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FEDERAL ON-SCENE COORDINATOR'S REPORT

FOR

TEN-MILE DRAIN POLYCHLORINATED BIPHENYL SITE
REMOVAL ACTION
ST. CLAIR SHORES, MACOMB COUNTY, MICHIGAN
SITE ID NO. B52U
TDD NO. S05-0206-012

August 9, 2004

Prepared for

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
Region 5 Emergency Response Branch
77 West Jackson Boulevard
Chicago, IL 60604

Prepared by: _____ Date: 8/9/04
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Reviewed and
Approved by: James E Augustyn Date: 8-13-04
James Augustyn, On-Scene Coordinator

U.S. ENVIRONMENTAL PROTECTION AGENCY
REGION 5

DATE: August 9, 2004

SUBJECT: Federal On-Scene Coordinator's Report: Removal Action at Ten-Mile Drain Polychlorinated Biphenyl Site, St. Clair Shores, Macomb County, Michigan, Site ID No. B52U

FROM: James Augustyn
On-Scene Coordinator, RS-1

TO: Paul Nadeau, Director
R5-R7 Accelerated Response Center, 5201-G

THROUGH: Richard Karl, Acting Director
Superfund Division, S-6J

Attached is the United States Environmental Protection Agency (U.S. EPA) On-Scene Coordinator's (OSC) Report for the time-critical removal action conducted at the Ten-Mile Drain (TMD) Polychlorinated Biphenyl (PCB) Site in St. Clair Shores, Macomb County, Michigan. This report follows the format outlined in the National Oil and Hazardous Substances Pollution Contingency Plan. Removal activities were initiated on July 28, 2002 and completed on March 31, 2003. Restoration activities associated with the canal were completed on July 16, 2004. The OSC for this site is James Augustyn.

The TMD PCB Site posed an immediate threat to public health, public welfare, and the environment. The removal action was undertaken to mitigate threats posed by the presence of potentially hazardous concentrations of PCBs in storm sewer sediment, canal sediment, and surface water associated with the site.

Costs under the control of the OSC are estimated at $7,606,843 for U.S. EPA contractors. Additional costs incurred by EPA, state, and local agencies are not included in this cost estimate. Any indication in this OSC Report of specific costs incurred at the site is only an approximation subject to audit and final approval by U.S. EPA. The OSC Report is not a final reconciliation of the costs associated with the site.

Portions of the OSC Report appendices may contain confidential business or enforcement-sensitive information and must be reviewed by the Office of Regional Counsel before this report is released to the public.

The TMD PCB Site is not on the National Priorities List.

Attachments: OSC Report and Appendices

cc: J. El-Zein, Chief, RS-1

FEDERAL ON-SCENE COORDINATOR'S REPORT

FOR

TEN-MILE DRAIN POLYCHLORINATED BIPHENYL SITE
REMOVAL ACTION
ST. CLAIR SHORES, MACOMB COUNTY, MICHIGAN

NPL STATUS: NON-NPL

Project Dates: 07/28/02 to 07/16/04

UNITED STATES
ENVIRONMENTAL PROTECTION AGENCY

Emergency Response Branch
Superfund Division
Region 5

EXECUTIVE SUMMARY OF THE REMOVAL ACTION

SITE: Ten-Mile Drain Polychlorinated Biphenyl Site
LOCATION: St. Clair Shores, Macomb County, Michigan

PROJECT DATES: 07/28/02 - 07/16/04

INCIDENT DESCRIPTION: The Ten-Mile Drain (TMD) Polychlorinated Biphenyl (PCB) Site is located on the western shore of Lake St. Clair in a residential and commercial area of St. Clair Shores, Macomb County, Michigan. The site is defined by an area approximately 275 acres in size consisting of (1) a network of storm sewers and catch basins that collect and manage storm water runoff (collectively known as the "TMD System") and (2) portions of the Ten-Mile/Lange/Revere Canal (collectively known as "the canal"). The TMD System discharges to the canal through an outfall located northeast of the intersection of Jefferson and Lange Avenues. The TMD PCB Site includes the areas of significant PCB impact located within the TMD System and the canal.

In July 2001, elevated concentrations of PCBs were detected in sediment in the canal during sampling events conducted to support a dredging permit application to be submitted to the U.S. Army Corps of Engineers (USACE). The canal system is hydraulically connected to Lake St. Clair. Upon identification of the elevated PCB concentrations, USACE notified the Michigan Department of Environmental Quality (MDEQ) in accordance with standard operating procedures.

Elevated PCB concentrations were detected in portions of the canal located near the outfall of the TMD System. In December 2001, MDEQ collected environmental samples from the TMD System with the objective of identifying a potential upstream source of the PCB contamination. The investigation confirmed PCB contamination within the TMD System and showed that PCBs were present at the greatest concentrations in sediment in the storm sewer along Bon Brae Avenue. As a result of the MDEQ investigation, Macomb County hired a contractor to perform additional sampling to better define the extent of the contamination. Sample analytical results confirmed the presence of PCBs in the canal and the TMD System. The Macomb County Drainage Commission installed a steel weir at the head of the canal (the discharge point for the TMD System outfall). This weir permitted water to flow into the canal but inhibited sediment flow from the TMD System to the canal.

In March 2002, MDEQ requested technical assistance from the U.S. Environmental Protection Agency (U.S. EPA) in assessing the source and extent of PCB contamination in the TMD System and the canal. Following this request, U.S. EPA immediately arranged for Superfund Technical Assessment and Response Team (START) contractor assistance to support its investigations. On March 5, 2002, Tetra Tech EM Inc. (Tetra Tech), U.S. EPA's START contractor, mobilized to the site to support the investigation. Investigative efforts included determining the extent of contamination through collection of samples from potentially impacted media in the TMD System and canal. Investigative efforts included an attempt to identify the source of the PCBs.

Sample analytical results showed that the highest concentrations of PCBs (up to 121,000 milligrams per kilogram [mg/kg]) in storm sewer sediment within the TMD System generally occurred along Bon Brae Avenue. PCB concentrations in sediment samples collected from the western portions of the canal were as high as 4,900 mg/kg. Based on site assessment results, U.S. EPA concluded that site conditions met the criteria for initiating a removal action under the National Oil and Hazardous Substances Pollution Contingency Plan as documented in Title 40 of the *Code of Federal Regulations*, Section 300.415(b)(2).

ACTIONS: Under U.S. EPA oversight, a time critical removal action involving excavation and disposal of sediment from the TMD System and the western end of the canal was initiated at the TMD PCB Site on July 28, 2002. U.S. EPA's Emergency and Rapid Response Services (ERRS) contractor, Environmental Quality Management, Inc. (EQM), and START were retained to perform and support removal action activities for U.S. EPA.

The following removal activities were performed by ERRS and START: (1) personnel, office trailers, and equipment were mobilized to the site; (2) electrical and telephone services were procured; (3) segments of the storm sewer were isolated, dewatered, cleared of sediment, and cleaned using a high-pressure hydrowash system and vacuum trucks and by workers using shovels; (4) impacted canal sediment was isolated in stabilization cells, stabilized, and removed from the canal; (5) contact and decontamination water from removal activities was treated in a wastewater treatment system installed on site and discharged to a nearby storm sewer; (6) soil samples were collected from residential yards along the canal and analyzed for PCBs and total Resource Conservation and Recovery Act metals to determine whether action was needed; (7) Wahby Park pond (which had previously received water from the canal) was drained, its sediment was sampled and analyzed, and it was refilled (drained water was treated in the on-site treatment system); (8) post-removal, confirmation, and quality assurance/quality control sampling were conducted; (9) project equipment was decontaminated; and (10) removed materials were treated and/or properly disposed. The site command post was demobilized on March 31, 2003. Site restoration activities were completed on July 16, 2004.

Approximately 5,914 tons of Toxic Substances Control Act (TSCA)-regulated soil and sediment was transported to and landfilled at Wayne Disposal, Inc., in Belleville, Michigan. Approximately 18,315 tons of non-TSCA-regulated soil and sediment was transported to and landfilled at the Pine Tree Acres landfill in Lenox, Michigan.

James E. Augustyn 8-13-04

James Augustyn, On-Scene Coordinator
U.S. EPA Region 5
Westlake, Ohio

CONTENTS

Section **Page**

EXECUTIVE SUMMARY OF THE REMOVAL ACTION i

OSC REPORT STANDARD LIST OF APPENDIXES v

I. SUMMARY OF EVENTS 1
- A. Site Conditions and Background 1
  - 1. Initial situation 1
  - 2. Location of hazardous substances 3
  - 3. Cause of the release or discharge 3
  - 4. Efforts to locate and obtain response by responsible parties 4
- B. Organization of the Response 4
- C. Injury or Possible Injury to Natural Resources 5
  - 1. Content and time of notice to natural resource trustees 5
  - 2. Trustee damage assessment and restoration activities 7
- D. Chronological Narrative of Removal Activities 8
  - 1. Threat abatement actions taken 8
    - 1.1 Mobilization, security, and site setup 9
    - 1.2 TMD System sediment removal 10
    - 1.3 Additional canal sediment sampling 13
    - 1.4 Canal sediment excavation 14
    - 1.5 Residential yard sampling 18
    - 1.6 Wahby Park pond sediment sampling 19
    - 1.7 Air monitoring and sampling 19
    - 1.8 On-site water treatment operations 21
    - 1.9 Waste disposal 23
    - 1.10 Demobilization 25
    - 1.11 Treatment, disposal, or alternative technology approaches pursued 25
  - 2. Public information and community relations activities 26
- E. Resources Committed 27

II. EFFECTIVENESS OF REMOVAL ACTIVITIES 28
- A. Actions Taken by PRPs 28
- B. Actions Taken by State and Local Agencies 28
- C. Actions Taken by Federal Agencies and Special Teams 29
- D. Actions Taken by Contractors, Private Groups, and Volunteers 29

III. DIFFICULTIES ENCOUNTERED 30
- A. Items That Affected the Response 30
- B. Issues of Intergovernmental Coordination 31
- C. Difficulties Interpreting, Complying With, or Implementing Policies and Regulations 31

IV. RECOMMENDATIONS 31
- A. Means to Prevent a Recurrence of the Discharge or Release 31
- B. Means to Improve Removal Activities 31
- C. Recommendations for New Policy or Regulations and Changes in Current Regulations and Response Plans 31

REFERENCES 32

FIGURES

Figures Included in Body of Report **Page**

1 Site Location 2
11 Wahby Park Pond Sampling Locations 20

Oversize Figures Located at the End of Report

2 TMD System and Canal
3 Sampling Locations and PCB Analytical Results
4 Area of Removal Action - TMD System
5 Area of Removal Action - Canal
6 Areas of Restoration
7 Post-Removal Wipe Sampling in the TMD System
8 Confirmation Sampling Locations - Revere Canal
9 Confirmation Sampling Locations - Ten-Mile/Lange Canal
10 Residential Yard Sampling Locations

TABLES

Tables Included in Body of Report **Page**

1 Organization of the Response 6
3 Waste Materials and Their Disposition 24
4 Removal Action Estimated Cost Summary 28

Tables with Analytical Results Located at the End of Report

2 Sample Analytical Results for Residential Yards

Attachments Located at End of Report

1 Sample Analytical Results Excluding Residential Yards

Emergency Response Branch
Office of Superfund, U.S. EPA Region 5

OSC REPORT STANDARD LIST OF APPENDIXES*

Site Name: Ten-Mile Drain Polychlorinated Biphenyl Site, St. Clair Shores, Macomb County, Michigan
Site ID No.: B52U

1.	OPERATIONAL FILES	ID No.
	-Action Memoranda	1-A
	-Pollution Reports	1-B
	-Site Entry Logs	1-C
	-Hot Zone Entry Logs	1-D
	-Site Computer Disks	1-E
	-Site Contacts/Business Cards	1-F
	-Site Activity Logs	1-G
	-Daily Work Orders	1-H
	-Site Monitoring Logs	1-I
	-Site Maps	1-J
	-General Correspondence/Information	1-K
	-Newspaper Articles	1-L
	-Site Photographs/Videos	1-M
	-Heath and Safety Plan	1-N
	-Post Sediment Removal Storm Sewer Video	1-O
	-Structure Issues Associated with the Canal	1-P
	-Access Agreements	1-Q
	-Community Involvement	1-R
2.	FINANCIAL FILES	ID No.
	-Superfund Technical Assessment and Response Team Technical Direction Documents/Modifications (START)	2-A
	-Technical Status Reports	2-B
	-Daily Cost Reporting, U.S. EPA Form 1900-55	2-C
	-Incident Obligation Log	2-D
	-START Cost Documentation Forms	2-E
	-Subcontractor Bid Sheets	2-F
	-Emergency and Rapid Response Services (ERRS) Task Orders	2-G
3.	TECHNICAL FILES	ID No.
	-START Site Assessment and Other Reports	3-A
	-State Information	3-B
	-County Information	3-C
	-City Information	3-D
	-U.S. EPA Analytical Results	3-E
	-Disposal Information	3-F
	-Chain-of-Custody Documentation	3-G
	-Historical Research	3-H
	-Wastewater Treatment Information	3-I

* Portions of the OSC Report appendixes may contain confidential business or enforcement-sensitive information and must be reviewed by the Office of Regional Counsel prior to the report's release to the public.

* Certain files for the site are maintained elsewhere by the Emergency Response Branch. The appendixes listed above contain the files maintained by the OSC during the removal action.

I. SUMMARY OF EVENTS

A. Site Conditions and Background

1. Initial situation

The Ten-Mile Drain (TMD) Polychlorinated Biphenyl (PCB) Site is located in an area of residential and commercial development along the western shore of Lake St. Clair in St. Clair Shores, Macomb County, Michigan. St. Clair Shores is a suburban community in the northern Detroit metropolitan area. Figure 1 shows the location of the TMD PCB Site relative to the surrounding area and local features. The areal extent of the TMD PCB Site is approximately 275 acres and includes the following primary components: (1) the TMD storm sewer system (TMD System) and (2) the Ten-Mile/Lange/Revere Canal (the canal). These two components are described below.

TMD System: The TMD System consists of storm sewers and catch basins that collect and manage storm water runoff for an area in the eastern section of St. Clair Shores. The main line associated with the TMD System is owned and managed by Macomb County; the storm sewers that feed into the main line are owned and managed by the City of St. Clair Shores. The TMD System is generally bordered to the north by Bon Brae Avenue, to the east by Jefferson Avenue, to the south by Lange Avenue, and to the west by Harper Avenue. The TMD System drains to the southeast and discharges to the canal.

Canal: The canal receives storm water from the TMD System through a 90-inch diameter drainage pipe outlet at the northwestern corner of the canal. The canal includes two parallel branches that meet at the canal's western end. These two branches run parallel to the following three streets along the canal: (1) Ten-Mile Road to the north, (2) Lange Avenue between the two branches, and (3) Revere Avenue to the south. The canal is bordered by residences lying along these streets. Wahby Park lies south of the canal. The canal is hydraulically connected to Lake St. Clair.

Figure 2 at the end of this report shows the layout of the TMD System and the canal.

FIGURE 1 - SITE LOCATION

2. Location of hazardous substances

Elevated concentrations of PCBs were identified throughout the site. Investigations by the U.S. Army Corps of Engineers (USACE), Michigan Department of Environmental Quality (MDEQ), and Macomb County between July 2001 and March 2002 indicated the presence of PCBs in sediment, surface water, and on surfaces throughout the TMD System and in the canal. Investigations conducted by the U.S. Environmental Protection Agency (EPA) and its Superfund Technical Assessment and Response Team (START) contractor between March 2002 and June 2002 confirmed the presence of PCBs in the TMD System and canal (Tetra Tech 2002). PCB concentrations in sediment samples collected from the western portions of the canal were as high as 4,900 milligrams per kilogram (mg/kg). The potential source area associated with the TMD PCB Site was identified as sediment in a segment of the storm sewer located in the northwestern portion of the TMD System along Bon Brae Avenue, generally between Harper Avenue and D Street. This potential source area exhibited the highest PCB concentrations during the investigation, including the maximum PCB concentration of 121,000 mg/kg (Tetra Tech 2002).

Figure 3 at the end of this report shows site sampling locations and analytical results for PCBs.

3. Cause of the release or discharge

No obvious or likely source of the PCB release into the TMD System was identified. To investigate the potential cause of the release, the U.S. EPA and START reviewed available city and county records. U.S. EPA and START conducted this review to assess whether current or historical industrial or commercial facilities in the site area were obvious or likely sources of the PCB release, but no such facilities were identified as potential sources. In addition, the local power company was contacted to obtain historical records regarding the use and storage of transformers, but no obvious or likely utility-related source of PCBs was identified. Toxic Substances Control Act (TSCA) representatives conducted inspections of several properties near the source area but made no significant findings. In addition, a civil investigator working for the U.S. EPA reviewed records and spent two weeks in the community investigating potential sources or responsible parties. A criminal investigation task force of federal, state, and local officials investigated potential sources and established a

call-in line for tips. Someone in the neighborhood recalled that a sub-station was located on the corner of Bon Brae Avenue and D Street and that a fire had occurred in this area in the past; no records were identified to substantiate this recollection. Fire records are destroyed after 10 years. No other witnesses of, or participants in, illegal dumping of PCBs have come forth. Despite the efforts of U.S. EPA and others to identify the source of the PCB release, the information obtained during the investigations did not establish a viable link between any area businesses and PCB contamination at the site. In the absence of information to the contrary, U.S. EPA considers it likely that the source of the contamination was illegal dumping of PCBs into a catch basin or storm sewer near the northwestern corner of the TMD System.

4. Efforts to locate and obtain response by responsible parties

As described in Section I.A.3, efforts were made to identify the source of the release. All of these efforts also were used to identify any potential party or parties responsible for the PCB release at the site. Despite the efforts of U.S. EPA and others to identify a party or parties responsible for the PCB release, no information obtained during the investigations identified a viable potentially responsible party (PRP).

B. Organization of the Response

U.S. EPA and START finalized the site assessment report for the site in July 2002. The lead on-scene coordinator (OSC) for the assessment was Kurt Grunert. The site assessment report provides detailed information regarding the site, including a description of U.S. EPA's site investigation results and the proposed removal activities (Tetra Tech 2002). Figure 3 shows the sampling locations and associated PCB results. Removal activities at the site were initiated by U.S. EPA on July 28, 2002, and completed on March 31, 2003. On-site restoration activities were completed on July 16, 2004. The lead OSC for the removal action was James Augustyn of U.S. EPA Region 5. A START representative was present at the site throughout the removal action. Environmental Quality Management, Inc. (EQM), the Emergency and Rapid Response Services (ERRS) contractor, implemented the removal activities.

On July 29 and 30, 2002, U.S. EPA, ERRS, and START mobilized to the site and initiated the removal action. Based on site assessment findings and as described in the Incident Description in

the Executive Summary of this report, the PCB removal efforts included removal of sediment and debris from segments of the TMD System and power-washing of these segments. Also, additional sediment samples were collected from the canal to further delineate the removal areas in the canal; after further delineation, sediment with PCB concentrations exceeding 10 mg/kg was removed from portions of the canal. Figures 4 and 5 at the end of this report show the areas of the removal action in the TMD System and the canal, respectively.

Soil samples were collected from 15 residential properties and analyzed to evaluate whether nearby residential yards had been impacted. Results indicated no properties were adversely impacted. In addition, water in the Wahby Park pond was pumped out, treated, and discharged to a local storm sewer. Sediment in the pond was sampled to determined if the pond floor had been impacted. The pond was then refilled with potable water.

Table 1 shows the organization of the response; Table 1 identifies the parties that have provided response, assessment, or disposal support and the roles and responsibilities of the parties.

C. Injury or Possible Injury to Natural Resources

1. Content and time of notice to natural resource trustees

The State of Michigan requested U.S. EPA assistance to address the site and prevent potential impacts to human health or the environment (including natural resources). Because the canal is adjacent to Lake St. Clair and contained sediment with elevated levels of PCBs, the lake is a natural resource of concern associated with this site.

During the site assessment, water intakes that provide public drinking water and that draw water from Lake St. Clair were sampled by MDEQ; the water samples did not contain PCBs. U.S. EPA, the State of Michigan, and county and local officials have worked together to help ensure that site investigation or removal activities did not impact the lake.

TABLE 1

ORGANIZATION OF THE RESPONSE

TEN-MILE DRAIN POLYCHLORINATED BIPHENYL SITE
ST. CLAIR SHORES, MACOMB COUNTY, MICHIGAN

Organization	Primary Contact	Role and Responsibility
U.S. EPA	James Augustyn, On-Scene Coordinator (OSC) Westlake, OH augustyn.james@epa.gov	Oversaw the removal action in coordination with various agencies; supervised START and ERRS contractors; supported public involvement and outreach regarding the site; prepared or oversaw preparation of pollution reports, sampling plans, data validation reports, and site assessment and OSC reports.
MDEQ	Hae-Jin Yoon yoonh@st.mi.us	Supported site investigation and removal activities for the TMD System; Water Division prepared a staff report regarding Lake St. Clair and the canal.
Michigan Department of Community Health (MDCH)	Christine Bush Lansing, MI bushcr@michigan.gov	Monitored and assessed sampling results to evaluate any potential health risks to citizens; prepared a health consultation report under a cooperative agreement with the Agency for Toxic Substances and Disease Registry (ATSDR).
Macomb County Health Department (MCHD)	Cole Shoemaker Mt. Clemens, MI cole.shoemaker@co.macomb.mi.us	Hosted a hotline to assist citizens with questions regarding PCBs.
Macomb County Department of Public Works (DPW)	Keith Grabowski, P.E. keith.grabowski@co.macomb.mi.us	Supported activities related to county-owned portions of the TMD System; provided land for wastewater treatment system operation; prepared an operation and maintenance plan for the TMD System to address potential residual PCBs in the structure of the sewer.
City of St. Clair Shores	Linda Paladino, Assistance City Manager. lindap@scsmi.net Mary Jane Brunell, Community Involvement, maryjane@scsmi.net	Department of Public Works supported activities related to city-owned portions of the TMD System; Public Library hosted the site information repository; City participated in meetings and public involvement, and hosted a web site for with information (http://www.stclairshores.net).
START contractor	David L. Sawicki, C.P.G., david.sawicki@ttemi.com	Conducted site assessment of the TMD System and provided removal action oversight and restoration activities support under the direction of U.S. EPA.
ERRS contractor	Bob Armstrong barmstrong@eqm.com	Implemented removal action activities for the TMD system under the direction of U.S. EPA. Activities included mobilization, dredging, wastewater treatment, analytical services, demobilization, and waste disposal.

Because Lake St. Clair did not appear to be impacted, potential natural resource damage assessment (NRDA) activities were not undertaken for this site. However, the State of Michigan would be a potential trustee for the lake. As such, U.S. EPA communicated closely with the State throughout the removal action and supported public participation and other efforts related to the site in cooperation with state and local representatives.

2. Trustee damage assessment and restoration activities

No significant natural resource damage appears to be associated with the PCB release. During the removal action, U.S. EPA removed sediment from areas of the site that exhibited sediment with concentrations of PCBs at or above the initial screening level of 10 mg/kg. Sediment above this screening level was determined to present an immediate threat to the environment. Sediment in these areas was removed until the cleanup level of 1 mg/kg was achieved; U.S. EPA determined this cleanup level to be protective of human health and the environment.

To monitor long term, residual concerns that may be associated with the TMD System, Macomb County prepared an operation and maintenance plan that will include sampling of the storm sewer, outfall, and canal. Also, the State of Michigan provided funding to support overall water quality monitoring in the Lake St. Clair watershed.

During the removal action in the canal, some sea walls and residential yards were impacted by removal activities. In all cases, access agreements were signed before removal action personnel entered or impacted properties adjacent to the canal.

Where impacts to sea walls or residential yards occurred during, or as a result of, the removal action, U.S. EPA supported restoration activities such as reconstruction or repair of sea walls, residential yards, brick walls, fences, and concrete. Where feasible, the sea walls were restored to their pre-removal action condition based on site photographs, videos, and discussions with affected homeowners. A START structural engineer supported these efforts. Figure 6 at the end of this report shows the parcels where restoration activities have taken place in the vicinity of the canal.

Temporary gravel driveways constructed for the removal action were removed from the West Marine and Mike's Marine parking lots. The parking lot area of Blossom Heath, which was the former location of the on-site wastewater treatment system (WWTS), was power-washed and swept. These areas are shown in Figure 2 at the end of this report.

D. Chronological Narrative of Removal Activities

1. Threat abatement actions taken

The removal action was conducted under the authority of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980, Section 104(a). William E. Muno, Director, Superfund Division, U.S. EPA Region 5, authorized funding to mitigate an imminent threat to human health and the environment associated with PCBs in TMD System and canal sediment. In addition, funding was authorized for sampling conducted in support of the National Oil and Hazardous Substances Pollution Contingency Plan (NCP)-authorized removal action activities. U.S. EPA directed START to conduct the following supplemental investigative activities in parallel with the removal action activities in order to better characterize the site and to comply with MDEQ requests:

- Collecting post-removal wipe samples from the TMD System storm sewer surface to determine whether residual PCBs were present on the storm sewer structures following sediment removal activities.
- Collecting sediment samples from the Wahby Park pond (which is located approximately 200 feet south of the western end of the Revere Avenue canal) for screening-level evaluation of potential PCB impacts on pond sediment.
- Collecting screening-level soil samples from the yards of residences that (1) are adjacent to contaminated segments of the canal and (2) used canal water for lawn care or gardening purposes. These residences presented the highest probability of use of contaminated surface water for irrigation purposes.
- Collecting additional sediment samples from the canal to verify the extent of contamination and refine the limits of removal action activities.
- Collecting samples of ambient air during removal activities to monitor potential air impacts and ensure worker and public safety.
- Collecting equipment wipe samples to monitor the effectiveness of decontamination activities conducted during removal activities.

- Collecting soil samples from beneath equipment staging areas to identify potential cross-contamination from equipment.

- Conducting surface water monitoring from upstream and downstream of silt curtains to determine effectiveness of sedimentation control equipment.

- Collecting additional samples from areas of the canal after the removal action was performed to help verify that no additional PCB-containing materials were entering the canal. These samples consisted of sediment or underlying native material in areas where no residual sediment was present after the removal action activities.

- Collecting additional water samples from the TMD System to help evaluate the potential that additional sources of PCBs might be present in the system; U.S. EPA believes that no such further sources are present. Macomb County will implement an operation and maintenance plan to include sampling of the storm sewer, outfall and canal to monitor for PCBs and will address any issues if they are identified.

The following sections describe major activities conducted during the removal action. The activities generally are presented in chronological order.

1.1 Mobilization, security, and site setup

On July 29 and 30, 2002, U.S. EPA, START and ERRS mobilized to the site. U.S. EPA and START were present to begin oversight of cleanup activities; in addition, U.S. EPA coordinated with other agencies and supported public involvement activities. A site command post was established. ERRS procured and mobilized two office trailers equipped with electrical and telephone service to support the command post. EQM also mobilized a 10-person crew, track-mounted excavators, a rubber-tired loader, a storage unit for equipment, and portable restroom facilities to the site.

On July 31 and August 1, 2002, 11 fractionation tanks and a barge were mobilized to the Site in order to support activities related to sampling and excavation in the canal and treatment of water impacted by PCBs.

Between July 30 and August 10, 2002, ERRS constructed a temporary WWTS on site. The WWTS was equipped with the 11 fractionation tanks. Piping was installed between the WWTS, the canal, and the Wahby Park pond to collect contaminated water for treatment. The St. Clair Shores DPW removed and subsequently replaced asphalt and concrete on Revere Street to allow placement of the necessary pipes.

Personnel and equipment were demobilized and remobilized during the removal activities as approved by the OSC. Security was maintained at the command post during hours when removal action personnel were not working on site.

The command post was established in Wahby Park. The contamination reduction zones (CRZ) for Revere Canal, Ten-Mile/Lange Canal, and the TMD System were located in the parking lot of Mike's Marina, the West Marina parking lot, and the Macomb County DPW parking lot, respectively. These areas are depicted in Figure 2 at the end of this report. A sediment staging area was established in the parking lot of the Macomb County DPW.

1.2 TMD System sediment removal

A primary objective of the removal action was removal of sediment from areas of the TMD System where PCB concentrations exceeded the U.S. EPA-established screening level of 10 mg/kg. Based on site assessment findings, removal of sediment from the following areas of the TMD System was included in the removal action: (1) along Bon Brae Avenue beginning 600 feet west of Manhattan Avenue and proceeding east to the intersection of Bon Brae and Jefferson Avenues, (2) along Harper Avenue beginning 400 feet south of the intersection of Bon Brae and Harper Avenues and continuing north to Bon Brae Avenue, (3) along B Street beginning 300 feet north of its intersection with Bon Brae Avenue, and (4) along Jefferson Avenue beginning at Bon Brae Avenue and proceeding south to the TMD System outfall immediately south of Ten-Mile Road. Before sediment removal was undertaken, the TMD System was dewatered using high capacity pumps to pump the water from the system through the TMD System outfall and into the canal.

Contaminated sediment was then removed from the TMD System using an approach that involved isolation of the impacted sewer line segments followed by pressure-washing and the removal of sediment, debris, and contact water. Isolation of an impacted area was achieved by installing inflatable plugs to isolate a segment of the sewer. Water in the isolated segment was collected using a vacuum truck and transported to the WWTS. The water was off-loaded into temporary holding tanks,

treated, and discharged via a storm drain. The removal action for the TMD System involved the following general steps for each isolated segment:

(1) Removing sediment in the segment using high-pressure water equipment and a vacuum truck

(2) Staging sediment in the designated staging area

(3) Managing contaminated sediment off site

Steps 1 through 3 are described in greater detail below.

An isolated segment was established in the storm sewer to prevent further migration of impacted sediment. Two rubber pillow plugs (72-inches in diameter) were inserted into different locations along a storm sewer segment through manholes. The plugs were then inflated. Once a storm sewer segment was isolated, the segment was dewatered and washed using a "jetter-vac" system. The jetter-vac system provided clean water under high pressure. The high-pressure water cleaned the interior surfaces of the storm sewer, causing residual materials to collect with water in the isolated segment.

After the jetter-vac system was used on a segment, sediment and water were collected from the segment by a vacuum truck. The vacuum truck system included a hose that was inserted into the segment through catch basins or manholes to collect the water and sediment and pump them into the vacuum truck holding tank. Sediment was allowed to settle; the water was then pumped from the truck into the on-site WWTS.

Sediment collected in the vacuum truck was transferred into roll-off boxes located on Macomb County DPW property. Sediment was stabilized in the roll-off boxes using crystalline quartz. The stabilized material was then transported to the Wayne Disposal, Inc., facility in Belleville, Michigan.

Throughout the removal action process, START conducted confirmatory, post-removal, and quality assurance/quality control sampling of surfaces and materials that might have contacted PCBs in accordance with the TMD PCB Site removal action sampling plan (Tetra Tech 2003). START collected confirmatory wipe samples from large equipment (for example, water pumps, vacuum trucks, and tanks) used during the

removal action to screen for the presence of PCBs after equipment decontamination. In addition, as part of post-removal sampling activities, START collected wipe samples from the inside surfaces of TMD System storm sewer walls adjacent to manholes in order to screen for the presence of PCBs after sediment removal activities had been completed. In general, one wipe sample was collected from the storm sewer interior surface adjacent to selected manholes. Quality assurance/quality control samples were collected as described in the sampling plan (Tetra Tech 2003).

START sent some post-removal wipe samples to the ERRS-procured laboratory for analysis. The rest of the samples were provided to the Macomb County DPW. The Macomb County DPW submitted its wipe samples to a county-procured laboratory for analysis. Significant discrepancies were identified between the analytical results obtained by START and the Macomb County DPW. Because of the discrepancies, U.S. EPA directed START to collect additional post-removal wipe samples from the sewer system and to analyze them through an ERRS-procured laboratory. The analytical results for these additional post-removal samples were consistent with the previous analytical results obtained for post-removal sampling using the ERRS laboratory.

Post-removal wipe sampling locations are shown in Figure 7 at the end of this report. Analytical results for post-removal wipe samples are presented in Attachment 1 at the end of this report. As shown in the attachment, PCB levels for some wipe samples were elevated. Wipe samples were collected from the structure of the storm sewer in areas that had been under sediment and water contaminated with significant concentrations of PCBs; therefore, post-removal wipe samples with elevated levels of PCBs likely resulted from PCBs that were absorbed into, or adhered onto, the surface of the storm sewer structure. U.S. EPA's efforts focused on removing impacted water and sediment that posed an immediate risk to human health and the environment. Because PCBs generally are not mobile, it is likely that PCBs adhered to the storm sewer structure do not present a significant potential for further releases to the canal. However, Macomb County has developed a long term operation and maintenance plan for the TMD System that will monitor residual PCBs to determine if any additional action is warranted to address potential PCB impacts to the structures that comprise the TMD System.

1.3 Additional canal sediment sampling

During the removal action, START conducted two additional canal sediment sampling events to supplement site assessment analytical data and refine the removal areas for the canal. Samples collected during the first event were used to determine where removal action activities should terminate in both the Ten-Mile/Lange and Revere branches of the canal. The removal areas included the areal extent of canal sediment where PCB concentrations exceeded the U.S. EPA-established screening level of 10 mg/kg. Samples collected during the second event were used to verify the removal area in the Ten-Mile/Lange Canal.

For the first and second canal sampling events, sediment samples were collected using boats provided by the U.S. Coast Guard and ERRS, respectively. Sediment samples were collected using 4-foot-long, acetate, Macrocore liners to obtain sediment cores from the sediment surface down to a maximum depth of approximately 24 inches below the sediment surface. The procedures used to collect sediment samples from the canal are described in the TMD PCB Site removal action sampling plan (Tetra Tech 2003).

1.4 Canal sediment excavation

Excavation of canal sediment that was impacted with PCB concentrations greater than U.S. EPA's screening level of 10 mg/kg was a removal action criteria. The cleanup goal established by U.S. EPA was 1 mg/kg for PCBs in sediment. The areal extent of sediment to be excavated from the canal was determined based on the analytical results from the sediment sampling events discussed in the site assessment report (Tetra Tech 2002) and Section I.D.1.3 above.

For the canal, the removal action focused on excavating sediment in the following canal segments:

- For the Revere Canal - A segment extending approximately 400 linear feet south and east of the Lange Avenue bridge that separates Revere Canal from Ten-Mile/Lange Canal, plus an approximately 30-foot-long "hot spot" located approximately 150 feet east of the end of the main removal action area of Revere Canal (see Figure 5).
- For the Ten-Mile/Lange - A segment extending approximately 1,100 linear feet north and east of the Ten-Mile/Lange Avenue bridge that separates Revere Canal from Ten-Mile/Lange Canal (see Figure 5).

The canal removal action was implemented by dividing the canal areas into active cells. To support the removal action, several "treatment cells" also were established. The removal action for PCB-impacted sediment in the canal involved the following general steps:

1. Installing sheet piling in the canal to isolate an active cell and using silt curtains downgradient (generally east) of the active cell to prevent any suspended sediment from migrating outside the removal area
2. Dewatering the active cell by pumping water over the sheet piling into the remaining area of the canal (after this pumping was approved by MDEQ)
3. Excavating canal sediment from the active cell and placing the sediment in one of several designated treatment cells

Any water (for example, rainwater) that entered an active cell or treatment cell during removal activities was managed with other removal activity water (see step one below). Once all of the sediment subject to removal was addressed in a particular active cell, a

new active cell was created. Steps 1 through 3 above were then implemented for the new active cell.

The following steps were conducted in each treatment cell:

1. Dewatering contaminated canal sediment in the treatment cell. Water removed from the sediment was pumped from the cell and processed through the WWTS while it was in operation (see Section 1.8); after use of the WWTS was discontinued, water was allowed to stand in an adjacent cell so that suspended sediments were allowed to settle. Water was then discharged into the canal.

2. Stabilizing the sediment by mixing a commercially available bentonite and polymer additive (in granular form) with the sediment in the treatment cell.

3. Excavating the stabilized mixture.

4. Transporting the stabilized mixture off site for disposal at either the TSCA-certified Wayne Disposal, Inc., facility in Belleville, Michigan, or the non-TSCA-regulated Pine Tree Acres landfill in Lenox, Michigan, based on the analytical results for profiling samples (waste profiling procedures are described in Section I.D.1.9).

During the removal action, a total of eight active cells were established and excavated in the Revere Canal and a total of four active cells were established and excavated in the Ten-Mile/Lange Canal.

Excavation of an active cell was considered complete when visual observation indicated that all sediment had been removed. Confirmation sediment sampling was conducted in each active cell after excavation to determine whether the native, underlying material met the cleanup goal for PCBs of 1 mg/kg. Specific sampling procedures used during the removal action are described in the TMD PCB Site removal action sampling plan (Tetra Tech 2003).

Two approaches were used to collect confirmation samples for the Revere and Ten-Mile/Lange portions of the canal. These approaches are summarized below and are described in detail in the TMD PCB Site removal action sampling plan (Tetra Tech 2003).

The collection of confirmation samples for the eight cells established in the Revere portion of the canal and for cell 2 in the Ten-Mile/Lange portion of the canal included

the following steps. Each active or treatment cell was divided into multiple square grids (depending on cell size) and subcells, which were numbered. One sample was collected from each subcell in the grid, and all of samples (up to nine) from an individual grid were composited in an aluminum pan. A portion of each composite sample was used for the immunoassay field analysis method discussed later in this section. The rest of each composite sample was archived. Figure 8 at the end of this report shows confirmation sampling locations in the Revere Canal.

U.S. EPA Field Environmental Decision Support (FIELDS) team software was used to support sample collection for cells 1, 3, and 4, in the Ten-Mile/Lange portion of the canal. This software allows the input of parameters such as the required upper confidence limit (UCL) and the desired distance between samples. Based on the input of these parameters, the software generates a sampling grid that is overlain with the area to be sampled; the software then identifies random sampling points within the sampling grid. These points are exported as "waypoints" to a global positioning system (GPS). The GPS system includes the specific latitude and longitude location information for each sample. Cells 1, 3, and 4 of the Ten-Mile/Lange Canal were divided into sampling areas and the software was used to create random sampling locations for almost 2,000 sampling points. These points were then loaded into GPS units for use by field personnel. The field personnel used the GPS units to locate and mark sample locations. Over 2,000 samples were then composited in a manner similar to that used for the Revere portion of the canal and cell 2 of the Ten-Mile/Lange portion of the canal; up to nine samples were collected in a given area and used to prepare a composite sample. The composite samples were analyzed in the field using immunoassay methods. A portion of each composite sample also was archived. Figure 9 at the end of this report shows confirmation sampling locations in the Ten-Mile/Lange Canal.

The total PCB concentration in each composite sample collected from the Revere or Ten-Mile/Lange Canal was individually measured at the site using an immunoassay method (RaPID Assay®). The TMD PCB Site removal action sampling plan provides details regarding the procedures used to conduct this analysis (Tetra Tech 2003).

The composite samples collected from each active or treatment cell were considered to form a statistical group and their PCB immunoassay results were evaluated to determine whether the 95 percent UCL for all samples was at or below the PCB cleanup goal of 1 mg/kg. If the 95 percent UCL for all samples collected in the cell was less than or equal to the cleanup goal, no further action would be required unless laboratory analytical results (discussed below) contradicted the field immunoassay results. If the 95 percent UCL for all samples collected in the cell was greater than the cleanup goal of 1 mg/kg, additional excavation and confirmation sampling were conducted. The TMD PCB Site Removal Action Sampling Plan summarizes the statistical analysis used to guide and evaluate the results of the confirmation sampling effort (Tetra Tech 2003).

Approximately one-half of the archived composite samples was submitted to a laboratory for confirmation PCB analysis using U.S. EPA SW-846 Method 8082. Additionally, one sample from each active cell was analyzed for total Resource Conservation and Recovery Act (RCRA) metals using SW-846 Methods 6010B and 7471A. The number of samples sent off site for confirmation analysis varied over time. Specifically, 100 percent of the archived composite samples from the first two active cells were sent off site for laboratory analysis to establish a baseline accuracy rate for the field immunoassay method. The percentage of archived samples sent off site for analysis decreased over time for samples collected from active cells that were addressed later in the removal action; this was based on the positive correlation between immunoassay and laboratory analytical results. Overall, approximately 50 percent (218 samples) of the archived samples were sent off site for confirmation analysis. Of these, 203 agreed with field immunoassay method results regarding whether the PCB concentration in the respective sample was above, or below, the cleanup goal of 1 mg/kg. This represents agreement between the field and laboratory results for 93 percent of the total samples compared. Analytical results for confirmation samples, including results for PCBs and RCRA metals, are summarized in Attachment 1 at the end of this report.

1.5 Residential yard sampling

Several residents who live along the canal currently use, or have historically used, water from the canal to irrigate their lawns and gardens. PCBs in yard soil could result in human exposures to PCBs through ingestion of vegetables grown in the yards, incidental ingestion of soil from the yards, inhalation of suspended soil particles from the yards, or other pathways. For this reason, U.S. EPA investigated the possibility that PCBs could be present in yard soil. U.S. EPA tasked START to survey residents living adjacent to contaminated segments of the canal in order to identify residents who used canal water. Based on the survey results, START conducted yard soil sampling at 15 residences that had a higher probability for the presence of PCBs based on the survey results. This work was conducted as a screening activity to evaluate whether residential properties might have been contaminated through use of canal water for irrigation purposes. For comparison purposes, START established one residence as a background location; this residence was located away from the canal (on Lange Avenue, west of Jefferson Avenue).

For each residence sampled, START collected five surface soil grab samples from each of up to three areas (front yard lawn, back yard lawn, and garden), as appropriate based on water use and the layout of the yard. For each area sampled at a given residence, the five grab samples were composited in a disposable aluminum pan. This process resulted in up to three composite samples for each residence: one representing the front yard, one representing the back yard, and one representing the garden. The samples were collected in accordance with the procedures described in the TMD PCB Site Removal Action Sampling Plan (Tetra Tech 2003). Figure 10 at the end of this report shows the residential yard sampling locations. The composite samples were sent to an off-site laboratory for PCB and RCRA metal analysis.

PCBs were detected in only one composite soil sample collected from a residential yard. The PCB concentration in this sample was 0.86 mg/kg, which was below U.S. EPA's cleanup goal for soil of 1 mg/kg. Sample analytical results were shared with the MDCH, MDEQ, and the MCHD. Analytical results for residential yard samples are provided in Table 2 at the end of this report.

1.6 Wahby Park pond sediment sampling

Water in the Wahby Park pond was pumped to and treated in the on-site WWTS. Following the dewatering procedure, sediment sampling was performed to determine whether pond sediment contained total PCB concentrations above the screening level of 10 mg/kg. For the purposes of sampling, the pond was divided into four circular sections. Using disposable scoops, START collected two samples from each section, for a total of eight samples. Figure 11shows the approximate sampling locations in the Wahby Park pond. The samples underwent laboratory analysis for PCBs by U.S. EPA SW-846 Method 8082.

PCBs were detected in two of the eight samples at concentrat ons of 0.044 and 0.027 mg/kg, well below U.S. EPA's screening level for PCBs in sediment of 10 mg/kg. Because PCB concentrations in Wahby Park pond sediment samples were below the PCB cleanup level, no removal action activities were conducted for sediment in the pond. The pond was refilled with clean, potable water. The analytical results for the Wahby Park pond sediment samples are summarized in Attachment 1 at the end of this report.

1.7 Air monitoring and sampling

During the removal activities at the TMD PCB Site, START collected air samples using National Institute for Occupational Safety and Health (NIOSH) Methods 0500 and 5503; these samples were submitted to a laboratory for particulate and PCB analyses, respectively. Air sampling for particulate analysis was conducted during the early stages of the removal action and on days with high visible dust levels. Air

FIGURE 11 - WAHBY PARK POND SAMPLING LOCATION

sampling locations were selected based on work locations and weather conditions on a given day. In general, air samples were collected at one location upwind and one location downwind of the area where removal activities occurred. The procedures used to collect air samples for particulate and PCB analyses are described in the TMD PCB Site Removal Action Sampling Plan (Tetra Tech 2003).

No air samples contained PCBs at a concentration that would suggest that airborne PCB exposures associated with the removal action or the site in general would result in long-term adverse health effects. PCBs were detected in only 4 of 239 air samples collected and analyzed for PCBs. The highest PCB concentration in a sample collected during the removal action was 0.0066 microgram per cubic meter ($\mu g/m^3$). This value is slightly higher than the U.S. EPA Region 9 Preliminary Remediation Goal (PRG) for total PCBs of 0.0034 $\mu g/m^3$, the primary screening level used to evaluate potential health effects associated with chronic exposure to PCBs in ambient air. This PRG is based on long-term exposure assumptions and was considered a conservative screening level for the site because PCBs would be present in air only for a relatively short time during the removal action. None of the other PCB concentrations detected exceeded the PRG. A second screening level used to evaluate PCBs in air is the NIOSH Recommended Exposure Limit (REL) of 1.0 $\mu g/m^3$. This REL is a time-weighted average exposure value that is considered acceptable for shorter-term exposures. All air sample results were below the NIOSH REL.

Analytical results for ambient air samples collected during the removal action are provided in Attachment 1 at the end of this report.

1.8 On-site water treatment operations

A temporary WWTS was installed on site to treat contact water associated with the removal action. This water included water associated removal activities in the storm sewer, equipment decontamination, infiltration or rainwater that entered the canal cells during removal activities, and Wahby Park pond. The WWTS was installed in the parking lot of the Blossom Heath property (see Figure 2). The WWTS was operated from August 10, until November 21, 2002, and treated approximately 2,349,000 gallons of water. After treatment in the WWTS, water was released to a storm sewer

catch basin in the parking lot of the nearby Blossom Heath property. After the WWTS operation was discontinued, any water associated with removal action work was managed as described later in this section.

The NCP does not require U.S. EPA to obtain a permit to discharge treated wastewater to a storm sewer for activities related to a removal action; however, effluent limit goals were established in coordination with MDEQ. Treated water from the on-site WWTS was sampled daily during system operation to determine the efficiency of the treatment system and to evaluate whether effluent requirements ("MDEQ-equivalent" effluent limitations) were being met. Samples were analyzed for PCBs and total lead. The action level for PCBs in effluent samples was the lowest available method detection limit (0.10 microgram per liter [µg/L]), and the action level for total lead was 46 µg/L.

PCB concentrations in effluent samples ranged from an estimated concentration of 0.04 µg/L (the PCB detection limit for effluent samples was less than 0.10 µg/L) to 1,151 µg/L. Suspended sediment containing PCBs that was present in the wastewater was primarily responsible for the common detection of PCBs in the effluent samples. The suspended sediment was not consistently removed by the WWTS probably because of the size of the filter used. Efforts were made to adjust the WWTS, allow sediment to settle from the effluent, and ensure that the WWTS operated as effectively as possible during the removal action. The majority of the contact water associated with the removal action (over 2 million gallons) was treated using the WWTS, as discussed in pollution reports included as Appendix 1-B of this report. However, based on operational issues, cost, and the removal action schedule, continued use of the WWTS was determined to be infeasible and was discontinued in November 2002 (see also Section III.A).

After the WWTS was discontinued, a one-time discharge of water was conducted to the sanitary sewer after a rain event resulted in water in active cells in the canal. However, other contact water associated with the removal action was discharged to an area of the canal where removal activities were planned (downstream of active cells and upstream of a silt curtain). The water was then allowed to stand in the partitioned portion of the canal, so that sediment could settle. After allowing sediment in the water to settle, the water was pumped into the area of the canal not undergoing removal action activities.

To ensure that this method of water management did not impact the canal, START was directed to resample the canal sediment in the areas potentially impacted by this water management approach.

Analytical results for wastewater treated in the on-site WWTS are presented in Attachment 1 at the end of this report. Sediment sampling results for canal areas that were re-sampled also are presented in that attachment.

1.9 Waste disposal

Sediment removed from the TMD System by vacuum trucks was transferred into roll-off boxes located on the Macomb County DPW property. Sediment was stabilized in the boxes using crystalline quartz. The stabilized material was then transported to the Wayne Disposal, Inc., facility in Belleville, Michigan. All sediment removed from the TMD System was managed as a TSCA-regulated waste.

Sediment removed from the canal was sampled following stabilization in treatment cells. ERRS and START collected composite samples using disposable sampling equipment. Samples of the stabilized sediment were analyzed for PCBs at the site using an immunoassay method and at a laboratory procured by ERRS. PCB analytical results were compared to applicable regulatory protocols for waste profiling.

Generally, PCB concentrations in canal sediment were higher near the TMD System outfall. As sampling proceeded from areas near the outfall to areas further away from the outfall, PCB concentrations in the stabilized sediment decreased. When PCB concentrations in the stabilized sediment were consistently below 50 mg/kg in the areas sampled, sampling was suspended for cells further away from the outfall. For these cells, the stabilized sediment was managed as a non-TSCA-regulated waste.

Based on the waste profiling results, sediment was managed as either TSCA-regulated (greater than 50 mg/kg of PCBs) or non-TSCA-regulated (less than 50 mg/kg of PCBs) and was transported to the appropriate off-site facility. TSCA-regulated waste shipments were manifested and transported to the Wayne Disposal, Inc., facility in Belleville, Michigan. Non-TSCA-regulated waste shipments were transported to the

Pine Tree Acres landfill in Lenox, Michigan. Table 3 below summarizes the quantities of waste managed during the removal action by disposal location.

TABLE 3

WASTE MATERIALS AND THEIR DISPOSITION
TEN-MILE DRAIN POLYCHLORINATED BIPHENYL SITE
ST. CLAIR SHORES, MACOMB COUNTY, MICHIGAN

July 28, 2002, through March 31, 2003

Waste Material	Approximate Amount	Disposition	Location
TSCA-regulated soil and sediment	5,914 tons	Landfilled	Wayne Disposal, Inc., Belleville, Michigan
Non-TSCA-regulated soil and sediment	18,315 tons	Landfilled	Pine Tree Acres, Lenox, Michigan
Removal action contact water treated in on-site WWTS	2,349,000 gallons	Discharged to storm sewer	Storm sewer catch basin in Blossom Heath parking lot (on site)

Notes: TSCA = Toxic Substances Control Act
WWTS = Wastewater treatment system

START and ERRS also collected confirmation soil samples from the sediment staging area to ensure that PCB-contaminated residues were not left on site following the removal action. PCBs were not detected in any confirmation soil samples collected from the staging area. Analytical results for these confirmation soil samples are included in Attachment 1 at the end of this report.

1.10 Demobilization

After removal activities in the TMD System were completed, demobilization was conducted. Equipment and tools were decontaminated and prepared for removal from the site. Wipe samples were collected during demobilization to ensure that decontamination procedures were sufficient and that equipment and tools used during the removal action did not contain residual PCB contamination. Analytical results for these wipe samples are presented in Attachment 1 at the end of this report.

Any remaining rental equipment, trailers, and supplies were removed from the site, and the temporary electrical and telephone services were disconnected. On March 31, 2003, U.S. EPA, START, and EQM completed demobilization of personnel and equipment from the site. Restoration activities associated with the canal continued at the site and were completed during the restoration period. Additional confirmation soil and sediment sampling were also was conducted. Analytical results are presented in Attachment 1 (all non-residential sampling) and Table 2 (residential yard sampling) at the end of this report.

1.11 Treatment, disposal, or alternative technology approaches pursued

Transport and disposal of wastes from the TMD PCB Site were completed between August 14, 2002, and April 1, 2003. A total of 5,914 tons of TSCA-regulated stabilized soil and sediment material was transported to Wayne Disposal, Inc., a licensed facility in Belleville, Michigan. In addition, 18,315 tons of non-TSCA-regulated stabilized soil and sediment material was transported to the Pine Tree Acres facility in Lenox, Michigan. Waste disposition information is summarized in Table 3. Both off-site hazardous waste disposal facilities were determined to be in compliance with the U.S. EPA Off-Site Disposal Policy at the time of waste transport and disposal. All actions taken were consistent with the NCP.

2. Public information and community relations activities

Fact sheets describing removal activities at the TMD PCB Site were generated periodically by U.S. EPA and START between March 2002 and April 2003. Copies of the fact sheets were distributed to appropriate officials and local businesses, residents, and interested parties and were posted on City of St. Clair Shores web site (*http://www.StClairShores.net*).

Specific community relations activities associated with the removal action at the TMD PCB Site included the following in chronological order:

- The lead OSC attended Water Quality Board and City Council meetings to keep city personnel and the public informed about removal activities.
- U.S. EPA provided the City of St. Clair Shores with electronic copies of site assessment findings, fact sheets, weekly progress reports, and sample analytical results. These items are posted on the City of St. Clair Shores web site.
- The Macomb County Health Department established a PCB Hotline (586-466-7023) to address health-related questions and concerns regarding the site.
- An information repository was established for the site at the City of St. Clair Shores Public Library. U.S. EPA provided documents for the repository.
- U.S. EPA supported three press conferences during which reporters accompanied U.S. EPA personnel to sampling locations and interviewed personnel conducting the sampling activities.
- U.S. EPA attended weekly status meetings with city, county, and other agencies to report on removal action progress and address any issues.
- U.S. EPA shared site assessment data with MDEQ and the MDCH. MDCH prepared a health consultation report for the site under a cooperative agreement with the ATSDR. This document is currently available in the information repository and on the City of St. Clair Shores web site.
- U.S. EPA and local officials sent informational letters to residents in the impacted area.
- U.S. EPA worked with Macomb County to issue a fact sheet about PCBs and investigations at the site in March 2002.
- U.S. EPA, with input from the City of St. Clair Shores, issued fact sheets to the general public or to selected residents in the site area in April, August, and November 2002. The April 2002 fact sheet describes the background of the site and preliminary site assessment analytical results. The August and November 2002 fact sheets describe the removal activities completed as of those periods.

- U.S. EPA supported public meetings regarding the site, including a June 2002 open forum meeting with state and local officials that was hosted by the Toxic-Free Shores organization.

- U.S. EPA conducted door-to-door surveys of residents living adjacent to the canal in July 2002. The surveys were conducted to evaluate water use and obtain any necessary access agreements to support the removal action. U.S. EPA assisted the City of St. Clair Shores and residents in moving boats to boat slips outside the removal area during the removal action.

- On August 14, 2002, U.S. EPA and its contractors participated in a public forum at the City of St. Clair Shores Public Library. Approximately 175 residents attended the session and asked questions of U.S. EPA and other response agency personnel.

- The lead OSC (James Augustyn) appeared as a guest of the mayor of St. Clair Shores in a 1-hour television program titled "Mayor's Corner" devoted to the U.S. EPA efforts at the site. The program aired on local cable and government access channels in August and September 2002.

- U.S. EPA worked with the Water Division of MDEQ to prepare a "Sediment Chemistry Survey" for the site and surrounding area dated December 2002.

- U.S. EPA released a press notice dated April 8, 2003, on its web site that states that the removal activities associated with the storm sewer, canal, Wahby Park Pond and associated areas at the TMD PCB Site has been completed and that a restoration project for the sea walls had begun.

E. Resources Committed

Site activities commenced on July 28, 2002. Removal activities in the storm sewer were completed on October 31, 2003 and activities in the canal were completed on March 31, 2003. Site restoration activities associated with the sea walls in the canal were completed on July 16, 2004. Various removal action memoranda and other documentation were completed to explain site needs, request funding, and authorize efforts (see Appendices for this report). All cleanup activities at the site were conducted by U.S. EPA's ERRS contractor, EQM, with oversight and support from U.S. EPA's START contractor. An estimated total of $561,014 was expended on site-related activities by START under Technical Direction Document No. S05-0206-012 (through July 16, 2004). ERRS costs to support the removal action are estimated at $6,890,129. Table 4 summarizes costs incurred for the removal action. The amounts shown are those reported through the dates indicated and are subject to audit and final approval by U.S. EPA; this report is not meant to provide a final reconciliation of the costs associated with the site.

TABLE 4

REMOVAL ACTION ESTIMATED COST SUMMARY
TEN-MILE DRAIN POLYCHLORINATED BIPHENYL SITE
ST. CLAIR SHORES, MACOMB COUNTY, MICHIGAN

Entity	Cost Incurred
START contractor	$561,014 through July 16, 2004
ERRS contractor	$6,890,129 through July 16, 2004
USEPA	$155,700 through July 16, 2004
Total contractor cost	**$7,606,843**

Notes: OSC-controlled costs for U.S. EPA contractors are shown. Other U.S. EPA, state, and local costs are not included in this table. Values are rounded to the nearest whole dollar. The above accounting of expenditures is an estimate based on figures known to the OSC at the time this report is written. The cost accounting provided in this report does not necessarily represent an exact monetary figure which the government may include in any claim for cost recovery.

II. EFFECTIVENESS OF REMOVAL ACTIVITIES

A. Actions Taken by PRPs

U.S. EPA and other agencies were unable to identify a PRP for the PCB release at the TMD PCB Site. U.S. EPA assumed full financial responsibility for the removal action, which was conducted under the authority of CERCLA, Section 104(a). Targeted contaminated sediments were removed in accordance with established health and safety protocols and were disposed of at appropriate facilities.

B. Actions Taken by State and Local Agencies

MDEQ conducted the initial response for the site and actively advised U.S. EPA throughout removal operations. MDCH, with support from ATSDR, authored a health consultation report for the site (which is available on the City of St. Clair Shores web site). The City of St. Clair Shores and Macomb County supported the removal activities and, in some cases, sample analysis. The MCHD posted information on PCBs. Macomb County has developed a long-term operation and maintenance plan for the TMD System and canal to identify and address any residual PCBs that may remain in the concrete structure of the system or in the canal. All parties attended regular communication and planning meetings during the removal action and supported public involvement efforts to keep the community apprised of ongoing and planned activities.

C. Actions Taken by Federal Agencies and Special Teams

The U.S. Coast Guard supported site-related activities by (1) performing an overflight of the area during the site assessment to take aerial photographs and (2) providing boats for use in canal sampling operations during the site assessment and in further canal sediment sampling for the removal action. The aerial photographs supported development of figures used in this report. U.S. EPA TSCA representatives conducted inspections of local businesses in attempts to identify a potential source of the PCB release. The U.S. EPA Region 5 FIELDS team provided technical support and equipment for the removal activities (for example, the software used to select confirmation sampling locations in the Ten-Mile/Lange portion of the canal). The U.S. EPA Criminal Investigation Division supported efforts to locate the source and potential PRPs associated with the site. Aside from the U.S. EPA, START, and ERRS activities described in this report, no other actions were performed by federal agencies or special teams during the removal action.

D. Actions Taken by Contractors, Private Groups, and Volunteers

All on-site removal activities were performed by ERRS on behalf of U.S. EPA in accordance with the scope of work documented in a U.S. EPA-approved work plan. At U.S. EPA's direction, START provided sampling and oversight support throughout the removal action. Various public interest organizations, such as Toxic Free Shores, attended meetings and provided input to the site investigation and removal action process. Also, public citizens attended meetings and forums regarding the site.

III. DIFFICULTIES ENCOUNTERED

A. Items That Affected the Response

Portions of the removal action were conducted during the winter months and temperatures were below average during the winter of 2002 and 2003. As a result, water and sediment in all or part of the canal were frozen, delaying excavation and treatment because of the need for ice breaking and removal activities.

PCBs were commonly detected in effluent samples collected from the on-site WWTS. Fine suspended sediment present in wastewater processed through the WWTS was believed to be primarily responsible for these detections. The detections of PCBs in effluent resulted in increased costs and significant delays in the removal action because of WWTS shutdowns and frequent efforts to improve the efficiency of the WWTS. Based on the time-critical nature of the response and the immediate risk to human health and the environment posed by sediments contaminated with PCBs, U.S. EPA determined that the need to continue with the removal action outweighed the potential for releasing contact water associated with the removal action without treatment. Therefore, use of the WWTS was discontinued in November 2003. At this point, the on-site WWTS had treated over 2 million gallons of removal action contact water.

To minimize the potential effects of discontinuing use of the WWTS, a one-time discharge of contact water to the sanitary sewer was implemented after a rainfall event. Other contact water was subsequently discharged into areas of the canal planned for removal activities, east of active removal operations and west of a silt curtain installed in the canal. Water was allowed to stand in the partitioned area so that sediment could settle. Water was then discharged to the open portion of the canal. After the removal action, areas used to manage this contact water were re-sampled for PCBs in sediment or the underlying clay to ensure no further impact to sediment in these areas of the canal had occurred. Analytical results did not indicate an impact to sediment; analytical results are shown in Attachment 1 at the end of this report.

Because of the complexity of the removal action and the volume of material that had to be addressed, additional action memoranda were prepared to request additional funding. These action memoranda are available as Appendix 1-A to this report.

B. Issues of Intergovernmental Coordination

There were no issues associated with intergovernmental coordination. Throughout the removal action, federal, state, and local agencies cooperated effectively.

C. Difficulties Interpreting, Complying With, or Implementing Policies and Regulations

No difficulties were encountered in interpreting, complying with, or implementing policies and regulations.

IV. RECOMMENDATIONS

A. Means to Prevent a Recurrence of the Discharge or Release

Increased community awareness related to identification of facilities that illegally discharge product or waste into storm sewers might eliminate the need for large-scale removal actions. The community should be provided with information regarding proper disposal of hazardous waste and should have access to a telephone number established to report illegal activities.

B. Means to Improve Removal Activities

No recommendations are offered for improvement of removal activities.

C. Recommendations for New Policy or Regulations and Changes in Current Regulations and Response Plans

No recommendations are offered with regard to policy, regulations, or response plans.

REFERENCES

The list below includes documents cited in the body of the report. Theses documents are included with the appendices to this report (see list of appendices at the beginning of this report).

Tetra Tech EM Inc. (Tetra Tech). 2002. Ten Mile Drain Polychlorinated Biphenyl Site, Site Assessment Report. July.

Tetra Tech. 2003. Ten Mile Drain Polychlorinated Biphenyl Site, Removal Action Sampling Plan. July.

OVERSIZE FIGURES

FIGURES 2 THROUGH 10

Figure 2 - TMD System and Canal

Figure 3 - Sampling Locations and PCB Analytical Results

Figure 4 - Area of Removal Action - TMD System

Figure 5 - Area of Removal Action - Canal

Figure 6 - Areas of Restoration

Figure 7 - Post-Removal Wipe Sampling in the TMD System

Figure 8 - Confirmation Sampling Locations - Revere Canal

Figure 9 - Confirmation Sampling Locations -Ten-Mile/Lange Canal

Figure 10 - Residential Yard Sampling Locations

TABLE 2

SAMPLE ANALYTICAL RESULTS FOR RESIDENTIAL YARDS

ATTACHMENT 1

SAMPLE ANALYTICAL RESULTS EXCLUDING RESIDENTIAL YARDS

This attachment was prepared by Environmental Quality Management, Inc. the U.S. Environmental Protection Agency Environmental Emergency and Rapid Response Services contractor.

August 9, 2004

Mr. James Augustyn
On-Scene Coordinator
Emergency Response Branch
U.S. Environmental Protection Agency Region 5
25089 Center Ridge Road
Westlake, OH 44145

Subject: **Federal On-Scene Coordinator's Report**
Ten-Mile Drain Polychlorinated Biphenyl Site Removal Action
St. Clair Shores, Macomb County, Michigan
Technical Direction Document No. S05-0206-012
Tetra Tech Contract No. 68-W-00-129

Dear Mr. Augustyn:

The Tetra Tech EM Inc. (Tetra Tech) Superfund Technical Assessment and Response Team (START) is submitting the enclosed Federal On-Scene Coordinator's (OSC) Report for the Ten-Mile Drain Polychlorinated Biphenyl (PCB) Site time critical removal action in St. Clair Shores, Macomb County, Michigan. Your comments and suggested changes on the draft have been incorporated.

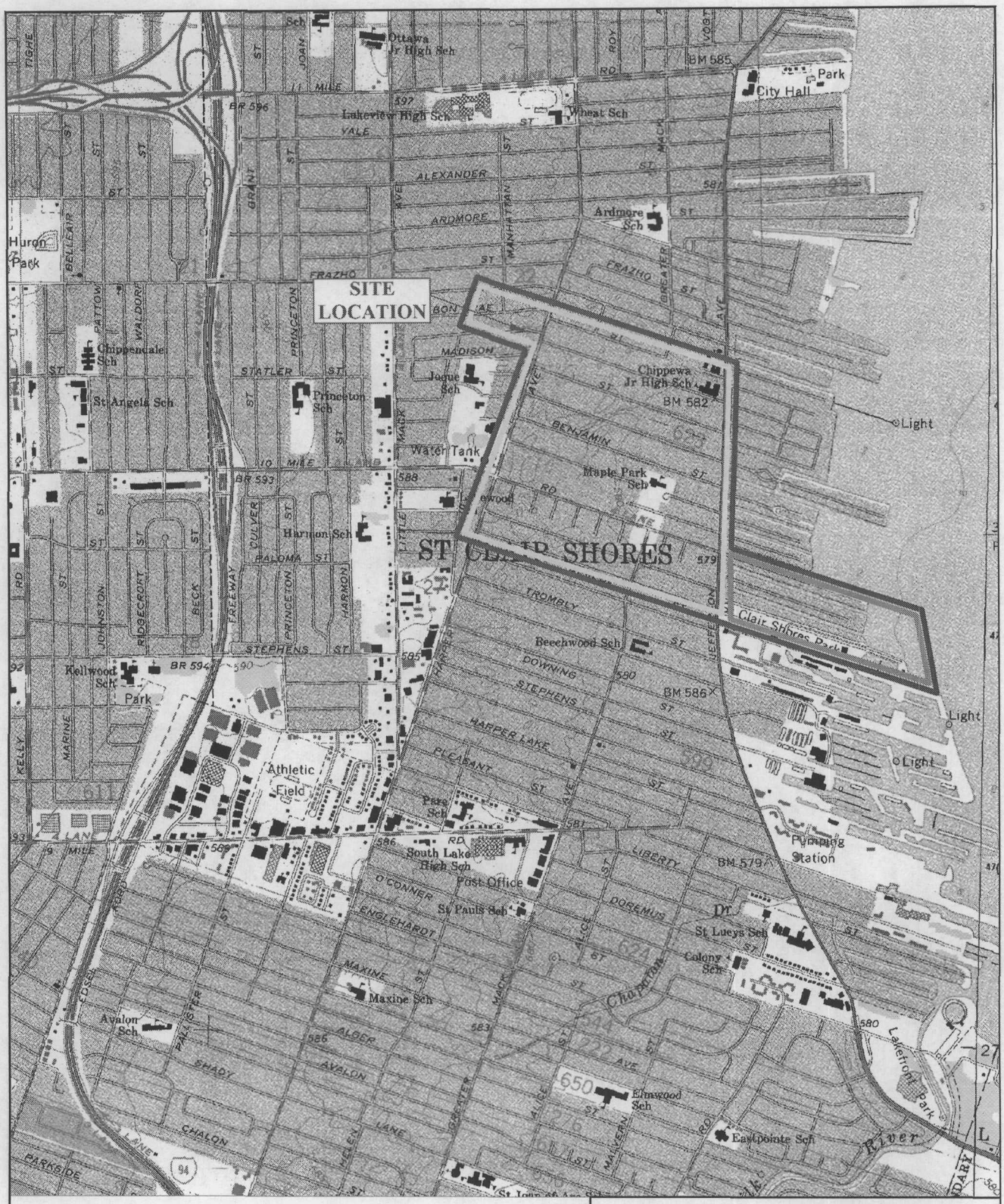
If you have any questions or comments regarding the report or require additional copies, please contact me at (248) 350-9694 or Thomas Kouris at (312) 946-6431.

Sincerely,

David L. Sawicki, C.P.G.
Tetra Tech Project Manager

Enclosure (OSC Report and Appendices)

cc: Lorraine Kosik, U.S. EPA START Project Officer
Thomas Kouris, Tetra Tech START Program Manager



TMD SITE BOUNDARY

CANAL AREA

TMD SYSTEM AREA

0 1000 2000

SCALE IN FEET

SOURCE: MODIFIED FROM U.S. GEOLOGICAL SURVEY, 7.5 MINUTE SERIES TOPOGRAPHIC MAP OF MOUNT CLEMENS EAST, MICHIGAN, QUADRANGLE, 1971

TEN-MILE DRAIN POLYCHLORINATED BIPHENYL
SITE REMOVAL ACTION
ST. CLAIR SHORES, MACOMB COUNTY, MICHIGAN
TDD NO. S05-0206-012

FIGURE 1

SITE LOCATION

Tetra Tech EM Inc.

TABLE 2
SAMPLE ANALYTICAL RESULTS
FOR RESIDENTIAL YARDS
TEN-MILE DRAIN POLYCHLORINATED BIPHENYL SITE
REMOVAL ACTION
ST. CLAIR SHORES, MACOMB COUNTY, MICHIGAN

				Metals							
Address	Street	Sample Location	PCB	Arsenic	Barium	Cadmium	Chromium	Lead	Mercury	Selenium	Silver
[redacted]	Revere	Back yard	ND (0.33)	5.2	68	0.48	19	20 J	0.20	ND (0.20)	ND (0.50)
[redacted]	Revere	Front yard	ND (0.33)	3.8	110	0.76	15	28 J	0.16	ND (0.28)	ND (0.50)
[redacted]	Revere	Garden	ND (0.33)	81	49	0.14	14	11 J	ND (0.10)	ND (0.20)	ND (0.50)
[redacted]	Revere	Back yard	ND (0.33)	6.3	42	0.061	15	25 J	0.12	ND (0.20)	ND (0.50)
[redacted]	Revere	Front yard	ND (0.33)	4.0	58	0.30	19	36 J	0.19	ND (0.20)	ND (0.50)
[redacted]	Revere	Back yard	ND (0.33)	7.4	85	0.42	29	35 J	0.14	ND (0.20)	ND (0.50)
[redacted]	Revere	Front yard	ND (0.33)	5.8	77	1.3	38	100 J	0.19	ND (0.20)	ND (0.50)
[redacted]	Revere	Garden	ND (0.33)	3.8	61	0.55	26	58 J	0.13	ND (0.20)	ND (0.50)
[redacted]	Lange	Back yard	ND (0.33)	1.9	49	0.77	14	92	0.38	2.2	ND (0.50)
[redacted]	Lange	Front yard	ND (0.33)	4.6	63	0.82	22	100	0.58	3.5	ND (0.50)
[redacted]	Lange	Back yard	ND (0.33)	5.7	62	0.35	25	21 J	ND (0.10)	ND (0.20)	ND (0.50)
[redacted]	Lange	Front yard	ND (0.33)	3.0	39	0.16	15	17	ND (0.10)	ND (0.20)	ND (0.50)
[redacted]	Lange	Front yard	ND (0.33)	6.3	42	0.32	17	27 J	ND (0.10)	2.2	ND (0.50)
[redacted]	Lange	Garden	ND (0.33)	25	29	0.43	25	16 J	ND (0.10)	ND (0.20)	ND (0.50)
[redacted]	Lange	Back yard	ND (0.33)	3.3	51	0.55	16	33 J	0.12	ND (0.20)	ND (0.50)
[redacted]	Lange	Front yard	ND (0.33)	3.3	40	0.12	15	35 J	0.10	ND (0.20)	ND (0.50)
[redacted]	Lange	Garden	ND (0.33)	6.2	58	0.75	19	64 J	0.25	1.7	ND (0.50)
[redacted]	Lange	Back yard	0.86	14	47	0.95	32	45 J	0.13	ND (0.20)	ND (0.50)
[redacted]	Lange	Front yard	ND (0.33)	5.3	53	0.91	20	47 J	ND (0.10)	ND (0.20)	ND (0.50)
[redacted]	Lange	Garden	ND (0.33)	7.7	75	0.59	98	56 J	ND (0.10)	ND (0.20)	ND (0.50)
[redacted]	Lange	Back yard	ND (0.33)	5.9	46	0.36	17	36 J	ND (0.10)	ND (0.20)	ND (0.50)
[redacted]	Lange	Front yard	ND (0.33)	4.7	67	0.44	23	27 J	ND (0.10)	ND (0.29)	ND (0.50)
[redacted]	Lange	Seawall	ND (0.33)	15	86	0.55	28	39 J	0.23	ND (0.20)	ND (0.50)
[redacted]	Lange	Back yard	ND (0.33)	19	56	0.47	22	34 J	ND (0.10)	ND (0.20)	ND (0.50)
[redacted]	Lange	Front yard	ND (0.33)	13	47	0.51	23	49 J	0.16	ND (0.20)	ND (0.50)
[redacted]	Lange	Garden	ND (0.33)	3.3	29	0.24	11	12 J	ND (0.10)	ND (0.20)	ND (0.50)
[redacted]	Lange	Back yard	ND (0.33)	24	45	0.76	25	39 J	0.28	ND (0.20)	ND (0.50)
[redacted]	Lange	Front yard	ND (0.33)	16	58	0.88	300	52 J	0.54	ND (0.20)	ND (0.50)
[redacted]	10 Mile	Back yard	ND (0.33)	11	37	0.60	21	38 J	ND (0.10)	ND (0.20)	ND (0.50)
[redacted]	10 Mile	Front yard	ND (0.33)	3.8	52	1.0	23	88 J	0.20	ND (0.20)	ND (0.50)
[redacted]	10 Mile	Garden	ND (0.33)	7.6	55	0.53	16	31 J	0.12	ND (0.20)	ND (0.50)
[redacted]	10 Mile	Back yard	ND (0.33)	6.7	70	1.0	21	31 J	ND (0.10)	ND (0.20)	ND (0.50)
[redacted]	10 Mile	Front yard	ND (0.33)	4.0	46	0.92	23	59 J	ND (0.10)	ND (0.20)	ND (0.50)
[redacted]	10 Mile	Back yard	ND (0.33)	8.1	67	2.3	42	52 J	0.13	ND (0.20)	ND (0.50)
[redacted]	10 Mile	Front yard	ND (0.33)	5.6	51	0.79	20	54 J	ND (0.10)	ND (0.20)	ND (0.50)
[redacted]	10 Mile	Garden	ND (0.33)	14	50	1.7	23	32 J	0.10	ND (0.35)	ND (0.50)

Notes:

All concentrations are reported in units of mg/kg

PCB	Polychlorinated biphenyl
J	Sample concentration is estimated for quality control reasons
ND (0.33)	Analyte was not detected in sample; value in parenthesis is the laboratory reporting limit for the sample