



Ten-Mile Drain Superfund Site

Site History

Michigan Department of Environmental Quality (MDEQ), Macomb County Public Works Office (MCPWO), City of St. Clair Shores, Macomb County Health Department, and EPA's removal response staff have done extensive cleanup, responded to resident concerns, and conducted investigations at the Ten-Mile Drain site.



2001

2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018

2001: Sediment samples were collected for a proposed dredging project in the Lange and Revere Street canals. The analytical results indicated elevated levels of polychlorinated biphenyls (PCBs) in the sediment.



2001

2002

2003

2004

2005

2006

2007

2008

2009

2010

2011

2012

2013

2014

2015

2016

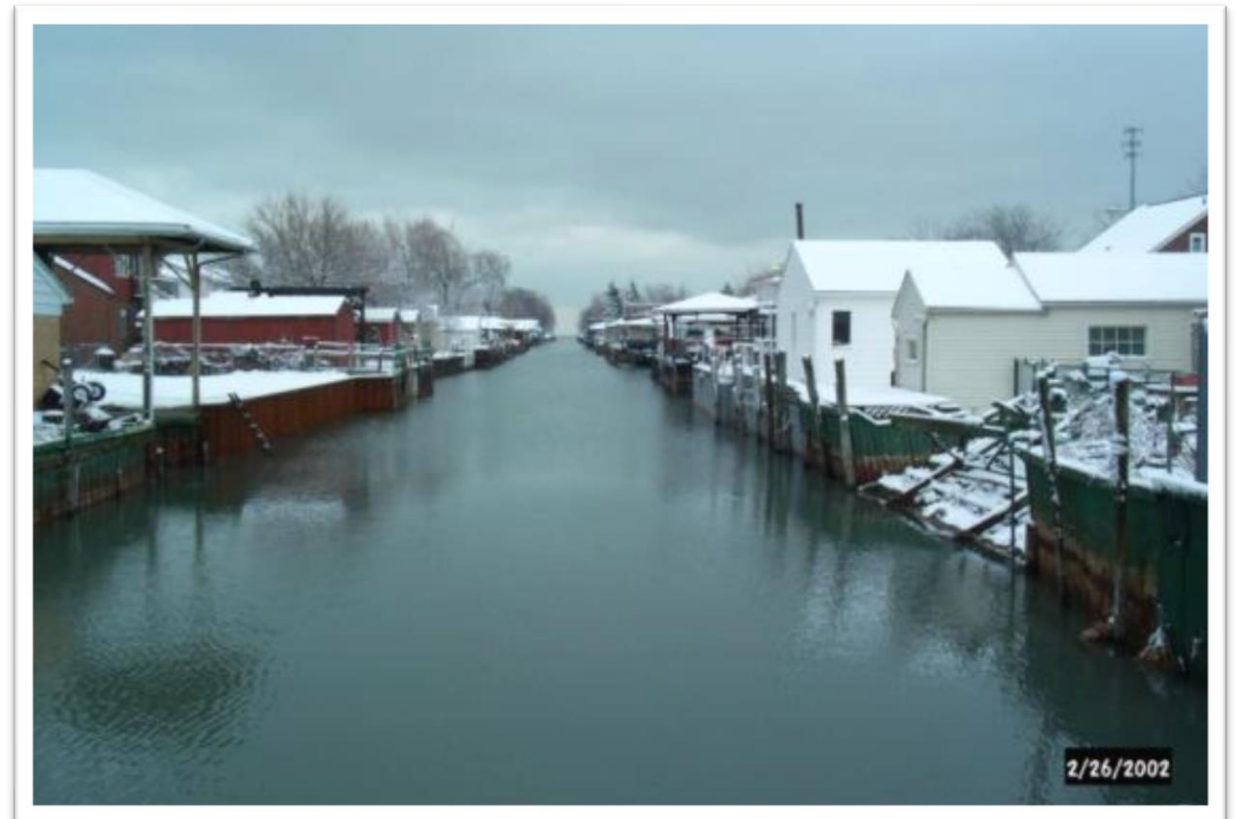
2017

2018

January/February: MDEQ notified the city and county of the PCB-contaminated sediments in the canals. The county immediately conducted an investigation and determined the PCBs were discharging from the Ten-Mile Drain and the highest drain concentrations were in the vicinity of Harper Avenue and Bon Brae Street.

MDEQ, MCPWO, and the City of St. Clair Shores asked for EPA assistance to investigate the extent and degree of the contamination in the drain and canals.

March: Federal, state and local agencies held a public meeting to update the residents on the findings of the initial investigation.



2001 2002 **2003** **2004** 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018

EPA dredged the most contaminated sections of the canals and dewatered the drain. Over 24,000 tons of PCB-contaminated materials were removed and disposed.

Removal action was completed in 2004. [EPA - Federal On Scene Coordinator's \(OSC\) Report](#) (Redacted) (46 pp, 2.66 MB)



Preparing to enter the Ten-Mile Drain system to collect samples.



Dredging and removal of PCBs.

2001

2002

2003

2004

2005

2006

2007

2008

2009

2010

2011

2012

2013

2014

2015

2016

2017

2018



January: MCPWO conducted quarterly post-removal sampling inside the drain and detected elevated PCB concentrations.

February: MCPWO hosted a second public meeting to update residents.

May: EPA and MDEQ drilled 64 additional soil samples near the intersection of Bon Brae Street and Harper Avenue in suspected source areas to better understand the extent of contamination of PCBs.

2001

2002

2003

2004

2005

2006

2007

2008

2009

2010

2011

2012

2013

2014

2015

2016

2017

2018

EPA conducted another removal action from May through July 2006; the majority of activities focused on seawall repairs, installing a cured-in-place pipe liner inside a portion of the drain, and adding monitoring wells. In addition, the EPA removed contaminated soil from nine residential yards and public easements. [EPA Memo RE: Completion of PCB Removal Activities By SFD, ERB1, RS1](#) (Redacted) (86 pp, 194.23 MB)



Contractors preparing the liner for installation into the drain line intersection.



Excavation of PCB-contaminated soil.

2001

2002

2003

2004

2005

2006

2007

2008

2009

2010

2011

2012

2013

2014

2015

2016

2017

2018

The City of St. Clair Shores performed environmental sampling to monitor the conditions inside the drain from 2007 to 2011; funding was provided by MDEQ.



2001

2002

2003

2004

2005

2006

2007

2008

2009

2010

2011

2012

2013

2014

2015

2016

2017

2018

July: MDEQ conducted a site investigation to document and obtain sufficient data to support listing the Ten-Mile Drain site on the National Priorities List, or NPL. The NPL is a roster of the nation's hazardous waste sites eligible for investigation and cleanup under EPA's Superfund program. The transfer of the site from Superfund's removal branch to its remedial branch provides for additional funding and resources.

October: The City of St. Clair Shores contractor (ECT) designed a drain-cleaning system and began removing the most recent contaminated sediment from the drain.



2001 2002 2003 2004 2005 2006 2007 2008

2009

2010 2011 2012 2013 2014 2015 2016 2017 2018

In late 2009, ECT discovered PCB-contaminated oil inside the lined portion of the Ten-Mile Drain located at the corner of Bon Brae Street and Harper Avenue.



Oil on sample probes.



2001 2002 2003 2004 2005 2006 2007 2008 2009

2010

2011 2012 2013 2014 2015 2016 2017 2018

March: EPA initiated another time critical removal action, which included the following activities: high-pressure jet-vacuuming of the storm sewer system to remove PCB oil and sediment; off-site disposal of the PCB-contaminated materials; and installation of temporary weir structures in 15 manhole locations to allow sediment collection points. In addition, a total of 43 soil borings were installed at eleven properties (seven residential and four commercial). [Letter RE: Bon Brae/Harper Site Removal Action w/ Attachments \(Redacted\)](#) (288 pp, 4.56 MB)

EPA proposed the site for the NPL due to PCB contamination.

May: The City of St. Clair Shores began monitoring weirs and periodically sampling behind weirs to keep track of sediment and PCB levels.



Weir sitting in the Ten-Mile Drain. The weirs act like small dams collecting polluted oil and sediment before the contamination can move into the canals.

2001

2002

2003

2004

2005

2006

2007

2008

2009

2010

2011

2012

2013

2014

2015

2016

2017

2018

September: The Ten-Mile Drain site was placed on EPA's NPL. More information can be found in [EPA Fact Sheet - Health Concerns and PCBs: Questions and Answers](#) (2 pp, 163.99 KB).

The City continued to conduct environmental sampling to monitor the conditions behind the 17 weirs inside the drain.

February: EPA conducted a removal action to remove PBC oil inside the drain. Absorbent snares were used to swipe and soak up the oil that had collected behind the weirs. A total of 6 of the 17 weirs required cleanout and one 55-gallon drum of soiled absorbent snares was collected for disposal.

April: The City of St. Clair Shores inspected the absorbent snares and removed and replaced snares containing oil; clean absorbent snares were placed at four weir locations.

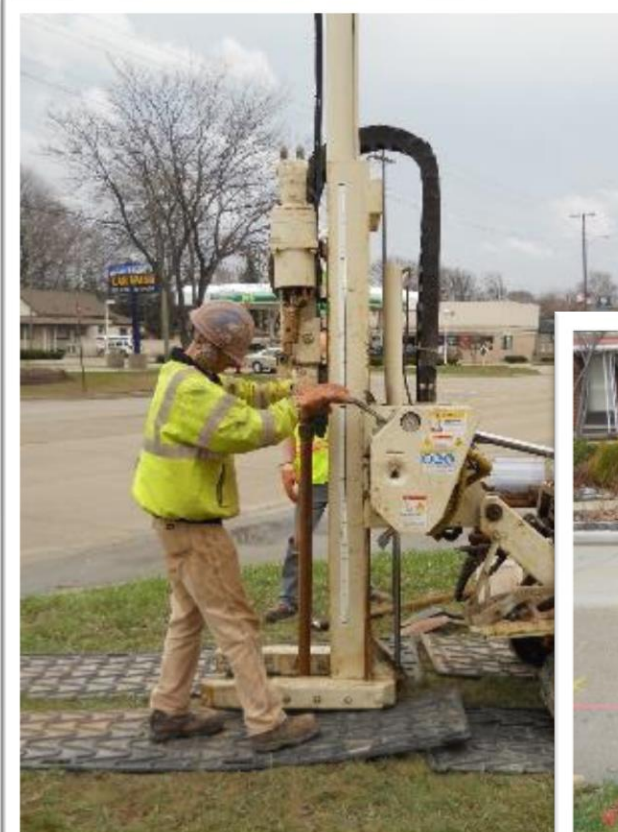
April/May: EPA began its source area investigation fieldwork. EPA took 90 samples in an effort to identify sources of PCBs within the Ten-Mile Drain system. More information can be found in [EPA Fact Sheet - Sampling Project Planned to Find PCB Source](#) (4 pp, 1.43 MB).



Absorbent snare being placed at a weir.



Snare containing oil.



Sampling activities.



July: EPA held an open house and public meeting to present proposed weir maintenance activities for review and public comment. More information can be found in [EPA Fact Sheet - EPA Proposes Interim Cleanup Plan for PCB Contamination](#) (8 pp, 1.84 MB).

August: EPA designed and conducted a sediment sampling project in the Lange and Revere Street canals. 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 PCB concentrations were found near the Ten-Mile Drain system outfall and ranged from 100 ppm to 570 ppm. The PCB concentrations decreased with depth and distance from the outfall.

September: EPA selected an [Interim Record of Decision](#) (52 pp, 5.56 MB), or ROD, to address the high concentrations of PCB oil and contaminated sediment that continued to accumulate behind weirs and sediment traps placed in an effort to prevent PCB contamination from reaching the canals. Actions included placing absorbent snares to soak up oil, periodic removal and proper disposal of the snares and sediment (if needed), and monitoring for PCBs.



Sampling the canals.

The Michigan Department of Health and Human Services (MDHHS) issued a ["Do Not Eat" Fish Advisory](#) for Ten-Mile/Lange/Revere Canals in St. Clair Shores.

The MDHHS is advising people not to eat carp or channel catfish from Lake St. Clair until more data are available. For other fish from Lake St. Clair, follow the Michigan Fish Advisory at www.michigan.gov/eatsafefish or call (800) 648-6942.

Do Not Eat Fish From These Canals

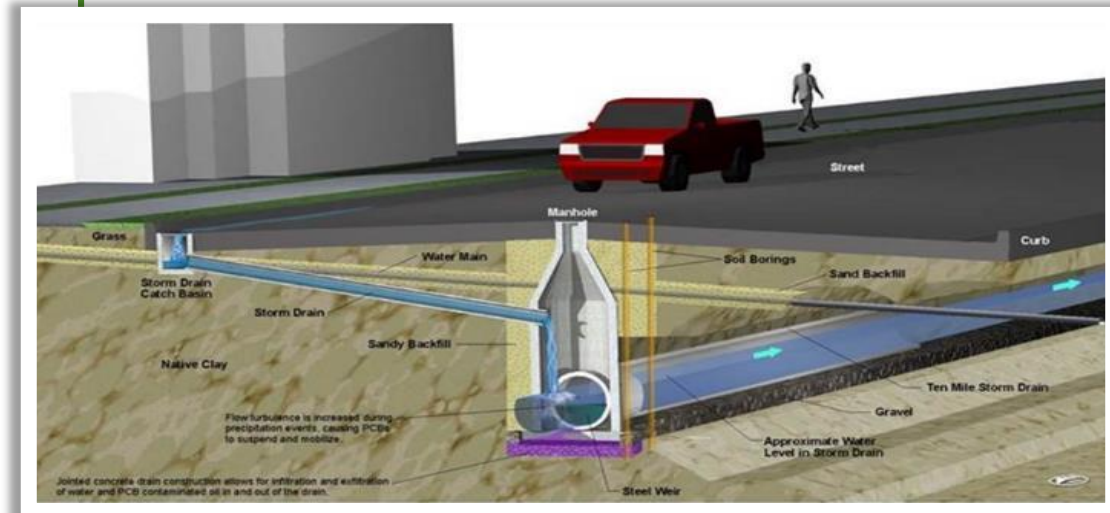
The Michigan
Department of Community Health
has found unsafe levels of
chemicals (PCBs) in fish from the
Lange and Revere Canals.



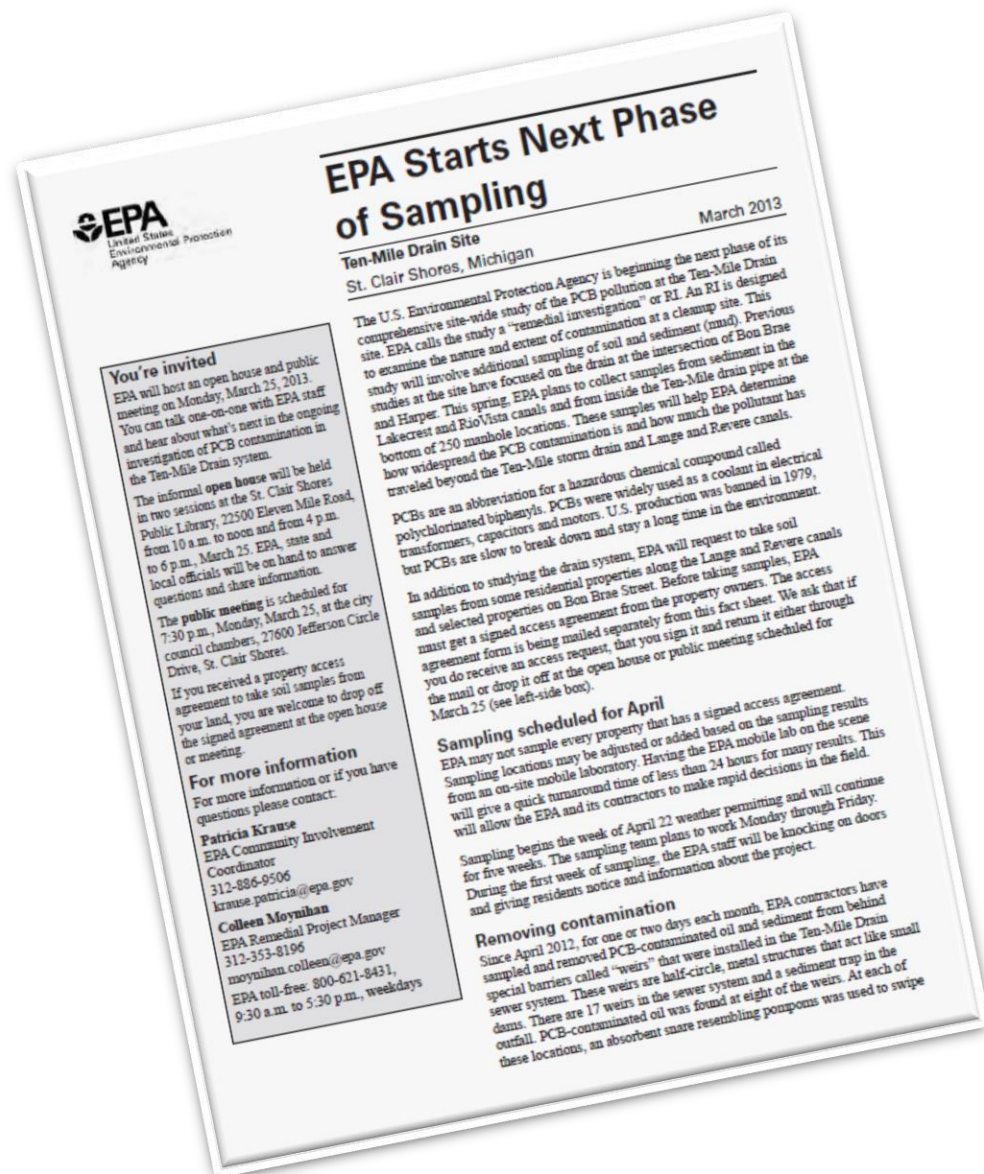
**Eating these fish may
harm your health.**

January: EPA finalized its [Source Area Investigation Report](#) (389 pp, 9.03 MB). The results of the extensive investigation found significant concentrations of PCB-contaminated oil within the Ten-Mile Drain system utility corridor backfill materials adjacent to four vaulted manhole locations: J01, M7179, M4335, and M7183.

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.



Graphic shows cross-section of one of the manhole vault locations in the underground Ten-Mile Drain storm sewer system. Graphic shows potential movement of PCBs re-entering the drain at the bottom of the manhole vault location.



March: EPA held an open house and public meeting to allow local residents to discuss the Ten-Mile Drain site one-on-one with government representatives, as well as to hear more details about the investigation into the source of the PCB contamination. [EPA Fact Sheet - EPA Discovers PCBs under Manhole Vaults](#) (6 pp, 1.05 MB).

2001

2002

2003

2004

2005

2006

2007

2008

2009

2010

2011

2012

2013

2014

2015

2016

2017

2018

March: EPA held an open house and public meeting to discuss upcoming site-wide remedial investigation field work. [EPA Fact Sheet - EPA Starts Next Phase of Sampling](#) (2 pp, 93.31 KB).

April-June: EPA conducted residential and commercial sampling for first phase of site-wide remedial investigation.

September: EPA conducted residential sampling for the second phase of site-wide remedial investigation. [EPA Fact Sheet - Site Investigation Continues; Health Concerns Addressed](#) (2 pp, 107.56 KB).

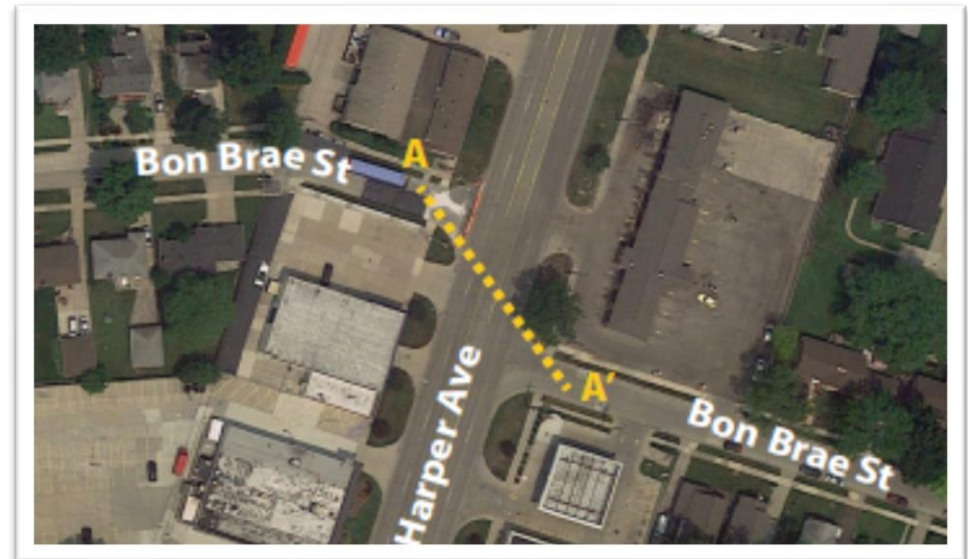
EPA also hosted an availability session for residents who were notified about their property sample results.



Sampling activities.



May: EPA issued the second interim cleanup plan called an [Interim ROD](#) (73 pp, 11.07 MB) to remove PCB-contaminated oil, along with the underlying stone bedding and backfill material, at the two manhole vaults where the highest PCB levels were found. This interim action intended to serve as source control measures to reduce infiltration of PCB-contaminated oil and utility trench water into the Ten-Mile Drain storm sewer pipe, thereby preventing high concentrations of PCBs from moving through the Ten-Mile Drain system to the canals. The estimated capital cost of EPA's interim cleanup was \$2.6 million. The cleanup complied with state and federal regulations, was implemented, and was cost-effective.



Map showing locations of the two selected vaults.

2001

2002

2003

2004

2005

2006

2007

2008

2009

2010

2011

2012

2013

2014

2015

2016

2017

2018

July: EPA completed a time-critical removal of PCB-contaminated soil from nine residential properties and one commercial property. PCBs were found in the soil at or near the ground surface at these locations that were above EPA's removal action criteria. [EPA Fact Sheet - EPA Conducting Cleanup of PCBs Near Harper and Lakeland](#) (2 pp, 788.53 KB). About 1,500 tons of soil were removed and disposed at an offsite facility located in Wayne, Michigan.



Removal of soil from residential property.



Parkway that was restored after soil removal.

2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 **2015** 2016 2017 2018

June: EPA started construction work to remove and replace two manhole vaults, along with the underlying bedding materials, where high concentrations of PCBs were found.



Dewatering at Ten-Mile Drain.



Excavation of impacted soil and vaulted manhole demolition.



Mobilized wastewater treatment plant at site.

2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 **2015** 2016 2017 2018

July/August: Sheet pile installation at vaulted manholes 7179 and J01 began.

While cutting back the liner inside the reinforced concrete pipe that extended under Harper Avenue, PCB oil was observed flowing out the end of the pipe between the liner and the pipe.



Sheet pile being installed.



Oil flowing out of pipe.

August: Additional remedial investigation sampling was conducted focusing on the former Martin Drain (also known as the Old Martin Drain). The Martin Drain was an open, above-ground storm water drain. Historical Macomb County drain maps indicate that the former Martin Drain had flowed through the investigation area and discharged at the Rio Vista Canal located approximately three-quarters of a mile northeast of the Lange and Revere Street canals.

Based on historical information, it appeared that the former Martin Drain was backfilled after the Ten-Mile Drain storm sewer was constructed in the mid-1960s. The objective of the sampling was to determine if the former Martin Drain was previously a migration pathway for PCB contamination. EPA completed approximately 34 borings within the former Martin Drain pathway on Bon Brae Street, B Street, and Jefferson Avenue. A total of 72 samples were analyzed for PCBs. Nineteen of the 34 cores sampled contained no detectable concentrations of PCBs. Based on the overall sample results, EPA determined that the former Martin Drain was likely a limited historical pathway for PCB migration.

October/November: Due to the release of the PCB-contaminated oil into the excavation area, EPA was prompted to expand the remedial action project to include the removal and replacement of the 120-foot length of pipe between the two manhole vaults. Harper Avenue had to be closed for three weeks. [EPA Fact Sheet - EPA Expanding Cleanup near Bon Brae and Harper](#) (2 pp, 235.92 KB). Construction was completed in December.



Placement of new manhole vault.



Excavation during the removal and replacement of the pipe.

Restoration Activities

New sod was installed in parkway areas, curbs were replaced, and repairs to sidewalks and damaged parking lot areas were completed.



New sod on corner.



Concrete restoration in progress.



Demolition and removal of concrete from Harper Avenue property.

2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015 **2016** 2017 2018

May: After review and feedback from stakeholders, including the MDEQ, City of St. Clair Shores, and Macomb County, EPA separated the near-surface soils feasibility study—that addresses PCB-contaminated near-surface soils on affected residential and commercial properties—from the site-wide feasibility study.

August: The [Feasibility Study for Residential & Commercial Near-surface Soils](#) (57 pp, 4.19 MB) was completed to address soils outside of the Ten-Mile Drain utility corridor.

October: The site-wide feasibility study addressing soil within the Ten-Mile Drain and the sediment in the Lange and Revere Street Canals was prepared.



September: EPA selected a cleanup plan to address PCB-contaminated soil at residential and commercial properties at the site. The human health risk-based cleanup goals were identified for PCBs in residential, commercial and utility corridor soil. These cleanup goals are set to protect people and the environment:

For residential soil, EPA set a cleanup goal of no more than 1 part per million (ppm) of PCBs in soil.

For commercial soil, EPA set a cleanup goal of no more than 10 ppm of PCBs in soil.

For the right-of-way/utility corridor soil, EPA set a cleanup goal of no more than 21 ppm of PCBs in soil.

EPA's cleanup project for near-surface soil in the Ten-Mile Drain site involves properties and utility corridors in Investigation Areas 1 and 2. Under the plan, EPA will remove soil contaminated with elevated levels of PCBs.



Spring/Summer: EPA starts Remedial Design sampling in two residential areas. This includes requesting permission from property owners to access yards to collect soil samples. These are typically taken from approximately eight to 16 locations to a depth of 4 feet in front and back yards, if applicable. All samples are analyzed for PCBs. The sample holes are about the size of a soda can. Grass and soil are replaced, and care is taken to leave each yard the way it was prior to sampling.



Sampling is done either by hand (left) or by using a Geoprobe (right).

