07/13/04	
	required treatment via the on-site water treatment system prior to discharge to the lake.	
	(2) Remedial Action	
	The Remedial Action started in October 2003 and targeted the remaining two-thirds length of the canals from where the TCRA ended to approximately the mouth of each canal.	
	Sediment removal was by wet excavation using a barge-mounted excavator. The barge was relatively small and included a sediment receiving area with three to four-foot sides where the excavator deposited the removed sediment. About three to four feet of sediment were removed, except near the canal banks and sea walls where only about one foot of sediment was removed out to about five feet to maintain structural stability.	
	Once the receiving area on the barge was full, a small tug maneuvered the barge into Lake St. Clair to a second, larger barge. The excavator was then used to transfer the sediment from the smaller to the larger barge. This was repeated until the larger barge was full.	
	Silt curtains were used to control resuspension; one was placed to protect the TCRA removal area and a second silt curtain was placed at the mouth of the canal to prevent migration into Lake St. Clair.	
<b>Volume Removed:</b>	TCRA: 24,230 tons of combined canal sediment and sediment and soil from the Ten-Mile Drain System	
	Remedial Action: 17,500 cy of canal sediment	
<b>Calendar Time:</b>	TCRA: July 2002 to March 2003	
	Remedial Action: October 2003 to December 2003, with a return in 2004 to perform limited dredging around boat slips and complete restoration activities.	
<b>Time To Implement:</b>	TCRA: 8 months	
	Remedial Action: 4 to 5 months	
<b>Total Cost:</b>	TCRA: \$7 million; in addition to the removal of canal sediment, this includes work on the Ten-Mile Drain System, Wahby Pond, and restoration activities (\$292 per ton)	
	Remedial Action: \$1 million (~\$57 per cy; of this amount, T&D was estimated at \$7.50 per cy)	
<b>Dredging Cost:</b>	N/A	
<b>Disposal of Sediment:</b>	TCRA: Disposal of the approximately 5,915 tons of TSCA soil and sediment was at Wayne Disposal, Belleville, MI. The remaining approximately 18,315 tons of non-TSCA soil and sediment was disposed of at the Lenox, MI landfill. These totals include soil and sediment from both the TMD System and the canals; individual totals were not tracked.	
	Remedial Action: The removed sediment was barged to the USACE Pointe Mouillee, MI disposal facility. The sediment was offloaded to dump trucks for transportation to disposal cells designated to accept PCB-contaminated sediments.	
<b>Volume of Water:</b>	TCRA: 2.3 million gallons	

## REMEDIAL ACTION IMPLEMENTED

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<b>Project Name:</b>	<b><u>TEN-MILE/LANGE/REVERE CANAL (St. Clair Shores)</u></b>	<b>ProjectID:</b> 05-44
<b>Last Updated:</b>	07/13/04	
<b>Method of Water Treatment:</b>	The water treatment system comprised, in series of operation, sand filters, bag filters, carbon units, and polishing bag filters. The system was used to treat water generated during the TCRA for PCBs and lead before discharging it into Lake St. Clair.	
<b>Water Discharge Limit:</b>		
<b>Air Monitoring During Remediation:</b>		
<b>Water Monitoring During Remediation:</b>	The MDEQ allowed the water initially removed from each isolated dredge area to be discharged directly over the sheetpile wall and back into the canal without treatment. A silt curtain was installed downstream, with turbidity monitoring. Water discharge was required to stop if turbidity levels downstream of the silt curtain reached twice background, which reportedly never occurred.	
<b>Outcome:</b>	<p>TCRA: Removal was to a visually clean, or native, clay substrate. Confirmation sampling was performed on 5 foot x 5 foot grids, collecting one random surface (top one to two inches) sample from each grid, and compositing up to nine individual samples into a single composite sample. Each composite sample was analyzed by immunoassay and 50% of the composite samples were sent to an offsite laboratory for PCB analysis. Approximately 3,500 individual samples were collected, resulting in about 1,200 composite samples.</p> <p>Remedial Action: Confirmation sediment samples are to be collected from the targeted areas of the canal following the completion of dredging in Summer 2004.</p>	
<b>Restoration and Post-Monitoring:</b>	Following removal, restoration was performed to repair infrastructure (e.g., sea walls, parking lots, landscaping) damaged as part of the removal. This work is targeted for completion in Summer 2004.	
<b>Site-Specific Difficulties:</b>	<ul style="list-style-type: none"><li>• Work continued through the winter and in very cold conditions, but with little snow. The cold made performing cleanup passes and the collection of confirmation samples difficult due to the exposed material freezing.</li><li>• Smaller equipment will be necessary to complete the removal of the remaining targeted sediment due to limited access around existing piers and bulkheads where much of the remaining sediment is located.</li></ul>	
<b>Monitoring Data References:</b>	<ul style="list-style-type: none"><li>• <i>Sediment</i></li><li>• <i>Water:</i></li><li>• <i>Fish:</i></li></ul>	

**POTENTIALLY RESPONSIBLE PARTIES**

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**Project Name** TEN-MILE/LANGE/REVERE CANAL (St. Clair Shores)

**ProjectID:** 05-44

**PRP Name:** PRP INFORMATION NOT RELEASED

**PRPID:**

**Street Address:**

**City:**

**State:**

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## **KEY CONTACTS**

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***Project Name*** **TEN-MILE/LANGE/REVERE CANAL (St. Clair Shores)**

***ProjectID:*** 05-44

***Last Name:*** KEY CONTACT INFORMATION NOT RELEASED

***Contact ID:***

***First Name:***

***Title:***

***Company:***

***Address:***

***City:***

***State:***

***Postal Code:***

***Work Phone # :***

***Other Phone #:***

***Fax # :***

***Email Address:***

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## REFERENCES

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**Project Name** TEN-MILE/LANGE/REVERE CANAL (St. Clair Shores)

**ProjectID:** 05-44

**Reference Type:** A

**ReferenceID:** 1054

**Title:** *Final Health Consultation: Ten-Mile/Lange/Revere Drainage System, Response to Public Comments*

**Location:** AEM

**Category:** Risk Assessment

**Prepared by/Author:** Michigan Department of Community Health  
Under a Cooperative Agreement with Agency for Toxic Substance and  
Disease Registry

**Preparer/Author  
Address:**

**Prepared For:**

**Date Published:** 2003 circa

**Key Words and  
Phrases:**

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**Reference Type:** B

**ReferenceID:** 1069

**Title:** *Just the Facts: PCB Investigation Update*

**Location:** AEM

**Category:** Site Update

**Prepared by/Author:** The City of St. Clair Shores

**Preparer/Author  
Address:**

**Prepared For:** General Public

**Date Published:** May 2002

**Key Words and  
Phrases:**

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**Reference Type:** B

**ReferenceID:** 1070

**Title:** *Ten Mile/Lange/Revere Drainage System Project*

**Location:** AEM

**Category:** Site Update

**Prepared by/Author:** US EPA Region V

**Preparer/Author  
Address:**

**Prepared For:** General Public

**Date Published:** April 2002

**Key Words and  
Phrases:**

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## REFERENCES

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**Project Name** TEN-MILE/LANGE/REVERE CANAL (St. Clair Shores)

**ProjectID:** 05-44

**Reference Type:** B

**ReferenceID:** 1071

**Title:** *Ten Mile Drainage System and Ten Mile/Lange/Revere Canal  
PCB Cleanup*

**Location:** AEM

**Category:** Site Update

**Prepared by/Author:** US EPA Region V

**Preparer/Author  
Address:**

**Prepared For:** General Public

**Date Published:** August 2002

**Key Words and  
Phrases:**

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**Reference Type:** B

**ReferenceID:** 1072

**Title:** *Ten Mile Drainage System and Ten Mile/Lange/Revere Canal  
PCB Cleanup*

**Location:** AEM

**Category:** Site Update

**Prepared by/Author:** US EPA Region V

**Preparer/Author  
Address:**

**Prepared For:** General Public

**Date Published:** November 2002

**Key Words and  
Phrases:**

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**Reference Type:** B

**ReferenceID:** 1073

**Title:** *Memo: To the Residents of the Ten-Mile Drainage District and  
the Ten-Mile/Lange/Revere Canal*

**Location:** AEM

**Category:** Site Update

**Prepared by/Author:** The City of St. Clair Shores

**Preparer/Author  
Address:**

**Prepared For:** General Public

**Date Published:** July 26, 2002

**Key Words and  
Phrases:**

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## REFERENCES

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**Project Name** TEN-MILE/LANGE/REVERE CANAL (St. Clair Shores)

**ProjectID:** 05-44

**Reference Type:** B

**ReferenceID:** 1074

**Title:** *Evaluating Ecosystem Results of PCB Control Measures within the Detroit River - Western Lake Erie Basin: Appendix 13. Ten-Mile Drain Polychlorinated Bi-Phenyl Investigation and Removal Action Site*

**Location:** AEM

**Category:** Site Update

**Prepared by/Author:** (1) Jason El-Zein, (2) James Augustyn, (3) David L. Sawicki

**Preparer/Author Address:** (1) and (2) US EPA Region V  
(3) Tetra Tech EM, Inc.

**Prepared For:** US EPA

**Date Published:** April 2003

**Key Words and Phrases:**

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**Reference Type:** B

**ReferenceID:** 1075

**Title:** *A Sediment Chemistry Survey of Lake Saint Clair, The Revere Street Canal and the Lange Street Canal*

**Location:** AEM

**Category:** Contaminated Sediments: Investigation/Delineation

**Prepared by/Author:** Michigan DEQ - Water Division

**Preparer/Author Address:**

**Prepared For:**

**Date Published:** December 2002

**Key Words and Phrases:**

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**Reference Type:** B

**ReferenceID:** 1076

**Title:** *Fact Sheet: St Clair Shores PCB Investigation Update*

**Location:** AEM

**Category:** Site Update

**Prepared by/Author:** Macomb County Public Works Office

**Preparer/Author Address:**

**Prepared For:** General Public

**Date Published:** March 13, 2002

**Key Words and Phrases:**

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## REFERENCES

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**Project Name** TEN-MILE/LANGE/REVERE CANAL (St. Clair Shores)

**ProjectID:** 05-44

**Reference Type:** C

**ReferenceID:** 1025

**Title:** *PCB Contamination Removed From Storm Sewer System*

**Location:** AEM

**Category:** Site Update

**Prepared by/Author:**

**Preparer/Author**

**Address:**

**Prepared For:** Hazardous Waste/Superfund Week

**Date Published:** April 14, 2003

**Key Words and Phrases:** St. Clair Shores

---

**Reference Type:** D

**ReferenceID:** 385

**Title:** *EPA works to unravel mystery of Shores PCBs*

**Location:** AEM

**Category:** Site Update

**Prepared by/Author:** Gene Schabath

**Preparer/Author**

**Address:**

**Prepared For:** The Detroit (MI) News

**Date Published:** April 1, 2002

**Key Words and Phrases:** St. Clair Shores

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**Reference Type:** D

**ReferenceID:** 522

**Title:** *PCB probe to pinpoint source*

**Location:** AEM

**Category:** Site Update

**Prepared by/Author:**

**Preparer/Author**

**Address:**

**Prepared For:** The Detroit (MI) News

**Date Published:** January 23, 2004

**Key Words and Phrases:**

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## REFERENCES

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**Project Name** TEN-MILE/LANGE/REVERE CANAL (St. Clair Shores)

**ProjectID:** 05-44

**Reference Type:** D

**ReferenceID:** 523

**Title:** *Cleanup Nearly Complete, but PCB Mystery not Solved*

**Location:** AEM

**Category:** Site Update

**Prepared by/Author:**

**Preparer/Author**

**Address:**

**Prepared For:** The Associated Press

**Date Published:** January 4, 2004

**Key Words and  
Phrases:**

---

**Reference Type:** D

**ReferenceID:** 524

**Title:** *Removal of Lake St. Clair Canal Contaminants to Begin*

**Location:** AEM

**Category:** Site Update

**Prepared by/Author:**

**Preparer/Author**

**Address:**

**Prepared For:** The Detroit (MI) Free Press

**Date Published:** August 4, 2002

**Key Words and  
Phrases:**

---

**Reference Type:** D

**ReferenceID:** 525

**Title:** *\$2.5 Million to Fight Water Pollution in Macomb, Oakland, St. Clair Counties*

**Location:** AEM

**Category:** Site Update

**Prepared by/Author:** Peggy Walsh-Sarnecki

**Preparer/Author**

**Address:**

**Prepared For:** The Detroit (MI) Free Press

**Date Published:** September 30, 2003

**Key Words and  
Phrases:**

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## REFERENCES

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**Project Name** TEN-MILE/LANGE/REVERE CANAL (St. Clair Shores)

**ProjectID:** 05-44

**Reference Type:** D

**ReferenceID:** 526

**Title:** *Michigan: St. Clair Shores*

**Location:** AEM

**Category:** Site Update

**Prepared by/Author:**

**Preparer/Author**

**Address:**

**Prepared For:** USA Today

**Date Published:** January 5, 2003

**Key Words and  
Phrases:**

---

**Reference Type:** D

**ReferenceID:** 536

**Title:** *EPA completes St Clair clean-up project*

**Location:** AEM

**Category:** Site Update

**Prepared by/Author:** US EPA

**Preparer/Author**

**Address:**

**Prepared For:** News Release

**Date Published:** April 17, 2003

**Key Words and  
Phrases:**

---

**Reference Type:** H

**ReferenceID:** 23

**Title:** *Map of St. Clair Shores, Macomb County, MI*

**Location:** AEM

**Category:** Miscellaneous

**Prepared by/Author:** Michigan Department of Natural Resources

**Preparer/Author**

**Address:**

**Prepared For:**

**Date Published:** July 29, 2002

**Key Words and  
Phrases:**

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## REFERENCES

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**Project Name** TEN-MILE/LANGE/REVERE CANAL (St. Clair Shores)

**ProjectID:** 05-44

**Reference Type:** L

**ReferenceID:** 229

**Title:** *Memo re: Ten-Mile Drain Polychlorinated Biphenyl Spill Site, St. Clair Shores, MI*

**Location:** AEM

**Category:** Site Update

**Prepared by/Author:** AEM, Inc.

**Preparer/Author  
Address:**

**Prepared For:** Distribution

**Date Published:** January 26, 2004

**Key Words and  
Phrases:**

---

**Reference Type:** M

**ReferenceID:** 450

**Title:** *PCB Contaminant Profile in a Sediment Core from the Lange and Revere Canals St. Clair Shores*

**Location:** AEM

**Category:** Contaminated Sediments: Investigation/Delineation

**Prepared by/Author:** Linda Schweitzer, (2) Mark Baskaran

**Preparer/Author  
Address:** (1) Oakland University  
Department of Chemistry  
Rochester, MI 48309  
(2) Department of Geology  
Wayne State University  
Detroit, MI 48202

**Prepared For:** City of St. Clair Shores

**Date Published:** May 20, 2003

**Key Words and  
Phrases:**

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## ***FISH ADVISORIES***

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***Project Name*** **TEN-MILE/LANGE/REVERE CANAL (St. Clair Shores)**

***ProjectID:*** 05-44

***Advisory:*** Lake St. Clair ***AdvisoryID:*** 1254  
***Extent:*** Mi and Ontario waters (Great Lake connecting waterbody)  
***Pollutant:*** PCBs (total)  
***Species:*** bass-largemouth  
***Population:*** RSP  
***Population Definition:*** Restricted Consumption-Subpopulation(s): Advises subpopulations potentially at greater risk, e.g., pregnant or nursing women, and/or small children, to restrict the size of the organism and/or frequency of meals consumed.  
***Advisory Type:*** Great Lake ***Advisory Number:*** 225  
***Status (Active or Rescinded):*** Active ***Date Rescinded:***  
***Contact Name:*** David R. Wade ***Contact Number:*** 517-335-8834

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***Advisory:*** Lake St. Clair ***AdvisoryID:*** 1255  
***Extent:*** Mi and Ontario waters (Great Lake connecting waterbody)  
***Pollutant:*** PCBs (total)  
***Species:*** bass-largemouth  
***Population:*** RGP  
***Population Definition:*** Restricted Consumption-General Population: Advises the general population to restrict the size of the organisms and/or the frequency of meals consumed.  
***Advisory Type:*** Great Lake ***Advisory Number:*** 225  
***Status (Active or Rescinded):*** Active ***Date Rescinded:***  
***Contact Name:*** David R. Wade ***Contact Number:*** 517-335-8834

---

***Advisory:*** Lake St. Clair ***AdvisoryID:*** 1256  
***Extent:*** Mi and Ontario waters (Great Lake connecting waterbody)  
***Pollutant:*** PCBs (total)  
***Species:*** bass-smallmouth  
***Population:*** RSP  
***Population Definition:*** Restricted Consumption-Subpopulation(s): Advises subpopulations potentially at greater risk, e.g., pregnant or nursing women, and/or small children, to restrict the size of the organism and/or frequency of meals consumed.  
***Advisory Type:*** Great Lake ***Advisory Number:*** 225  
***Status (Active or Rescinded):*** Active ***Date Rescinded:***  
***Contact Name:*** David R. Wade ***Contact Number:*** 517-335-8834

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## ***FISH ADVISORIES***

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***Project Name*** **TEN-MILE/LANGE/REVERE CANAL (St. Clair Shores)**

***ProjectID:*** 05-44

***Advisory:*** Lake St. Clair

***AdvisoryID:*** 1257

***Extent:*** Mi and Ontario waters (Great Lake connecting waterbody)

***Pollutant:*** PCBs (total)

***Species:*** bass-smallmouth

***Population:*** RGP

***Population Definition:*** Restricted Consumption-General Population: Advises the general population to restrict the size of the organisms and/or the frequency of meals consumed.

***Advisory Type:*** Great Lake

***Advisory Number:*** 225

***Status (Active or Rescinded):*** Active

***Date Rescinded:***

***Contact Name:*** David R. Wade

***Contact Number:*** 517-335-8834

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***Advisory:*** Lake St. Clair

***AdvisoryID:*** 1258

***Extent:*** Mi and Ontario waters (Great Lake connecting waterbody)

***Pollutant:*** PCBs (total)

***Species:*** bass-white

***Population:*** RSP

***Population Definition:*** Restricted Consumption-Subpopulation(s): Advises subpopulations potentially at greater risk, e.g., pregnant or nursing women, and/or small children, to restrict the size of the organism and/or frequency of meals consumed.

***Advisory Type:*** Great Lake

***Advisory Number:*** 225

***Status (Active or Rescinded):*** Active

***Date Rescinded:***

***Contact Name:*** David R. Wade

***Contact Number:*** 517-335-8834

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***Advisory:*** Lake St. Clair

***AdvisoryID:*** 1259

***Extent:*** Mi and Ontario waters (Great Lake connecting waterbody)

***Pollutant:*** PCBs (total)

***Species:*** carp-common

***Population:*** RSP

***Population Definition:*** Restricted Consumption-Subpopulation(s): Advises subpopulations potentially at greater risk, e.g., pregnant or nursing women, and/or small children, to restrict the size of the organism and/or frequency of meals consumed.

***Advisory Type:*** Great Lake

***Advisory Number:*** 225

***Status (Active or Rescinded):*** Active

***Date Rescinded:***

***Contact Name:*** David R. Wade

***Contact Number:*** 517-335-8834

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## ***FISH ADVISORIES***

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***Project Name*** **TEN-MILE/LANGE/REVERE CANAL (St. Clair Shores)**

***ProjectID:*** 05-44

***Advisory:*** Lake St. Clair ***AdvisoryID:*** 1260  
***Extent:*** Mi and Ontario waters (Great Lake connecting waterbody)  
***Pollutant:*** PCBs (total)  
***Species:*** catfish-channel  
***Population:*** RSP  
***Population Definition:*** Restricted Consumption-Subpopulation(s): Advises subpopulations potentially at greater risk, e.g., pregnant or nursing women, and/or small children, to restrict the size of the organism and/or frequency of meals consumed.  
***Advisory Type:*** Great Lake ***Advisory Number:*** 225  
***Status (Active or Rescinded):*** Active ***Date Rescinded:***  
***Contact Name:*** David R. Wade ***Contact Number:*** 517-335-8834

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***Advisory:*** Lake St. Clair ***AdvisoryID:*** 1261  
***Extent:*** Mi and Ontario waters (Great Lake connecting waterbody)  
***Pollutant:*** PCBs (total)  
***Species:*** walleye  
***Population:*** RSP  
***Population Definition:*** Restricted Consumption-Subpopulation(s): Advises subpopulations potentially at greater risk, e.g., pregnant or nursing women, and/or small children, to restrict the size of the organism and/or frequency of meals consumed.  
***Advisory Type:*** Great Lake ***Advisory Number:*** 225  
***Status (Active or Rescinded):*** Active ***Date Rescinded:***  
***Contact Name:*** David R. Wade ***Contact Number:*** 517-335-8834

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***Advisory:*** Lake St. Clair ***AdvisoryID:*** 1262  
***Extent:*** Mi and Ontario waters (Great Lake connecting waterbody)  
***Pollutant:*** PCBs (total)  
***Species:*** bass-white  
***Population:*** RGP  
***Population Definition:*** Restricted Consumption-General Population: Advises the general population to restrict the size of the organisms and/or the frequency of meals consumed.  
***Advisory Type:*** Great Lake ***Advisory Number:*** 225  
***Status (Active or Rescinded):*** Active ***Date Rescinded:***  
***Contact Name:*** David R. Wade ***Contact Number:*** 517-335-8834

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## ***FISH ADVISORIES***

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***Project Name*** **TEN-MILE/LANGE/REVERE CANAL (St. Clair Shores)**

***ProjectID:*** 05-44

***Advisory:*** Lake St. Clair

***AdvisoryID:*** 1263

***Extent:*** Mi and Ontario waters (Great Lake connecting waterbody)

***Pollutant:*** PCBs (total)

***Species:*** carp-common

***Population:*** RGP

***Population Definition:*** Restricted Consumption-General Population: Advises the general population to restrict the size of the organisms and/or the frequency of meals consumed.

***Advisory Type:*** Great Lake

***Advisory Number:*** 225

***Status (Active or Rescinded):*** Active

***Date Rescinded:***

***Contact Name:*** David R. Wade

***Contact Number:*** 517-335-8834

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***Advisory:*** Lake St. Clair

***AdvisoryID:*** 1264

***Extent:*** Mi and Ontario waters (Great Lake connecting waterbody)

***Pollutant:*** PCBs (total)

***Species:*** catfish-channel

***Population:*** RGP

***Population Definition:*** Restricted Consumption-General Population: Advises the general population to restrict the size of the organisms and/or the frequency of meals consumed.

***Advisory Type:*** Great Lake

***Advisory Number:*** 225

***Status (Active or Rescinded):*** Active

***Date Rescinded:***

***Contact Name:*** David R. Wade

***Contact Number:*** 517-335-8834

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***Advisory:*** Lake St. Clair

***AdvisoryID:*** 1265

***Extent:*** Mi and Ontario waters (Great Lake connecting waterbody)

***Pollutant:*** PCBs (total)

***Species:*** walleye

***Population:*** RGP

***Population Definition:*** Restricted Consumption-General Population: Advises the general population to restrict the size of the organisms and/or the frequency of meals consumed.

***Advisory Type:*** Great Lake

***Advisory Number:*** 225

***Status (Active or Rescinded):*** Active

***Date Rescinded:***

***Contact Name:*** David R. Wade

***Contact Number:*** 517-335-8834

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## ***FISH ADVISORIES***

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***Project Name*** **TEN-MILE/LANGE/REVERE CANAL (St. Clair Shores)**

***ProjectID:*** 05-44

***Advisory:*** Lake St. Clair

***AdvisoryID:*** 1266

***Extent:*** Mi and Ontario waters (Great Lake connecting waterbody)

***Pollutant:*** PCBs (total)

***Species:*** carp-common

***Population:*** NCSP

***Population Definition:*** No Consumption-Subpopulation(s): Advises against consumption for populations that are potentially at greater risk, e.g., pregnant or nursing women, and small children.

***Advisory Type:*** Great Lake

***Advisory Number:*** 225

***Status (Active or Rescinded):*** Rescinded

***Date Rescinded:***

***Contact Name:*** David R. Wade

***Contact Number:*** 517-335-8834

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***Advisory:*** Lake St. Clair

***AdvisoryID:*** 1267

***Extent:*** Mi and Ontario waters (Great Lake connecting waterbody)

***Pollutant:*** PCBs (total)

***Species:*** catfish-channel

***Population:*** NCSP

***Population Definition:*** No Consumption-Subpopulation(s): Advises against consumption for populations that are potentially at greater risk, e.g., pregnant or nursing women, and small children.

***Advisory Type:*** Great Lake

***Advisory Number:*** 225

***Status (Active or Rescinded):*** Active

***Date Rescinded:***

***Contact Name:*** David R. Wade

***Contact Number:*** 517-335-8834

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