

HRS DOCUMENTATION RECORD--REVIEW COVER SHEET

Name of Site: Eighteenmile Creek

Date Prepared: September 2011

Contact Person:

Documentation Record: Ildefonso Acosta
U.S. Environmental Protection Agency
New York, NY

Pathways, Components, or Threats Not Scored

Surface Water: The Surface Water Migration Pathway Drinking Water Threat was not scored. Water from Eighteenmile Creek is not used for drinking water purposes [Ref. 43, p. 1]. The Human Food Chain and Environmental Threats produce an overall score above the minimum required for the site to qualify for the National Priorities List.

Ground Water: The Ground Water Migration Pathway is not scored because there is not sufficient documentation to score the Ground Water Pathway, nor would the pathway contribute significantly to the site score based on the available data.

Soil Exposure: Although the proposed site consists of a contaminated sediment plume, there are numerous residential properties along the banks of Eighteenmile Creek. During flooding events, the contaminated sediment from Eighteenmile Creek might have contributed to soil contamination. However, soil contamination was not considered in scoring the site at this time because there is not sufficient documentation to score the Soil Exposure Pathway; regardless, the pathway score based on the available data would not affect the listing decision.

Air: No samples were collected to characterize the Air Migration Pathway; there is no documentation of an observed release or of potential contamination. The Air Migration Pathway would not contribute to the site score based on available data.

The Ground Water, Soil Exposure, and Air Pathways might be evaluated further during future investigations because evaluation of those pathways might lead to identification of contributing sources of sediment contamination.

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HRS DOCUMENTATION RECORD

Name of Site: Eighteenmile Creek Date Prepared: September 2011
EPA ID No.: NYN000206456
EPA Region: 2
Street Address of Site*: 198-300 Mill Street, Lockport, NY 14094
County and State: Niagara County, New York
General Location in the State: Western New York State; Southern side of Lake Ontario
Topographic Map: Lockport, NY and Newfane, NY
Latitude*: 43° 10' 52.68" North Longitude*: 78° 41' 22.36" West
Site Reference Point: Eighteenmile Creek just south of its intersection with William Street (midway between 198 and 300 Mill Street), Lockport, New York
[Ref. 3, p. 1; 4, p. 1, 2; 5, p. 1; 10, p. 1]

* The street address, coordinates, and contaminant locations presented in this Hazard Ranking System (HRS) documentation record identify the general area where the site originates. They represent one or more locations EPA considers to be part of the site based on the screening information EPA used to evaluate the site for NPL listing. EPA lists national priorities among the known "releases or threatened releases" of hazardous substances; thus, the focus is on the release, not precisely delineated boundaries. A site is defined as where a hazardous substance has been "deposited, stored, placed, or otherwise come to be located." Generally, HRS scoring and the subsequent listing of a release merely represent the initial determination that a certain area may need to be addressed under CERCLA. Accordingly, EPA contemplates that the preliminary description of facility boundaries at the time of scoring will be refined as more information is developed as to where the contamination has come to be located.

Scores

Ground Water Pathway	Not Scored
Surface Water Pathway	100.00
Soil Exposure Pathway	Not Scored
Air Pathway	Not Scored
HRS SITE SCORE	50.00

**WORKSHEET FOR COMPUTING HRS SITE SCORE
EIGHTEENMILE CREEK**

	<u>S</u>	<u>S²</u>
1. Ground Water Migration Pathway Score (S _{gw}) (from Table 3-1, line 13)	<u>Not Scored</u>	
2a. Surface Water Overland/Flood Migration Component (from Table 4-1, line 30)	<u>100.00</u>	<u>10,000</u>
2b. Ground Water to Surface Water Migration Component (from Table 4-25, line 28)	<u>Not Scored</u>	
2c. Surface Water Migration Pathway Score (S _{sw}) Enter the larger of lines 2a and 2b as the pathway score.	<u>100.00</u>	<u>10,000</u>
3. Soil Exposure Pathway Score (S _s) (from Table 5-1, line 22)	<u>Not Scored</u>	
4. Air Migration Pathway Score (S _a) (from Table 6-1, line 12)	<u>Not Scored</u>	
5. Total of S _{gw} ² + S _{sw} ² + S _s ² + S _a ²	<u>10,000</u>	
6. HRS Site Score Divide the value on line 5 by 4 and take the square root	<u>50.00</u>	

**SURFACE WATER OVERLAND/FLOOD MIGRATION COMPONENT SCORESHEET
EIGHTEENMILE CREEK**

SURFACE WATER OVERLAND/FLOOD MIGRATION COMPONENT Factor Categories & Factors DRINKING WATER THREAT	MAXIMUM VALUE	VALUE ASSIGNED
Likelihood of Release		
1. Observed Release	550	550
2. Potential to Release by Overland Flow		
2a. Containment	10	not scored
2b. Runoff	25	not scored
2c. Distance to Surface Water	25	not scored
2d. Potential to Release by Overland Flow (lines 2a [2b + 2c])	500	not scored
3. Potential to Release by Flood		
3a. Containment (Flood)	10	not scored
3b. Flood Frequency	50	not scored
3c. Potential to Release by Flood (lines 3a x 3b)	500	not scored
4. Potential to Release (lines 2d + 3c)	500	not scored
5. Likelihood of Release (higher of lines 1 and 4)	550	550
Waste Characteristics		
6. Toxicity/Persistence	*	not scored
7. Hazardous Waste Quantity	*	not scored
8. Waste Characteristics	100	not scored
Targets		
9. Nearest Intake	50	not scored
10. Population		
10a. Level I Concentrations	**	not scored
10b. Level II Concentrations	**	not scored
10c. Potential Contamination	**	not scored
10d. Population (lines 10a + 10b + 10c)	**	not scored
11. Resources	5	not scored
12. Targets (lines 9 + 10d + 11)	**	not scored
13. DRINKING WATER THREAT SCORE ([lines 5 x 8 x 12]/82,500)	100	not scored

* Maximum value applies to waste characteristics category.

** Maximum value not applicable

**SURFACE WATER OVERLAND/FLOOD MIGRATION COMPONENT SCORESHEET
EIGHTEENMILE CREEK**

SURFACE WATER OVERLAND/FLOOD MIGRATION COMPONENT Factor Categories & Factors HUMAN FOOD CHAIN THREAT	MAXIMUM VALUE	VALUE ASSIGNED
Likelihood of Release		
14. Likelihood of Release (same as line 5)	550	550
Waste Characteristics		
15. Toxicity/Persistence/Bioaccumulation	*	5.00E+08
16. Hazardous Waste Quantity	*	100
17. Waste Characteristics	1,000	320
Targets		
18. Food Chain Individual	50	45
19. Population		
19a. Level I Concentrations	**	0
19b. Level II Concentrations	**	0.03
19c. Potential Human Food Chain Contamination	**	0.003
19d. Population (lines 19a + 19b + 19c)	**	0.033
20. Targets (lines 18 + 19d)	**	45.033
21. HUMAN FOOD CHAIN THREAT SCORE ([(lines 14 x 17 x 20)/82,500])	100	96.07

- * Maximum value applies to waste characteristics category.
- ** Maximum value not applicable

**SURFACE WATER OVERLAND/FLOOD MIGRATION COMPONENT SCORESHEET
EIGHTEENMILE CREEK**

SURFACE WATER OVERLAND/FLOOD MIGRATION COMPONENT Factor Categories & Factors ENVIRONMENTAL THREAT	MAXIMUM VALUE	VALUE ASSIGNED
Likelihood of Release		
22. Likelihood of Release (same as line 5)	550	550
Waste Characteristics		
23. Ecosystem Toxicity/Persistence/Bioaccumulation	*	5.00E+08
24. Hazardous Waste Quantity	*	100
25. Waste Characteristics	1,000	320
Targets		
26. Sensitive Environments		
26a. Level I Concentrations	**	0
26b. Level II Concentrations	**	100
26c. Potential Contamination	**	not scored
26d. Sensitive Environments (lines 26a + 26b + 26c)	**	100
27. Targets (line 26d)	**	100
28. ENVIRONMENTAL THREAT SCORE ([(lines 22 x 25 x 27]/82,500)	60	60.00
29. WATERSHED SCORE (lines 13 + 21 + 28)	100	100.00
30. SURFACE WATER OVERLAND/FLOOD MIGRATION COMPONENT SCORE (S_{of})	100	100.00
SURFACE WATER MIGRATION PATHWAY SCORE (S_{sw})	100	100.00

* Maximum value applies to waste characteristics category.

** Maximum value not applicable

REFERENCES

- | <u>Reference Number</u> | <u>Description of the Reference</u> |
|-------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1. | U.S. Environmental Protection Agency (EPA). <u>Hazard Ranking System, Final Rule</u> . Federal Register, Volume 55, No. 241, pp. 51532-51667. December 14, 1990. [138 pages] |
| 2. | EPA. <u>Superfund Chemical Data Matrix, SCDM Data Version: 1/28/2004, Appendices B-I (Hazardous Substances Factor Values), B-II (Hazardous Substance Benchmarks) (excerpts)</u> . Downloaded from http://www.epa.gov/superfund/sites/npl/hrsres/tools/scdm.htm on April 6, 2009. [9 pages] |
| 3. | EPA. <u>Superfund Information Systems, CERCLIS Database, Eighteenmile Creek: Site Information</u> . Downloaded from http://cumulis.epa.gov/supercpad/cursites/csinfo.cfm?id=0206456 on July 5, 2011. [1 page] |
| 4. | U.S. Department of the Interior Geological Survey (USGS). <u>Lockport Quadrangle, New York, 7.5-Minute Series (Topographic)</u> . 1980; and <u>Newfane Quadrangle, New York, 7.5-Minute Series Topographic</u> . 1978. [2 maps] |
| 5. | New York State Department of Environmental Conservation Region 9 Division of Environmental Remediation. <u>Remedial Investigation Report Eighteenmile Creek Corridor</u> . September 2006. [243 pages] |
| 6. | Ecology and Environment, Inc. <u>Eighteenmile Creek State of the Basin Report</u> . Prepared for U.S. Army Corps of Engineers and Niagara County Soil and Water Conservation District. December 2007. [216 pages] |
| 7. | Ecology and Environment Engineering, P.C. <u>Final Supplemental Remedial Investigation Report for the Eighteenmile Creek Corridor Site</u> . Prepared for New York State Department of Environmental Conservation. July 2009. [624 pages] |
| 8. | Ecology and Environment Engineering, P.C. <u>Final Additional Investigation Addendum to the Supplemental Remedial Investigation Report for the Eighteenmile Creek Corridor Site</u> . Prepared for New York State Department of Environmental Conservation. July 2009. [170 pages] |
| 9. | CH2M Hill, Ecology and Environment, Inc., Environmental Design International, Inc., and Teska Associates, Inc. <u>Data Summary Report Site Characterization of the Eighteenmile Creek Area of Concern</u> . Prepared for U.S. Environmental Protection Agency. March 2011. [6,894 pages] |
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| 11. | USEPA Contract Laboratory Program. <u>Modifications Updating SOM01.1 to SOM01.2</u> . Date Amended: April 11, 2007. [129 pages] |
| 12. | Capriglione, Michele, Weston Solutions, Inc. <u>Project Note to Eighteenmile Creek HRS Site File, Subject: Type of surface water body determination for Eighteenmile Creek</u> . July 5, 2011. [7 pages] |

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- | <u>Reference Number</u> | <u>Description of the Reference</u> |
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| 15. | Bogolin, Anthony, STL Buffalo. <u>Analytical Report Job#: A07-3976,A07-4048,A07-4052; STL Project#: NY5A9393.3; SDG#: A73976; Site Name: Ecology and Environment NYSDEC Standby; Task: 18 Mile Creek Site-002699.ID19.02.</u> May 15, 2007. [2,272 pages] |
| 16. | Bogolin, Anthony, STL Buffalo. <u>Analytical Report Job#: A07-4049,A07-4053,A07-4121; STL Project#: NY5A9393.3; SDG#: A74049; Site Name: Ecology and Environment NYSDEC Standby; Task: 18 Mile Creek Site-002699.ID19.02.</u> May 15, 2007. [2,301 pages] |
| 17. | Bogolin, Anthony, STL Buffalo. <u>Analytical Report Job#: A07-4119,A07-4120,A07-4125,A07-4126; STL Project#: NY5A9393.3; SDG#: A74119; Site Name: Ecology and Environment NYSDEC Standby; Task: 18 Mile Creek Site-002699.ID19.02.</u> May 15, 2007. [2,161 pages] |
| 18. | Bogolin, Anthony, STL Buffalo. <u>Analytical Report Job#: A07-4182,A07-4187; STL Project#: NY5A9393.3; SDG#: A74182; Site Name: Ecology and Environment NYSDEC Standby; Task: 18 Mile Creek Site-002699.ID19.02.</u> May 21, 2007. [1,968 pages] |
| 19. | Bogolin, Anthony, STL Buffalo. <u>Analytical Report Job#: A07-4183,A07-4188; STL Project#: NY5A9393.3; SDG#: A74183; Site Name: Ecology and Environment NYSDEC Standby; Task: 18 Mile Creek Site-002699.ID19.02.</u> May 21, 2007. [2,009 pages] |
| 20. | Bogolin, Anthony, STL Buffalo. <u>Analytical Report Job#: A07-4235,A07-4237; STL Project#: NY5A9393.3; SDG#: A74235; Site Name: Ecology and Environment NYSDEC Standby; Task: 18 Mile Creek Site-002699.ID19.02.</u> May 21, 2007. [2,128 pages] |
| 21. | Bogolin, Anthony, STL Buffalo. <u>Analytical Report Job#: A07-4236,A07-4238; STL Project#: NY5A9393.3; SDG#: A74236; Site Name: Ecology and Environment NYSDEC Standby; Task: 18 Mile Creek Site-002699.ID19.02.</u> May 24, 2007. [2,148 pages] |
| 22. | Bogolin, Anthony, STL Buffalo. <u>Analytical Report Job#: A07-4304,A07-4305; STL Project#: NY5A9393.3; SDG#: A74304; Site Name: Ecology and Environment NYSDEC Standby; Task: 18 Mile Creek Site-002699.ID19.02.</u> May 24, 2007. [2,027 pages] |
| 23. | Daniels, Anthony, Weston Solutions, Inc. <u>Documentation of Communication between Sue Donaldson and Guy Boos of Les Allen Bait and Tackle. Subject: Documentation of Fish Caught for Consumption at Burt Dam/Fisherman's Park.</u> June 3, 2011. [1 page] |

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- | <u>Reference Number</u> | <u>Description of the Reference</u> |
|-------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 24. | Capriglione, Michele, Weston Solutions, Inc. <u>Project Note to Eighteenmile Creek HRS Site File, Subject: Distance Calculations Using ArcGIS 10.0 (with attached site location map).</u> June 3, 2011. [3 pages] |
| 25. | Ecology and Environment. <u>18 Mile Creek Logbook, Job Number 002699.ID19.02.</u> April 16, 2007 – June 12, 2007. [49 pages] |
| 26. | Bogolin, Anthony, STL Buffalo. <u>Analytical Report Job#: A07-4304,A07-4319,A07-4455; STL Project#: NY5A9393.3; SDG#: A74303; Site Name: Ecology and Environment NYSDEC Standby; Task: 18 Mile Creek Site-002699.ID19.02.</u> May 23, 2007. [2,697 pages] |
| 27. | EPA. <u>Using Qualified Data to Document an Observed Release and Observed Contamination.</u> November 1996. [18 pages] |
| 28. | Weston Solutions, Inc. Region 5 Superfund Technical Assessment and Response Team. <u>Site Logbook No. 1400-4E-ANSF with attached photo documentation log.</u> June 2011. [33 pages] |
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| 30. | Capriglione, Michele, Weston Solutions, Inc. <u>Project Note to Eighteenmile Creek HRS Site File, Subject: Data Validation Qualifier Information, with attachments from EPA Region 2, EPA Great Lakes National Program Office, and Ecology and Environment, Inc.</u> July 7, 2011. [46 pages] |
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| 36. | New York State Department of Health. <u>Chemicals in Sportfish and Game, Health Advisories.</u> 2010-1011. [39 pages] |

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- | <u>Reference Number</u> | <u>Description of the Reference</u> |
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| 37. | Capriglione, Michele, Weston Solutions, Inc. <u>Project Note to Eighteenmile Creek HRS Site File, Subject: Determination of Eighteenmile Creek as Significant Coastal Fish and Wildlife Habitat, with attachments from the New York State Department of State and New York State Department of Environmental Conservation.</u> July 19, 2011. [6 pages] |
| 38. | Capriglione, Michele, Weston Solutions, Inc. <u>Project Note to Eighteenmile Creek HRS Site File, Subject: Calculation of Sample Quantitation Limits (SQLs).</u> July 21, 2011. [5 pages] |
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| 41. | New York State Department of Environmental Conservation Region 9 Division of Environmental Remediation. <u>Site Investigation Report Former Flintkote Plant Site, 198 and 300 Mill Street, City of Lockport, Niagara County, New York.</u> September 2000. [130 pages] |
| 42. | New York State Department of Environmental Conservation Division of Environmental Remediation. <u>Record of Decision Eighteenmile Creek Corridor Site, Operable Unit Nos. 1, 3, 4, 5 and 6, State Superfund Project, Lockport, Niagara County, New York, Site Number 932121.</u> March 2010. [79 pages] |
| 43. | Capriglione, Michele, Weston Solutions, Inc. <u>Documentation of Communication between Victor DiGiacomo of Niagara County Soil and Water Conservation District, Subject: Determination of usage of Eighteenmile Creek.</u> July 14, 2011. [1 page] |

SITE SUMMARY

The Eighteenmile Creek site (CERCLIS ID No. NYN000206456) in Niagara County, New York consists of contaminated sediments and water of Eighteenmile Creek above the contaminated sediments. The site as scored presently does not include the shoreline or areas beyond the shoreline. The site location includes the geographic coordinates of 43° 10' 52.68" north latitude and 78° 41' 22.36" west longitude [Ref. 4, p. 1; 10, p. 1]. The headwaters of Eighteenmile Creek originate southeast of Lockport in the Niagara County Park and Golf Course and flow aboveground to the west for approximately 1 mile, where they enter an underground pipe on the east side of Lockport [Ref. 7, p. 65; 28, pp. 6, 7, 21]. The creek then flows northwest under Lockport for approximately ¼ mile, where it empties into a sluice located just southeast of the New York State Barge Canal (NYSBC) and just southwest of the Mill Street Bridge [Ref. 7, p. 65; 28, pp. 6, 19, 20]. Water from the NYSBC is discharged through the Hall Spillway and flows east into the sluice [Ref. 28, pp. 6, 19]. The headwaters of Eighteenmile Creek and NYSBC waters combine in the sluice and flow through Culvert No. 125 under the NYSBC, exiting on the north side of the NYSBC and forming what is referred to as the East Branch of Eighteenmile Creek [Ref. 5, p. 69; 28, pp. 6, 13, 14, 19]. The East Branch associated with the headwaters of Eighteenmile Creek is not the same stream as East Branch, a tributary of Eighteenmile Creek entering the creek just south of Newfane, New York, approximately 4 miles downstream of the headwaters [Ref. 4, p. 1]. The West Branch of Eighteenmile Creek originates in Upson Park at the dry dock on the north side of the NYSBC, and also receives water from two underground flows from the south and southwest [Ref. 5, p. 69; 28, pp. 5, 17, 18]. Waters from the East and West Branches converge on the south side of Clinton Street and flow under Clinton Street to the Mill Pond (which is the result of Clinton Street Dam) [Ref. 5, p. 69, 182-184; 7, p. 24; 8, p. 68]. Eighteenmile Creek flows north for approximately 15 miles and discharges to Lake Ontario in Olcott, New York [Ref. 7, p. 24; 9, p. 13, 319]. The zone of contamination, defined by samples documenting an observed release (18MC-L03W-S01-Z1 through R2-001-V-Z3) extends for 12.71 miles [Ref. 7, p. 116; 9, p. 89; 13, pp. 16, 20; 15, pp. 49, 140; 24, pp. 1, 2].

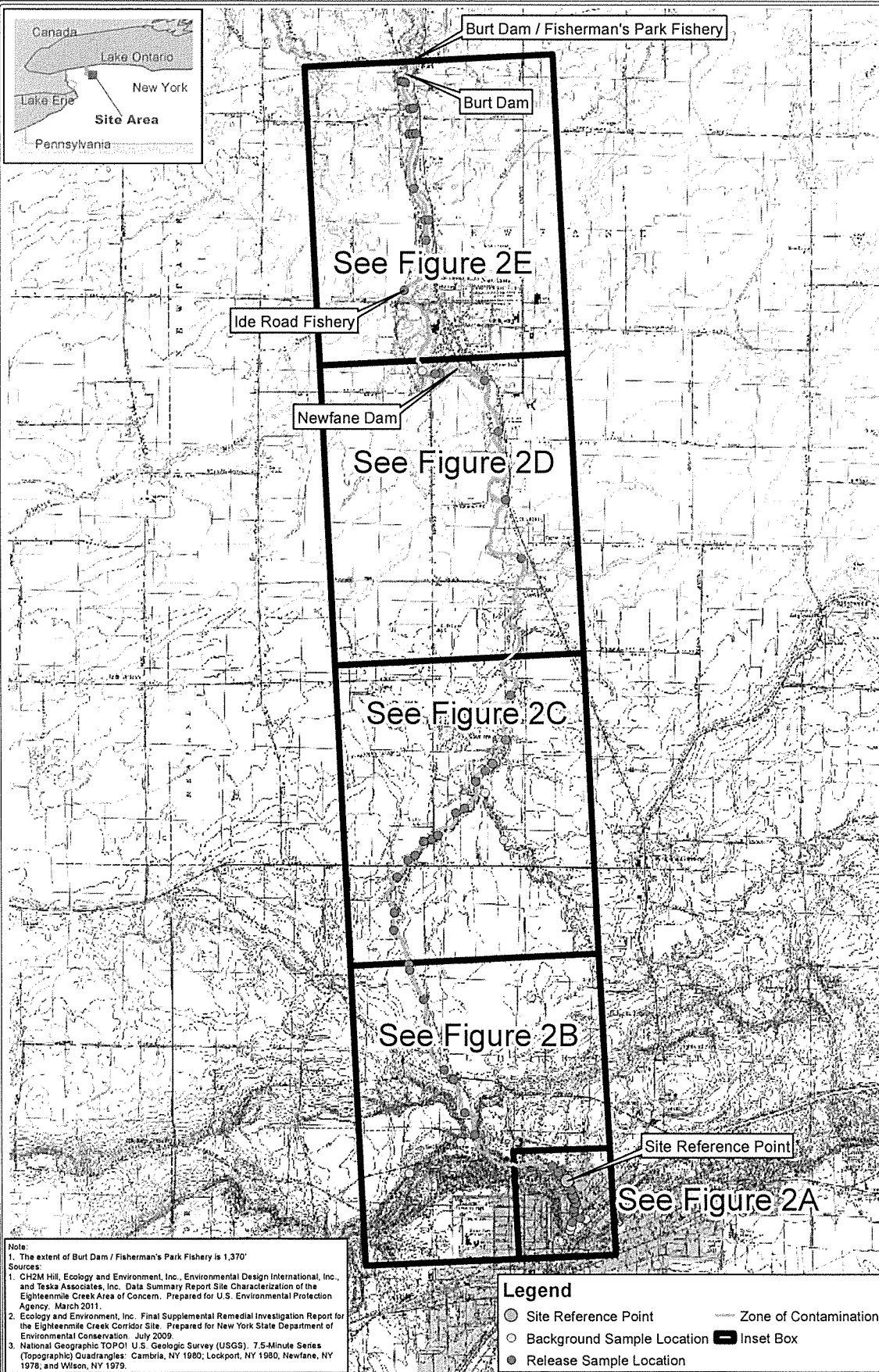
Eighteenmile Creek has a long history of industrial use dating back to the 19th century. In Lockport, New York, where the creek originates, four industrial or former industrial facilities (i.e., Former Flintkote Plant; Former United Paperboard Company; Upson Park; and Former White Transportation property), as well as the NYSBC, have been investigated [Ref. 5, p. 24; 7, p. 24; 9, p. 13]. This stretch of Eighteenmile Creek is referred to as the Eighteenmile Creek Corridor [Ref. 5, p. 16]. There are several other industrial facilities and inactive hazardous waste sites located along or in the vicinity of Eighteenmile Creek [Ref. 9, p. 13]. Investigations have confirmed the presence of polychlorinated biphenyls (PCB), metals, and other contaminants throughout most of Eighteenmile Creek, but specific sources of contamination have not been definitively identified [Ref. 42, pp. 8, 72]. Possible sources of contamination include: contaminant migration from hazardous waste sites or contaminated properties, industrial and municipal wastewater discharges, storm water and combined sewer overflow (CSO) discharges, as well as sources on the NYSBC [Ref. 6, pp. 102, 103; 9, pp. 13, 14]. The Burt and Newfane Dams, both located on Eighteenmile Creek downstream of the Eighteenmile Creek Corridor, may serve as areas within the creek where contaminated sediments accumulate [Ref. 9, p. 13].

Sampling events have indicated that Eighteenmile Creek sediments are contaminated with a variety of pollutants, including the metals lead, zinc and copper; pesticide/insecticides; PCBs; benzo(a)pyrene; dioxins; and furans. PCBs are the primary contaminants, with total PCB concentrations as high as 237 milligrams per kilogram (mg/kg) in sediment samples collected from Eighteenmile Creek [see Tables 1 and 2]. Although the highest PCB concentrations have been reported within the Eighteenmile Creek Corridor, sampling data indicate that the sediment contamination extends for 12.71 miles downstream, just south of Burt Dam [Ref. 24, pp. 1, 2].

Eighteenmile Creek and surrounding properties have been the focus of numerous investigations by New York State Department of Environmental Conservation (NYSDEC) and EPA since the late 1980s. In Lockport, New York, where the creek originates, four industrial or former industrial facilities (i.e., Former Flintkote Plant; Former United Paperboard Company; Upson Park; and Former White Transportation Property), as well as the NYSBC, have been investigated [Ref. 5; 7; 8]. The area encompassing these properties and the associated reach of Eighteenmile Creek (i.e., from NYSBC downstream past the Former Flintkote Plant) is referred to as the Eighteenmile Creek Corridor and is the focus of a

Remedial Investigation (RI) and Supplemental RI completed on behalf of the NYSDEC [Ref. 5; 7; 8]. The most recent study completed on behalf of EPA (for the Great Lakes National Program Office [GLNPO]) focused on collecting sediment samples from Eighteenmile Creek beginning just downstream of the Eighteenmile Creek Corridor for almost the entire length of the creek, but samples were not collected downstream of Burt Dam to the mouth of the creek at Lake Ontario [Ref. 9]. NYSDEC has identified six Operable Units (OU) within the Eighteenmile Creek Corridor and has produced two Records of Decision (ROD), but remedial actions have not been implemented [Ref. 40; 42].

Eighteenmile Creek is surrounded by six residential townships [Ref. 7, p. 24]. The land within the Eighteenmile Creek watershed consists primarily of croplands and orchards, with residential, commercial and industrial areas located around Lockport, Newfane, and Olcott Harbor [Ref. 6, pp. 51, 68]. There are 3.3 miles of wetlands along the contaminated portion of the creek, and evidence of fishing has been reported in the Eighteenmile Creek Corridor and other portions of the creek [Ref. 23, p. 1; 32, pp. 1-3; 35, p. 1; 36, pp. 5, 29]. The 15-Mile Surface Water Pathway begins at the farthest upstream sediment sample locations meeting observed release criteria and extends for 15 miles along surface water [Ref. 1, p. 51605; 31]. Fisherman's Park, a public fishing area located within Eighteenmile Creek just downstream of Burt Dam, is a major fishing destination where species of fish including steelhead trout, salmon, walleye, perch, and northern pike are caught and consumed [Figure 2E; Ref. 23, p. 1]. In addition, a consumption fishery is located on Eighteenmile Creek at Ide Road in Newfane, New York, within the zone of contamination [Ref. 35, p. 1]. The reach of Eighteenmile Creek between Burt Dam and Lake Ontario has been classified as an Area of Concern (AOC) by the EPA GLNPO, due to its natural resources value within the Lake Ontario watershed, although GLNPO subsequently evaluated upstream reaches of Eighteenmile Creek for inclusion in this AOC [Ref. 6, pp. 27-28; 9, pp. 13, 318, 319].

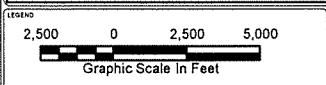


Note:
 1. The extent of Burt Dam / Fisherman's Park Fishery is 1,370'

Sources:
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 2. Ecology and Environment, Inc. Final Supplemental Remedial Investigation Report for the Eighteenmile Creek Corridor Site. Prepared for New York State Department of Environmental Conservation, July 2009.
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Legend

- Site Reference Point
- Background Sample Location
- Release Sample Location
- Zone of Contamination
- Inset Box



TITLE

Site Location Map
 Eighteenmile Creek HRS
 Niagara County, NY

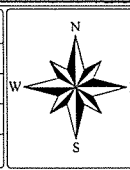
GRAPHY BY
 J. Lynes

REVIEWED BY
 M. Capriglione

PROJECT MANAGER
 G. Gilliland

SCALE
 1" = 5,000'

DATE
 July 2011



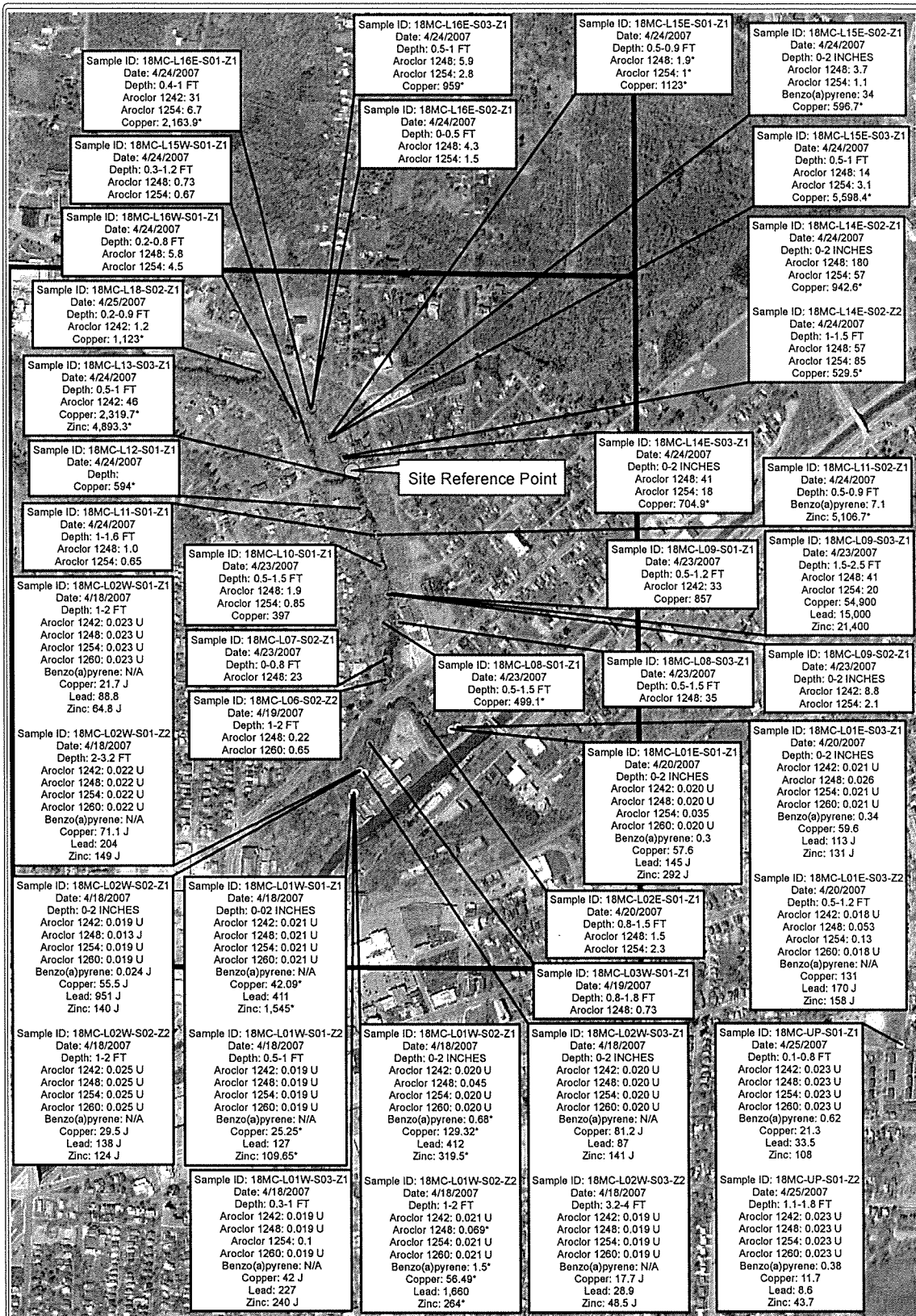
PROJECT
 Eighteenmile Creek HRS

CLIENT NAME
 EPA



DRAWING NUMBER
 09850

FIGURE #
 1



Notes:

- All results are in MG/KG
- J - Indicates estimated value
- * - All estimated results were adjusted for unknown bias in accordance with "Using Qualified Data to Document and Observed Release and Observed Contamination" [Ref. 27, pp. 4-8, 14, 16, 18]
- U - Indicates the compound was analyzed for not detected
- N/A - The analyte was not analyzed for

Sources:

- Ecology and Environment, Inc. Final Supplemental Remedial Investigation Report for the Eighteenmile Creek Corridor Site. Prepared for New York State Department of Environmental Conservation July 2009.
- NYS Cyber Security and Critical Infrastructure Coordination. "NIAGARA_County_Ortho_4bd_1ft". <http://www.nys.gov/state/nys/gateway/mg/2008/niagara/> 2009

LEGEND Site Reference Point Background Sample Location Release Sample Location	TITLE Sample Location Map Eighteenmile Creek HRS Niagara County, NY 1 of 5	DRAWN BY J. Lynes	
		PROJECT Eighteenmile Creek HRS	
CUSTOMER NAME EPA		DRAWING NUMBER 09847	SCALE 1" = 1,000'
	FIGURE # 2A	DATE July 2011	

P:\A12\Eighteenmile Creek HRS\MG090531_ECHRIS_Sample_Loc_146.mxd



Sample ID: R7-091-C
Date: 11/24/2009
Depth: 0-1.4 FT
Aroclor 1254: 11

Sample ID: R7-094-C
Date: 11/23/2009
Depth: 0-1 FT
Aroclor 1254: 1.3

Sample ID: R7-092-C
Date: 11/24/2009
Depth: 0-1 FT
Aroclor 1254: 2.5

Sample ID: R7-194-C-Comp
Date: 6/29/2010
Depth: 0-0.6 FT
Aroclor 1248: 23
Aroclor 1254: 10

Sample ID: R7-101-C
Date: 11/30/2009
Depth: 0-0.5 FT
Aroclor 1254: 1.1

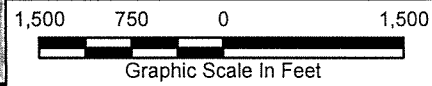
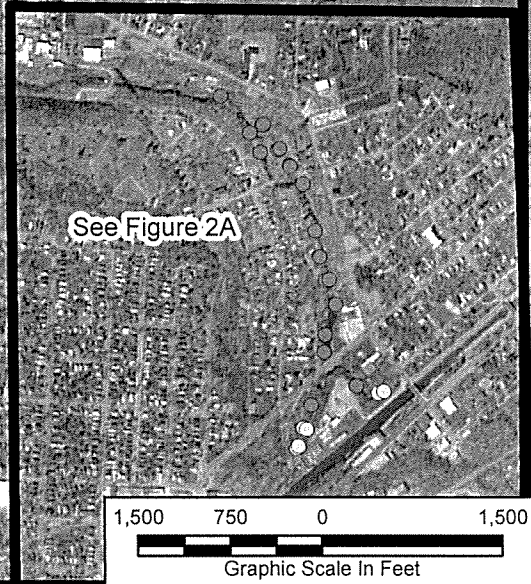
Sample ID: R7-195-C-Comp
Date: 6/29/2010
Depth: 0-0.6 FT
Aroclor 1254: 3

Sample ID: R7-203-T-Z1a
Date: 6/29/2010
Depth: 0-0.5 FT
Aroclor 1242: 0.08 U
Aroclor 1248: 0.08 U
Aroclor 1254: 0.08 U
Aroclor 1260: 0.08 U

Sample ID: R7-198-C-Comp
Date: 6/28/2010
Depth: 0-0.9 FT
Aroclor 1254: 1.3

Sample ID: R7-200-C-Z1a
Date: 6/28/2010
Depth: 0-0.5 FT
Aroclor 1254: 0.052

Sample ID: R7-204-T-Z1a
Date: 6/29/2010
Depth: 0-0.3 FT
Aroclor 1242: 0.062 U
Aroclor 1248: 0.062 U
Aroclor 1254: 0.062 U
Aroclor 1260: 0.062 U



Notes:
1. All results are in MG/KG
2. U - Undetected Value
Sources
1. CH2M Hill, Ecology and Environment, Inc., Environmental Design International, Inc., and Teska Associates, Inc. Data Summary Report Site Characterization of the Eighteenmile Creek Area of Concern. Prepared for U.S. Environmental Protection Agency. March 2011.
2. Ecology and Environment, Inc. Final Supplemental Remedial Investigation Report for the Eighteenmile Creek Corridor Site. Prepared for New York State Department of Environmental Conservation. July 2009.
3. NYS Cyber Security and Critical Infrastructure Coordination. "NIAGARA_County_Ortho_4bd_1ft". <http://www.nysgis.state.ny.us/gateway/mg/2008/niagara/>. 2009.

LEGEND:	○ Background Sample Location
	● Release Sample Location
	▭ Inset Box

PROJECT:
Eighteenmile Creek HRS

TITLE:
**Sample Location Map
Eighteenmile Creek HRS
Niagara County, NY
2 of 5**

CLIENT NAME:
EPA



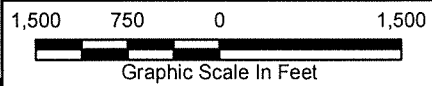
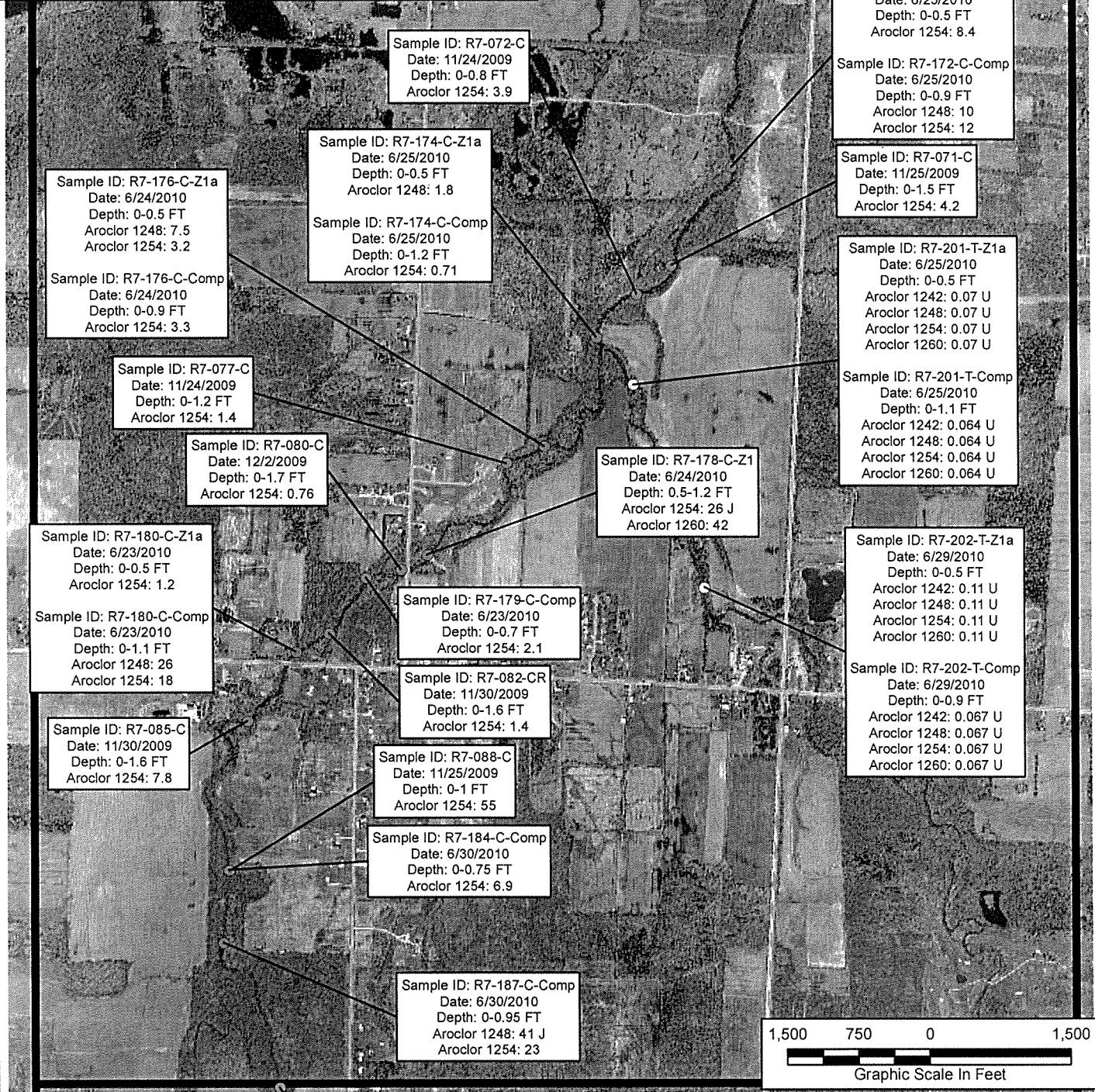
DATE:
June 2011

FIGURE #:
2B

P:\SATZ\Eighteenmile Creek HRS\MXD\09576_ECHRS_Sample_Loc_2of5.mxd

- Notes:
- All results are in MG/KG
 - J - Indicates estimated value
 - U - Indicates the compound was analyzed for not detected
- Sources

- CH2M Hill, Ecology and Environment, Inc., Environmental Design International, Inc., and Teska Associates, Inc. Data Summary Report Site Characterization of the Eighteenmile Creek Area of Concern. Prepared for U.S. Environmental Protection Agency. March 2011.
- NYS Cyber Security and Critical Infrastructure Coordination. "NIAGARA_County_Ortho_4bd_1ft". <http://www.nysgis.state.ny.us/gateway/mg/2008/niagara/>. 2009.
- NYS Cyber Security and Critical Infrastructure Coordination. "NIAGARA_County_Ortho_4bd_2ft". <http://www.nysgis.state.ny.us/gateway/mg/2008/niagara/>. 2009.



P:\SAT2\Eighteenmile Creek HRS\MXD\09575_ECHRS_Sample_Loc_3of5.mxd

LEGEND:

- Background Sample Location
- Release Sample Location
- ▭ Inset Box

TITLE:

Sample Location Map

Eighteenmile Creek HRS

Niagara County, NY

3 of 5

PROJECT: Eighteenmile Creek HRS

CLIENT NAME: EPA



DATE: June 2011

FIGURE #: 2C



Sample ID: R4-119-T
 Date: 11/17/2009
 Depth: 0-0.5 FT
 Aroclor 1242: 0.048 U
 Aroclor 1248: 0.048 U
 Aroclor 1254: 0.048 U
 Aroclor 1260: 0.048 U

Newfane Dam

Sample ID: R5-045-V-Z1
 Date: 5/20/2010
 Depth: 0-1 FT
 Aroclor 1248: 0.88

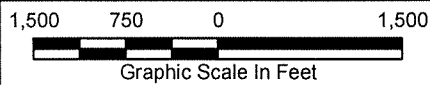
Sample ID: R4-143-C-Z1a
 Date: 6/23/2010
 Depth: 0-0.3 FT
 Aroclor 1254: 1.1

Sample ID: R4-035-C
 Date: 11/17/2009
 Depth: 0-0.8 FT
 Aroclor 1254: 0.81

Sample ID: R6-052-C
 Date: 11/19/2009
 Depth: 0-1.3 FT
 Aroclor 1254: 1.3

Sample ID: R6-056-CR
 Date: 11/17/2009
 Depth: 0-1.2 FT
 Aroclor 1254: 1

Sample ID: R6-161-C-Z1
 Date: 7/1/2010
 Depth: 0.5-1.5 FT
 Aroclor 1254: 25 J



Notes:
 1. All results are in MG/KG
 2. J - Indicates estimated value
 3. U - Indicates the compound was analyzed for not detected

Sources
 1. CH2M Hill, Ecology and Environment, Inc., Environmental Design International, Inc., and Teska Associates, Inc. Data Summary Report Site Characterization of the Eighteenmile Creek Area of Concern. Prepared for U.S. Environmental Protection Agency. March 2011.
 2. NYS Cyber Security and Critical Infrastructure Coordination. "NIAGARA_County_Ortho_4bd_2ft". <http://www.nysgis.state.ny.us/gateway/mg/2008/niagara/>. 2009.

LEGEND:

- Background Sample Location
- Release Sample Location
- Match Line

TITLE:

Sample Location Map Eighteenmile Creek HRS Niagara County, NY 4 of 5

PROJECT:
Eighteenmile Creek HRS

CLIENT NAME:
EPA

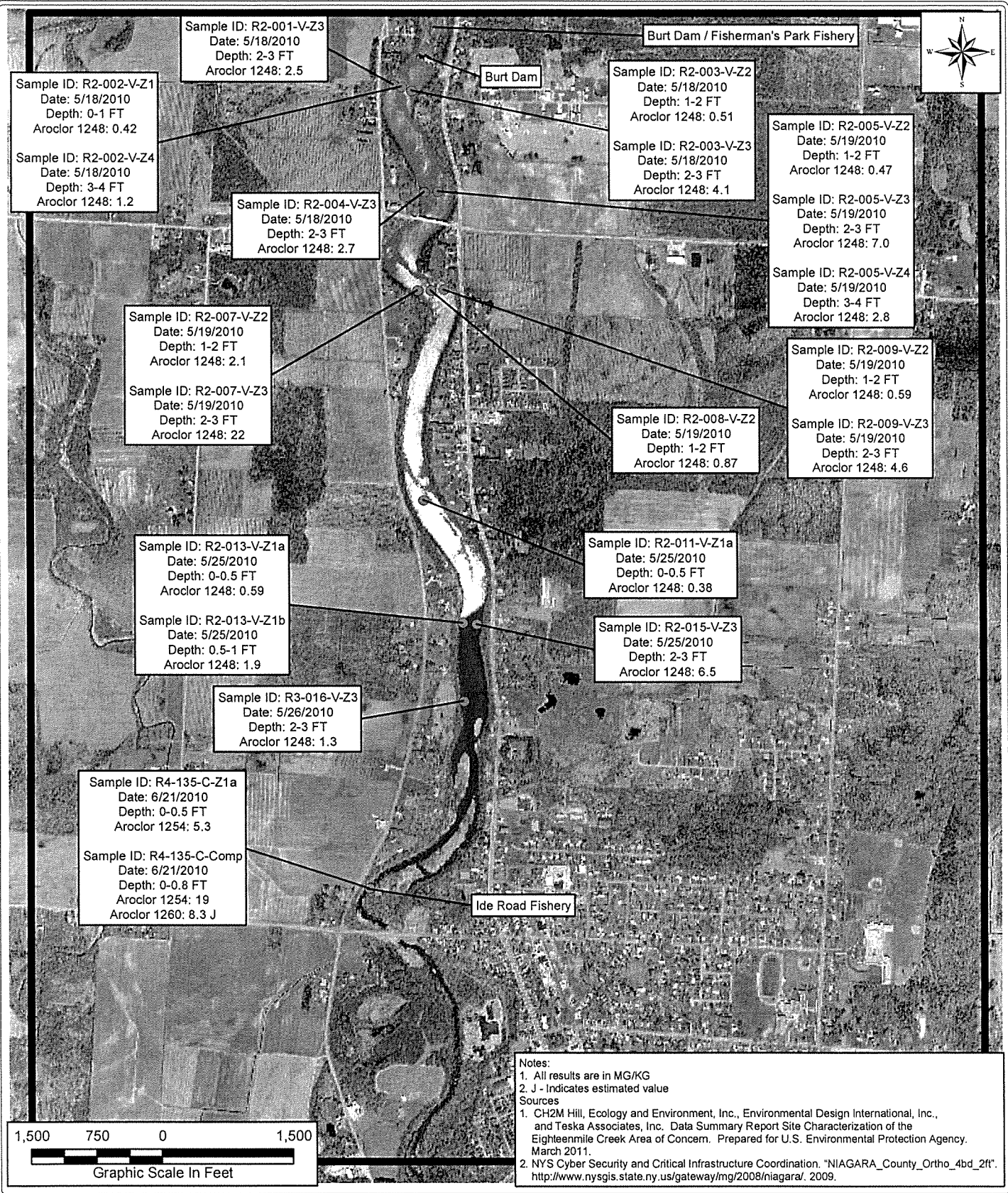


DATE:
 July 2011

FIGURE #:
 2D

P:\SAT2\Eighteenmile Creek HRS\MXD\09574_ECHRS_Sample_Loc_4of5.mxd

P:\SAT2\Eighteenmile Creek HRS\MXD\09573_ECHRHS_Sample_Loc_5of5.mxd



LEGEND:

- Release Sample Location
- ▭ Inset Box

PROJECT:
Eighteenmile Creek HRS

CLIENT NAME:
EPA

TITLE:
Sample Location Map
Eighteenmile Creek HRS
Niagara County, NY
5 of 5

DATE: July 2011

FIGURE #: 2E

SOURCE DESCRIPTION

2.2 SOURCE CHARACTERIZATION

2.2.1 Source Identification

Number of the source: Source No. 1

Name and description of the source: Eighteenmile Creek contaminated sediments

Source Type: Other (contaminated sediments with no identified source)

Source 1 consists of contaminated sediments in Eighteenmile Creek defined by the presence of sediment samples meeting observed release criteria. The hazardous substances most significantly affecting the creek sediments include PCBs, metals, and benzo(a)pyrene [see Section 2.4.1 of this HRS documentation record]. The origin of these hazardous substances in the contaminated sediments has not been identified due to the presence of multiple possible sources for the substance [see Section 4.1.2.1.1]. As a result, the source(s) of all the contamination in any particular location in the creek cannot be determined. The NYSBC runs across the upstream portion of Eighteenmile Creek [Ref. 4, p. 1]. An environmental database search shows dozens of possible pollution sources along the canal and within 1 mile of its confluence with Eighteenmile Creek [Ref. 33, pp. 1-37]. PCBs were detected in six out of seven samples (including one duplicate) collected from the NYSBC with detections ranging from 0.0066 mg/kg to 2.63 mg/kg indicating the presence of possible sources discharging to the NYSBC [Ref. 7, pp. 65, 91, 92, 112, and 130]. In Lockport, New York, where the Creek originates, four industrial or former industrial facilities (i.e., the Former Flintkote Plant; Former United Paperboard Company; Upson Park; and White Transportation Property) have been the focus of numerous investigations; detections of PCBs, copper, lead, zinc, and benzo(a)pyrene have been identified in Eighteenmile Creek sediment adjacent to White Transportation, Former United Paperboard, Former Flintkote Plant, Upson Park, and the areas downstream of the Former Flintkote Plant [Ref. 7, pp. 93-96, 118-129]. The highest detection of PCBs in sediment of Eighteenmile Creek adjacent to the Former Flintkote Plant is 237 mg/kg; more specifically, in sample 18MC-L14E-S02-Z1, Aroclor 1248 was detected at 180 mg/kg and Aroclor 1254 was detected at 57 mg/kg [Table 1; Ref. 7, pp. 65, 95, 126, 127].

Location of the source, with reference to a map of the site:

The sampling results using observed release criteria show that contaminated sediments are located throughout Eighteenmile Creek, from the Eighteenmile Creek Corridor in Lockport (farthest upstream sample: 18MC-L03W-S01-Z1 indicated PCB Aroclor 1248 detected at 0.73 mg/kg) to just south of the Fisherman's Park fishery near Burt Dam (farthest downstream sample: R2-001-V-Z3 indicated PCB Aroclor 1248 detected at 2.5 mg/kg) [Tables 1 and 2; Ref. 7, p. 116; 9, p. 89; 13, pp. 16, 20; 15, p. 49, 140; 23, p. 1]. The sample locations are shown on Figures 2A and 2E.

Containment

Release to surface water via overland migration and/or flood:

The presence of contaminated sediments provides evidence that hazardous substances (PCBs, copper, lead, zinc, and benzo(a)pyrene) have migrated into Eighteenmile Creek from multiple sources [see Section 4.1.2.1.1]. Therefore, a surface water containment factor value of 10 is assigned for this source [Ref. 1, p. 51609, Table 4-2].

2.4.1 Hazardous Substances

Sampling and analysis on behalf of NYSDEC in April 2007 and on behalf of EPA from November 2009 through June 2010 showed the presence of PCBs, metals, and other hazardous substances in Eighteenmile Creek sediments at concentrations significantly above background concentrations. Tables 1 and 2 show samples that document background and observed release concentrations.

Notes on Sample Similarity:

The background samples from Eighteenmile Creek and its tributaries and the contaminated samples from Eighteenmile Creek were handled the same procedurally and were similar physically, as follows:

- **Physical Setting:** All background and release sediment samples were collected from Eighteenmile Creek or (for certain background samples) from tributaries just upstream of the creek [Figures 1 and 2A-2F]. Eighteenmile Creek and its tributaries are considered to be part of the Eighteenmile Creek watershed [Ref. 6, pp. 14, 49]. Available flow data for Eighteenmile Creek in the East Branch and downstream at Ide Road indicate that the water body type (i.e., moderate to large stream) is maintained throughout the sample locations [Ref. 1, p. 51613; 8, pp. 23, 24, 26; 12, p. 1].
- **Sampling Depth:** Background and release samples were collected at depth intervals between 0 and 4 feet below top of sediment [Tables 1 and 2; Ref. 7, pp. 55-57; 9, pp. 454, 487, 525-526, 528, 530-532, 536, 539, 546, 547, 552-556, 561, 563-568, 572-574, 577, 583-588, 581, 589; 25, pp. 5, 7, 8, 10, 15, 20-27, 30].
- **Sample Description:** Visual descriptions from core logs show that background and release samples within Eighteenmile Creek consist predominantly of the same material (silt with small gravel) [9, pp. 454, 487, 525-526, 528, 530-532, 536, 539, 546, 547, 552-556, 561, 563-568, 572-574, 577, 583-588, 581, 589; 25, pp. 5, 7, 8, 10, 15, 21-27, 30].
- **Sampling Methods:** The background and release sediment samples were all collected using coring devices. In April 2007, sediment coring was performed along transects using a coring device comprised of a macrocore-type sampler with dedicated acetate liners [Ref. 7, p. 41]. In November and December 2009, sediment samples were collected via hand-coring. All but one core was collected by advancing a clear polyvinyl chloride (PVC) sleeve into the sediment by hand via a pushing and twisting motion [Ref. 9, p. 20]. In May 2010, a vibracore was used to core into sediment until refusal [Ref. 9, p. 20]. It should be noted that, due to varying conditions present along Eighteenmile Creek, the various sampling methods described above (i.e., macrocore-type sampling; hand-core sampling, and vibracore sampling) were employed to retrieve sediment in cores; EPA considers the collection of sediment samples from cores to be similar, regardless of the method used to retrieve the sediment core.
- **Samples collected in 2007 were analyzed for Aroclors according to Analytical Services Protocol, New York State Department of Environmental Conservation, July 2005 (ASP05) 8082, and samples collected in 2009 and 2010 were analyzed for Aroclors according to CLP Statement of Work (SOW) SOM01.2; both protocols are based on EPA SW-846 analytical methods [Ref. 11, pp. 68, 127; 13, pp. 10, 27, 51, 70, 90, 102, 103, 129, 145, 159, 177, 195, 221, 235, 279, 280, 325, 326, 355-357, 371, 389, 390, 399, 419-421; 14, p. 12; 16, p. 13; 17, p. 12; 18, p. 12; 19, p. 11; 20, pp. 5, 12; 21, pp. 5, 12; 22, pp. 5, 12; 26, pp. 5, 13]. Each set of release samples has its own associated background samples evaluated by the same method [see Tables 1 and 2].**
- **Total Organic Carbon (TOC):** The analytical results indicate that the ranges of background TOC levels and release TOC levels overlap [see Tables 1 and 2].

The following criteria from the HRS were used to evaluate significance above background (i.e., observed release):

- If the maximum background concentration is not detected or is less than the detection limit, an observed release is established when the sample measurement equals or exceeds the sample quantitation limit (SQL) [Ref. 1, p. 51589].

- If the maximum background concentration equals or exceeds the detection limit, an observed release is established when the sample measurement equals or exceeds the SQL and is three times or more above the background concentration [Ref. 1, p. 51589].
- Because numerous sample analysis results are qualified as estimated (“J”) with no direction of bias specified [Tables 1 and 2; Ref. 13 through 26], EPA took a step to ensure that the observed release significant increase criteria would be met if the possible variation related to the estimates were considered. For the J-flagged results, EPA used adjustment factors presented in the EPA Fact Sheet “Using Qualified Data to Document an Observed Release and Observed Contamination” to complete the background-release comparison, thereby compensating for probable uncertainty in the analyses [Ref. 27, pp. 1-18]. EPA took the most conservative approach to screening the data (i.e., the highest scrutiny for data to meet observed release criteria) by assuming all estimated concentrations to be of unknown bias [Tables 1 and 2]. Even after this adjustment, the observed release criteria were met.

EIGHTEENMILE CREEK HRS
 TABLE 1 - BACKGROUND AND RELEASE SAMPLES
 SUPPLEMENTAL REMEDIAL INVESTIGATION REPORT, JULY 2009

Sample ID	Date	Depth	Sample Description	Percent Moisture	TOC (mg/kg)	Substance	Results (mg/kg)	Adjusted Result (mg/kg) *	Detection Limit (mg/kg)	References
BACKGROUND										
18MC-UP-S01-Z1	4/25/2007	0.1-0.8 feet	dark gray silt with 50% mixed gravel	28	N/A	Aroclor 1242	0.023U	162	0.0029	Ref. 7, pp. 51, 54, 55, 65, 84, 86, 111-113, 130, 512-522; 26, pp. 4-5, 13, 16-20, 38, 66, 84, 179, 874, 2602; 25, p. 30
						Aroclor 1248	0.023U		0.004	
						Aroclor 1254	0.023U		0.0087	
						Aroclor 1260	0.023U		0.0035	
						Copper	21.3		0.16	
						Lead	33.5		0.4	
						Zinc	108 J		0.55	
Benzo(a)pyrene	0.62	0.0041								
18MC-UP-S01-Z2	4/25/2007	1.1-1.8 feet	red-brown clay with few fine to small gravel	27	N/A	Aroclor 1242	0.023U	65.6	0.0029	Ref. 7, pp. 51, 54, 55, 65, 84, 86, 111-113, 130, 512-522; 26, pp. 4-5, 13, 16-20, 42, 67, 85, 179, 874, 2602; 25, p. 30
						Aroclor 1248	0.023U		0.004	
						Aroclor 1254	0.023U		0.0087	
						Aroclor 1260	0.023U		0.0035	
						Copper	11.7		0.17	
						Lead	8.6		0.4	
						Zinc	43.7 J		0.55	
Benzo(a)pyrene	0.38	0.0041								
18MC-L01W-S01-Z1	4/18/2007	0-2 inches	dark gray, very fine silt, moderately plastic, 30% dolostone gravel	20	6,490	Aroclor 1242	0.021U	42.09	0.0029	Ref. 7, pp. 51, 53, 55, 59, 65, 84, 86, 114, 116, 130, 434-442; 14, pp. 4-5, 14-17, 23, 44, 64, 137, 160, 704, 1691; 25, p. 5
						Aroclor 1248	0.021U		0.004	
						Aroclor 1254	0.021U		0.0087	
						Aroclor 1260	0.021U		0.0035	
						Copper	34.5 J		0.21	
						Lead	411		0.52	
						Zinc	1,030 J		0.71	
Benzo(a)pyrene	N/A	0.0041								
18MC-L01W-S01-Z2	4/18/2007	0.5-1 feet	dark gray, very fine silt with 20% dolostone gravel	14	29,200	Aroclor 1242	0.019U	25.25	0.0029	Ref. 7, pp. 51, 53, 55, 59, 65, 84, 86, 114, 116, 130, 434-442; 14, pp. 4-5, 14-17, 23, 45, 65, 137, 160, 704, 1691; 25, p. 5
						Aroclor 1248	0.019U		0.004	
						Aroclor 1254	0.019U		0.0087	
						Aroclor 1260	0.019U		0.0035	
						Copper	20.7 J		0.14	
						Lead	127		0.34	
						Zinc	73.1 J		0.47	
Benzo(a)pyrene	N/A	0.0041								

EIGHTEENMILE CREEK HRS
 TABLE 1 - BACKGROUND AND RELEASE SAMPLES
 SUPPLEMENTAL REMEDIAL INVESTIGATION REPORT, JULY 2009

Sample ID	Date	Depth	Sample Description	Percent Moisture	TOC (mg/kg)	Substance	Results (mg/kg)	Adjusted Result (mg/kg) *	Detection Limit (mg/kg)	References
18MC-L01W-S02-Z1	4/18/2007	0-2 inches	dark brown to dark gray, fine silt, moderately plastic, with 20% dolostone gravel	20	6,490	Aroclor 1242	0.020U		0.0029	Ref. 7, pp. 51, 53, 55, 59, 65, 84, 86, 114, 116, 130, 434-442; 14, pp. 4-5, 14-17, 23, 25, 46, 66, 136-137, 160, 704, 1691, 1694; 25, p. 5
						Aroclor 1248	0.045		0.004	
						Aroclor 1254	0.020U		0.0087	
						Aroclor 1260	0.020U		0.0035	
						Copper	106 J	129.32	0.16	
						Lead	412		0.38	
Zinc	213 J	319.5	0.52							
Benzo(a)pyrene	0.068 J	0.68	0.0041							
18MC-L01W-S02-Z2	4/18/2007	1-2 feet	dark brown to dark gray, very fine silt with 30% dolostone gravel and 20% debris (glass/plastic/metal)	22	29,200	Aroclor 1242	0.021U		0.0029	Ref. 7, pp. 51, 53, 56, 59, 65, 84, 86, 114, 116, 130, 434-442; 14, pp. 4-5, 14-17, 23, 29, 47, 67, 136-137, 160, 704, 1691, 1693; 25, p. 5
						Aroclor 1248	0.0069 J	0.069	0.004	
						Aroclor 1254	0.021U		0.0087	
						Aroclor 1260	0.021U		0.0035	
						Copper	46.3 J	56.49	0.16	
						Lead	1,660		0.38	
Zinc	176 J	264	0.52							
Benzo(a)pyrene	0.15 J	1.5	0.0041							
18MC-L01W-S03-Z1	4/18/2007	0.3-1 feet	dark brown to gray, very fine silt, moderately plastic, 30% dolostone gravel	14	N/A	Aroclor 1242	0.019U		0.0029	Ref. 7, pp. 51, 53, 56, 59, 65, 84, 86, 116, 130, 434-442; 14, pp. 4-5, 14-17, 23, 48, 68, 137, 160, 704, 1691; 25, p. 5
						Aroclor 1248	0.019U		0.004	
						Aroclor 1254	0.100		0.0087	
						Aroclor 1260	0.019U		0.0035	
						Copper	42 J	51	0.14	
						Lead	227		0.34	
Zinc	240 J	360	0.47							
Benzo(a)pyrene	N/A		0.0041							
18MC-L02W-S01-Z1	4/18/2007	1-2 feet	tan-brown, silty clay with 10% gravel and 5% shell fragments	28	N/A	Aroclor 1242	0.023U		0.0029	Ref. 7, pp. 51, 53, 56, 59, 65, 84, 86, 116, 130, 434-442; 14, pp. 4-5, 14-17, 23, 57, 77, 138, 160, 704, 1691; 25, p. 8
						Aroclor 1248	0.023U		0.004	
						Aroclor 1254	0.023U		0.0087	
						Aroclor 1260	0.023U		0.0035	
						Copper	21.7 J	26.5	0.170	
						Lead	88.8		0.400	
Zinc	64.8 J	97.2	0.560							
Benzo(a)pyrene	N/A		0.0041							

EIGHTEENMILE CREEK HRS
 TABLE 1 - BACKGROUND AND RELEASE SAMPLES
 SUPPLEMENTAL REMEDIAL INVESTIGATION REPORT, JULY 2009

Sample ID	Date	Depth	Sample Description	Percent Moisture	TOC (mg/kg)	Substance	Results (mg/kg)	Adjusted Result (mg/kg) *	Detection Limit (mg/kg)	References
18MC-L02W-S01-Z2	4/18/2007	2-3.2 feet	dark gray to black plastic clay.	27	N/A	Aroclor 1242	0.022U		0.0029	Ref. 7, pp. 51, 53, 56, 59, 65, 84, 86, 116, 130, 434-442; 14, pp. 4-5, 14-17, 23, 58, 78, 138, 160, 704, 1691; 25, p. 8
						Aroclor 1248	0.022U		0.004	
						Aroclor 1254	0.022U		0.0087	
						Aroclor 1260	0.022U		0.0035	
						Copper	71.1 J	86.7	0.160	
						Lead	204		0.380	
						Zinc	149 J	224	0.530	
Benzo(a)pyrene	N/A		0.0041							
18MC-L02W-S02-Z1	4/18/2007	0-2 inches	poorly sorted, sandy, gravelly sediment with 20% shell fragments	13	22,400 J	Aroclor 1242	0.019U	0.13	0.0029	Ref. 7, pp. 51, 53, 56, 59, 65, 84, 86, 114, 116, 130, 434-442; 14, pp. 4-5, 14-17, 23, 59, 79, 138, 160, 704, 1691, 1695; 25, p. 7
						Aroclor 1248	0.013J		0.004	
						Aroclor 1254	0.019U		0.0087	
						Aroclor 1260	0.019U		0.0035	
						Copper	55.5 J	67.7	0.14	
						Lead	951 J	1369	0.34	
						Zinc	140 J	210	0.47	
Benzo(a)pyrene	0.024 J	0.24	0.0041							
18MC-L02W-S02-Z2	4/18/2007	1-2 feet	mottled dark and light gray clay; appears native	34	31,500	Aroclor 1242	0.025U		0.0029	Ref. 7, pp. 51, 53, 56, 59, 65, 84, 86, 114, 116, 130, 434-442; 14, pp. 4-5, 14-17, 23, 60, 80, 138, 160, 704, 1691, 1693; 25, p. 8
						Aroclor 1248	0.025U		0.004	
						Aroclor 1254	0.025U		0.0087	
						Aroclor 1260	0.025U		0.0035	
						Copper	29.5 J	36	0.180	
						Lead	138 J	199	0.430	
						Zinc	124 J	186	0.590	
Benzo(a)pyrene	N/A		0.0041							
18MC-L02W-S03-Z1	4/18/2007	0-2 inches	tan-brown, silty clay with 10-15 % gravel and few organic fragments	16	N/A	Aroclor 1242	0.020U		0.0029	Ref. 7, pp. 51, 53, 56, 59, 65, 84, 86, 116, 130, 434-442; 14, pp. 4-5, 14-17, 23, 62, 82, 138, 160, 704, 1691; 25, p. 8
						Aroclor 1248	0.020U		0.004	
						Aroclor 1254	0.020U		0.0087	
						Aroclor 1260	0.020U		0.0035	
						Copper	81.2 J	99.1	0.140	
						Lead	87		0.350	
						Zinc	141 J	212	0.480	
Benzo(a)pyrene	N/A		0.0041							

EIGHTEENMILE CREEK HRS
 TABLE 1 - BACKGROUND AND RELEASE SAMPLES
 SUPPLEMENTAL REMEDIAL INVESTIGATION REPORT, JULY 2009

Sample ID	Date	Depth	Sample Description	Percent Moisture	TOC (mg/kg)	Substance	Results (mg/kg)	Adjusted Result (mg/kg) *	Detection Limit (mg/kg)	References
18MC-L02W-S03-Z2	4/18/2007	3.2-4 feet	dark gray to black, plastic clay; appears native	15	N/A	Aroclor 1242	0.019U		0.0029	Ref. 7, pp. 51, 53, 56, 59, 65, 84, 86, 116, 130, 434-442; 14, pp. 4-5, 14-17, 23, 63, 83, 138, 704, 1691; 25, p. 8
						Aroclor 1248	0.019U		0.004	
						Aroclor 1254	0.019U		0.0087	
						Aroclor 1260	0.019U		0.0035	
						Copper	17.7 J	21.6	0.14	
						Lead	28.9		0.34	
						Zinc	48.5 J	72.8	0.47	
Benzo(a)pyrene	N/A		0.0041							
18MC-L01E-S01-Z1	4/20/2007	0-2 inches	black, granular soil with 5% fine gravel	20	193,000	Aroclor 1242	0.020U		0.0029	Ref. 7, pp. 51, 53, 55, 59, 65, 84, 86, 118-119, 130, 464-475; 17, pp. 4-5, 14-17, 23, 64, 84, 146, 169, 933, 2046, 2050; 25, p. 15
						Aroclor 1248	0.020U		0.004	
						Aroclor 1254	0.035		0.0087	
						Aroclor 1260	0.020U		0.0035	
						Copper	57.6		0.150	
						Lead	145 J	209	0.350	
						Zinc	292 J	438	0.480	
Benzo(a)pyrene	0.3		0.0041							
18MC-L01E-S03-Z1	4/20/2007	0-2 inches	dark brown soil with 10% fine gravel	23	51,400	Aroclor 1242	0.021U		0.0029	Ref. 7, pp. 51, 53, 55, 59, 65, 84, 86, 118-119, 130, 464-475; 17, pp. 4-5, 14-17, 23, 29, 65, 85, 146, 169, 933, 1940, 1942; 25, p. 15
						Aroclor 1248	0.026		0.004	
						Aroclor 1254	0.021U		0.0087	
						Aroclor 1260	0.021U		0.0035	
						Copper	59.6		0.16	
						Lead	113 J	192	0.39	
						Zinc	131 J	197	0.53	
Benzo(a)pyrene	0.34		0.0041							
18MC-L01E-S03-Z2	4/20/2007	0.5-1.2 feet	brown soil with clay and silt, slightly plastic, 15% fine gravel and asphalt fragments	6	N/A	Aroclor 1242	0.018U		0.0029	Ref. 7, pp. 51, 53, 55, 59, 65, 84, 86, 118-119, 130, 464-475; 17, pp. 4-5, 14-17, 23, 66, 86, 146, 169, 933; 25, p. 15
						Aroclor 1248	0.053		0.004	
						Aroclor 1254	0.13		0.0087	
						Aroclor 1260	0.018U		0.0035	
						Copper	131		0.12	
						Lead	170 J	245	0.3	
						Zinc	158 J	237	0.42	
Benzo(a)pyrene	N/A		0.0041							
OBSERVED RELEASE										
18MC-L03W-S01-Z1	4/19/2007	0.8-1.8 feet	dark brown, soft silt with 10% gravel	32	N/A	Aroclor 1248	0.73		0.004	Ref. 7, pp. 51, 53, 56, 59, 65, 84, 86, 116, 130, 443-452; 15, pp. 4-5, 14-16, 19, 49, 140, 752; 25, p. 10

EIGHTEENMILE CREEK HRS
 TABLE 1 - BACKGROUND AND RELEASE SAMPLES
 SUPPLEMENTAL REMEDIAL INVESTIGATION REPORT, JULY 2009

Sample ID	Date	Depth	Sample Description	Percent Moisture	TOC (mg/kg)	Substance	Results (mg/kg)	Adjusted Result (mg/kg) *	Detection Limit (mg/kg)	References
18MC-L02E-S01-Z1	4/20/2007	0.8-1.5 feet	Dark gray to black silt with estimated 20% fine to small gravel	24	N/A	Aroclor 1248 Aroclor 1254	1.5 2.3		0.004 0.0087	Ref. 7, pp. 51, 53, 55, 59, 65, 84, 86, 118-119, 130, 464-475; 17, pp. 4-5, 14-17, 23, 67, 147, 933; 25, p. 10
18MC-L07-S02-Z1	4/23/2007	0-2 inches	black soft silt with 15% gravel	49	80,500	Aroclor 1248	23		0.004	Ref. 7, pp. 51, 53, 56, 59, 65, 84, 86, 120, 122, 130, 476-483; 18, pp. 4-5, 14-17, 23, 56, 141, 1855, 1857; 25, p. 21
18MC-L08-S01-Z1	4/23/2007	0.5-1.5 feet	dark brown clay rich soil with 35% wood fragmants	71	N/A	Copper	609 J	499.2	0.42	Ref. 7, pp. 51, 53, 56, 59, 65, 84, 86, 122, 130, 476-483; 18, pp. 4-5, 12, 82, 820, 1855, 1857; 25, p. 21
18MC-L08-S03-Z1	4/23/2007	0.5-1.5 feet	Mixed brown silty, sandy, clay. 10-20% unsorted gravel	39	N/A	Aroclor 1248	35		0.004	Ref. 7, pp. 51, 53, 56, 59, 65, 84, 86, 122, 130, 476-483; 18, pp. 4-5, 14-17, 23, 64, 140, 820; 25, p. 20
18MC-L09-S01-Z1	4/23/2007	0.5-1.2 feet	Brown clay with gravel and wood fragments	61	N/A	Aroclor 1242 Copper	33 857		0.0029 0.3	Ref. 7, pp. 51, 53, 57, 59, 65, 84, 86, 122, 130, 484-491; 19, pp. 3-5, 10-11, 18, 39, 54, 111, 747; 25, p. 22
18MC-L09-S02-Z1	4/23/2007	0-2 inches	Loose black sediment with mix of poorly sorted sand, gravel, and silt	38	50,600	Aroclor 1242 Aroclor 1254	8.8 2.1		0.0029 0.0087	Ref. 7, pp. 51, 53, 57, 59, 65, 84, 86, 120, 122, 130, 484-491; 19, pp. 3-5, 10-11, 18, 40, 112, 747, 1840, 1842; 25, p. 22
18MC-L09-S03-Z1	4/23/2007	1.5-2.5 feet	Black, unconsolidated sediment comprised of a mix of silt, sand, and fine gravel. Possible very light sheen.	30	N/A	Aroclor 1248 Aroclor 1254 Copper Lead Zinc	41 20 54,900 15,000 21,400		0.004 0.0087 3.4 2.1 11.3	Ref. 7, pp. 51, 53, 57, 59, 65, 84, 86, 123, 130, 484-491; 19, pp. 3-5, 10-11, 18, 42, 57, 112, 747; 25, p. 22
18MC-L10-S01-Z1	4/23/2007	0.5-1.5 feet	Dark brown loose top soil with fragments of wood, fine gravel, and few sand	39	N/A	Aroclor 1248 Aroclor 1254 Copper	1.9 0.85 397		0.004 0.0087 0.2	Ref. 7, pp. 51, 53, 57, 59, 65, 84, 86, 123, 130, 484-491; 19, pp. 3-5, 10-11, 18, 47, 62, 112, 747; 25, p. 23
18MC-L10-S01-Z1/D	4/23/2007	0.5-1.5 feet	Dark brown loose top soil with fragments of wood, fine gravel, and few sand	32	N/A	Aroclor 1248 Aroclor 1254	1.2 0.63		0.004 0.0087	Ref. 7, pp. 53, 57, 59, 65, 84-86, 123, 130, 484-491; 19, pp. 3-5, 10-11, 18, 48, 112, 747; 25, p. 23

EIGHTEENMILE CREEK HRS
 TABLE 1 - BACKGROUND AND RELEASE SAMPLES
 SUPPLEMENTAL REMEDIAL INVESTIGATION REPORT, JULY 2009

Sample ID	Date	Depth	Sample Description	Percent Moisture	TOC (mg/kg)	Substance	Results (mg/kg)	Adjusted Result (mg/kg) *	Detection Limit (mg/kg)	References
18MC-L11-S01-Z1	4/24/2007	1-1.6 feet	Dark gray to dark tan mixed soft silt. Possible light sheen	41	N/A	Aroclor 1248 Aroclor 1254	1.0 0.65		0.004 0.0087	Ref. 7, pp. 51, 53, 57, 59, 65, 84, 86, 123, 130, 492-499; 20, pp. 4-5, 14-17, 23, 64, 143; 25, p. 24
18MC-L11-S02-Z1	4/24/2007	0.5-0.9 feet	black silty sediment with 30% mixed gravel and unsorted sand	N/A	N/A	Zinc Benzo(a)pyrene	7,660 J 7.1	5,106.7	7.1 0.0041	Ref. 7, pp. 51, 53, 57, 59, 65, 84, 86, 123, 130, 492-499; 20, pp. 4-5, 12, 14, 17, 21, 23, 25, 85, 143, 163; 25, p. 24
18MC-L12-S01-Z1	4/24/2007	1.0-1.6 feet	Tan to dark brown soft silt with black streaks and some small gravel.	N/A	N/A	Copper	725 J	594	0.19	Ref. 7, pp. 51, 53, 57, 59, 65, 84, 86, 126, 130, 492-499; 20, pp. 4-5, 12, 17, 21, 23, 90, 143; 25, p. 24
18MC-L13-S03-Z1	4/24/2007	0.5-1.0 feet	Black silt with 20% coarse sand to small gravel and fragments of plastic	52	N/A	Aroclor 1242 Copper Zinc	46 2,830 J 7,340 J	2,319.7 4,893.3	0.0029 0.25 8.3	Ref. 7, pp. 52-53, 57, 59, 65, 84, 86, 126, 130, 500-511; 21, pp. 4-5, 13-15, 18, 37, 53, 114, 730, 1260, 1264; 25, p. 26
18MC-L14E-S02-Z1	4/24/2007	0-2 inches	Gray silt with 25% sorted sand and gravel	46	51,000	Aroclor 1248 Aroclor 1254 Copper	180 57 1150 J	942.6	0.004 0.0087 0.22	Ref. 7, pp. 52, 54, 57, 59, 65, 84, 86, 124, 126, 130, 492-499; 20, pp. 4-5, 14-17, 23, 77, 97, 144, 935, 1894, 1900; 25, p. 25
18MC-L14E-S02-Z2	4/24/2007	1-1.5 feet	Dark brown silt with 10% fine gravel	38	79,000	Aroclor 1248 Aroclor 1254 Copper	57 85 646 J	529.5	0.004 0.0087 0.19	Ref. 7, pp. 52, 54, 57, 59, 65, 84, 86, 124, 126, 130, 492-499; 20, pp. 4-5, 14-17, 23, 78, 98, 144, 935, 1894, 1901; 25, p. 25
18MC-L14E-S03-Z1	4/24/2007	0-2 inches	Black silt with 25% fine gravel and organic matter	37	N/A	Aroclor 1248 Aroclor 1254 Copper	41 18 860 J	704.9	0.004 0.0087 0.19	Ref. 7, pp. 52, 54, 57, 59, 65, 84, 86, 126, 130, 492-499; 20, pp. 4-5, 14-17, 23, 79, 99, 144, 935; 25, p. 25
18MC-L15E-S01-Z1	4/24/2007	0.5-0.9 feet	Dark gray silt with 25% unsorted sand and small gravel	57	N/A	Aroclor 1248 Aroclor 1254 Copper	19 J 10 J 1,370 J	1.9 1 1,123	0.004 0.0087 0.29	Ref. 7, pp. 52, 54, 57, 59, 65, 84, 86, 126, 130, 500-511; 21, pp. 4-5, 13-15, 18, 38, 54, 115, 737, 1260, 1265; 25, p. 26
18MC-L15E-S02-Z1	4/24/2007	0-2 inches	Brown-gray silt with 60% unsorted sand and fine gravel	35	100,000	Aroclor 1248 Aroclor 1254 Copper Benzo(a)pyrene	3.7 1.1 728 J 34	596.7	0.004 0.0087 0.19 0.0041	Ref. 7, pp. 52, 54, 57, 59, 65, 84, 86, 125, 127, 130, 500-511; 21, pp. 4-5, 13-15, 18, 20, 40, 115, 137, 142, 751, 1260, 1267; 25, p. 26

EIGHTEENMILE CREEK HRS
 TABLE 1 - BACKGROUND AND RELEASE SAMPLES
 SUPPLEMENTAL REMEDIAL INVESTIGATION REPORT, JULY 2009

Sample ID	Date	Depth	Sample Description	Percent Moisture	TOC (mg/kg)	Substance	Results (mg/kg)	Adjusted Result (mg/kg) *	Detection Limit (mg/kg)	References
18MC-L15E-S03-Z1	4/24/2007	0.5-1.0 feet	Soft brown silt. 20% fine to small gravel	42	N/A	Aroclor 1248 Aroclor 1254 Copper	14 3.1 6,830 J	5,598.4	0.004 0.0087 0.2	Ref. 7, pp. 52, 54, 57, 59, 65, 84, 86, 127, 130, 500-511; 21, pp. 4-5, 13-15, 18, 41, 57, 114, 758, 1260, 1268; 25, p. 26
18MC-L15W-S01-Z1	4/24/2007	0.3-1.2	Dark brown clay-rich soil wth 30% organic matter and 10% small gravel	50	N/A	Aroclor 1248 Aroclor 1254	0.73 0.67		0.004 0.0087	Ref. 7, pp. 52, 54, 57, 59, 65, 84, 86, 127, 130, 500-511; 21, pp. 4-5, 13-15, 18, 42, 115, 765, 1260; 25, p. 27
18MC-L16E-S01-Z1	4/24/2007	0.4-1.0 feet	Black to dark brown silt with 25% organic matter and 10% fine to medium gravel	50	N/A	Aroclor 1242 Aroclor 1254 Copper	31 6.7 2,640 J	2,163.9	0.0029 0.0087 1.2	Ref. 7, pp. 52, 54, 57, 60, 65, 84, 86, 127, 130, 500-511; 21, pp. 4-5, 13-15, 18, 44, 60, 115, 779, 1202, 1209, 1260, 1271; 25, p. 26
18MC-L16E-S02-Z1	4/24/2007	0-0.5 feet	Soft black silt with 10% wood fragments	56	50,200	Aroclor 1248 Aroclor 1254	4.3 1.5		0.004 0.0087	Ref. 7, pp. 52, 54, 57, 60, 65, 84, 86, 125, 127, 130, 500-511; 21, pp. 4-5, 13-15, 18, 45, 115, 786; 25, p. 26
18MC-L16E-S03-Z1	4/24/2007	0.5-1 feet	Dark brown silt with 30% organic fragments (roots) and 5% small gravel	59	N/A	Aroclor 1248 Aroclor 1254 Copper	5.9 2.8 1,170 J	959	0.004 0.0087 0.3	Ref. 7, pp. 52, 54, 57, 60, 65, 84, 86, 127, 130, 500-511; 21, pp. 4-5, 13-15, 18, 46, 62, 115, 793, 1260, 1273; 25, p. 26
18MC-L16W-S01-Z1	4/24/2007	0.2-0.8 feet	Brown-red silt with 20% organic fragments and 15% fine to small gravel	49	N/A	Aroclor 1248 Aroclor 1254	5.8 4.5		0.004 0.0087	Ref. 7, pp. 52, 54, 58, 60, 65, 84, 86, 129, 130, 500-511; 21, pp. 4-5, 13-15, 18, 47, 115, 800; 25, p. 27
18MC-L18-S02-Z1	4/25/2007	0.2-0.9 feet	Mixed brown silt with 40% fine wood fragments and a few fine gravel	46	36,300	Aroclor 1242 Copper	1.2 1,370		0.0029 0.22	Ref. 7, pp. 52, 54, 58, 60, 65, 84, 86, 128-130, 523-531; 22, pp. 4-5, 14-16, 19, 48, 66, 125, 687, 1935, 1939; 25, p. 29

Notes:

U - Indicates the compound was analyzed for not detected [Ref. 14, p. 23; 15, p. 19; 17, p. 23; 18, p. 23; 19, p. 18; 20, p. 23; 21, p. 18; 22, p. 19; 26, p. 20]

J - Indicates estimated value [Ref. 14, p. 23; 15, p. 19; 17, p. 23; 18, p. 23; 19, p. 18; 20, p. 23; 21, p. 18; 22, p. 19; 26, p. 20]

* All estimated results were adjusted for unknown bias in accordance with "Using Qualified Data to Document and Observed Release and Observed Contamination" [Ref. 27, pp. 4-8, 14, 16, 18]

The sample analyses were not performed under the EPA CLP and the analytical data packages do not establish SQLs, so the detection limits are used [Ref. 1, p. 51589].

Bold indicates maximum background levels

EIGHTEENMILE CREEK HRS
 TABLE 2 - BACKGROUND AND RELEASE SAMPLES
 DATA SUMMARY REPORT, MARCH 2011

Sample ID	Date	Depth (ft bgs)	Sample Description	Grain Size (% fines)*	TOC (mg/kg)	Hazardous Substance	Result (mg/kg)	Adjusted Result (mg/kg)*	% Moisture	Dilution Factor	SQL (mg/kg)	References
TRIBUTARY (BACKGROUND) SAMPLES												
R7-203-T-Z1a	6/29/2010	0-0.5	Silt, little fine sand, some organic matter	53.7	50,200	PCB-1242 (AROCOLOR 1242) PCB-1248 (AROCOLOR 1248) PCB-1254 (AROCOLOR 1254) PCB-1260 (AROCOLOR 1260)	0.08U 0.08U 0.08U 0.08U		59	1.0	0.080 0.080 0.080 0.080	Ref. 9, pp. 77, 216, 228, 329, 330, 555, 587, 744-749, 1965, 2118, 2197, 13, pp. 248, 256, 273, 30, pp. 40, 38, pp. 1, 2
R7-204-T-Z1a	6/29/2010	0-0.3	Brown silt, trace organic matter	40.3	52,300	PCB-1242 (AROCOLOR 1242) PCB-1248 (AROCOLOR 1248) PCB-1254 (AROCOLOR 1254) PCB-1260 (AROCOLOR 1260)	0.062U 0.062U 0.062U 0.062U		47	1.0	0.062 0.062 0.062 0.062	Ref. 9, pp. 77, 216, 228, 330, 556, 587, 721-726, 2120, 2198, 13, pp. 182, 183, 188, 30, pp. 41, 38, pp. 1, 2
R7-201-T-Comp	6/25/2010	0-1.1	Brown silt, organic traces of gravel	52.4	28,400	PCB-1242 (AROCOLOR 1242) PCB-1248 (AROCOLOR 1248) PCB-1254 (AROCOLOR 1254) PCB-1260 (AROCOLOR 1260)	0.064U 0.064U 0.064U 0.064U		49	1.0	0.064 0.064 0.064 0.064	Ref. 9, pp. 77, 214, 228, 326, 553, 585, 744-749, 2838, 2994, 3075, 13, pp. 248, 252, 267, 30, pp. 40, 38, pp. 1, 2
R7-201-T-Z1a	6/25/2010	0-0.5	Brown and grey silt, organic matter, and traces of gravel	89.3	34,200	PCB-1242 (AROCOLOR 1242) PCB-1248 (AROCOLOR 1248) PCB-1254 (AROCOLOR 1254) PCB-1260 (AROCOLOR 1260)	0.07U 0.07U 0.07U 0.07U		53	1.0	0.070 0.070 0.070 0.070	Ref. 9, pp. 77, 214, 227, 326, 553, 585, 727-731, 2996, 3076, 13, pp. 163, 164, 169, 30, pp. 40, 38, pp. 1, 2
R7-202-T-Comp	6/29/2010	0-0.9	Grey-brown silt and mixed sand and wet soft organic matter	65	30,600	PCB-1242 (AROCOLOR 1242) PCB-1248 (AROCOLOR 1248) PCB-1254 (AROCOLOR 1254) PCB-1260 (AROCOLOR 1260)	0.067U 0.067U 0.067U 0.067U		51	1.0	0.067 0.067 0.067 0.067	Ref. 9, pp. 77, 214, 228, 326, 554, 587, 721-726, 1962, 2112, 2194, 13, pp. 182, 183, 189, 30, pp. 40, 38, pp. 1, 2
R7-202-T-Z1a	6/29/2010	0-0.5	Grey-brown silt and mixed sand and wet soft organic matter	84.9	45,900	PCB-1242 (AROCOLOR 1242) PCB-1248 (AROCOLOR 1248) PCB-1254 (AROCOLOR 1254) PCB-1260 (AROCOLOR 1260)	0.11U 0.11U 0.11U 0.11U		69	1.0	0.110 0.110 0.110 0.110	Ref. 9, pp. 77, 216, 228, 326, 554, 587, 744-749, 1963, 2114, 2193, 13, pp. 248, 255, 272, 30, pp. 40, 38, pp. 1, 2
R4-119-T	11/17/2009	0-0.5	Brown and green clay few rootlets little to trace silt and sand	80.4	22,000	PCB-1242 (AROCOLOR 1242) PCB-1248 (AROCOLOR 1248) PCB-1254 (AROCOLOR 1254) PCB-1260 (AROCOLOR 1260)	0.048U 0.048U 0.048U 0.048U		31.9	1.0	0.048 0.048 0.048 0.048	Ref. 9, pp. 58, 301, 322, 561, 139, 224, 352, 13, pp. 323, 326, 335, 30, pp. 33, 38, pp. 1, 2
RELEASE SAMPLES												
R7-071-C	11/25/2009	0-1.5	Brown soft silt with few mixed sand	61.4	72,000	PCB-1254 (AROCOLOR 1254)	4.2		67.4	10.0	1.0	Ref. 9, pp. 59, 188, 227, 302, 326, 385, 566, 13, pp. 469, 470, 472, 473, 30, pp. 35, 38, pp. 1, 2
R7-072-C	11/24/2009	0-0.8	Dark gray silt	67.2	93,000	PCB-1254 (AROCOLOR 1254)	3.9		53.2	10.0	0.70	Ref. 9, pp. 59, 188, 227, 302, 326, 386, 565, 13, pp. 416, 419, 429, 430, 30, pp. 35, 38, pp. 1, 2
R7-077-C	11/24/2009	0-1.2	Dark gray to black soft silt with few mixed sand	69.4	73,000	PCB-1254 (AROCOLOR 1254)	1.4		67	5.0	0.50	Ref. 9, pp. 60, 190, 227, 302, 326, 391, 565, 13, pp. 416, 419, 427, 428, 30, pp. 35, 38, pp. 1, 2
R7-080-C	12/2/2009	0-1.7	0.1-0.2 Grey silty clay with medium grained sand, organics; 0.2-0.3 fine sub angular gravel; 0.3-1.1 grey to black stained silty clay with fine sand, organics sheen and fuel odor; 1.1-1.3 black material with strong fuel odor; 1.3-1.7 black stained clayey silt w/o cinders	64.3	41,000	PCB-1254 (AROCOLOR 1254)	0.76		47.5	1.0	0.062	Ref. 9, pp. 60, 190, 227, 302, 326, 394, 568, 13, pp. 478, 481, 483, 30, pp. 35, 38, pp. 1, 2
R7-082-CR	11/30/2009	0-1.6	0-1.4 Gray to black clay silt with sparse sand, high organic content, sheen faint fuel odor, saturated; 1.4-1.6 Reddish brown clay	61.5	39,000	PCB-1254 (AROCOLOR 1254)	1.4		49.3	5.0	0.33	Ref. 9, pp. 60, 192, 227, 302, 327, 396, 567, 13, pp. 418, 420, 435, 436, 30, pp. 35, 38, pp. 1, 2
R7-085-C	11/30/2009	0-1.6	Medium to dark brown clayey silt with high organic content, saturated, sheen, fuel odor present.	45.7	62,000	PCB-1254 (AROCOLOR 1254)	7.8		54.4	10.0	0.72	Ref. 9, pp. 60, 192, 227, 302, 327, 399, 567, 1510, 13, pp. 418, 420, 437, 438, 30, pp. 35, 38, pp. 1, 2
R7-088-C	11/25/2009	0-1	Moist clayey sand almost black	61.8	91,000	PCB-1254 (AROCOLOR 1254)	55		53.4	100.0	7.0	Ref. 9, pp. 60, 192, 227, 303, 327, 402, 566, 13, pp. 469, 471, 476, 477, 30, pp. 36, 38, pp. 1, 2

EIGHTEENMILE CREEK HRS
 TABLE 2 - BACKGROUND AND RELEASE SAMPLES
 DATA SUMMARY REPORT, MARCH 2011

Sample ID	Date	Depth (ft bgs)	Sample Description	Grain Size (% fines)*	TOC (mg/kg)	Hazardous Substance	Result (mg/kg)	Adjusted Result (mg/kg)*	% Moisture	Dilution Factor	SQL (mg/kg)	References
R7-091-C	11/24/2009	0-1.4	Saturated silty sand, dark brown and organic debris	44.5	109,000	PCB-1254 (AROCLOR 1254)	11		67.2	10.0	1.0	Ref. 9, pp. 60, 194, 227, 303, 327, 328, 405, 565; 13, pp. 416, 420, 431, 432; 30, pp. 36; 38, pp. 1, 3
R7-092-C	11/24/2009	0-1	Saturated silty sand, dark brown and slight organic odor	53.1	64,000	PCB-1254 (AROCLOR 1254)	2.5		58.5	10.0	0.79	Ref. 9, pp. 60, 194, 227, 303, 328, 406, 565; 13, pp. 417, 420, 433, 434; 30, pp. 36; 38, pp. 1, 3
R7-094-C	11/23/2009	0-1	Black silt with mixed sand	62.1	64,000	PCB-1254 (AROCLOR 1254)	1.3		65.8	1.0	0.096	Ref. 9, pp. 60, 194, 227, 303, 328, 408, 564, 1311; 13, pp. 387, 389, 397, 30, pp. 36; 38, pp. 1, 3
R7-172-C-Comp	6/25/2010	0-0.9	Dark gray and brown silt and sand, hydrocarbon odor	35	42,900	PCB-1248 (AROCLOR 1248) PCB-1254 (AROCLOR 1254)	10 12		52	50.0	3.4 3.4	Ref. 9, pp. 75, 200, 227, 325, 326, 524, 585, 738-742, 2823, 2964, 3060; 13, pp. 283, 286, 299, 300; 30, pp. 36; 38, pp. 1, 3
R7-172-C-Z1a	6/25/2010	0-0.5	Dark gray and brown silt and sand, hydrocarbon odor	30	58,600	PCB-1254 (AROCLOR 1254)	8.4		54	15.0	1.1	Ref. 9, pp. 75, 200, 227, 325, 326, 524, 585, 744-749, 2966, 3061; 13, pp. 248, 252, 263, 264; 30, pp. 37, 38, pp. 1, 3
R7-174-C-Z1a	6/25/2010	0-0.5	Mixed silt, mostly dark gray, little brown, fine gravel and sand with some decayed organics, hydrocarbon odor, slight sheen	79.3	82,200	PCB-1248 (AROCLOR 1248)	1.8		69	5.0	0.53	Ref. 9, pp. 75, 202, 227, 326, 526, 585, 744-749, 2828, 2974; 13, pp. 248, 252, 263, 266; 30, pp. 37, 38, pp. 1, 3
R7-176-C-Comp	6/24/2010	0-0.9	Mix of sandy silt, brown and black, slight odor no sheen	31.3	108,000	PCB-1254 (AROCLOR 1254)	3.3		59	10.0	0.80	Ref. 9, pp. 75, 202, 227, 326, 528, 584, 738-742, 2831, 2980; 13, pp. 283, 286, 295, 296; 30, pp. 37, 38, pp. 1, 3
R7-176-C-Z1a	6/24/2010	0-0.5	Mix of sandy silt, brown and black, slight odor no sheen	44.8	106,000	PCB-1248 (AROCLOR 1248) PCB-1254 (AROCLOR 1254)	7.5 3.2		75	10.0	1.3 1.3	Ref. 9, pp. 75, 202, 227, 326, 528, 584, 744-749, 2832, 2982; 13, pp. 248, 251, 259, 260; 30, pp. 37, 38, pp. 1, 3
R7-178-C-Z1	6/24/2010	0.5-1.2	0.4-0.9 dark gray silt with few decayed organics; 0.9-1.2 brown silty sand	52.2	130,000	PCB-1248 (AROCLOR 1248) PCB-1254 (AROCLOR 1254) PCB-1260 (AROCLOR 1260)	16 NJ 26 J 42	1.6 NJ 2.6 J	64	100.0	9.1 9.1 9.1	Ref. 9, pp. 75, 204, 227, 326, 327, 530, 584, 738-742, 2990; 13, pp. 283, 286, 297, 298; 30, pp. 37, 38, pp. 1, 3
R7-179-C-Comp	6/23/2010	0-0.7	All wet soft brown silt, little traces of gravel.	80.7	41,400	PCB-1254 (AROCLOR 1254)	2.1		65	10.0	0.94	Ref. 9, pp. 75, 204, 227, 327, 531, 583, 738-742, 1577, 1832; 13, pp. 283, 285, 291, 292; 30, pp. 38
R7-180-C-Comp	6/23/2010	0-1.1	0-0.5 Brown sandy silt, traces of gravel, decayed organics; 0.5-1.1 brown silt with little sand, traces of organics	42.7	64,500	PCB-1248 (AROCLOR 1248) PCB-1254 (AROCLOR 1254)	26 18		51	100.0	6.7 6.7	Ref. 9, pp. 75, 204, 227, 327, 532, 583, 738-742, 1579, 1836; 13, pp. 283, 285, 293, 294; 30, pp. 38; 38, pp. 1, 3
R7-184-C-Comp	6/30/2010	0-0.75	Very dark gray-brown clayey silt with fine sand. Very thin film of med brown sandy silt. Strong sweet/rancid fuel odor. Bubbly and oil sheen on water surface.	67.8	101,000	PCB-1254 (AROCLOR 1254)	6.9		52	50.0	3.4	Ref. 9, pp. 76, 206, 227, 327, 536, 588, 750-755, 2247, 2485; 13, pp. 207, 209, 216, 217; 30, pp. 38; 38, pp. 1, 3
R7-187-C-Comp	6/30/2010	0-0.95	0-0.5 dark grey-brown organic silt/muck, mild sulfur odor; 0.5-0.95 dark gray brown sandy silt/muck, high organic content, very mild decay odor.	71.1	53,700	PCB-1248 (AROCLOR 1248) PCB-1254 (AROCLOR 1254)	41 J 23	4.1 J	59	50.0	4.0 4.0	Ref. 9, pp. 76, 208, 227, 327, 539, 588, 721-726, 2252, 2495; 13, pp. 182, 184, 190, 191; 30, pp. 38; 38, pp. 1, 3
R7-194-C-Comp	6/29/2010	0-0.6	Dark gray-brown silty sand with fine gravel, organics, paint chips, metal shards, plastic shreds, mild odor of sweet/rancid fuel smell.	21.8	84,700	PCB-1248 (AROCLOR 1248) PCB-1254 (AROCLOR 1254)	23 10		63	50.0	4.4 4.4	Ref. 9, pp. 76, 210, 227, 328-330, 546, 587, 744-749, 1958, 2104; 13, pp. 248, 255, 270, 271; 30, pp. 39; 38, pp. 1, 3
R7-195-C-Comp	6/29/2010	0-0.6	Gray-brown silty sand with fine gravel, organic material, black staining, shredded rubber, and plastic, strong rancid/sweet fuel odor. Darker stained lens at 0.2	22.8	66,600	PCB-1254 (AROCLOR 1254)	3.0		42	10.0	0.57	Ref. 9, pp. 76, 212, 227, 329, 330, 547, 587, 727-731; 1959, 2106; 13, pp. 163, 167, 173, 174; 30, pp. 39, 38, pp. 1, 3

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Sample ID	Date	Depth (ft bgs)	Sample Description	Grain Size (% fines)*	TOC (mg/kg)	Hazardous Substance	Result (mg/kg)	Adjusted Result (mg/kg)*	% Moisture	Dilution Factor	SQL (mg/kg)	References
R7-198-C-Comp	6/28/2010	0-0.9	0-0.5 medium brown, fine to medium grained sand; 0.5-0.9 dark brown to black sandy silt with decaying organic matter, shredded plastic and black streaking, sweet/rancid fuel like odor	28.4	57,500	PCB-1254 (AROCLOR 1254)	1.3		40	5.0	0.27	Ref. 9, pp. 76, 212, 227, 329, 330, 586, 727-731, 550, 3119, 3260; 13, pp. 163, 165, 171, 172; 30, pp. 39; 38, pp. 1, 3
R7-200-C-Z1a	6/28/2010	0-0.5	Dark brown silty sand	23.5	66,900	PCB-1254 (AROCLOR 1254)	0.52		44	1.0	0.059	Ref. 9, pp. 77, 214, 227, 329, 330, 552, 586, 744-749, 3124, 3270; 13, pp. 248, 253, 268; 30, pp. 39; 38, pp. 1, 4
R6-052-C	11/19/2009	0-1.3	Black silt, strong hydrocarbons odor, sheen visible	67.6	84,000	PCB-1254 (AROCLOR 1254)	1.3		67.5	5.0	0.5	Ref. 9, pp. 59, 167, 226, 301, 323, 324, 362, 563, 13, pp. 356, 354, 368, 369; 30, pp. 34; 38, pp. 1, 4
R6-056-CR	11/17/2009	0-1.2	Sandy gravel with few clays, brownish gray with some red observed, dark blue sheen	52.5	26,000	PCB-1254 (AROCLOR 1254)	1.0		39.9	10.0	0.55	Ref. 9, pp. 59, 167, 226, 301, 324, 366, 561; 13, pp. 319, 320, 323, 326; 30, pp. 34; 38, pp. 1, 4
R6-066-C	11/25/2009	0-1.9	Gray silt with sand and decayed organics	69.9	47,000	PCB-1254 (AROCLOR 1254)	4.5		60.7	10.0	0.82	Ref. 9, pp. 59, 171, 226, 301, 325, 326, 376, 566; 13, pp. 469, 470, 474, 475; 30, pp. 34; 38, pp. 1, 4
R6-161-C-Z1	7/1/2010	0.5-1.5	0.5-1.2 mixed black silt and fine sand and few gravel and up to 50% decayed organics; 1.2-1.5 black silt, hydrocarbon odor, no sheen	57.5	51,500	PCB-1254 (AROCLOR 1254)	25 J	2.5 J	65	100.0	9.5	Ref. 9, pp. 74, 179, 226, 324, 513, 589, 733-737, 3390, 3547; 13, pp. 226, 229, 231, 232; 30, pp. 34; 38, pp. 1, 4
R5-045-V-Z1	5/20/2010	0-1	Brown silt with mostly twigs and organics, wet	N/A	N/A	PCB-1248 (AROCLOR 1248)	0.88		75	1.0	0.13	Ref. 9, pp. 71, 154, 323, 477, 574, 862-869; 13, pp. 115, 116, 121; 30, pp. 34; 38, pp. 1, 4
R4-135-C-Comp	6/21/2010	0-0.8	Mix of dark and brown silt, sand and organics, moderate hydrocarbon odor, little sheen	21.1	43,200	PCB-1254 (AROCLOR 1254) PCB-1260 (AROCLOR 1260)	19 8.3 J	0.83 J	59	50.0	4.0	Ref. 9, pp. 73, 139, 224, 321, 322, 487, 581, 738-742; 1565, 1808, 4691; 13, pp. 283, 284, 288, 289; 30, pp. 33; 38, pp. 1, 4
R4-135-C-Z1a	6/21/2010	0-0.5	Mix of dark and brown silt, sand and organics, moderate hydrocarbon odor, little sheen	47.1	115,000	PCB-1254 (AROCLOR 1254)	5.3		67	10.0	0.99	Ref. 9, pp. 73, 139, 224, 321, 322, 487, 581, 744-749, 1566, 1810; 13, pp. 248, 249, 257, 258; 30, pp. 33; 38, pp. 1, 4
R4-143-C-Z1a	6/23/2010	0-0.3	Decayed organics twigs and leaves, with little brown silt.	33.7	102,000	PCB-1254 (AROCLOR 1254)	1.1		64	1.0	0.091	Ref. 9, pp. 73, 141, 224, 322, 583, 738-742, 495, 1576, 1830; 13, pp. 283, 285, 290; 30, pp. 33; 38, pp. 1, 4
R2-001-V-Z3	5/18/2010	2-3	Wet black slightly soft fine silt	97.9	91,800	PCB-1248 (AROCLOR 1248)	2.5		75	5.0	0.66	Ref. 9, pp. 62, 89, 222, 320, 434, 572, 767-772, 4686, 4847; 13, pp. 15, 16, 19, 20; 30, pp. 30; 38, pp. 1, 4
R2-002-V-Z1	5/18/2010	0-1	Soft very fine silt, few organics (leaves)	98.8	46,200	PCB-1248 (AROCLOR 1248)	0.42		72	1.0	0.12	Ref. 9, pp. 62, 91, 222, 320, 436, 572, 798-804, 4691, 4852; 13, pp. 39, 40, 44; 30, pp. 30; 38, pp. 1, 4
R2-003-V-Z2	5/18/2010	1-2	Dark gray silt, few twigs and leaves debris	99.4	42,800	PCB-1248 (AROCLOR 1248)	0.51		67	1.0	0.099	Ref. 9, pp. 62, 93, 222, 320, 438, 572, 767-772, 4700, 4797; 13, pp. 15, 17, 21; 30, pp. 30; 38, pp. 1, 4
R2-003-V-Z3	5/18/2010	2-3	Dark gray silt, few twigs and leaves debris	93.8	92,400	PCB-1248 (AROCLOR 1248)	4.1		75	5.0	0.66	Ref. 9, pp. 62, 93, 222, 320, 438, 572, 767-772, 4701, 4798; 13, pp. 15, 18, 24, 25; 30, pp. 30; 38, pp. 1, 4
R2-004-V-Z3	5/18/2010	2-3	Gray-black very soft silt, few organics (leaves, roots), hydrocarbon odor	98.1	73,100	PCB-1248 (AROCLOR 1248)	2.7		74	5.0	0.63	Ref. 9, pp. 63, 95, 222, 320, 440, 572, 767-772, 4240, 4267; 13, pp. 15, 18, 22, 23; 30, pp. 30; 38, pp. 1, 4
R2-005-V-Z2	5/19/2010	1-2	Brown-gray very fine, soft silt, few organics	99.2	46,900	PCB-1248 (AROCLOR 1248)	0.47		66	1.0	0.096	Ref. 9, pp. 63, 95, 222, 320, 442, 573, 831-836, 4245, 4272; 13, pp. 74, 75, 77; 30, pp. 31; 38, pp. 1, 4

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 TABLE 2 - BACKGROUND AND RELEASE SAMPLES
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Sample ID	Date	Depth (ft bgs)	Sample Description	Grain Size (% fines)*	TOC (mg/kg)	Hazardous Substance	Result (mg/kg)	Adjusted Result (mg/kg)*	% Moisture	Dilution Factor	SQL (mg/kg)	References
R2-005-V-Z3	5/19/2010	2-3	Black gray very fine silt, few rootlets and leaves, slight sheen, hydrocarbon odor	97.9	107,000	PCB-1248 (AROCOLOR 1248)	7.0		71	10.0	1.1	Ref. 9, pp. 63, 95, 222, 320, 442, 573, 831-836, 4247, 4274; 13, pp. 74, 75, 78, 79, 30, pp. 31, 38, pp. 1, 4
R2-005-V-Z4	5/19/2010	3-4	Gray-black very fine fine silt, traces of fine gravel, few rootlets, slight sheen, hydrocarbon odor	97.2	69,800	PCB-1248 (AROCOLOR 1248)	2.8		68	10.0	1.0	Ref. 9, pp. 63, 95, 222, 320, 442, 573, 831-836, 4247, 4274; 13, pp. 74, 75, 80, 85; 30, pp. 31, 38, pp. 1, 4
R2-007-V-Z2	5/19/2010	1-2	Brown-gray very fine silt, traces of rootlets	100	58,300	PCB-1248 (AROCOLOR 1248)	2.1		68	5.0	0.51	Ref. 9, pp. 64, 99, 222, 320, 445, 573, 831-836, 4878, 4975; 13, pp. 74, 76, 81, 82; 30, pp. 31, 38, pp. 1, 4
R2-007-V-Z3	5/19/2010	2-3	Gray-black gray very fine silt, few rootlets, slight hydrocarbon odor, traces of fine gravel	99.8	136,000	PCB-1248 (AROCOLOR 1248)	22		71	50.0	5.7	Ref. 9, pp. 64, 99, 222, 320, 445, 573, 831-836, 4879, 4976; 13, pp. 74, 76, 83, 84; 30, pp. 31, 38, pp. 1, 5
R2-008-V-Z2	5/19/2010	1-2	Gray-brown very soft wet silt, few rootlets	98.9	57,400	PCB-1248 (AROCOLOR 1248)	0.87		63	1.0	0.089	Ref. 9, pp. 64, 101, 222, 320, 446, 573, 798-804, 4885, 4982; 13, pp. 39, 42, 47, 30, pp. 31, 38, pp. 1, 5
R2-009-V-Z2	5/19/2010	1-2	Gray-brown soft wet silt, few rootlets, fine gravel	98.9	54,300	PCB-1248 (AROCOLOR 1248)	0.59		66	1.0	0.097	Ref. 9, pp. 64, 101, 222, 320, 447, 573, 779-785, 4892, 4989; 13, pp. 56, 59, 62; 30, pp. 32, 38, pp. 1, 5
R2-009-V-Z3	5/19/2010	2-3	Gray-black silt, mildly firm, few rootlets, wood pulp	97.2	99,700	PCB-1248 (AROCOLOR 1248)	4.6		69	10.0	1.1	Ref. 9, pp. 64, 101, 222, 320, 447, 573, 779-785, 5068, 5272; 13, pp. 56, 59, 63, 64; 30, pp. 32, 38, pp. 1, 5
R2-011-V-Z1a	5/25/2010	0-0.5	Brown silt, wet low density, traces of fine sand, few organics	94.9	32,000***	PCB-1248 (AROCOLOR 1248)	0.38		64	1.0	0.091	Ref. 9, pp. 65, 105, 320, 450, 577, 862-869, 5609, 5745; 13, pp. 115, 120, 122; 30, pp. 32, 38, pp. 1, 5
R2-013-V-Z1a	5/25/2010	0-0.5	Brown wet loose fine silt, traces of fine sand, few organics, low density	91.9***	53,000***	PCB-1248 (AROCOLOR 1248)	0.59		70	1.0	0.11	Ref. 9, pp. 66, 109, 320, 452, 577, 855-861, 5834, 5976; 13, pp. 94, 97, 99; 30, pp. 32, 38, pp. 1, 5
R2-013-V-Z1b	5/25/2010	0.5-1	Brown wet loose fine silt, traces of fine sand, few organics, low density	91.9***	53,000***	PCB-1248 (AROCOLOR 1248)	1.9		89	1.0	0.3	Ref. 9, pp. 66, 109, 320, 452, 577, 855-861, 5834, 5976; 13, pp. 94, 98, 100; 30, pp. 32, 38, pp. 1, 5
R2-015-V-Z3	5/25/2010	2-3	Brown wet loose fine silt, traces of fine sand	91.8	131,000	PCB-1248 (AROCOLOR 1248)	6.5		69	10.0	1.1	Ref. 9, pp. 66, 113, 222, 320, 321, 454, 577, 904-909, 6068, 6165; 13, pp. 133, 136, 139, 140; 30, pp. 32, 38, pp. 1, 5

Notes:

- ft bgs = feet below ground surface
- TOC = total organic carbon
- mg/kg = milligrams per kilogram
- SQL = sample quantitation limit = adjusted CRQL as defined in CLP Statement of Work SOM01.2 [Ref. 1, pp. 51586, 51589; 11, pp. 62, 111-113].
- J - The analyte was positively identified-the associated numerical value is the approximate concentration of the analyte in the sample [Ref. 27, p. 6; 30, pp. 3-4]
- N - The analysis indicates the presence of an analyte that has been "tentatively identified," and the associated numerical value represents its approximate concentration [Ref. 30 p. 3].
- U - The substance or analyte was analyzed for, but no quantifiable concentration was found at or above the CRQL [Ref. 27, p. 6; 30, pp. 3-4]
- * - Grain size (% fines) = particle size less than 75µm [Ref. 34, p. 1]
- ** - All estimated results were adjusted for unknown bias in accordance with "Using Qualified Data to Document and Observed Release and Observed Contamination" [Ref. 27, pp. 4-8, 14, 16, 18]
- *** - Result for total depth
- Bold** indicates maximum background levels
- N/A = not available

2.4.2 Hazardous Waste Quantity

2.4.2.1.1 Hazardous Constituent Quantity

The information available is not sufficient to evaluate Tier A source hazardous waste quantity; therefore, hazardous constituent quantity is not scored (NS).

Hazardous Constituent Quantity (C) Value: NS

2.4.2.1.2 Hazardous Wastestream Quantity

The information available is not sufficient to evaluate Tier B source hazardous waste quantity; therefore, hazardous wastestream quantity is not scored.

Hazardous Wastestream Quantity (W) Value: NS

2.4.2.1.3 Volume

Analytical results show that contaminated sediments are located throughout Eighteenmile Creek [see Sections 2.2.1 and 2.4.1]. However, the total volume of PCB-contaminated sediments is unknown. Therefore, the volume of contaminated sediments is considered to be greater than 0 (>0) cubic yards. The source type is 'Other,' so the volume value is divided by 2.5 to obtain the assigned value, as shown below [Ref. 1, p. 51591 (Section 2.4.2.1.3, Table 2-5)].

Dimension of source (yd³): >0 yd³
Volume (V) Assigned Value: (>0)/2.5 =>0

2.4.2.1.4 Area

Tier D is not evaluated for source type "other" [Ref. 1, p. 51591 (Table 2-5, Section 2.4.2.1.4)].

Area of source (ft²): N/A
Area (A) Assigned Value: 0

2.4.2.1.5 Source Hazardous Waste Quantity Value

The source hazardous waste quantity value for Source 1 is >0 for Tier C - Volume [Ref. 1, p. 51591].

Source Hazardous Waste Quantity Value: >0

SITE SUMMARY OF SOURCE DESCRIPTIONS

<u>Source Number</u>	<u>Source Hazardous Waste Quantity Value</u>	<u>Containment</u>			
		<u>Ground Water</u>	<u>Surface Water</u>	<u>Gas</u>	<u>Air Particulate</u>
1	>0	NS	10 *	NS	NS

NS = Not Scored

* The overland flow containment factor is 10 for the source [see Section 2.2.1].

4.1 OVERLAND/FLOOD MIGRATION COMPONENT

4.1.1.1 Definition of Hazardous Substance Migration Path for Overland/Flood Component

The headwaters of Eighteenmile Creek originate southeast of Lockport in the Niagara County Park and Golf Course and flow aboveground to the west for approximately 1 mile, where they enter an underground pipe on the east side of Lockport [Ref. 7, p. 65; 28, pp. 6, 7, 21]. The creek then flows northwest under Lockport for approximately ¼ mile, where it empties into a sluice located just southeast of the NYSBC and just southwest of the Mill Street Bridge [Ref. 7, p. 65; 28, pp. 6, 19, 20]. Water from the NYSBC is discharged through the Hall Spillway and flows east into the sluice [Ref. 28, pp. 6, 19]. The headwaters of Eighteenmile Creek and NYSBC waters combine in the sluice and flow through Culvert No. 125 under the NYSBC, exiting on the north side of the NYSBC and forming what is referred to as the East Branch of Eighteenmile Creek [Ref. 5, p. 69; 28, pp. 6, 13, 14, 19]. The East Branch associated with the headwaters of Eighteenmile Creek is not the same stream as East Branch, a tributary of Eighteenmile Creek entering the creek just south of Newfane, New York, approximately 4 miles downstream of the headwaters [Ref. 4, p. 1]. The West Branch of Eighteenmile Creek originates in Upson Park at the dry dock on the north side of the NYSBC, and also receives water from two underground flows from the south and southwest [Ref. 5, p. 69; 28, pp. 5, 17, 18]. Waters from the East and West Branches converge on the south side of Clinton Street and flow under Clinton Street to the Mill Pond (which is the result of Clinton Street Dam) [Ref. 5, p. 69, 182-184; 7, p. 24; 8, p. 68]. Eighteenmile Creek flows north for approximately 15 miles and discharges to Lake Ontario in Olcott, New York [Ref. 7, p. 24; 9, p. 13, 319].

The Eighteenmile Creek site is scored by the following approach:

The threats being evaluated are the Surface Water Pathway Human Food Chain and Environmental Threats.

An observed release by chemical analysis is documented throughout Eighteenmile Creek, and the hazardous substances present include PCBs [see Section 2.2].

Since the source is contaminated sediments in the waterway with discernable flow, the 15-Mile Surface water Pathway begins at the most upstream sediment sample documenting observed release [Ref. 1, p. 51605].

The known zone of contamination extends from the Eighteenmile Creek Corridor in Lockport (farthest upstream sample: 18MC-L03W-S01-Z1 indicated PCB Aroclor 1248 detected at 0.73 mg/kg) to just south of the Burt Dam fishery (farthest downstream sample: R2-001-V-Z3 indicated PCB Aroclor 1248 detected at 2.5 mg/kg) [Tables 1 and 2; Ref. 7, p. 116; 9, p. 89; 13, pp. 16, 20; 15, p. 49, 140; 23, p. 1; 24, pp. 1, 2; 25, p. 1]. The sample locations are shown on Figures 2A and 2E.

Targets subject to actual contamination include wetlands and the Eighteenmile Creek fishery at Ide Road in Town of Newfane [Sections 4.1.3.3 and 4.1.4.3], and targets subject to potential contamination include the Eighteenmile Creek fishery at Fisherman's Park and significant coastal fish and wildlife habitat downstream of Burt Dam [Section 4.1.4.3].

4.1.2.1 Likelihood of Release

4.1.2.1.1 Observed Release

Direct Observation

An observed release by direct observation is not being scored.

Chemical Analysis

An observed release by chemical analysis is documented in Eighteenmile Creek between the Eighteenmile Creek Corridor in Lockport (farthest upstream sample: 18MC-L03-S01-Z1 indicated PCB Aroclor 1248 detected at 0.73 mg/kg) to just south of the Burt Dam fishery (farthest downstream sample: R2-001-V-Z3 indicated PCB Aroclor 1248 detected at 2.5 mg/kg) [Tables 1 and 2; Ref. 7, p. 116; 9, p. 89; 13, pp. 15, 16, 19, 20; 15, p. 49, 140; 23, p. 1]. The sample locations are shown on Figures 2A through 2E [see Section 2.2].

Attribution

Sediments in Eighteenmile Creek are contaminated with PCBs, copper, lead, zinc, and benzo(a)pyrene for a length of approximately 12.71 miles [see Section 2.2]. The origin of these hazardous substances in the contaminated sediments has not been identified due to the presence of multiple possible sources [Ref. 42, pp. 8, 72]. There are numerous routes that contamination can be taking to reach the water body and underlying sediments, including spillage during product shipping and handling, direct disposal and discharge, storm water runoff, and air deposition. As a result, the source(s) of all the contamination in any particular location in the creek cannot be determined. EPA considers any upland properties contributing to the sediment contamination observed in Eighteenmile Creek as a “possible source”. After extensive NYSDEC and EPA investigations, including Remedial Investigation and supplemental sampling, the specific sources of contaminants in Eighteenmile Creek have not been defined [Ref. 9, pp. 13-16; 42, pp. 8, 72]. EPA considers these activities equivalent to a multi-stage Expanded Site Inspection (ESI).

The contaminants detected in the creek sediments can come from a wide variety of industrial and other anthropogenic activities. Potential sources and conduits of contaminants to Eighteenmile Creek have been identified as industrial and municipal wastewater discharges, CSOs, inactive hazardous waste sites, the New York Barge Canal discharge, contaminated sediments already present in the creek, and others [Ref. 9, p. 14]. For instance, CSOs and storm water runoff are major contributors of PCBs, copper, lead, zinc, and other pollutants, with a variety of contaminated properties or facilities as the likely contributors to those waste streams [Ref. 6, pp. 29, 43, 100, 102, 105]. NYSDEC and EPA have identified several potential contamination sources of hazardous substances in the Eighteenmile Creek watershed [Ref. 7, pp. 16-29]. As discussed below, there are numerous possible contributors to the sediment contamination observed in Eighteenmile Creek sediments.

While these facilities or properties are thought to be contributing to the contamination in the creek, they have not been identified definitively as such and are not thought to be the only sources of contamination. Previous investigations by NYSDEC – brief descriptions of the facilities and associated investigations are provided below:

Former Flintkote Plant Property:

The Former Flintkote Plant property is located at 198, 225, and 300 Mill Street, Lockport, Niagara County, New York [Ref. 5, p. 25; 7, p. 27]. The Beckman Dawson Roofing Company purchased the Flintkote property in 1928 and manufactured felt and felt products [Ref. 5, p. 25; 7, p. 27]. Production of sound-deadening and tufting felt for use in automobiles began at Flintkote in 1935 and continued until operations ceased and the plant closed in December 1971

[Ref. 5, p. 25; 7, p. 27]. In addition to felt, composite laminates are suspected to have been manufactured at Flintkote, as they have been observed at the southernmost demolished building on the 198 Mill Street Property [Ref. 5, pp. 24-25; Ref. 7, p. 26]. A portion of the Flintkote property at 300 Mill Street near William Street was formerly listed as "Site No. 932072" in the Registry of Inactive Hazardous Waste Disposal Sites in New York State (NYS) with a classification code of 3 because of seven drums containing sweepings, solid materials and polychlorinated biphenyl (PCB) transformer oil that were stored in the basement of a building on site [Ref. 5, p. 25]. These drums were removed from the property by a waste oil processor in January 1984, and the "site" was removed from the Registry in 1985 [Ref. 5, p. 25]. In 1989, various drums containing chemicals were found at locations throughout the buildings at 300 Mill Street with 28 of these drums containing hazardous wastes [Ref. 5, p. 25]. These drums were disposed of off-site in May 1991 during a NYSDEC drum removal action [Ref. 5, p. 25; Ref. 7, p. 27]. The Former Flintkote Plant property is currently vacant and in disrepair [Ref. 5, p. 24]. A Site Investigation completed by the NYSDEC at the Former Flintkote Plant property during November and December 1999 revealed the presence of a consequential amount of hazardous waste (D008-lead) present on the property [Ref. 41, pp. 7, 32]. The NYSDEC concluded that the property should be included on the NYSDEC Registry of Inactive Hazardous Waste Disposal Sites in New York State and that Niagara County should continue to restrict access to the property [Ref. 41, pp. 7, 32].

In 2005, the NYSDEC completed a Remedial Investigation (RI) at the Eighteenmile Creek Corridor to better define the nature and extent of sediment contamination in Eighteenmile Creek [Ref. 5, p. 10]. An objective of the RI included an investigation of potential sources of contaminants to the creek, including the Former Flintkote Plant Property [Ref. 5, pp. 10, 69]. In March 2006, the NYSDEC issued a Record of Decision (ROD) for the Former Flintkote Plant Property [Ref. 5, p. 26; 40, pp. 1-53]. Data collected from October 1995 through October 2003 at the Former Flintkote Plant Property is summarized in the ROD; the data indicates the presence of PCBs, SVOCs including benzo(a)pyrene, and inorganics including copper, lead, and zinc in a variety of matrices, including PCBs up to 108 mg/kg in sediment samples collected from buildings [Ref. 40 pp. 26-32].

A Supplemental Remedial Investigation was completed in July 2009 to further evaluate sediment contamination in Eighteenmile Creek and to determine the vertical and lateral extent of contamination in properties adjacent to the creek [Ref. 7, p. 16]. A total of 22 sediment samples (and one duplicate) were collected along seven transects established along the Eighteenmile Creek adjacent to the Former Flintkote Plant property [Ref. 7, pp. 17, 95]. The highest detection of PCBs in sediment of Eighteenmile Creek were found adjacent to the Former Flintkote Plant at 237 mg/kg; more specifically, in sample 18MC-L14E-S02-Z1, Aroclor 1248 was detected at 180 mg/kg and Aroclor 1254 was detected at 57 mg/kg [Table 1; Ref. 7, pp. 65, 95, 126, 127]. Detections of benzo(a)pyrene in the sediment samples adjacent to the former Flintkote Plant Property, ranged from an estimated concentration of 0.28 mg/kg to 34 mg/kg, and the highest detections of copper, lead, and zinc in these samples were copper an estimated concentration of 6,830 mg/kg, lead at 3,990 mg/kg, and zinc at an estimated concentration of 7,340 mg/kg [Ref. 7, pp. 124-127, 130].

Former United Paperboard Company Property:

The Former United Paperboard Company Property is approximately 4.8 acres in size and is located at 62 and 70 Mill Street, Lockport, Niagara County, New York [Ref. 5, pp. 30-31; Ref. 7, p. 25]. The Jackson Lumber Company owned and operated at the 62 Mill Street United Paperboard property in the late 1880s and early 1890s [Ref. 7, p. 26]. A warehouse building was designated as the Saw Mill and Sash & Blind Manufacturing [Ref. 7, p. 26]. Sash & Blind added a pulp mill and box facility to its operations in 1892 [Ref. 7, p. 26]. By 1898 the lumber company had shut down their operations and the area previously occupied by Sash & Blind became the Traders' Paper Company paper mill, which became United Box Board and Paper Company in 1903 [Ref. 7, p. 26]. The 70 Mill Street United Paperboard property was owned by United Box Board Company in 1909 [Ref. 7, p. 26]. United Box Board Company became United Paper Board Company in 1914, which changed its name to United Paperboard Company in 1928, which then became United Board's Carton Corporation in 1948 and Beaverboard Company, Inc., in 1969 [Ref. 7, p. 26]. By 1969 the buildings had been vacated and dismantled [Ref. 7, p. 26]. The property is occupied by Duraline Abrasives, Inc., owned by TriSide, LLC, and contains one warehouse building [Ref. 5, p. 31; Ref. 7, p. 25].

In 2005, the NYSDEC completed an RI at the Eighteenmile Creek Corridor to better define the nature and extent of sediment contamination in Eighteenmile Creek [Ref. 5, p. 10]. The investigation included an investigation of potential sources of contaminants to the creek, including the Former United Paperboard Company Property [Ref. 5, pp. 10, 69]. The RI included the following activities: property inspection, completion of soil boring and test pit program, and collection of environmental samples for chemical analysis [Ref. 5, pp. 20-22]. During the property inspection of the Former United Paperboard Company Property, extensive ash fill was observed [Ref. 5, p. 51]. Five soil borings and three test pits were completed at the Former United Paperboard Company Property [Ref. 5, pp. 35, 69, 70]. Five surface and seven subsurface soil and fill samples were collected from the Former United Paperboard Company Property [Ref. 5, pp. 51, 72]. The surface soil samples were analyzed for PCBs and select metals and the subsurface soil samples were analyzed for PCBs, select metals, and SVOCs [Ref. 5, pp. 51]. The analytical results indicated the presence of PCBs, benzo(a)pyrene, copper, lead, and zinc [Ref. 5, pp. 156-159].

A Supplemental Remedial Investigation was completed in July 2009 in order to further evaluate sediment contamination the Eighteenmile Creek and to determine the vertical and lateral extent of contamination in properties adjacent to the Creek [Ref. 7, p. 16]. A total of 21 surface soil samples and 37 subsurface soil samples were collected from the Former United Paperboard Company Property as well as 20 sediment samples collected along six transects established along the Eighteenmile Creek adjacent to the Former United Paperboard Company property [Ref. 7, pp. 17, 94, 99, 104]. Surface and subsurface soil samples all indicated the presence of PCBs, benzo(a)pyrene, copper, lead, and zinc [Ref. 7, pp. 138-141, 167-173]. Sediment samples collected along Eighteenmile Creek adjacent to the Former United Paperboard Company Property indicate the presence of total PCBs ranging from 0.04 mg/kg to 61 mg/kg; benzo(a)pyrene ranging from non-detect to 7.1 mg/kg; and elevated detections of copper, lead, and zinc at 54,900 mg/kg, 15,000 mg/kg, and 21,400 mg/kg, respectively [Ref. 7, pp. 94, 120-123, 130].

Upton Park:

Upton Park is listed as a town park and it consists of 5.9 acres of land owned by the City of Lockport [Ref. 7, p. 24]. The park is located at 100 Clinton Street, Lockport, Niagara County, New York [Ref. 5, pp. 31-32; Ref. 7, p. 24]. A canal boat building company operated on this property from the mid 1880s until no later than 1892 [Ref. 5, p. 32; Ref. 7, p. 24]. A pulp mill operated on this property between 1919 and 1928; in 1914, the mill company name changed to the United Paper Board Company [Ref. 5, p. 32; Ref. 7, p. 24]. By 1948, operations at the mill had been shut down and the buildings on the property had been demolished by 1969 [Ref. 7, pp. 24-25].

In 2005, the NYSDEC completed a RI at the Eighteenmile Creek Corridor to better define the nature and extent of sediment contamination in Eighteenmile Creek [Ref. 5, p. 10]. The investigation included an investigation of potential sources of contaminants to the creek. Potential sources investigated included the Upton Park Property [Ref. 5, pp. 10, 69]. The RI included the following activities: property inspection, completion of soil boring and collection of environmental samples for chemical analysis [Ref. 5, pp. 20-22]. During the property inspection, fill material was observed on the Upton Park property [Ref. 5, p. 48]. Four surface and subsurface fill/soil samples were analyzed for PCBs, select metals, and SVOCs [Ref. 5, pp. 49, 69, 71]. The analytical results indicated the presence of PCBs, benzo(a)pyrene, copper, lead, and zinc [Ref. 5, pp. 152, 153].

A Supplemental Remedial Investigation was completed in July 2009 in order to further evaluate sediment contamination the Eighteenmile Creek and to determine the vertical and lateral extent of contamination in properties adjacent to the Creek [Ref. 7, p. 16]. A total of 16 surface soil samples and 28 subsurface soil samples were collected from the Upton Park property as well as 24 sediment samples (and one duplicate) collected along five transects established along the Eighteenmile Creek adjacent to the Upton Park property [Ref. 7, pp. 17, 92, 97, 102]. Surface soil samples indicated the presence of PCBs, benzo(a)pyrene, copper, lead, and zinc; subsurface soil samples indicated the presence of PCBs, copper, lead, and zinc [Ref. 7, pp. 135, 136, 141, 161, 162, 173]. Sediment samples collected along Eighteenmile Creek adjacent to the Upton Park property indicate the presence of: total PCBs ranging from non-detect to 0.73 mg/kg; benzo(a)pyrene ranging from estimated concentrations of 0.024J mg/kg to 1.2J mg/kg; and detections of copper, lead, and zinc at 702 mg/kg, 1,660 mg/kg, and 1,300J mg/kg, respectively [Ref. 7, pp. 92, 114-117, 130].

Former White Transportation Property:

The Former White Transportation Property is approximately 2.6 acres in size and is located at 30-40 Mill Street, Lockport, Niagara County, New York [Ref. 5, p. 27; Ref. 7, p. 25]. There is a single-story concrete block building on the property, approximately 5,915 square feet in size, which was built in 1901 and had an addition to the western end completed in the early 1950s [Ref. 5, p. 27]. The building is currently vacant, but it was used in the recent past to store tractor-trailer trucks and equipment associated with former trucking operations [Ref. 5, p. 27]. Additionally, there were three trailers on the property: one locked trailer located near the front of the building facing Mill Street and two trailers near the bank of the East Branch of Eighteenmile Creek [Ref. 7, p. 25]. One of the trailers along the bank contained 55-gallon drums, two of which were lying on the ground behind the trailer; trailers and drums were later removed from the property under the supervision of NYSDEC [Ref. 7, p. 25]. The northern portion of the White Transportation property operated as the New York Cotton Bating Company from at least 1909 until at least 1920, as the James O-Ring Company during the early 1940s, and as White Transportation from 1948 until the late 1990s when all operations on the property ceased [Ref. 5, p. 28; Ref. 7, p. 25]. It is unknown what operations took place on the northern property during the 1920s and the 1930s [Ref. 5, p. 28; Ref. 7, p. 25]. The southern portion of the subject property operated as the Niagara Paper Mill from at least 1875 until approximately 1898, as a box factory by D.C. Graham in at least 1903, as a cold storage facility by L. Huston from at least 1903 until at least 1937, as the Lockport Leather Board Company from at least 1909 until no later than 1914, as the Simon William Brewery from at least 1940 to 1952; and White Transportation from 1952 until the late 1990s, when operations ceased [Ref. 5, p. 28; Ref. 7, p. 25].

In 2005, the NYSDEC completed a RI at the Eighteenmile Creek Corridor to better define the nature and extent of sediment contamination in Eighteenmile Creek [Ref. 5, p. 10]. The investigation included an investigation of potential sources of contaminants to the creek, including the Former White Transportation Property [Ref. 5, pp. 10, 69]. The RI included the following activities: property inspection, completion of soil borings, and collection of environmental samples for chemical analysis [Ref. 5, pp. 20-22, 50]. During the property inspection, extensive slag and cinder-fill was observed throughout the White Transportation property [Ref. 5, p. 50]. Subsurface soil samples were analyzed for PCBs, select metals, and SVOCs [Ref. 5, pp. 50, 69, 71]. The analytical results indicated the presence of PCBs, benzo(a)pyrene, copper, lead and zinc [Ref. 5, pp. 154, 155].

A Supplemental Remedial Investigation was completed in July 2009 in order to further evaluate sediment contamination the Eighteenmile Creek and to determine the vertical and lateral extent of contamination in properties adjacent to the Creek [Ref. 7, p. 16]. A total of eight surface soil samples and 21 subsurface soil samples were collected from the Former White Transportation as well as 11 sediment samples collected along three transects established along the Eighteenmile Creek adjacent to the Former United Paperboard Company Property [Ref. 7, pp. 17, 93, 98, 103]. Surface and subsurface soil samples all indicated the presence of PCBs, benzo(a)pyrene, copper, lead, and zinc [Ref. 7, pp. 135, 136, 141, 163-166, 173]. Sediment samples collected along Eighteenmile Creek adjacent to the Former White Transportation property indicate the presence of total PCBs ranging from 0.0066 mg/kg to 3.8 mg/kg; benzo(a)pyrene ranging from an estimated concentration of 0.15J mg/kg to 2.7 mg/kg and detections of copper lead and zinc at 361 mg/kg, 807J mg/kg, and 5,190J mg/kg, respectively [Ref. 7, pp. 93, 118-119, 130].

Sources on the NYSBC

The New York State Barge Canal (NYSBC; a.k.a. Erie Canal) is a manmade waterway that passes through the Eighteenmile Creek watershed in the City of Lockport [Ref. 6, p. 146]. Approximately 9 miles of the historic canal, which is laid out perpendicular to natural flow patterns and is fed by numerous tributaries, occur within the watershed [Ref. 6, pp. 85-86]. Water from the canal provided power for pulp mills, gristmills, tanneries, and sawmills in the City of Lockport during the 1800s [Ref. 6, p. 57]. The NYSBC currently provides important recreational land uses such as fishing, boating, and hiking opportunities [Ref. 6, p. 72]. During dry weather, the NYSBC provides an input of approximately 50 cubic feet per second (cfs) into Eighteenmile Creek through a spillway and sluice [Ref. 6, p. 146; 7, p. 24]. The canal is operated from early May to early November, at which time it is drawn down, temporarily increasing the inflow of water into Eighteenmile Creek [Ref. 6, p. 146].

An environmental database search shows dozens of possible pollution sources along the canal and within 1 mile of its confluence with Eighteenmile Creek [Ref. 33, pp. 1-37]. These possible pollution sources along the NYSBC are a suspected pollution source in the Eighteenmile Creek watershed, in addition to industrial and municipal wastewater discharges, inactive hazardous waste sites, and CSOs [Ref. 6, pp. 29, 44; 33, pp. 1-37]. Water quality studies by NYSDEC in 1994 and 1995 reportedly indicated high levels of PCBs in the NYSBC [Ref. 6, p. 96]. An investigation by NYSDEC in 1999 suggested multiple possible sources of the contamination in Eighteenmile Creek, including the NYSBC and the Gulf Creek (a tributary into Eighteenmile Creek near Lockport) [Ref. 6, pp. 87, 177]. An April 2005 sediment sampling investigation indicated elevated levels of PCBs in the NYSBC downstream from the Eighteenmile Creek confluence [Ref. 6, p. 96]. CSOs in the City of Lockport discharge to the NYSBC and Eighteenmile Creek during periods of significant precipitation; six CSOs have the potential to discharge to Eighteenmile Creek, and seven others have the potential to discharge into the NYSBC [Ref. 8, pp. 19-20]. NYSDEC has investigated the New York State Electric and Gas Substation at South Transit Street and State Road in the City of Lockport as a possible source of contamination in the NYSBC [Ref. 7, p. 205].

Based on findings during recent investigations, NYSDEC has indicated that the NYSBC does not appear to be a significant current contributor of PCBs and metals to Eighteenmile Creek sediments [Ref. 7, pp. 19, 204; 8, pp. 56, 57]. Metal contaminant concentrations found in Eighteenmile Creek sediments are generally higher than those found in the NYSBC, indicating that there is one or more sources located downstream of the canal [Ref. 8, p. 50; 33, pp. 1-37]. The NYSDEC found low levels of suspended solids in barge water entering Eighteenmile Creek, indicating that solids transported from the NYSBC into Eighteenmile Creek are mostly in the dissolved phase [Ref. 8, pp. 52-53]. Furthermore, NYSDEC concluded that the conditions (primarily evaporation and changes in pH) necessary for suspended solids to precipitate or adsorb to sediment in the Eighteenmile Creek Corridor do not exist [Ref. 8, p. 53].

Hazardous Substances Released:

PCBs [Aroclor-1242, Aroclor-1248, Aroclor-1254, and Aroclor-1260]

Copper

Lead

Zinc

Benzo(a)pyrene

[Tables 1 and 2]

Observed Release Factor Value: 550

4.1.3.2 Human Food Chain Threat - Waste Characteristics

4.1.3.2.1 Toxicity/Persistence/Bioaccumulation

Hazardous Substance	Toxicity Factor Value	River Persistence Factor Value	Food Chain Bioaccumulation Factor Value*	Toxicity/Persistence/Bioaccumulation Factor Value (Table 4-16)	Ref. 2 Page
PCBs [Aroclor-1242, Aroclor-1248, Aroclor-1254, and Aroclor-1260]	10,000	1	50,000	5×10^8	BI-10
Copper	0	1	500	0	BI-3
Lead	10,000	1	5	5×10^4	BI-8
Zinc	10	1	5	50	BI-12
Benzo(a)pyrene	10,000	1	50,000	5×10^8	BI-2

* Fresh water value.

PCBs and benzo(a)pyrene are the hazardous substances associated with the highest toxicity/persistence/bioaccumulation factor value with a quantity of 5×10^8 . PCBs were manufactured as a mixture of various PCB congeners through a chlorination process aimed at achieving a certain percentage of chlorine [Ref. 39, p. 1]. Mixtures with higher percentages of chlorine contain higher proportions of the more heavily chlorinated congeners; however, all congeners are expected to be present at some level in all mixtures [Ref. 39, p. 1].

4.1.3.2.2 Hazardous Waste Quantity

<u>Source Number</u>	<u>Source Hazardous Waste Quantity Value (HRS Section 2.4.2.1.5)</u>	<u>Is source hazardous constituent quantity data complete? (yes/no)</u>
1	>0	no
Sum of Values:		1 (rounded to 1 as specified in HRS Section 2.4.2.2)

The sum corresponds to a hazardous waste quantity factor value of 1 in Table 2-6 of the HRS [Ref. 1, p. 51591]. However, the HRS states that if any target is subject to Level I or Level II concentrations, assign either the value from Table 2-6 or a value of 100, whichever is greater, as the hazardous waste quantity factor value for that pathway [Ref. 1, p. 51592]. Therefore, a hazardous waste quantity factor value of 100 is assigned for the surface water pathway [Ref. 1, p. 51591-51592].

4.1.3.2.3 Waste Characteristics Factor Category Value

Hazardous substances [PCBs and benzo(a)pyrene] associated with the waste source, which has a surface water pathway containment factor greater than 0 for the watershed, corresponds to a Toxicity/Persistence Factor Value of 10,000 and Bioaccumulation Potential Factor Value of 50,000, as shown previously [Ref. 1, pp. 51618, 51620; 2, pp. BI-2, BI-10].

$$(\text{Toxicity/Persistence Factor Value}) \times (\text{Hazardous Waste Quantity Factor Value}) = 10,000 \times 100 = 1 \times 10^6$$

$$(\text{Toxicity/Persistence Factor Value} \times \text{Hazardous Waste Quantity Factor Value}) \times (\text{Bioaccumulation Potential Factor Value}) = (1 \times 10^6) \times (50,000) = 5 \times 10^{10}$$

The product corresponds to a Waste Characteristics Factor Category Value of 320 in Table 2-7 of the HRS [Ref. 1, p. 51592].

Toxicity/Persistence/Bioaccumulation Factor Value: 5×10^8
Hazardous Waste Quantity Factor Value: 100
Waste Characteristics Factor Category Value: 320

4.1.3.3 Human Food Chain Threat - Targets

Eighteenmile Creek at Ide Road in the Town of Newfane (i.e., within the documented zone of contamination) is fished for human consumption [Ref. 28, p. 11; 35, p. 1]. Therefore, Actual Contamination is documented, and the target fishery is evaluated for Actual Human Food Chain Contamination. There are no media-specific benchmarks for sediment, so the target fishery is subject to Level II concentrations [Ref. 1, pp. 51592-51593, 51620-51621; 36, pp. 5, 29]. Fisherman’s Park just downstream of Burt Dam is a major fishery where several species of fish, including steelhead trout, salmon, walleye, perch and northern pike are caught for consumption [Ref. 23, p. 1]. This target fishery is subject to potential contamination [Ref. 1, pp. 51592-51593, 51620-51621; 23, p. 1].

Sediment Samples for Observed Release

Note: The sediment sample showing the maximum PCB concentration is used to demonstrate the observed release.

<u>Sample ID</u>	<u>Distance from PPE*</u>	<u>Hazardous Substance</u>	<u>Bioaccumulation Potential Factor Value</u>	<u>Reference(s)</u>
18MC-L03W-S01-Z1	0 feet	PCBs [Aroclor-1248]	50,000	Figure 2A; Table 2; Ref. 1, pp. 51605, 51620; 2, p. BI-10

*The target distance limit is measured from the farthest upstream sediment sample that meets the criteria for an observed release [Ref. 1, p. 51605].

4.1.3.3.1 Food Chain Individual

Sample ID: R-2-001-V-Z3
 Hazardous Substance: PCBs
 Bioaccumulation Potential: 50,000
 References: Figure 2E; Ref. 1, p. 51620; 2, p. BI-10; 9, p. 89; 13, p. 16, 20

<u>Identity of Fishery</u>	<u>Type of Surface Water Body</u>	<u>Dilution Weight</u>	<u>Reference(s)</u>
Ide Road Fishery	Moderate to large stream (fresh water)	0.01	1, p. 51613; 12, p. 1

There is an observed release of hazardous substances, including PCBs and benzo(a)pyrene, with Bioaccumulation Potential Factor Values of 500 or greater, and there is Level II Actual Contamination of the Ide Road fishery located in the Town of Newfane [Ref. 1, pp. 51592-51593, 51620; 2, pp. BI-2, BI-10; 28, p. 11; 35, p. 1]. Therefore, a Food Chain Individual Factor Value of 45 is assigned [Ref. 1, p. 51620].

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Food Chain Individual Factor Value: 45

4.1.3.3.2 Population

4.1.3.3.2.1 Level I Concentrations

There are no media-specific benchmarks for sediment. Therefore, there are no fisheries subject to Level I concentrations and the Level I Concentrations Factor Value is 0 [Ref. 1, pp. 51592-51593, 51620-51621].

Level I Concentrations Factor Value: 0

4.1.3.3.2.2 Level II Concentrations

People fish for consumption from the Ide Road fishery located at Ide Road in Newfane, New York [Ref. 28, p. 11; 35, p. 1]. The fish consumption rate for the fishery is not documented, so the fishery is assigned to the category “Greater than 0 to 100 pounds per year” [Ref. 1, p. 51621; 35, p. 1; 36, pp. 5, 29]. The category corresponds to the assigned Human Food Chain Population Value of 0.03 in Table 4-18 of the HRS, which is assigned as the Level II Concentrations Factor Value [Ref. 1, p. 51621].

Level II Concentrations Factor Value: 0.03

4.1.3.3.2.3 Potential Human Food Chain Contamination

People catch fish for consumption from Fisherman’s Park just downstream of the zone of contamination [Ref. 23, p. 1]. The fish consumption rate for the downstream fishery documented to be over 1,000 pounds per year, so the fishery is assigned to the category “Greater than 1,000 to 10,000 pounds per year” , which corresponds to the assigned Human Food Chain Population Value of 3 in Table 4-18 of the HRS [Ref. 1, p. 51621].

<u>Identity of Fishery</u>	<u>Annual Production (pounds)</u>	<u>Type of Surface Water Body</u>	<u>Average Annual Flow (cfs)</u>	<u>Population Value (P_i)</u>	<u>Dilution Weight (D_i)</u>	<u>P_i x D_i</u>
Burt Dam/ Fisherman’s Park	1,000-10,000	Moderate to large stream	100-1,000	3	0.01	0.03

Sum of P_i x D_i: 0.03
(Sum of P_i x D_i)/10: 0.003

[Figures 1, 2; Ref. 12, p. 1; 23, p. 1]

Potential Human Food Chain Contamination Factor Value: 0.003

4.1.4.2 Environmental Threat - Waste Characteristics

4.1.4.2.1 Ecosystem Toxicity/Persistence/Bioaccumulation

Hazardous Substance	Ecotoxicity Factor Value*	River Persistence Factor Value	Environment Bioaccumulation Factor Value*	Ecotoxicity/Persistence/Bioaccumulation Factor Value (Table 4-21)*	Ref. 2 Page
PCBs [Aroclor-1242, Aroclor-1248, Aroclor-1254, and Aroclor-1260]	10,000	1	50,000	5×10^8	BI-10
Copper	1,000	1	5,000	5×10^6	BI-3
Lead	1,000	1	50,000	5×10^7	BI-8
Zinc	10	1	50,000	5×10^5	BI-12
Benzo(a)pyrene	10,000	1	50,000	5×10^8	BI-2

* Fresh water values

PCBs and benzo(a)pyrene are the hazardous substances associated with the highest ecotoxicity/persistence/bioaccumulation factor value with a quantity of 5×10^8 . PCBs were manufactured as a mixture of various PCB congeners through a chlorination process aimed at achieving a certain percentage of chlorine [Ref. 39, p. 1]. Mixtures with higher percentages of chlorine contain higher proportions of the more heavily chlorinated congeners; however, all congeners are expected to be present at some level in all mixtures [Ref. 39, p. 1].

Ecosystem Toxicity/Persistence/Bioaccumulation Factor Value: 5×10^8

4.1.4.2.2 Hazardous Waste Quantity

<u>Source Number</u>	<u>Source Hazardous Waste Quantity Value (HRS Section 2.4.2.1.5)</u>	<u>Is source hazardous constituent quantity data complete? (yes/no)</u>
1	>0	no
Sum of Values:		1 (rounded to 1 as specified in HRS Section 2.4.2.2)

The sum corresponds to a hazardous waste quantity factor value of 1 in Table 2-6 of the HRS [Ref. 1, p. 51591]. However, the HRS states that if any target is subject to Level I or Level II concentrations, assign either the value from Table 2-6 or a value of 100, whichever is greater, as the hazardous waste quantity factor value for that pathway [Ref. 1, p. 51592]. Therefore, a hazardous waste quantity factor value of 100 is assigned for the surface water pathway [Ref. 1, p. 51591-51592].

4.1.4.2.3 Waste Characteristics Factor Category Value

Hazardous substances [PCBs and benzo(a)pyrene] associated with the waste source, which has a surface water pathway containment factor greater than 0 for the watershed, corresponds to an Ecotoxicity/Persistence Factor Value of 10,000 and Bioaccumulation Potential Factor Value of 50,000, as shown previously [Ref. 1, pp. 51618, 51620; 2, pp. BI-2, BI-10].

$$(\text{Ecotoxicity/Persistence Factor Value}) \times (\text{Hazardous Waste Quantity Factor Value}) = 10,000 \times 100 = 1 \times 10^6$$

$$(\text{Ecotoxicity/Persistence Factor Value} \times \text{Hazardous Waste Quantity Factor Value}) \times (\text{Bioaccumulation Potential Factor Value}) = (1 \times 10^6) \times (50,000) = 5 \times 10^{10}$$

The product corresponds to a Waste Characteristics Factor Category Value of 320 in Table 2-7 of the HRS [Ref. 1, p. 51592].

Hazardous Waste Quantity Factor Value: 100
Waste Characteristics Factor Category Value: 320

4.1.4.3 Environmental Threat - Targets

There are several HRS-eligible wetlands along the contaminated portion of Eighteenmile Creek [Ref. 1, p. 51625; 7, p. 228; 32, pp. 1-3]. Therefore, Actual Contamination is documented, and the target sensitive environment (i.e., wetland frontage) is evaluated for Actual Contamination [Ref. 1, p. 51625]. There are no media-specific benchmarks for sediment, so the target sensitive environment is subject to Level II concentrations [Ref. 1, pp. 51592-51593, 51624-51625].

Sediment Samples for Observed Release

Note: The sample that showed the maximum PCB concentration is listed.

<u>Sample ID</u>	<u>Distance from PPE</u>	<u>Hazardous Substance</u>	<u>Bioaccumulation Potential Factor Value</u>	<u>Reference(s)</u>
18MC-L14E-S02-Z1	2125 feet	PCBs [Aroclor-1248]	50,000	Figure 2A; Table 1; Ref. 1, pp. 51613, 51625; 2, p. BI-10; 7, p. 126

The maximum factor value of 50,000 applies to PCBs [Ref. 2, p. BI-10].

4.1.4.3.1 Sensitive Environments

4.1.4.3.1.1 Level I Concentrations

There are no media-specific benchmarks for sediment. Therefore, there are no sensitive environments subject to Level I concentrations and the Level I Concentrations Factor Value is 0 [Ref. 1, pp. 51592-51593, 51624-51625].

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Level I Concentrations Factor Value: 0

4.1.4.3.1.2 Level II Concentrations

Sensitive Environments

The zone of contamination within Eighteenmile Creek is not known to contain any sensitive environments (e.g., endangered species habitats) other than wetlands [Ref. 1, pp. 51624-51625; 6, pp. 146; 7, pp. 66, 221-222, 228; 32, p. 3].

<u>Sensitive Environment</u>	<u>Distance from PPE to Sensitive Environment</u>	<u>Reference</u>	<u>Sensitive Environment Value(s)</u>
None	N/A	1, pp. 51624-51625	0

Sum of Sensitive Environments Value: 0

Wetlands

<u>Wetland</u>	<u>Wetland Frontage</u>	<u>Reference(s)</u>
HRS-Eligible Wetlands	3.33 miles (estimate)	1, p. 51625; 32, pp. 1-3

Total Wetland Frontage: 3.33 mile
Wetland Value: 100

Sum of Sensitive Environments Value + Wetland Value: 100

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Level II Concentrations Factor Value: 100

4.1.4.3.1.3 Potential Contamination

Since a maximum score of 100.00 was achieved for the surface water migration pathway, the Potential Contamination Factor Value was not scored (NS). However, there are downstream targets subject to Potential Contamination. The reach of Eighteenmile Creek between Burt Dam and the Route 18 bridge in Olcott, New York, near Lake Ontario (i.e., downstream of the zone of contamination) is classified as a significant coastal fish and wildlife habitat [Ref. 4, p. 2; 37, p. 1]. Fisherman's Park, located within Eighteenmile Creek just downstream of Burt Dam, is a major recreational fishing destination where species of fish including steelhead trout, salmon, walleye, perch, and northern pike are caught and consumed [Figure 1; Figure 2E; Ref. 23, p. 1; 36, pp. 5, 29].

Potential Contamination Factor Value: NS