Final Report for Eighteenmile Creek PCB Source Trackdown Project Niagara County, New York

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Prepared for:

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List of Abbreviations and Acronyms

AOC	Area of Concern
CCB	continuous calibration blank
COC	chain-of-custody
DGPS	Differential Global Positioning Systems
E & E	Ecology and Environment, Inc.
EPA	United States Environmental Protection Agency
GIS	geographic information system
LCS	laboratory control sample
MDL	method detection limit
mg/kg	milligram per kilogram
MS/MSD	matrix spike/matrix spike duplicate
NCSWCD	Niagara County Soil and Water Conservation District
NYSBC	New York State Barge Canal
NYSDEC	New York State Department of Environmental Conservation
PCB	polychlorinated biphenyl
ppb	parts per billion
QA/QC	quality assurance/quality control
QAM	Quality Assurance Manual
QAPP	Quality Assurance Project Plan
RAP	Remedial Action Plan
RPD	relative percent difference

List of Abbreviations and Acronyms (cont.)

SDG	sample delivery group
SPDES	State Pollutant Elimination System
SRI/FS	sediment remedial investigation/feasibility study
STL	Severn Trent Laboratories
TAGM	Technical Administrative Guidance and Memorandum
TAL	Target Analyte List
TOC	total organic carbon
USACE	U.S. Army Corps of Engineers

Distribution List

Party	Affiliation and Title	Revision	Date Sent
Eighteenmile Creek QAPP Original Distribution			
Marcia Meredith Galloway	E & E QA Director	0	January 30, 2007
Kris Erickson	E & E Project Manager	0	January 30, 2007
Victor DiGiacomo	NCSWCD Project Manager	0	January 30, 2007
Marie O'Shea	EPA Project Officer	0	January 30, 2007
Greg Sutton	NYSDEC Project Manager	0	January 30, 2007
Tony Friona	USACE Engineer	0	January 30, 2007

Revision List

Revision	Modifications	Distribution

1 Introduction

On behalf of the Niagara County Soil and Water Conservation District (NCSWCD), Ecology and Environment, Inc. (E & E) completed the Eighteenmile Creek Polychlorinated Biphenyl (PCB) Trackdown Study for Eighteenmile Creek, located in Niagara County, New York. The work was performed in accordance with the Quality Assurance Project Plan (QAPP) Eighteenmile Creek PCB Source Trackdown Project prepared by E & E for NCSWCD and approved by the U.S. Environmental Protection Agency (EPA) Region 2 in May 2006.

The purpose of the trackdown project was to further evaluate contamination in Eighteenmile Creek sediments. The specific objectives of the investigation were to:

- Review all available historical sampling data to identify potential PCB sources and future sampling locations of interest, using geographic information system (GIS) technology to accurately depict the data spatially;
- Further evaluate the nature and extent (horizontally and vertically) of PCBs, arsenic, copper, chromium, lead, zinc, and mercury contamination in Eighteen- mile Creek sediment that has the potential to negatively impact the downstream Area of Concern (AOC); and
- Assist and make progress towards de-listing Eighteenmile Creek as an AOC.

This report presents the results of the sampling and analytical program in Section 2 and provides a summary of the review of the historical data in Section 3. Section 4 provides an overview all the PCB results and recommendations for making additional progress toward de-listing of Eighteenmile Creek as an AOC. The remainder of this section provides background information and discusses planned work activities.

Supporting information is included as appendices to the report. The appendices include:

- Appendix A, Laboratory Data and Data Review Memos. A compact disc (CD) of all laboratory reports in .pdf format including case narratives and quality control (QC) sample results. The CD also includes a copy of the data validation memos prepared for each sample delivery group (SDG) of core sampling data.

- Appendix B, PCB Trackdown Supporting Documentation. Supporting tables and field documentation that were too large to include in the report text. Tables B-1 and B-2 are included in Appendix B along with a CD of supporting files documentation that include GIS figures and links and field photographs.

1.1 Project Team

The project team for this work was described in the QAPP. Table 1-1 provides an updated list of the current team. All analytical services were provided by Severn Trent Laboratories, Inc (STL) Buffalo, New York except for analyses for total organic carbon (TOC), which were run at the STL Burlington location.

Table 1-1 Project Team, Eighteenmile Creek PCB Trackdown Study

Key Team Member	Contact Information	
NCSWCD Project Manager	Victor F. DiGiacomo	716-434-4949
EPA Region 2 Project Officer	Barbara Belasco	212-637-3848
E & E QA Director/Program QA Officer	Marcia Meredith Galloway	716-684-8060
E & E Project Manager	Kris Erickson	716-684-8060
E & E Field Team Leader	David Shultz	716-684-8060
E & E Project Chemist	Barbara Krajewski	716-684-8060
Subcontractors		
Laboratory (sediment)	Tony Bogolin Project Manager Severn Trent Laboratories, Inc. 10 Hazelwood Drive Amherst, NY 14228	716-504-9822

The U.S. Army Corps of Engineers (USACE) and New York State Department of Environmental Conservation (NYSDEC) provided historical data reports and participated in project planning to ensure project objectives were coordinated with other related aspects of work at the site.

1.2 Project Background

PCBs contaminate the sediments of Eighteenmile Creek and its AOC. PCBs are factors in restrictions on fish and wildlife consumption, bird and animal deformities, or reproductive problems and degradation of benthos. A surface sediment sample taken during the 1994 Olcott harbor sediment sampling from the Eight-

eenmile Creek AOC contained PCBs at a concentration greater than the NYSDEC guidance for screening of contaminated sediments. Ten of 15 fish flesh samples from the creek contained PCBs at levels above the Food and Drug Administration action level of 2.0 milligrams per kilogram (mg/kg). Additionally, studies of sediment in the creek and surrounding areas have been conducted by NYSDEC upstream of the project area (i.e., the Flintkote Site). (See Section 3 for a complete overview of the historical data.)

Sources and potential sources of PCBs to Eighteenmile Creek have been identified as industrial and municipal wastewater discharges, combined sewer overflows, inactive hazardous waste sites, the New York State Barge Canal (NYSBC) discharge, contaminated sediments already present in the creek, and an unknown source between Olcott Street and North Transit Road. Extensive progress has been made by monitoring discharges and updating State Pollutant Elimination System (SPDES) permits for industrial and municipal wastewater dischargers and de-listing inactive hazardous waste sites. NYSDEC's investigation of areas north of the Flintkote site and the Barge Canal continues to help identify the unknown source of PCBs. NYSDEC expects a full remediation plan to be in place by 2008 for this entire area; however, the need to determine the source of PCBs is critical to the overall remediation plan.

This study hopes to contribute to the progress of implementing the Remedial Action Plan (RAP) for the Eighteenmile Creek AOC by completing a preliminary step necessary to make improvements in overall water quality, habitat, and the health of fish and wildlife. The goal of the remedial action is to restore the chemical, physical, and biological integrity of the AOC ecosystem. Locating upstream sources of contamination to the AOC will aid in this mission and make progress towards the overall goal of de-listing Eighteenmile Creek as an AOC.

1.3 Site Description

Eighteenmile Creek, located in the heart of Niagara County, is surrounded by six highly residential townships. Many citizens own creek-front property from the start of its headwaters in the town of Lockport to its discharge to Lake Ontario in Olcott, New York. The creek is used extensively for fishing, boating, and recreation. The projected sampling location is primarily in a rural/residential area. Sediment contamination in the area upstream of the project study area has impacted residential properties adjacent to the creek.

Sediments are continually migrating downstream. Contaminated sediments in the upper areas of the creek will continue to move downstream and negatively impact the lower areas of creek and the AOC. It is inferred that other "pockets" of contaminated sediment exist in the creek that have the same negative potential. The PCB trackdown study focused on clarifying the location of PCB-, lead-, arsenic-, copper-, chromium-, zinc-, and mercury-contaminated sediments in Eighteenmile

Creek in a historically industrial area of the City of Lockport and downstream of the former Flintkote plant site. Figure 1-1 is a map of the project location.

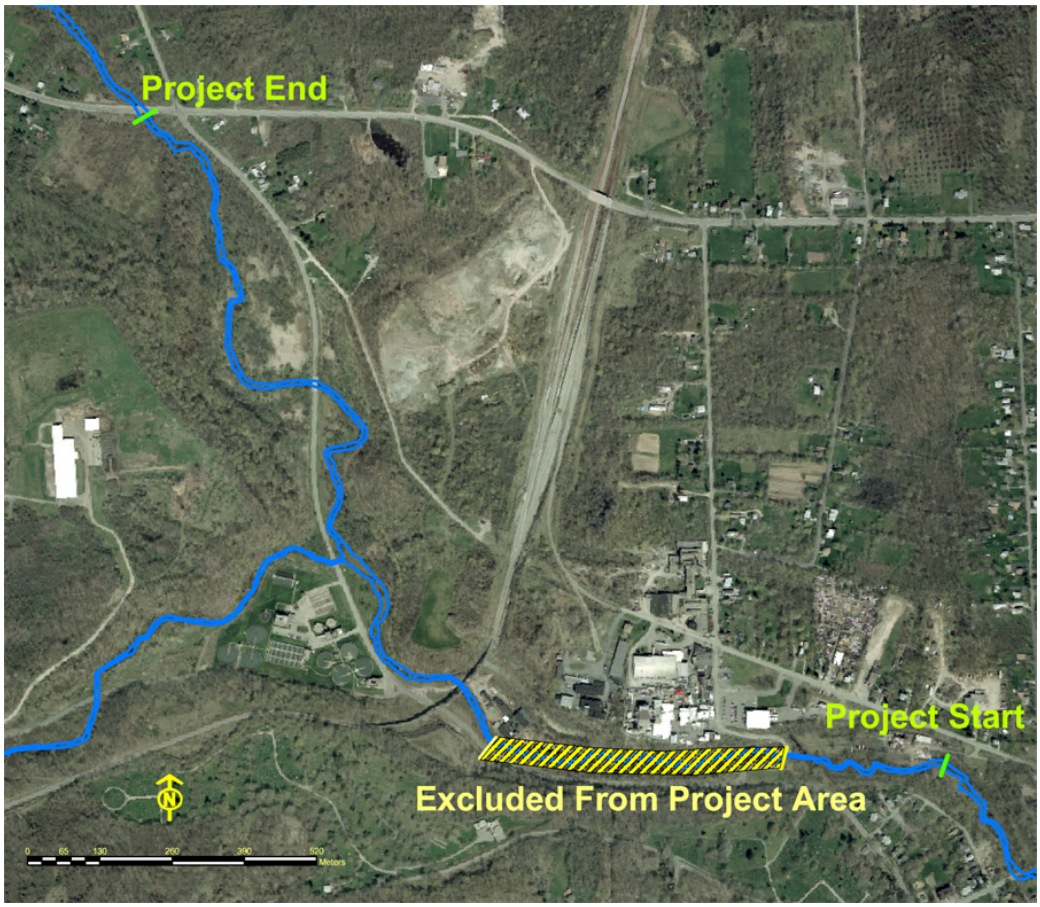

Figure 1-1 Project Location

1.4 Project Tasks

The project has two main tasks: trackdown of sources of contamination and review of historical data.

1.4.1 Source Trackdown Sampling in Eighteenmile Creek

Sediment core sampling in Eighteenmile Creek was conducted from Harwood Street to Stone Road (8,000 feet). Approximately 2,000 feet of creek within this area was not investigated because the gradient of the creek cascading down the Niagara Escarpment is too steep to ensure the safety of the field sampling crews. In addition, the amount of sediment in this area available for sampling is minimal because the water moves too swiftly. Sampling was conducted in a historically industrial area of the City of Lockport and downstream of the former Flintkote plant site. Based on the review of historical data, additional samples were collected from Gulf Creek, a tributary of Eighteenmile Creek, and a small, unmarked

drainage area north and east of the Gulf Creek confluence with Eighteenmile Creek.

The first phases of the sampling effort included collecting surface sediment grab samples for analysis of PCBs using a modified laboratory screening procedure. A total of 80 samples were collected around source areas, areas of deposition, and at defined intervals along the route for PCB screening at a detection limit of 0.25 mg/kg. A complete description of the sampling is provided in Section 2 below.

PCB screening sample results were analyzed within 72 hours. The screening results were used to determine locations for sediment core samples. A total of 12 sediment core samples (3-foot) were collected and analyzed for low level PCBs, selected metals (i.e., arsenic, chromium, copper, lead, zinc, and mercury) and TOCs. PCB concentrations were analyzed at approximately 1-foot intervals. In the original QAPP, metals and TOCs were to be analyzed as a composite of all 3 feet. However, based on the consistency of the PCB screening results and the sediment material, it was determined that analysis of the surface interval for metals was more appropriate. TOC samples were collected from representative sediment types across all the cores. A summary of the planned and actual sample collection is provided on Table 1-2. Section 2 provides a detailed discussion of the analytical results.

Table 1-2 Sampling and Chemical Analysis Summary Table, Eighteenmile Creek PCB Source Trackdown, Lockport, NY

Analysis	Method No.	No. of Field Samples	Field Duplicates	Trip Blanks	Rinseate Blanks	MS/MSD	Total No. of Samples
Sediment Sampling - Planned							
TCL PCBs-Screening	SW 8082 Mod	80	4	–	–	4	84
TCL PCBs	SW 8082	36	0	–	–	0	36
Target Analyte List (TAL) As, Cu, Cr, Pb, Zn, and Hg only (composite)	SW 6010B/ 7471A	12	0	–	–	0	12
TOCs (composite)	Lloyd-Kahn	12	0	–	–	0	12
Sediment Sampling - Actual							
TCL PCBs-Screening	SW 8082 Mod	80	3	–	–	4	83
TCL PCBs	SW 8082	36	0	–	–	3	36
TAL As, Cu, Cr, Pb, Zn, and Hg only (surface interval of each core)	SW 6010B/ 7471A	12	0	–	–	1	12
TOC (select intervals of various cores)	Lloyd-Kahn	12	0	–	–	1	12

1.4.2 Review of Historical Data

All sources of existing data were collected and subject to quality review as described in Section 2.9 of the QAPP. The data were entered into the GIS database and sampling locations were geo-referenced. The PCB results were corrected to be in consistent units and reporting criteria. Meta-data files were created for each data source to indicate pertinent quality information. The historical data are presented in a GIS website (see Section 3).

All sampling sites were logged using a Differential Global Positioning System (DGPS) unit and added to the GIS database. The analytical data collected during the PCB trackdown study also was entered into the database.

Potential PCB sources (historical polluters) in the area were investigated and entered into the GIS database. The GIS database contains the known PCB data and the identified potential sources. The GIS database map was used by E & E and NCSWCD to identify and map key sampling locations. The historical data were combined with the data collected on the PCB source trackdown to provide final contour maps of historical contamination and project potential sources. All data are presented on the GIS website (described in Section 3). The website will be used by NCSWCD and USACE to implement the RAP.

2 Sampling and Analysis Results

This section of the report describes the sampling and analysis results of the Eighteenmile Creek PCB Trackdown Study.

2.1 Field Sampling

The purpose of the sampling project was to further determine the location, nature, and extent of PCB contamination in Eighteenmile Creek sediments. The field program was conducted in phases. During the early phases, PCB samples were collected from surface sediments and screened for PCBs using a medium-level extraction procedure. The results were obtained in 72 hours and the concentrations evaluated in order to determine the next set of sample locations. Table 2-1 provides a summary of the samples collected and the laboratory methods and work orders. Appendix A contains all the associated laboratory data. Appendix B provides a detailed listing of the screening samples.

Sediment core sample locations were determined based upon the results of the preliminary PCB screening round. A total of 12 cores and 36 sediment core samples were collected. Due to the difficulty of extracting 3-foot cores, samples were extracted from the point of refusal. Point of refusal varied from as low as 14 inches to more than 60 inches. Extractions were divided into three intervals according to sample depth. Table 2-2 provides detailed listing of cores collected and field observations. Information about each sample interval is provided in Table 2-3.

All the surface interval core samples (i.e., noted “A”) were analyzed for arsenic, chromium, copper, lead, and mercury. One sample from each core was collected and analyzed for TOCs for a total of 12 TOC samples. TOC samples were chosen by visual observation of changes in each profile that best represented overall soil representation. The samples selected for TOC analyses are noted on Table 2-3.

All samples were collected as described in the QAPP. The screening samples as well as sediment core samples were referenced using a DGPS. The DGPS data were downloaded into the GIS database along with the sample location.

Table 2-1 Summary of Samples and Sample Delivery Groups

Type	Collection Date	No. of Samples	Lab Work Order	Parameter
Screen	7/6/2006	18	A06-7658	PCBs Screen
Screen	7/14/2006	20	A06-8044	PCBs Screen
Screen	7/14/2006	9	A06-8045	PCBs Screen
Screen	7/27/2006	20	A06-8652	PCBs Screen
Screen	7/27/2006	9	A06-8655	PCBs Screen
Screen	7/28/2006	4	A06-8655	PCBs Screen
Screen	9/8/2006	3	A06-A306	PCBs Screen
Core	8/23/2006	5	A06-A671	Metals
Core	8/23/2006	15	A06-9725	PCBs
Core	8/23/2006	5	A06-9732	TOC
Core	8/24/2006	5	A06-A671	Metals
Core	8/24/2006	15	A06-9727	PCBs
Core	8/24/2006	5	A06-9732	TOC
Core	9/8/2006	2	A06-A671	Metals
Core	9/8/2006	6	A06-A304	PCBs
Core	9/8/2006	2	A06-A305	TOC

Table 2-2 Summary of Core Sample Information

Sample ID	Date	Bank	Water Depth	Distance from Bank	Sample Time	Water Flow	Weather
EMC-C-01-SD	23-Aug-06	RDB	9"	2' 9"	9:26	low-mod	clear 60*-68* wind 0-1 S
EMC-C-02-SD	23-Aug-06	RDB	16"	3'	11:30	low-mod	clear 60*-68* wind 0-1 S
EMC-C-03-SD	23-Aug-06	RDB	16"	4'	13:05	low-mod	P/C 73* 3-5 S
EMC-C-04-SD	23-Aug-06	LDB	20"	19'	13:35	mod	clear 75* 5-8 SW
EMC-C-05-SD	23-Aug-06	RDB	8"	6'	14:10	mod-high	clear 75* 5-8 SW
EMC-C-06-SD	24-Aug-06	LDB	12"	2' 8"	9:32	high	M/C 68* 2-5 SW low/N upper
EMC-C-07-SD	24-Aug-06	RDB	7"	5' 3"	10:10	mod	M/C 68* 2-5 SW low/N upper
EMC-C-08-SD	24-Aug-06	RDB	0"	3'	11:35	low	M/C 68* 2-5 SW low/N upper
EMC-C-09-SD	24-Aug-06	LDB	3'	6'	12:00	low-mod	M/C 68* 2-5 SW low/N upper
EMC-C-10-SD	24-Aug-06	LDB	3"	2'	12:45	mod-high	M/C 68* 2-5 SW low/N upper

Table 2-2 Summary of Core Sample Information

Sample ID	Date	Bank	Water Depth	Distance from Bank	Sample Time	Water Flow	Weather
EMC-C-11-SD	9-Sep-06	RDB	12"	4'	9:00	low	P/C 65*-75* 8-15 SW
EMC-C-12-SD	9-Sep-06	LDB	11"	4.5'	10:15	mod	P/C 65*-75* 8-15 SW

Key:

LDB = Left descending bank.
RDB = Right descending bank.

Table 2-3 Summary of Core Sample Intervals

Sample ID	Interval	Depth (inches)	TOC	Sediment Composition	Notes
EMC-C-01-SD	A	0"-10.5"		sand/silt, black organic <50%	Photo SSE #27 and #26/#25 of core
EMC-C-01-SD	B	10"-21"		80% clay/sand dark/gray	Refusal at 37"
EMC-C-01-SD	C	21"-32"	Yes	clay brown	
EMC-C-02-SD	A	0"-8"		organic dark black w/ 75% sand	Photo E #24.
EMC-C-02-SD	B	8"-16"	Yes	organic w/ 75% sand dark/black	Refusal at 25 1/2"
EMC-C-02-SD	C	16"-25"		clay, cobble organic tan black	
EMC-C-03-SD	A	0"-7"		organic w/ dark gray clay	Photo #23-22 E.
EMC-C-03-SD	B	7"-14"	Yes	dark tan clay	Refusal at 25"
EMC-C-03-SD	C	14"-22"		tan clay	
EMC-C-04-SD	A	0"-6"		gravel/coarse sand	Photo #21 NE.
EMC-C-04-SD	B	6"-12"	Yes	gravel w/ dark clay(<25%)	Center channel, best soil profile, other sections of muck did not hold in place 6"-14" captures.
EMC-C-04-SD	C	12"-18"		clay	Refusal at 21"
EMC-C-05-SD	A	0"-6"		silt/sand, 75% gravel	Photo #19 N and #18 S.
EMC-C-05-SD	B	6"-12"		gravel less silt/sand	Very cobbled section of stream, probed 6 locations on RDB because LDB was undercut and all gravel/cobble/stone
EMC-C-05-SD	C	12"-18"	Yes	gravel and rocks	Refusal at 20"
EMC-C-06-SD	A	0"-5"	Yes	organic, wood chip, gravel	Photo #18 S: #11 of core; #10 core sections.
EMC-C-06-SD	B	5"-10"		organic, <% gravel some clay	Looked at 6 other locations; soils were 2"-6"; went for deepest and best profile
EMC-C-06-SD	C	10"-15"		Clay, rock/cobble	Refusal at 18"

Table 2-3 Summary of Core Sample Intervals

Sample ID	Interval	Depth (inches)	TOC	Sediment Composition	Notes
EMC-C-07-SD	A	0"-5"		coarse sand	Photo #17 N; #16 E; #9 of core:
EMC-C-07-SD	B	5"-10"		sand, cobble	In backwater of swift water below rock wall behind sand bar
EMC-C-07-SD	C	10"-15"	Yes	sand with some clay mix	Refusal at 18"
EMC-C-08-SD	A	0"-6"		organic	Photo #15 S #14 E; #8 core section:
EMC-C-08-SD	B	6"-12"	Yes	sand/clay mix gray/black colors	Saturated soils above water level; deep muck.
EMC-C-08-SD	C	12"-18"		black sand/clay 12-15":16-18" gray clay	Refusal at 4 1/2'
EMC-C-09-SD	A	0"-8"		coarse sand, organic mix	Photos #13 NW, #7 core section:
EMC-C-09-SD	B	8"-16"		75% organic, gravel w/ pebbles, red clay	Deep muck >3': refusal at 5': probed to >5'.
EMC-C-09-SD	C	16"-24"	Yes	25% red clay, 75% black clay w/ sand	
EMC-C-10-SD	A	0"-6"		organic w/ sand mix	Photo # 12 NNW, #6 core section:
EMC-C-10-SD	B	6"-12"		sand/clay mix	Top layer deep muck >10": lots of sheen.
EMC-C-10-SD	C	12"-18"	Yes	black clay, last 1" red clay	Refusal at 24"
EMC-C-11-SD	A	0"-9.5"		organic, silts, some coarse sand, gray	No refusal past 3.5'.
EMC-C-11-SD	B	9.5"-19"	Yes	coarse sand w/ silts clay 1/3 bottom	Photo #1 of core sections
EMC-C-11-SD	C	19"-28.5"		clay w/ concretions, organics, silt (lens)	brownish gray in clay layer
EMC-C-12-SD	A	0"-9.5"	Yes	organic, silts, fine sand,	Photo #2 of core sections. Sheen upon retrieval; petroleum odor, dark gray.
EMC-C-12-SD	B	9.5"-19"		silts, organic, fine sand, wood, gray clay silt	Clay increases in depth.
EMC-C-12-SD	C	19"-28.5"		clay- silty gray upper/red brown lower	Both clay sections dry, compacted.

2.2 Sampling Locations

The sampling locations were chosen based on known contamination sources and potential for depositional areas in the Eighteenmile Creek sediments. Figure 2-1 shows the sample locations of both screening and core samples. The field program was conducted in phases. During the early phases, PCB samples were

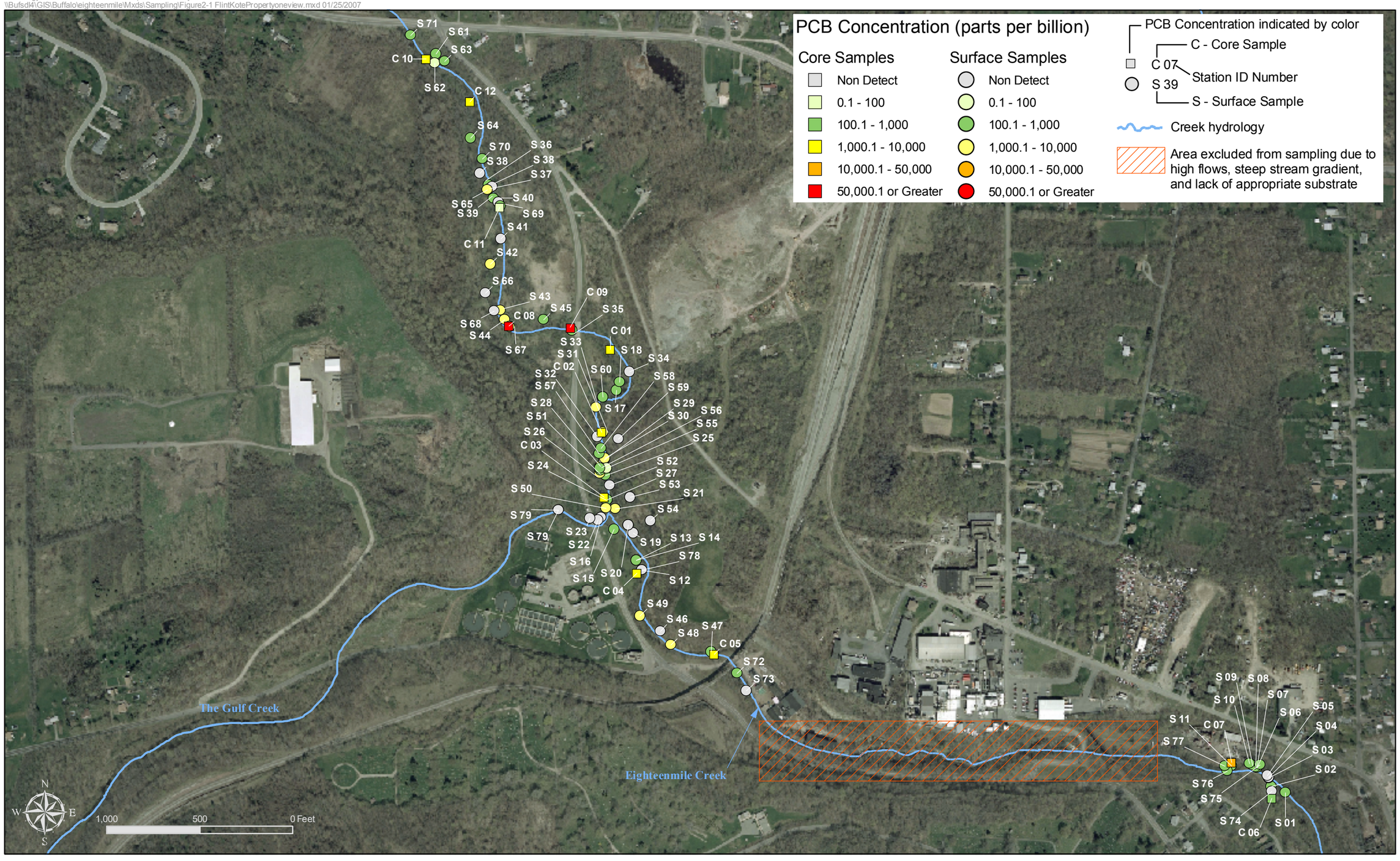

Figure 2-1 PCB Sampling Locations and Concentrations along Eighteenmile Creek

collected within the entire study area. In the later collection phases, locations were chosen to better define potential PCB-contaminated areas. Additional samples were collected from Gulf Creek, a tributary of Eighteenmile Creek along the left descending bank, and from an overflow, emergent wetland along the right descending bank farther downstream to identify potential contributions from the tributaries. The Gulf Creek's confluence and adjacent emergent wetlands along Eighteenmile Creek are located within the project area.

The core samples were selected to cover the entire study area. The cores were located in areas of low flow and high sediment deposition to maximize the depth of the core that could be extracted. The notes on Table 2-3 provide additional information on how core locations and sample intervals were selected.

2.3 Analytical Results

All samples were analyzed as described in the QAPP. Analytical method requirements are listed on Table 2-1. Analytical results for the screening samples are presented on Table 2-4. The screening results show the individual Aroclor mixtures detected in the samples and the total PCB concentration. PCBs were detected in 53 of the 80 samples with concentrations ranging from 59 parts per billion (ppb) to 4,300 ppb.

Analytical results for the core samples are presented on Table 2-5. The core results show the individual Aroclor mixtures detected in the samples and the total PCB concentration. Table 2-5 also shows the concentrations of metals and TOC in select samples. PCBs were detected in 31 of the 36 samples with concentrations ranging from 12 ppb to 69,000 ppb. Metals and TOCs were detected in all core samples as summarized in Table 2-6.

2.3.1 Quality Assurance/Quality Control

The quality assurance/quality control (QA/QC) procedures utilized for the project are described in the QAPP. These procedures were implemented for all activities in the project. E & E performed data review of all the core sample results. The data review memos and laboratory data reports are provided in Appendix A. The following summarizes any QA/QC concerns that may have impacted data usability.

Duplicate Samples

Consistency in both sample collection and sample analysis is checked through analysis of duplicate samples. Duplicate samples consist of aliquots of sample media placed in separate sample containers and labeled as separate samples. Duplicate samples were collected at a rate of approximately one per 20 field samples for the screening samples. Duplicate samples were collected for EMC-S20-SD, EMC-S40-SD, EMC-S60-SD, and EMC-S80-SD. The original sample EMC-S80-D was lost in packaging so only the duplicate was analyzed. The three

Table 2-4 Summary of Aroclor and Total PCB Concentrations in Screening Samples

Sample Identification	Date Collected	Method	Aroclor 1242 (µg/Kg)	Aroclor 1248 (µg/Kg)	Aroclor 1254 (µg/Kg)	PCBs (total) (µg/Kg)
EMC-S01-SD	6-Jul-06	8082	300 U	**170 J**	300 U	**170**
EMC-S02-SD	6-Jul-06	8082	190 U	**230**	190 U	**230**
EMC-S03-SD	6-Jul-06	8082	200 U	200 U	200 U	200 U
EMC-S04-SD	6-Jul-06	8082	200 U	200 U	200 U	200 U
EMC-S05-SD	6-Jul-06	8082	160 U	160 U	160 U	160 U
EMC-S06-SD	6-Jul-06	8082	150 U	**370**	**140 J**	**510**
EMC-S07-SD	6-Jul-06	8082	120 U	**300**	**200**	**500**
EMC-S08-SD	6-Jul-06	8082	110 U	**120**	110 U	**120**
EMC-S09-SD	6-Jul-06	8082	140 U	**190**	**82 J**	**272**
EMC-S10-SD	6-Jul-06	8082	130 U	**580**	**250**	**830**
EMC-S11-SD	6-Jul-06	8082	160 U	1000	160 U	1000
EMC-S12-SD	6-Jul-06	8082	190 U	**170 J**	190 U	**170**
EMC-S13-SD	6-Jul-06	8082	170 U	**460**	170 U	**460**
EMC-S14-SD	6-Jul-06	8082	200 U	**940**	200 U	**940**
EMC-S15-SD	6-Jul-06	8082	160 U	**150 J**	160 U	**150**
EMC-S16-SD	6-Jul-06	8082	140 U	140 U	140 U	140 U
EMC-S17-SD	6-Jul-06	8082	240 U	**620**	240 U	**620**
EMC-S18-SD	6-Jul-06	8082	260 U	**130 J**	260 U	**130**
EMC-S19-SD	14-Jul-06	8082	220 U	220 U	220 U	220 U
EMC-S20-SD	14-Jul-06	8082	160 U	160 U	160 U	160 U
EMC-S20-SD-D	14-Jul-06	8082	160 U	160 U	160 U	160 U
EMC-S21-SD	14-Jul-06	8082	130 U	**1600**	130 U	**1600**
EMC-S22-SD	14-Jul-06	8082	180 U	180 U	180 U	180 U
EMC-S23-SD	14-Jul-06	8082	230 U	230 U	230 U	230 U
EMC-S24-SD	14-Jul-06	8082	150 U	150 U	150 U	150 U
EMC-S25-SD	14-Jul-06	8082	210 U	**520**	**220**	**740**
EMC-S26-SD	14-Jul-06	8082	210 U	**1100**	210 U	**1100**
EMC-S27-SD	14-Jul-06	8082	170 U	**680**	170 U	**680**
EMC-S28-SD	14-Jul-06	8082	170 U	**1700**	170 U	**1700**
EMC-S29-SD	14-Jul-06	8082	250 U	250 U	250 U	250 U
EMC-S30-SD	14-Jul-06	8082	190 U	**2700**	190 U	**2700**
EMC-S31-SD	14-Jul-06	8082	190 U	**2400**	190 U	**2400**
EMC-S32-SD	14-Jul-06	8082	130 U	130 U	130 U	130 U
EMC-S33-SD	14-Jul-06	8082	140 U	**1500**	140 U	**1500**
EMC-S34-SD	14-Jul-06	8082	140 U	140 U	140 U	140 U
EMC-S35-SD	14-Jul-06	8082	210 U	1000	210 U	**1000**
EMC-S36-SD	14-Jul-06	8082	180 U	**830**	180 U	**830**
EMC-S37-SD	14-Jul-06	8082	210 U	**1900**	210 U	**1900**
EMC-S38-SD	14-Jul-06	8082	170 U	170 U	170 U	170 U
EMC-S39-SD	14-Jul-06	8082	260 U	**580**	260 U	**580**
EMC-S40-SD	14-Jul-06	8082	230 U	230 U	230 U	230 U
EMC-S40-SD-D	14-Jul-06	8082	200 U	200 U	200 U	200 U
EMC-S41-SD	14-Jul-06	8082	280 U	280 U	280 U	280 U
EMC-S42-SD	14-Jul-06	8082	210 U	**1100**	210 U	**1100**
EMC-S43-SD	14-Jul-06	8082	170 U	**4300**	170 U	**4300**

Table 2-4 Summary of Aroclor and Total PCB Concentrations in Screening Samples

Sample Identification	Date Collected	Method	Aroclor 1242 (µg/Kg)	Aroclor 1248 (µg/Kg)	Aroclor 1254 (µg/Kg)	PCBs (total) (µg/Kg)
EMC-S44-SD	14-Jul-06	8082	160 U	**1200**	160 U	**1200**
EMC-S45-SD	14-Jul-06	8082	160 U	**640**	160 U	**640**
EMC-S46-SD	27-Jul-06	8082	260 U	260 U	260 U	260 U
EMC-S47-SD	27-Jul-06	8082	110 U	**96 J**	**50 J**	**146**
EMC-S48-SD	27-Jul-06	8082	160 U	**1400**	160 U	**1400**
EMC-S49-SD	27-Jul-06	8082	140 U	**1300**	140 U	**1300**
EMC-S50-SD	27-Jul-06	8082	140 U	**1600**	140 U	**1600**
EMC-S51-SD	27-Jul-06	8082	160 U	**570**	160 U	**570**
EMC-S52-SD	27-Jul-06	8082	230 U	230 U	230 U	230 U
EMC-S53-SD	27-Jul-06	8082	190 U	190 U	190 U	190 U
EMC-S54-SD	27-Jul-06	8082	310 U	310 U	310 U	310 U
EMC-S55-SD	27-Jul-06	8082	200 U	**59 J**	200 U	**59**
EMC-S56-SD	27-Jul-06	8082	130 U	**380**	**120 J**	**500**
EMC-S57-SD	27-Jul-06	8082	140 U	**730**	140 U	**730**
EMC-S58-SD	27-Jul-06	8082	150 U	**650**	150 U	**650**
EMC-S59-SD	27-Jul-06	8082	220 U	220 U	220 U	220 U
EMC-S60-SD	27-Jul-06	8082	210 U	**340**	210 U	**340**
EMC-S60-SD-D	27-Jul-06	8082	210 U	**750**	210 U	**750**
EMC-S61-SD	27-Jul-06	8082	120 U	**460**	**460**	**920**
EMC-S62-SD	27-Jul-06	8082	120 U	**93 J**	120 U	**93**
EMC-S63-SD	27-Jul-06	8082	210 U	**950**	210 U	**950**
EMC-S64-SD	27-Jul-06	8082	180 U	**960**	180 U	**960**
EMC-S65-SD	27-Jul-06	8082	230 U	**1100**	**380**	**1480**
EMC-S66-SD	27-Jul-06	8082	110 U	110 U	110 U	110 U
EMC-S67-SD	27-Jul-06	8082	**1700**	190 U	190 U	**1700**
EMC-S68-SD	27-Jul-06	8082	170 U	170 U	170 U	170 U
EMC-S69-SD	27-Jul-06	8082	160 U	**130 J**	**38 J**	**168**
EMC-S70-SD	27-Jul-06	8082	240 U	**160 J**	240 U	**160**
EMC-S71-SD	27-Jul-06	8082	110 U	**130**	110 U	**130**
EMC-S72-SD	27-Jul-06	8082	160 U	**190**	**70 J**	**260**
EMC-S73-SD	27-Jul-06	8082	140 U	140 U	140 U	140 U
EMC-S74-SD	28-Jul-06	8082	190 U	190 U	190 U	190 U
EMC-S75-SD	28-Jul-06	8082	150 U	**1000**	150 U	**1000**
EMC-S76-SD	28-Jul-06	8082	130 U	**330**	130 U	**330**
EMC-S77-SD	28-Jul-06	8082	110 U	**220**	**54 J**	**274**
EMC-S78-SD	8-Sep-06	8082	330 U	330 U	330 U	330 U
EMC-S79-SD	8-Sep-06	8082	420 U	420 U	420 U	420 U
EMC-S80-SD-D	8-Sep-06	8082	240 U	240 U	240 U	240 U

(1) Bold and Shaded Maximum Value Exceeds Criteria. Bolded values are positive results. Slightly shaded areas indicate samples potentially exceed screening criteria based on bias correction.

Criteria are from New York State Department of Environmental Conservation, Technical and Administrative Guidance and Memorandum, # 4046, Revised Jan. 24, 1994 Determination of Soil Cleanup Objectives and Cleanup Levels

Key:

J = Estimated value ("-" is biased low and "+" is biased high)

U = Non-detect at the reported practical quantitation limit

µg/Kg = micrograms/Kilogram

Table 2-5 Summary of Analytical Results in Core Samples

Sample Identification	Date Collected	Aroclor 1242 (µg/Kg)	Aroclor 1248 (µg/Kg)	Aroclor 1254 (µg/Kg)	Aroclor 1260 (µg/Kg)	PCBs (total) (µg/Kg)
Screening Criteria [1]		1000 (µg/Kg)				1000 (µg/Kg)
EMC-C-01-SD-A	23-Aug-06	**4300**	280 U	280 U	280 U	**4300**
EMC-C-01-SD-B	23-Aug-06	23 U	**16 J**	23 U	23 U	**16**
EMC-C-01-SD-C	23-Aug-06	22 U	22 U	22 U	22 U	22 U
EMC-C-02-SD-A	23-Aug-06	**5400**	490 U	490 U	490 U	**5400**
EMC-C-02-SD-B	23-Aug-06	270 U	**4500**	270 U	270 U	**4500**
EMC-C-02-SD-C	23-Aug-06	**96**	27 U	27 U	27 U	**96**
EMC-C-03-SD-A	23-Aug-06	**7100**	530 U	530 U	530 U	**7100**
EMC-C-03-SD-B	23-Aug-06	24 U	**22 J**	24 U	24 U	**22**
EMC-C-03-SD-C	23-Aug-06	21 U	21 U	21 U	21 U	21 U
EMC-C-04-SD-A	23-Aug-06	**1400**	110 U	**430**	110 U	**1830**
EMC-C-04-SD-B	23-Aug-06	**4100**	260 U	260 U	260 U	**4100**
EMC-C-04-SD-C	23-Aug-06	22 U	22 U	22 U	22 U	22 U
EMC-C-05-SD-A	23-Aug-06	41 U	**860**	**430**	41 U	**1290**
EMC-C-05-SD-B	23-Aug-06	39 U	**470**	**210**	39 U	**680**
EMC-C-05-SD-C	23-Aug-06	410 U	**3700**	410 U	410 U	**3700**
EMC-C-06-SD-A	24-Aug-06	44 U	44 U	44 U	44 U	44 U
EMC-C-06-SD-B	24-Aug-06	**85**	**140**	**93**	**48**	**366**
EMC-C-06-SD-C	24-Aug-06	22 U	22 U	**12 J**	22 U	**12**
EMC-C-07-SD-A	24-Aug-06	2300 U	**6000**	**7300**	1000 J	**14300**
EMC-C-07-SD-B	24-Aug-06	1200 U	**9900**	**16000**	1200 U	**25900**
EMC-C-07-SD-C	24-Aug-06	3100 U	**17000**	**33000**	3100 U	**50000**
EMC-C-08-SD-A	24-Aug-06	3500 U	**20000**	**17000**	**16000**	**53000**
EMC-C-08-SD-B	24-Aug-06	6800 U	**21000**	**16000**	6800 U	**37000**
EMC-C-08-SD-C	24-Aug-06	**30 R**	**390 J-**	**140 J-**	**30 R**	**530 J-**
EMC-C-09-SD-A	24-Aug-06	7300 U	**21000**	**16000**	7300 U	**37000**
EMC-C-09-SD-B	24-Aug-06	4600 U	**69000**	4600 U	4600 U	**69000**
EMC-C-09-SD-C	24-Aug-06	6000 U	**48000**	6000 U	6000 U	**48000**
EMC-C-10-SD-A	24-Aug-06	200 U	**3000**	**4000**	**760**	**7760**
EMC-C-10-SD-B	24-Aug-06	74 U	**830**	**680**	74 U	**1510**
EMC-C-10-SD-C	24-Aug-06	39 U	**230**	**700**	**170**	**1100**
EMC-C-11-SD-A	8-Sep-06	26 U	**67**	**24 J**	26 U	**91**

Table 2-5 Summary of Analytical Results in Core Samples

Sample Identification	Date Collected	Aroclor 1242 (µg/Kg)	Aroclor 1248 (µg/Kg)	Aroclor 1254 (µg/Kg)	Aroclor 1260 (µg/Kg)		PCBs (total) (µg/Kg)
Screening Criteria [1]			1000 (µg/Kg)				1000 (µg/Kg)
EMC-C-11-SD-B	8-Sep-06	30 U	**36**	30 U	30 U		**36**
EMC-C-11-SD-C	8-Sep-06	29 U	**64**	29 U	29 U		**64**
EMC-C-12-SD-A	8-Sep-06	88 UJ	**450 J**	88 UJ	**1600 J**		**2050 J**
EMC-C-12-SD-B	8-Sep-06	42 UJ	42 UJ	42 UJ	42 UJ		42 UJ
EMC-C-12-SD-C	8-Sep-06	24 U	24 U	24 U	24 U		24 U

[1] Bold and Shaded Maximum Value Exceeds Criteria. Bolded values are positive results.

Criteria are from New York State Department of Environmental Conservation, Technical and Administrative Guidance and Memorandum, # 4046, Revised Jan. 24, 1994 Determination of Soil Cleanup Objectives and Cleanup Levels

Key:

J = Estimated value ("-" is biased low and "+" is biased high)

U = Non-detect at the reported practical quantitation limit

µg/Kg = micrograms/Kilogram

Table 2-5 Summary of Analytical Results in Core Samples

Sample Identification	Date Collected	Arsenic - Total (mg/Kg)	Chromium - Total (mg/Kg)	Copper - Total (mg/Kg)	Lead - Total (mg/Kg)	Mercury - Total (mg/Kg)	Zinc - Total (mg/Kg)	Total Organic Carbon (mg/Kg)
Screening Criteria [1]		7.5 (mg/Kg)	10 (mg/Kg)	25 (mg/Kg)	53 (mg/Kg)	0.1 (mg/Kg)	20 (mg/Kg)	
EMC-C-01-SD-A	23-Aug-06	**7**	**118**	**340**	**535**	**0.65**	**1040**	
EMC-C-01-SD-B	23-Aug-06							
EMC-C-01-SD-C	23-Aug-06							**8630**
EMC-C-02-SD-A	23-Aug-06	**9.4**	**612**	**1150**	**1630**	**1.3**	**4540**	
EMC-C-02-SD-B	23-Aug-06							**53200**
EMC-C-02-SD-C	23-Aug-06							
EMC-C-03-SD-A	23-Aug-06	**15.1**	**63.4**	**294**	**282**	**0.61**	**426**	
EMC-C-03-SD-B	23-Aug-06							**14500**
EMC-C-03-SD-C	23-Aug-06							
EMC-C-04-SD-A	23-Aug-06	**5.6**	**135**	**1320**	**300**	**0.35**	**427**	
EMC-C-04-SD-B	23-Aug-06							**35100**
EMC-C-04-SD-C	23-Aug-06							
EMC-C-05-SD-A	23-Aug-06	**5.8**	**77.4**	**1030**	**426**	**0.29**	**430**	
EMC-C-05-SD-B	23-Aug-06							
EMC-C-05-SD-C	23-Aug-06							**40500**
EMC-C-06-SD-A	24-Aug-06	**10.9**	**21.1**	**80**	**246**	**2.5**	**198**	**79800**
EMC-C-06-SD-B	24-Aug-06							
EMC-C-06-SD-C	24-Aug-06							
EMC-C-07-SD-A	24-Aug-06	**12.4**	**83.6**	**1720**	**531**	**0.6**	**1600**	
EMC-C-07-SD-B	24-Aug-06							
EMC-C-07-SD-C	24-Aug-06							**48400**
EMC-C-08-SD-A	24-Aug-06	**6.2**	**113**	**458**	**558**	**0.88**	**927**	
EMC-C-08-SD-B	24-Aug-06							**59300**
EMC-C-08-SD-C	24-Aug-06							
EMC-C-09-SD-A	24-Aug-06	**7.1**	**108**	**771**	**600**	**1.1**	**770**	
EMC-C-09-SD-B	24-Aug-06							
EMC-C-09-SD-C	24-Aug-06							**58500**
EMC-C-10-SD-A	24-Aug-06	**8.8**	**200**	**859**	**1270**	**18.4**	**1530**	
EMC-C-10-SD-B	24-Aug-06							
EMC-C-10-SD-C	24-Aug-06							**86400**
EMC-C-11-SD-A	8-Sep-06	**10.6**	**67.9**	**511**	**1010**	**6**	**1150**	

Table 2-5 Summary of Analytical Results in Core Samples

Sample Identification	Date Collected	Arsenic - Total (mg/Kg)	Chromium - Total (mg/Kg)	Copper - Total (mg/Kg)	Lead - Total (mg/Kg)	Mercury - Total (mg/Kg)	Zinc - Total (mg/Kg)	Total Organic Carbon (mg/Kg)
Screening Criteria [1]		7.5 (mg/Kg)	10 (mg/Kg)	25 (mg/Kg)	53 (mg/Kg)	0.1 (mg/Kg)	20 (mg/Kg)	
EMC-C-11-SD-B	8-Sep-06							**43400**
EMC-C-11-SD-C	8-Sep-06							
EMC-C-12-SD-A	8-Sep-06	**31.3**	**268**	**1040**	**892**	**1.8**	**4050**	**79600**
EMC-C-12-SD-B	8-Sep-06							
EMC-C-12-SD-C	8-Sep-06							

[1] Bold and Shaded Maximum Value Exceeds

Criteria are from New York State Department
24, 1994 Determination of Soil Cleanup Objec

Key:

J = Estimated value ("-" is biased low and "

U = Non-detect at the reported practical qua

µg/Kg = micrograms/Kilogram

samples collected show good precision. Duplicate samples S20 and S40 were all non-detect and the duplicate pair S60 had a relative percent difference (RPD) of 50%.

Table 2-6 Metals and TOC Concentrations in Core Samples

	Minimum Concentration (mg/Kg)	Maximum Concentration (mg/Kg)
Arsenic - Total	5.6	31.3
Chromium - Total	21.1	612
Copper - Total	80	1,720
Lead - Total	246	1,630
Zinc - Total	198	4,540
Mercury - Total	0.29	18.4
Total Organic Carbon	8630	86,400

Laboratory QC Samples

Data quality was evaluated based on sample integrity, holding times, method blank results, spike recoveries, surrogate recoveries, and duplicate precision. A complete sample listing for the samples analyzed is provided in the associated data review memo (Appendix A). The memos list specific analytes outside control limits and associated samples. Many results were reported below reporting limits and flagged "J" as estimated by the laboratory. Other results were flagged "J" as estimated due to minor QC deviations, noted below:

- Samples required dilution because high Aroclor concentrations were present. Surrogates diluted out of several samples. Surrogates also were high in several samples. Interference from Aroclor suspected.

- Results for samples EMC-C-12-SD-1 and EMC-C-12-SD-B qualified "UJ/J" because recovery of both surrogates was outside of control limits.

- Sample EMC-C-06-SD-B was re-extracted and reanalyzed due to conflicting results with its matrix spike/matrix spike duplicate (MS/MSD) sample. Correlation between original and re-extraction results was poor. Sample non-homogeneity suspected.

- Samples were analyzed for metals at dilutions based on levels of zinc present.

- Copper and zinc results qualified "J" based on high RPD values for MSD analysis.

- TOC results for samples EMC-C-01-SD-C, EMC-C-06-SD-A, EMC-C-07-SD-C and EMC-C-08-SD-C were qualified "J" based on continuing calibration blank (CCB) results.

The only potential concern with sample analysis procedures that impacted data usability was that there was no surrogate recovery for sample EMC-C-08-SD-C: The sample could not be reanalyzed, the positive hits qualified "J" with a low bias, and the non-detect results were qualified "R." The results of the sample intervals A and B were very high and the interval C was low. The results are likely bias from the analytical results because this finding is not consistent with the other core data.

2.3.2 Comparison of Screening and Core Sample Results

Under a separate project for NYSDEC, a large number of samples were analyzed for PCBs using a medium-level screening sample by STL, Buffalo using the same procedure used on the Eighteenmile Creek samples. In this, E & E collected a large number of split-sample pairs that were analyzed by both the screening method and the full Method 8082 that was used on the core samples. The PCB results were compared based on the potential for decision errors and similarity of numerical results. The comparison indicates the screening data are useable for making decisions related to site characterization but that the results have a generally low bias, particularly at higher concentrations relative to the standard method PCB analytical results. A mathematical evaluation of the comparison data was completed and showed that, on average, standard Method 8082 gave results about two-thirds higher than Method 8082-screen uncorrected results. In other words, on average, Method 8082-screen results underestimate standard Method 8082 results by approximately 40%.

2.4 Nature and Extent of Contamination

Figure 2-1 depicts the PCB concentrations in the sediment samples using color coded symbols. If no PCBs were detected the symbols are clear. More detailed figures are provided in Appendix B. Figures B-1a to B-1e are a series of five maps showing PCB concentrations in the sediments focusing on specific areas of the creek. Figure B-2 summarizes all the analytical results for PCBs and metals on all samples in the study area. The following sections summarized the nature and extent of PCB and metal contamination.

2.4.1 PCB Contamination

Screening samples indicated that PCBs were detected in all areas of the creek from the Flintkote property to Stone Road. The primary Aroclors detected were Aroclor 1248 and 1254 with some samples containing Arolcor 1242 and 1260. It should be noted that Aroclors 1242 and 1248 and Aroclors 1254 and 1260 are similar chemically. If the PCBs are subject to weathering, the Aroclors are often not distinguishable.

PCBs were not detected in samples from Gulf Creek or from an overflow, emergent wetland along the right descending bank farther downstream. The PCBs appear to be located only in the primary creek bed area. A total of 29 locations indicate high concentrations of PCBs that potentially exceed NYSDEC, Technical and Administrative Guidance and Memorandum (TAGM), # 4046, Determination of Soil Cleanup Objectives and Cleanup Levels (January 24, 1994 rev). The contamination appears to be evenly distributed along the study area.

Core samples were taken from depositional areas at locations along the entire study area. The core samples collected from locations C01 to C05 and C10 to C12 showed concentrations comparable to the screening data. The cores generally had higher concentrations near the surface and lower concentrations near the bottom. Cores collected from locations C07, C08, and C09 showed much higher concentrations than the screening samples. Core C07 was collected near the former Flintkote property along with core C06. The core samples from C06 showed low concentrations of PCBs, but this core was collected nearer the bank in what may have been more of fill area. C07 was collected near the middle of creek in a depositional area and showed higher concentrations at depth. Cores C08 and C09 were collected in a depositional area after the culvert where Plank Road crosses the creek. Concentrations in these cores were higher than the concentrations in the core near the former Flintkote site and indicate another area of potential concern.

TOC concentrations in the samples were very comparable except for the TOC sample collected from C01. The TOC results were averaged for all the sediment samples to determine a single value for the screening correction (i.e., 5.1%). If the lower TOC value was eliminated, the average TOC concentration was 5.4%. The TOC values for higher average and lower concentration in C01 were used to determine site-specific criteria, as shown on Table 2-7. Most of the samples exceeded the criteria for protection of human health, benthos, and wildlife. Only the criteria for acute toxic effects for benthos were not exceeded in any of the samples.

2.4.2 Metals Contamination

Metals were found in core samples at relatively consistent concentrations. No trends that correlate the metals concentrations with the PCB concentrations are apparent. All the samples exceed TAGM soil clean-up criteria for metals. The results indicate metals concentrations in the surface sediments are a concern.

Table 2-7 Comparison of PCB Concentrations to Sediment Criteria

Client ID	Compound	Result ug/kg	TOC gOC/kg	Human Health Sediment Criteria (ug/gOC)	Site Specific Criteria (ug cpd/ kg sediment)	Benthic Aquatic Life Acute Toxicity Water Criteria (ug/l)	Sediment Criteria (ug/gOC)	Site Specific Criteria (ug cpd/ kg sediment)	Benthic Aquatic Life Chronic Toxicity Water Criteria (ug/l)	Sediment Criteria (ug/gOC)	Site Specific Criteria (ug cpd/ kg sediment)	Wildlife Bioaccumulation Water Criteria (ug/l)	Sediment Criteria (ug/gOC)	Site Specific Criteria (ug cpd/ kg sediment)
Fresh Water	PCBs (total)	Avg All Other Cores	54.27	0.0008	0.043416	2	2760.8	149828.616	0.014	19.3	1047.411	0.001	1.4	75.978
Fresh Water	PCBs (total)	Core 1 Only	8.63	0.0008	0.006904	2	2760.8	23825.704	0.014	19.3	166.559	0.001	1.4	12.082
EMC-C-01-SD-A	PCBs (total)	4300			X						X			X
EMC-C-01-SD-B	PCBs (total)	16			X									X
EMC-C-01-SD-C	PCBs (total)	0												
EMC-C-02-SD-A	PCBs (total)	5400			X						X			X
EMC-C-12-SD-A	PCBs (total)	2050			X						X			X
EMC-C-12-SD-B	PCBs (total)	0												
EMC-C-12-SD-C	PCBs (total)	0												
EMC-C-02-SD-B	PCBs (total)	4500			X						X			X
EMC-C-02-SD-C	PCBs (total)	96			X									X
EMC-C-03-SD-A	PCBs (total)	7100			X						X			X
EMC-C-03-SD-B	PCBs (total)	22			X									
EMC-C-03-SD-C	PCBs (total)	0												
EMC-C-04-SD-A	PCBs (total)	1830			X						X			X
EMC-C-04-SD-B	PCBs (total)	4100			X						X			X
EMC-C-04-SD-C	PCBs (total)	0												
EMC-C-05-SD-A	PCBs (total)	1290			X						X			X
EMC-C-05-SD-B	PCBs (total)	680			X									X
EMC-C-05-SD-C	PCBs (total)	3700			X						X			X
EMC-C-06-SD-A	PCBs (total)	0												
EMC-C-06-SD-B	PCBs (total)	910			X									X
EMC-C-06-SD-C	PCBs (total)	12			X									
EMC-C-07-SD-A	PCBs (total)	14300			X						X			X
EMC-C-07-SD-B	PCBs (total)	25900			X						X			X
EMC-C-07-SD-C	PCBs (total)	50000			X						X			X
EMC-C-08-SD-A	PCBs (total)	53000			X						X			X
EMC-C-08-SD-B	PCBs (total)	37000			X						X			X
EMC-C-08-SD-C	PCBs (total)	530			X									X
EMC-C-09-SD-A	PCBs (total)	37000			X						X			X
EMC-C-09-SD-B	PCBs (total)	69000			X						X			X
EMC-C-09-SD-C	PCBs (total)	48000			X						X			X
EMC-C-10-SD-A	PCBs (total)	7760			X						X			X
EMC-C-10-SD-B	PCBs (total)	1510			X						X			X
EMC-C-10-SD-C	PCBs (total)	1100			X						X			X
EMC-C-11-SD-A	PCBs (total)	91			X									X
EMC-C-11-SD-B	PCBs (total)	36			X									

Table 2-7 Comparison of PCB Concentrations to Sediment Criteria

Client ID	Compound	Result ug/kg	TOC gOC/kg	Human Health Sediment Criteria (ug/gOC)	Site Specific Criteria (ug cpd/ kg sediment)	Benthic Aquatic Life Acute Toxicity Water Criteria (ug/l)	Sediment Criteria (ug/gOC)	Site Specific Criteria (ug cpd/ kg sediment)	Benthic Aquatic Life Chronic Toxicity Water Criteria (ug/l)	Sediment Criteria (ug/gOC)	Site Specific Criteria (ug cpd/ kg sediment)	Wildlife Bioaccumulation Water Criteria (ug/l)	Sediment Criteria (ug/gOC)	Site Specific Criteria (ug cpd/ kg sediment)
Fresh Water	PCBs (total)	Avg All Other Cores	54.27	0.0008	0.043416	2	2760.8	149828.616	0.014	19.3	1047.411	0.001	1.4	75.978
Fresh Water	PCBs (total)	Core 1 Only	8.63	0.0008	0.006904	2	2760.8	23825.704	0.014	19.3	166.559	0.001	1.4	12.082
EMC-C-11-SD-C	PCBs (total)	64			**X**									
EMC-C-12-SD-A	PCBs (total)	2050			**X**						**X**			**X**
EMC-C-12-SD-B	PCBs (total)	0												
EMC-C-12-SD-C	PCBs (total)	0												

3 Historical Data Review

E & E is developing a comprehensive GIS database for the Eighteenmile Creek project area that included pollutant-generator/discharge data. The use of GIS is integral to this project because of the amount and type of data involved, the need for all team members to have access to this data, and the benefits of the visual display of analytical results. GIS technology is being used to organize, map, and analyze the geospatial data that has been collected and developed for the study area.

The Eighteenmile Creek project requires that historical data in the GIS repository be subjected to QA/QC procedures to ensure accurate analytical results. As part of this project all the known sources of PCB results in the Eighteenmile Creek project area were reviewed. Table 3-1 presents a summary of the reports reviewed. The following outlines the steps associated with the review.

- Sources were examined for PCB sediment samples that were collected in the project area. If the source was not the original source of data, an attempt was made to locate the original source.
- The PCB concentrations and sample locations were entered into the GIS database if no electronic source was available. Sample locations were digitized into the database if a map reference was not available.
- The data points were plotted on maps and checked to ensure all the points were entered correctly and map coordinates were correct.
- A chemist performed a QA review on the data to evaluate the level of quality associated with the results. Criteria evaluated were original source, knowledge of data collection and laboratory analysis procedures, and presence of supporting documentation.
- A chemist also determined the correction factor for the results so that all PCB concentrations were reported in the GIS in the same units and total concentrations.

- GIS analysts created a file from the original data with corrected PCB values for all sources listed on Table 3-1.

- The data was presented in a GIS website for project personnel to access.

Table 3-1 Summary of Historical Data Sources

Source	QC Level	Date Sampled	Number of Samples
Final Report Eighteenmile Creek Sediment Study Summary of August 17-20 and November 3, 1998 Results. December 2001. Department of Environmental Conservation.	IV	Aug-98	19
	IV	Aug-98	43
Eighteenmile Creek Corridor: New York State Barge Canal to North Transit Road. August 2003 (rev. February 2004). New York State Department of Environmental Conservation.	II	10/12/1994	1
	II	10/27/1995	1
	II	1987	1
	II	1994	4
	III	8/7/1996	6
	IV	11/26/2002	6
	IV	4/16/2002	4
	IV	7/23/2002	6
Final Remedial Alternatives Report Site Investigation/Remedial Alternatives Report (SI/RAR). October 2005. Niagara County Department of Planning, Development and Tourism.	IV	11/26/2002	1
	IV	11/26/2005	2
	IV	2005	18
	IV	4/19/2005	1
	IV	4/26/2005	1
	IV	6/16/2005	2
	IV	7/23/2002	1
	IV	9/11/2003	1
	IV	9/13/2005	11
	IV	9/14/2005	8
	IV	9/14/2006	1
	IV	9/15/2005	16
	IV	9/21/2005	10
	IV	9/22/2005	6
Sediment Sampling, Biological Analysis, and Chemical Analysis for Eighteenmile Creek AOC, Olcott, NY. 2004. U.S. Army Corps of Engineers.	IV	2004	16

Table 3-1 Summary of Historical Data Sources

Source	QC Level	Date Sampled	Number of Samples
Summary of Detected Sediment Sample Analytical Results Compared to Human Health Bioaccumulation NYSEG-Former Transit Street and State Road MGP Sites. June 2005. New York State Electric and Gas Co.	IV	4/10/2005	12
	IV	4/11/2005	15
	IV	4/12/2005	16
	IV	4/9/2005	13

Key:

QC LEVEL

QC Level IV – Data was obtained from a known and documented source, data generation procedures were clearly documented, and quality control review was conducted by source generator.

QC Level III – Data was obtained from a known and documented source. Data generation procedures were assumed to be acceptable based on source information, but clear documentation on the level of QC was not provided.

QC Level II – Data was obtained from a secondary source. Data generation procedures could not be inferred. Sufficient information is available to make the results comparable to other datasets.

Instructions for accessing the historical data are provided in Appendix B.

Source Investigation

E & E reviewed all the data linked to the GIS that had been developed for the project to date. The data represented spill areas, hazardous waste sites, and regulatory data such as SPDES permits. Some single point source data came from other electronic databases and could not be correlated with all the GIS data collected for the project.

E & E also imported the tax parcel data for the study area to determine the landowners or businesses that were adjacent to or near the Eighteenmile Creek study area. E & E overlaid the points for the various data sources and established a link to the tax parcel data. The link allows the GIS user to evaluate potential sources near areas of PCB contamination. If a property was a hazardous waste site and known spill location, the data were linked to determine if this source had a potential relation to the PCB contamination. The GIS source relationships were added as GIS layers to make this a useful tool for the project team.

4 Conclusions and Recommendations

E & E implemented all aspects of the PCB trackdown project. The two main aspects of the project included determining PCB and metals concentrations in the study area and establishing a GIS database with historical data and known sources of environmental contamination.

4.1 Sediment Sampling

The sediment sampling program found that PCBs are present throughout the entire area of the creek. The concentrations are relatively consistent and in many of the samples exceed criteria for soil clean-up and sediment quality. The core samples indicate that PCBs are present in all sediment at depth and only reach background concentrations when native material in the creek bed is reached. The data indicate a potential continual re-suspension and movement of contaminated sediments downstream of the suspected source areas near the former Flintkote site.

The tributaries north of the wastewater treatment plant were eliminated as potential ongoing sources of PCBs. One significant hotspot of PCB contamination was identified in areas north of where Plank Road crosses the creek. The concentrations in these cores exceeded hazardous levels of PCBs. These cores are considered an anomaly and are not consistent with the other sediment samples. The data indicate another potential source of PCBs farther downstream.

The metals data show consistently elevated concentrations in all areas of the creek. The metals concentrations exceeded screening criteria, indicating that their presence could be an ongoing impairment for the AOC.

4.2 GIS Data

The development of the GIS database has resulted in a useful tool for all the stakeholders in the AOC. Future funding will provide additional opportunities to incorporate new data and enhance the interactive and analytical capabilities of the database. The database allows direct comparison of PCB concentrations in all sediment samples. The historical data review points to high concentrations of PCBs in the Barge Canal. The Aroclors detected in the Barge Canal samples are

the same as the Aroclors detected in the PCB sediments in creek, indicating a potential correlation.

NYSDEC is currently implementing a supplemental remedial investigation (SRI)/feasibility study (FS) at the Eighteenmile Creek Corridor (Site No. 932121), located between the Barge Canal NYSBC and Harwood Street in the City of Lockport, Niagara County, New York. One of the purposes of the study, as part of the goal to remediate the former Flintkote site, is to investigate upstream sources and concentrations of PCBs and determine the area and thickness of the contamination.

The GIS data also show that PCBs are present in areas near and around Lockport and near Burt Dam and the Eighteenmile Creek AOC. There are very few sample locations in the creek itself in areas between the Burt Dam and the AOC. The current PCB trackdown data indicate that PCB concentrations can be significant in these areas, particularly in depositional areas.

A review of the potential sources of the PCB contamination indicates that very little data are available from areas north of the industrial section of Lockport. The hot spot farther downstream of the waste water treatment plant indicates some other potential source. The results immediately downstream of the waste water plant indicate no significantly higher concentrations near the plant outflow. The aerial photographs and tax parcels indicate an area east of the canal appears to be significantly disturbed.

4.3 Recommendations

The following are recommendations for further investigation or actions to support the objectives of the RAP:

- The potential for PCB contamination north of Stone Road to the Burt Dam should be investigated similar to the current PCB trackdown work south of Stone Road. The current study showed a potential for significant contamination that was not expected in all areas. The high PCB concentrations downstream may be a continual source of PCBs to the AOC even if upstream sources are eliminated.

- The potential source of PCB contamination in the sediment at the Plank Road crossing should be investigated. The potential for runoff from PCB- contaminated areas could be investigated via soil samples and surveys of properties in this area.

- The GIS database was limited to PCB sediment contamination. The data sources contain other related data that should be included in the database to increase the capabilities of this tool for project stakeholders.

- Compare existing sediment chemistry data for this reach of the creek with sediment quality objectives that will be developed for the AOC by December 31, 2008.

- The hydrology, flow characteristics, and potential concentrations and types of contaminants within Eighteenmile Creek are all influenced by the Erie Canal (New York Barge Canal). Although a Soil and Water Assessment Tool (SWAT) model has been developed, the inputs from the canal complicate the modeling of hydrology within the Eighteenmile Creek watershed. An additional modeling effort should be undertaken to further and more accurately account for inputs from the canal as well as smaller tributaries. A more complete model would allow for a more accurate prediction of sediment loads and pollutant fate and transport flow- related issues throughout the creek and from the canal.

- A more complete sediment model could be combined with additional downstream data to determine the potential recovery of the creek following remediation efforts. The model also could be applied to determine if the high concentrations downstream could be accounted for by sediment re-suspension or whether new PCB sources are present.

- Develop an overall management plan for the Eighteenmile Creek watershed that ties together known air, soil, sediment, and groundwater contamination sources with priorities for the remediation of known sediment hot spots.

- Determine if any current or historical companies can be designated as potentially responsible parties for sediment contamination in Eighteenmile Creek.

A Laboratory Data and Data Review Memos

(Available on CD)

B PCB Trackdown Supporting Documentation

(Remainder of supporting documentation is available on CD.)

Table B-1 List of Photographs Included on CD

Sample ID	Photos
EMC-C-01-SD	Core Photo.
EMC-C-02-SD	East Direction.
EMC-C-03-SD	Photo Unavailable.
EMC-C-04-SD	Northeast Direction.
EMC-C-05-SD	Core Photo, North and South Direction.
EMC-C-06-SD	North and South Directions.
EMC-C-07-SD	Core Photo, North, South and East Direction.
EMC-C-08-SD	Core Photo, South and East Direction.
EMC-C-09-SD	Core and Northwest Direction.
EMC-C-10-SD	Core Photo and Northwest Direction.
EMC-C-11-SD	Core Photo and Northeast Direction.
EMC-C-12-SD	Core Photo.

Table B-2 Summary of Screening Sample Descriptions

Sample ID	Date	Bank	Sediment Composition	Core Location Potential	Depth	Water Depth	Distance from Bank	Time	Water Flow	Weather	Notes
EMC-S01-SD	6-Jul-06	Rdb	sand/silt, saturated, silt/clay	no	10"		5'				
EMC-S02-SD	6-Jul-06	Rdb	fine sand/silt, saturated, organics, silt/clay		14"				low		
EMC-S03-SD	6-Jul-06	Ldb	silt sand, organics, rock/gravel		12"	2.5'	3'		low		
EMC-S04-SD	6-Jul-06	Ldb	silt/sand organics, gravel		6"	4"			low		
EMC-S05-SD	6-Jul-06		silt, sand, organics, silt/clay, gravel/rock		6"		8'		mod-high		
EMC-S06-SD	6-Jul-06	Ldb	silt, coarse sand, gravel, organics, silt/clay		8"	4"			low		
EMC-S07-SD	6-Jul-06		coarse material, coarse sand/gravel		14"	6"					
EMC-S08-SD	6-Jul-06		coarse sand, small gravel, rock/shell fragments		12"	12"					
EMC-S09-SD	6-Jul-06	Ldb	coarse sand, gravel, pebble, some silt	potential	2.5'		10"				
EMC-S10-SD	6-Jul-06	Ldb	coarse sand, pebble, silts, clay/silt	potential	2.5'	18"	6'				
EMC-S11-SD	6-Jul-06	Rdb	coarse sand, gravel, silts, silt/clay	potential	2.5'	10"			mod-high		
EMC-S12-SD	6-Jul-06	Ldb	silt, silt/clay, fine sand, organic	potential	3'	20"	3'				
EMC-S13-SD	6-Jul-06	Ldb	silts, organics, silt/clay, sand	yes	4"	12"	8'				
EMC-S14-SD	6-Jul-06	Ldb	silts, organics, silt/clay, sand	yes	18"				high		
EMC-S15-SD	6-Jul-06	Ldb	dark organics, silt, fine sand, silt/clay, sand gravel	yes	3'	18"	3'				
EMC-S16-SD	6-Jul-06	Ldb	fine -coarse sand, silt, organics	yes		16"	3'		low		
EMC-S17-SD	6-Jul-06	Ldb	organic, silt/sand, silt/clay, clay, loose	yes	3'	5"	2'		low		
EMC-S18-SD	6-Jul-06		organic, silt, sand, silt/clay	yes		4"	4'				

Table B-2 Summary of Screening Sample Descriptions

Sample ID	Date	Bank	Sediment Composition	Core Location Potential	Depth	Water Depth	Distance from Bank	Time	Water Flow	Weather	Notes
EMC-S19-SD	14-Jul-06	Rdb	silt w/ fine sand	potential	6"	1.5'	1'		low	OC, humid-80*, wind 1-5 SW	
EMC-S20-SD	14-Jul-06	Rdb	silty clay, clay w/ gravel coarse sand	potential		2'		9:11	low	OC, humid-80*, wind 1-5 SW	
EMC-S20-SD-D	14-Jul-06	Rdb	silty clay, clay w/ gravel coarse sand	potential		2'		9:15	low	OC, humid-80*, wind 1-5 SW	
EMC-S21-SD	14-Jul-06	Rdb	coarse sand, gravel, some silt		6"	2'	15'			OC, humid-80*, wind 1-5 SW	
EMC-S22-SD	14-Jul-06	Ldb	litter, gravel, coarse sand, some silt		8"	1.5'	3'		stagnant	OC, humid-80*, wind 1-5 SW	Gulf Ck 35' from confluence with 18 Mile Ck, 18' from bridge
EMC-S23-SD	14-Jul-06	Ldb	litter, coarse sand, some gravel, silts	potential	8"	10"	4'		stagnant	OC, humid-80*, wind 1-5 SW	Gulf Ck, upstream from bridge, stagnant water
EMC-S24-SD	14-Jul-06	Rdb	litter, silts, sand, clay		10"	1.5'	4'		low	OC, humid-80*, wind 1-5 SW	downstream confluence of 18 Mile and Gulf Creeks
EMC-S25-SD	14-Jul-06	no de-scend-ing bank	silt, sandy silt, loam w/ coarse sand	potential	8"	3"	center pool		stagnant	OC, humid-80*, wind 1-5 SW	Overland drainage; small stream/wetland flows E-SE, sample from middle pool 35' from confluence with 18 Mile Ck.
EMC-S26-SD	14-Jul-06	Rdb	silts, silty clay w/ organics		10"	6"	3'	11:00	stagnant	OC, humid-80*, wind 1-5 SW	Overland drainage, wetland downstream from confluence of EMC-s15-SD sample
EMC-S27-SD	14-Jul-06	Rdb	silts, fine sand, organic in upper layer		8"	2'	4'	11:08	moderate	OC, humid-80*, wind 1-5 SW	

Table B-2 Summary of Screening Sample Descriptions

Sample ID	Date	Bank	Sediment Composition	Core Location Potential	Depth	Water Depth	Distance from Bank	Time	Water Flow	Weather	Notes
EMC-S28-SD	14-Jul-06	Rdb	silt, sand loam, organics	potential	16"	10"		11:15	low	OC, humid-80*, wind 1-5 SW	18' downstream from confluence of small stream and 18 Mile Ck
EMC-S29-SD	14-Jul-06	Rdb	deep, soft silt, fine sand, organics	potential	12"	1'	5'	11:30	low	OC, humid-80*, wind 1-5 SW	dark sediments w/ petroleum odors
EMC-S30-SD	14-Jul-06	Rdb	silt, fine sand, loam	potential	14"	12"		11:35	moderate	OC, humid-80*, wind 1-5 SW	dark sediments w/ petroleum odors
EMC-S31-SD	14-Jul-06	Rdb	saturated silts w/ organic material, silty clay, fine sand		14"	1.5'	5'	11:56	moderate	OC, humid-80*, wind 1-5 SW	soft, dark sediments w/ petroleum odors
EMC-S32-SD	14-Jul-06	Ldb	organic w/ silts, clay		12"	6"	1'	12:05	moderate	OC, humid-80*, wind 1-5 SW	
EMC-S33-SD	14-Jul-06	Rdb	silt, organics, coarse sand/gravel	difficult	12"	1'		12:25	low	OC, humid-80*, wind 1-5 SW	
EMC-S34-SD	14-Jul-06	Rdb	silt and organics, clay, some gravel	difficult	14"	2'	5'		moderate	OC, humid-80*, wind 1-5 SW	
EMC-S35-SD	14-Jul-06	Ldb	soft and saturated, silt, organics, fine/coarse sand		8"	1.5'	4'		low	OC, humid-80*, wind 1-5 SW	
EMC-S36-SD	14-Jul-06	Ldb	silt, with organics, fine/coarse sand	potential	10"	2'	3'	14:15	low	OC, humid-80*, wind 1-5 SW	strong odor
EMC-S37-SD	14-Jul-06	Ldb	silt, organics, fine sand, saturated	potential	14"	6"	3'	14:30	low	OC, humid-80*, wind 1-5 SW	
EMC-S38-SD	14-Jul-06	Rdb	silts w/ organics	potential	12"	1'		14:40	moderate	OC, humid-80*, wind 1-5 SW	

Table B-2 Summary of Screening Sample Descriptions

Sample ID	Date	Bank	Sediment Composition	Core Location Potential	Depth	Water Depth	Distance from Bank	Time	Water Flow	Weather	Notes
EMC-S39-SD	14-Jul-06	Ldb	silt w/ fine sand and organics	potential	>3'	10"		14:50	low	OC, humid-80*, wind 1-5 SW	very dark, w/ oil sheen in water after pulling auger
EMC-S40-SD	14-Jul-06	Rdb	soft and deep, silt, silty/clay, w/ coarse sand mixed organics	potential	>14"	2'	3'	15:15	low	OC, humid-80*, wind 1-5 SW	
EMC-S40-SD-D	14-Jul-06	Rdb	soft and deep, silt, silty/clay, w/ coarse sand mixed organics	potential	>14"	2'	3'	15:15	low	OC, humid-80*, wind 1-5 SW	
EMC-S41-SD	14-Jul-06	Rdb	super-saturated silt and organic material/dark	potential	>14"	2'	4'	15:35	low	OC, humid-80*, wind 1-5 SW	
EMC-S42-SD	14-Jul-06	Rdb	silts and organics with fine sand	potential	12"	2.5'	6'	15:45	moderate	OC, humid-80*, wind 1-5 SW	soft deep sample area
EMC-S43-SD	14-Jul-06	Rdb		potential	14"	2'	3'		low	OC, humid-80*, wind 1-5 SW	soft deep sample area
EMC-S44-SD	14-Jul-06	Rdb	silt and organic layer, coarse sand	potential	8"	6"	4'	16:15	low	OC, humid-80*, wind 1-5 SW	
EMC-S45-SD	14-Jul-06	Rdb	silt w/ organics, clay/silt, some coarse sand	potential	14"	2'			moderate-fast	OC, humid-80*, wind 1-5 SW	
EMC-S46-SD	27-Jul-06	Rdb	silts/silty clay	potential	10"	14"		8:50	low	Humid-90*, OC, drizzle, wind 8-15 SW	
EMC-S47-SD	27-Jul-06	Rdb	coarse sand, gravel, some silt		10"-12"	10"-12"	4'	9:00	moderate-fast	Humid-90*, OC, drizzle, wind 8-15 SW	
EMC-S48-SD	27-Jul-06	Rdb	silts, some coarse sand, organics, gravel		10"-12"	6"-10"	4'	9:30	low-slack	Humid-90*, OC, drizzle, wind 8-15 SW	

Table B-2 Summary of Screening Sample Descriptions

Sample ID	Date	Bank	Sediment Composition	Core Location Potential	Depth	Water Depth	Distance from Bank	Time	Water Flow	Weather	Notes
EMC-S49-SD	27-Jul-06	Rdb	silt, organic material, silt and clay	potential	14"	8"	1'	9:15	fast	Humid-90*, OC, drizzle, wind 8-15 SW	
EMC-S50-SD	27-Jul-06	Rdb	organic, silt, coarse sand	potential	>12"	2'	20'	9:48	low	Humid-90*, OC, drizzle, wind 8-15 SW	between EMC-s20-SD and EMC-s21-SD in tree fall
EMC-S51-SD	27-Jul-06	Rdb	silts, coarse sand, organic material		8"	0	center pool	10:05	none	Humid-90*, OC, drizzle, wind 8-15 SW	collected in overland drainage 3' from confluence, no water, but saturated.
EMC-S52-SD	27-Jul-06	no descending bank	mud bottom	potential	10"	0	center pool	10:20	none	Humid-90*, OC, drizzle, wind 8-15 SW	collected in overland drainage up from confluence, no water, but damp.
EMC-S53-SD	27-Jul-06	no descending bank	organics, silt, silt-clay, clay		12"	0	center bare ground	10:35	none	Humid-90*, OC, drizzle, wind 8-15 SW	collected in forested wetland up gradient from EMC-s52-SD near abandoned road. Source may be run-off from steeper eastern slope, or from main creek over flow events.
EMC-S54-SD	27-Jul-06	no descending bank	damp and soft	potential	8"	0	center bare ground	10:52	none	Humid-90*, OC, drizzle, wind 8-15 SW	collected in emergent forested wetland
EMC-S55-SD	27-Jul-06	no descending bank	organic layer, silt, silt-clay		10"	0	center bare ground	11:10	none	Humid-90*, OC, drizzle, wind 8-15 SW	in side drainage, shallow overland overflow approx. 80' from EMC-s25-SD
EMC-S56-SD	27-Jul-06	main channel	silt, w/ coarse sand, organics, silty clay		12"	4'		11:25	moderate	Humid-90*, OC, drizzle, wind 8-15 SW	collected near EMC-s26-SD and EMC-s28-SD in mid-channel of CK toward Ldb
EMC-S57-SD	27-Jul-06	Ldb	organics, silt, coarse sand, clay/silt clay	potential	14"	3'	2'	11:40	moderate	Humid-90*, OC, drizzle, wind 8-15 SW	across from EMC-s29-SD

Table B-2 Summary of Screening Sample Descriptions

Sample ID	Date	Bank	Sediment Composition	Core Location Potential	Depth	Water Depth	Distance from Bank	Time	Water Flow	Weather	Notes
EMC-S58-SD	27-Jul-06	Rdb	silty organic, clay, coarse sand, rock-hard pan	potential	8"	3.5'		11:56	fast	Humid-90*, OC, drizzle, wind 8-15 SW	between EMC-s30-SD and EMC-s31-SD
EMC-S59-SD	27-Jul-06	Ldb	silty organic, clay, coarse sand		12"	2'		12:15	low	Humid-90*, OC, drizzle, wind 8-15 SW	between EMC-s32-SD and EMC-s33-SD
EMC-S60-SD	27-Jul-06	Rdb	silty, heavy organic, coarse sand	potential	12"	14"		12:25	low	Humid-90*, OC, drizzle, wind 8-15 SW	sample collected down-stream of EMC-s33-SD
EMC-S60-SD-D	27-Jul-06	Rdb	silty, heavy organic, coarse sand	potential	12"	14"		12:25	low	Humid-90*, OC, drizzle, wind 8-15 SW	sample collected down-stream of EMC-s33-SD
EMC-S61-SD	27-Jul-06	Rdb	rocky, thin layer of silt, coarse sand, clay, rock throughout		6"	1.5'	4'	13:15	moderate	Humid-90*, OC, drizzle, wind 8-15 SW	
EMC-S62-SD	27-Jul-06	Ldb	silt w/ organic, coarse sand, red clay, gravel and rock, clay gleyed gray		10"	3.5'	5'	13:25	moderate	Humid-90*, OC, drizzle, wind 8-15 SW	
EMC-S63-SD	27-Jul-06	Ldb	silt, coarse sand, organics, silty/clay	potential	10"	10"	9"	13:40	moderate	Humid-90*, OC, drizzle, wind 8-15 SW	deep soft sediment
EMC-S64-SD	27-Jul-06	Ldb	dark organic silt, coarse sand, clay, pebble	potential	10"	6"	3'	14:00	moderate	Humid-90*, OC, drizzle, wind 8-15 SW	
EMC-S65-SD	27-Jul-06	Ldb	organic, silts, clay	potential	12"	10"	3'	14:20	low	Humid-90*, OC, drizzle, wind 8-15 SW	
EMC-S66-SD	27-Jul-06	Ldb	silty, w/ organics, clay		14"	3.5'		14:40	low	Humid-90*, OC, drizzle, wind 8-15 SW	
EMC-S67-SD	27-Jul-06	Rdb	silt, coarse sand, organics, clay/silt		14"	2'		14:55	low	Humid-90*, OC, drizzle, wind 8-15 SW	

Table B-2 Summary of Screening Sample Descriptions

Sample ID	Date	Bank	Sediment Composition	Core Location Potential	Depth	Water Depth	Distance from Bank	Time	Water Flow	Weather	Notes
EMC-S68-SD	27-Jul-06	Ldb	silt, organics, tight clay		12"	4'		15:05	low	Humid-90*, OC, drizzle, wind 8-15 SW	
EMC-S69-SD	27-Jul-06	Rdb	silt, coarse sand, organics	potential	10"	2.5'	5'	15:25	low	Humid-90*, OC, drizzle, wind 8-15 SW	
EMC-S70-SD	27-Jul-06	Rdb	silt, coarse sand, organic, saturated		12"	1.5'		16:10	low	Humid-90*, OC, drizzle, wind 8-15 SW	downstream 2' from tributary very little flow in trib.
EMC-S71-SD	27-Jul-06	Rdb	silt w/ sand and rock, organics, red gleyed clay		10"	1.5'	4'	16:40	mod-high	Humid-90*, OC, drizzle, wind 8-15 SW	
EMC-S72-SD	27-Jul-06	Rdb	silt, coarse sand, gravel, pebble		8"	1'	1'	17:10	high	Humid-90*, OC, drizzle, wind 8-15 SW	fast water in narrow channel
EMC-S73-SD	27-Jul-06	Ldb	silt, coarse sand, pebble, gravel, rock		10"	6"		17:20	high	Humid-90*, OC, drizzle, wind 8-15 SW	fast water in narrow channel
EMC-S74-SD	28-Jul-06	Ldb	organic, roots, silt, silt/clay, saturated		8"	2.5'		11:55	low-mod	Humid-90*, OC, wind 5-10 SW	collected 15' upstream from EMC-s02-SD in slack water
EMC-S75-SD	28-Jul-06	Ldb	silt, coarse sand, gravel, pebble		8"	8"		12:20	low	Humid-90*, OC, wind 5-10 SW	collected near EMC-s06-SD
EMC-S76-SD	28-Jul-06	Ldb	silt w/ coarse sand, organic, gravel, clay		8"	6"		12:35	high	Humid-90*, OC, wind 5-10 SW	collected near EMC-s10-SD and EMC-s11-SD near old structure creating fast flow of water, sample from eddy
EMC-S77-SD	28-Jul-06	Rdb	silt, coarse sand, gravel, pebble		7"	1'		12:50	high	Humid-90*, OC, wind 5-10 SW	collected near EMC-s10-SD and EMC-s11-SD near old structure creating fast flow of water, sample from eddy

Table B-2 Summary of Screening Sample Descriptions

Sample ID	Date	Bank	Sediment Composition	Core Location Potential	Depth	Water Depth	Distance from Bank	Time	Water Flow	Weather	Notes
EMC-S78-SD	9-Sep-06	Rdb	organic, silts, some coarse sand, gray	yes	12"	12"	4'	9:00	low	P/C 65*-75* 8-15 SW	extracted from EMC-C-11-SD from profile A
EMC-S79-SD	9-Sep-06	Rdb	coarse sand, minor silts, organic,		8"	7"	3'		low	P/C 65*-75* 8-15 SW	7" gravel/pebble, coarse sand: up Gulf Creek above mid-stream terrace
EMC-S80-SD-D	9-Sep-06	Rdb	coarse sand, minor silts, organic,		8"	7"	3'		low	P/C 65*-75* 8-15 SW	7" gravel/pebble, coarse sand: up Gulf Creek above mid-stream terrace

Accessing the website containing the GIS Database:

"Access to the PCB Trackdown study ArcIMS website can be obtained by authorized persons by contacting Ecology and Environment's GIS group at 716-684-8060 ext 2242.

The website URL is http://gis3.ene.com/eighteenmile/viewer.htm and is viewable with your internet browser without any special downloads or installations"

After the URL is loaded enter your username and password as noted below.