

RESULTS FROM THE SAMPLING OF ERIE CANAL SUSPENDED SEDIMENTS AND CREEK WATERS FOR PCBs

EIGHTEEN MILE CREEK CORRIDOR SITE

SITE No. 932123

CITY OF LOCKPORT

NIAGARA COUNTY, NEW YORK



OCTOBER 2010

PREPARED BY:

**NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
DIVISION OF ENVIRONMENTAL REMEDIATION
270 MICHIGAN AVE
BUFFALO, NEW YORK 14203**

TABLE OF CONTENTS

SECTION	PAGE
1.0 INTRODUCTION	1
2.0 SITE HISTORY AND BACKGROUND	
2.1 Site Description.....	2
2.2 Site History	3
2.3 Related Area Investigation.....	6
3.0 SAMPLING METHODS	
3.1 Suspended Sediments.....	10
3.2 Water for Total Suspended Sediment and PCBs	10
4.0 ANALYTICAL RESULTS	
4.1 Suspended Sediment Results	12
4.2 Surface Water Results - Barge Canal and Eighteenmile Creek Water	12
4.3 Suspended Sediments PCB Results	13
5.0 DISCUSSION AND RECOMMENDATIONS	
5.1 Conclusions.....	14
6.0 REFERENCES	<u>15</u>

LIST OF FIGURES

(Following Text)

Figure 1	Site Location Map
Figure 2	Site Plan
Figure 3	Water/Sediment Sample Locations On-Site
Figure 4	Water Sample Locations Off-Site

LIST OF TABLES

(Following Text)

Table 1	Suspended Sediment Analytical Results - PCBs
Table 2	Water Analytical Results - PCBs - Barge Canal and Eighteenmile Creek
Table 3	Total Suspend Sediments – Canal Discharge to Eighteenmile Creek

APPENDICIES

Appendix A	Photo Log
Appendix B	Laboratory Analytical Reports (CD)
Appendix C	Complete Category B Deliverable Laboratory Data (CD)

1.0 INTRODUCTION

Eighteenmile Creek, located in the heart of Niagara County, is surrounded by six residential townships, and many citizens own creek-front property. The creek is used extensively for fishing, boating, and recreation. The Creek has also been polluted by past industrial and municipal discharges, the disposal of waste and the use of pesticides. Fishing has been impaired by PCBs and dioxin found in the flesh of various game fish. The health of the benthos has been impaired by PCBs and metals in creek sediments. Bird and animal health is likely impaired by PCBs, dioxins, DDT and its metabolites, and dieldrin found in fish flesh. PCB and metals contamination prevents open lake disposal of dredged sediments. Additionally, fish and wildlife populations, the presence of fish tumors or other deformities, and the status of phytoplankton and zooplankton populations are unknown.

The Eighteenmile Creek Remedial Action Plan (RAP) of August 1997 made several recommendations and commitments for NYSDEC to conduct future activities to investigate contamination in the Creek and Erie Canal Watershed. The report provided several objectives and recommendations, which as part of the RAP, developed a comprehensive and focused strategy to:

- Continue assessment of sediment contamination in the creek;
- Identify and address sources of PCBs including the as yet to be identified source between Olcott and N. Transit Rd;
- Remediate inactive hazardous waste sites within the Eighteenmile Creek watershed; and
- Address inflow of contaminants from the NY Barge Canal.

As part of the on-going Eighteenmile Creek Corridor Site Remedial Investigation and Feasibility Study it was recognized that a data gap remained in the site evaluation that did not address the possible inflow of contaminants from the Barge Canal. Primary concern was the recontamination of the Corridor Site after clean-up was completed, if the Barge Canal system was also a source of contamination to the local ecosystem. In addition, the RAP specifically established objectives that would identify the source of impairment causing contaminants that may enter the creek from the Barge Canal, which is a major source of flow to the creek. The report further recommended that future activities include:

- Conducting a comprehensive sampling of canal sediments to determine what sediments need to be addressed. And based on those results:
- Evaluate remedial actions.

Therefore, the purpose of this study was to determine if PCBs, present in canal sediment are being discharged into Eighteenmile Creek. This was accomplished in a twofold manner by attempting to analyze both the suspended sediment and the water containing that sediment.

The history and description of the specific parcels associated with the site are described in Section 2 of this report. The sample methodologies and specific goals of each of the aforementioned activities are described in Section 3. Analytical results and findings are discussed in Section 4. Section 5 presents the evaluation and conclusion of whether the Barge Canal is a significant source of contamination to Eighteenmile Creek, and Section 6 provides a list of appropriate document references. A photographic log of the activities and sampling locations is presented in Appendix A. The laboratory analytical data reports are presented in Appendix B.

2.0 SITE HISTORY AND BACKGROUND

2.1 Site Description

The properties associated with the Barge Canal and the Eighteenmile Creek Corridor Site includes, Upson Park, White Transportation property, Former United Paperboard Company property, and the Former Flintkote Plant Site (see Figures 1 and 2). The headwaters of Eighteenmile Creek (north of the Barge Canal in Lockport, New York) originate from two branches (East and West) immediately north of the Barge Canal. Waters from the East Branch originate at the spillway in the Barge Canal near the Mill Street Bridge where canal waters join with water from the piped section of Eighteenmile Creek south of the Barge Canal. The water then flows north, under the Barge Canal, toward Mill and Clinton Streets. The waters from the West Branch originate from the dry dock on the north side of the Barge Canal and flow north toward Clinton Street. Waters from the East and West Branch converge on the south side of Clinton Street and flow under Clinton Street to the Mill Pond on the north side of Mill Street. The Mill Pond is the result of a dam on the United Paperboard property (see Figure 2). The waters from Eighteenmile Creek eventually discharge to Lake Ontario in Olcott, New York.

Canal locks are operational during the navigation season from early May to mid November (NYS Canal Corporation 2008). During this summer operating season, it has been reported by Canal personnel that two of the three sluice structures are opened 5 inches each. When open, the sluice structures draw canal water off near the bottom of the canal and discharge it into the Hall Spillway on the south side of

the canal. There the canal waters combine with flow from Eighteenmile Creek. The flow from the canal has been previously reported to be approximately 50 cubic feet per second (cfs); however, flow measurements conducted by Ecology and Environment Engineering, P.C. (EEEEPC) in 2008 as part of the Supplemental Remedial Investigation, measured this combined dry weather flow to be approximately 200 cfs. Flow measurements of the East Branch were also measured by the NYSDEC during the Fall of 2009. The average flows for October 29, 2009 and November 12, 2009 were determined to be 91 and 108 cfs, respectively. During dry weather periods, the Barge Canal provides a significant portion of the creek's flow.

The canal is drained every year for the non-navigational season to minimize the potential for freeze/thaw effects on the canal's elevated embankments and to perform routine maintenance on the system structures. This past year, the canal was drained during the week of November 17, 2008. The Barge Canal is drained annually at several locations along its length. In the vicinity of the site, it is drained directly to the East Branch of Eighteenmile Creek through a spillway on the southern side of the canal, just west of Mill Street. Personnel at the NYS Canal Corporation indicated that if maintenance is needed in the canal, the water level in the canal is further lowered by removing a "plug" located in the middle of the canal bottom. The plug drains into the tunnel that connects the headwaters of the East Branch with the junction of the spillway and the upstream waters of Eighteenmile Creek. Maintenance is performed as needed; therefore, the plug is only removed when maintenance requirements dictate that an extreme low water level is necessary.

2.2 Site History

The following is a brief background and history of the various parcels and areas of concern that make up the Eighteenmile Creek Corridor Site.

Upson Park

Upson Park is located at 100 Clinton Street in the City of Lockport, Niagara County, New York (see Figure 2). The property is bordered by Clinton Street and a residential area to the north, the West Branch of Eighteenmile Creek and the Barge Canal Authority Maintenance Yard to the east, the Barge Canal to the south, and a wooded area to the west. The land is currently listed as a City park and contains picnic areas and a walking trail along the canal. There is a parking area on the property, but no standing buildings. The City of Lockport Assessor's Office lists the parcel (Parcel ID 109.10-1-76) as consisting of 5.9 acres of land owned by the City of Lockport. In the mid 1880s, this property contained a canal boat

building company that was no longer in operation by 1892. A pulp mill operated at the Upson Park property between 1919 and 1928 and the pulp company operated until at least 1928. In 1914, the mill company name changed to the United Paper Board Company. By 1948, operations at the mill had been shut down and the buildings on the property were vacant. By 1969, the buildings on the property had been demolished. Additional detail concerning the history of this property can be found in the 2007 Phase I Environmental Site Assessment (ESA) report prepared by EEEPC (EEEPC, 2007a).

The White Transportation Property

The White Transportation property is located at 30-40 Mill Street in the City of Lockport, Niagara County, New York (see Figure 2). The property is bordered by the Barge Canal to the south, Mill Street to the east, Clinton Street to the north, and the East Branch of Eighteenmile Creek to the west. 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 White Transportation from 1948 until the late 1990s when operations ceased. Use of the northern portion of the White Transportation property during the 1920s and 1930s is unknown. 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 sometime in 1914, as the Simon William Brewery from at least 1940 to 1952; and White Transportation from 1952 until the late 1990s, when operations ceased. The entire subject property (109.10-1-60, 109.10-1-61, 109.10-1-58, and 109.10-1-59) is owned by the Gertrude W. White Estate. Additional detail concerning the history of this property can be found in the 2002 Phase I ESA report prepared by TVGA Consultants (TVGA, 2002) and the updated 2007 Phase I ESA prepared by EEEPC (EEEPC, 2007a).

The Former United Paperboard Company Property

The Former United Paperboard Company property is located at 62 and 70 Mill Street in the City of Lockport, Niagara County, New York (see Figure 2). Sixty-two Mill Street is the larger of the two parcels and is bordered by Olcott Street to the north, Mill Street to the east, Clinton Street to the south, and Water Street to the west. The property is currently owned by TriSide LLC and operated by Duraline Abrasives, Inc., and contains one warehouse building. Seventy Mill Street is a vacant lot with fill material and building ruins and is bordered by the Flintkote site to the north, Mill Street to the east, Olcott Street to the south, and Eighteenmile Creek to the west. An abandoned transformer pad and poles are present on the west bank of the creek, immediately downstream of the dam located in the creek behind the building on 62 Mill Street. The ponded water behind the dam is referred to as the Mill Pond. A storm sewer line

also crosses the creek approximately 25 to 50 feet downstream of the dam, and several sewer manholes were observed on both banks (east and west) of the creek. Water in the pond was high (close to the top of the dam), and flow beneath the dam was swift. Water from the pond leaks around the west side of the dam and flows adjacent to or over the top (during high flow conditions) of the abandoned transformer pad. The City of Lockport Assessor's Office lists the parcel (Parcel ID 109.10-1-57) as consisting of 3.7 acres and Parcel 109.06-3-11 as consisting of 1.2 acres of land owned by Tri-Side LLC. In the late 1880s and early 1890s, the 62 Mill Street United Paperboard property was owned and operated by the Jackson Lumber Company with the building designated as the Saw Mill and Sash & Blind Manufacturing. In 1892, Sash & Blind added a pulp mill and box facility to its operations. 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 (Mutual Risk) in 1903. The 70 Mill Street United Paperboard property was owned by United Box Board Company in 1909. 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. By 1969 the buildings have been vacated and dismantled. Additional detail concerning the history of this property can be found in the 2007 Phase I ESA report prepared by EEEPC (EEEPC, 2007a).

The Former Flintkote Plant Site

The Former Flintkote Plant Site (198, 225, and 300 Mill Street) in the City of Lockport, Niagara County, New York (see Figure 2) is bounded by Eighteenmile Creek to the west, Mill Street to the east, a commercial property to the north, and vacant land of the Former United Paperboard Company to the south. William Street, which is no longer open to vehicular traffic, bisects the site. A dam approximately 10 feet high diverts Eighteenmile Creek westward for approximately 300 feet along William Street (located on top of the dam). The creek continues northward and returns to its original natural channel farther downstream. The two sluice gates located at the east end of the dam have been closed for at least 30 years. A millrace containing a sluggish stream approximately 6 inches to 1 foot deep runs along the west side of the buildings at 300 Mill Street and empties into Eighteenmile Creek (see Figure 1-2). The Flintkote property was purchased from the Beckman Dawson Roofing Company in 1928 and was operated as a manufacturer of felt and felt products. 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. It is suspected that composite laminates observed at the southernmost demolished building on the 198 Mill Street Property may have also been manufactured at Flintkote. 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 (Registry) 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 an on-site building. In January 1984, these drums were removed from the site by a waste oil processor and the site was removed from the Registry in 1985. In 1989, a number of drums containing chemicals were found in various locations throughout the buildings at 300 Mill Street with 28 of these drums containing hazardous wastes. These drums were disposed of off-site in May 1991 during a NYSDEC drum removal action. Additional detail concerning the history of this property can be found in the Record of Decision (ROD) prepared by NYSDEC in March 2006.

2.3 Related Area Investigations

Surrounding Properties

The following is a brief history of the various environmental investigations and their results that were conducted in the area of the Eighteenmile Creek Corridor Site.

Between 1987 and 1998 NYSDEC collected 10 sediment samples from Eighteenmile Creek between Remick Parkway south of the Barge Canal and the Former Flintkote Plant Site in the City of Lockport. In 1996 the NYSDEC Division of Environmental Remediation (DER) collected six additional sediment samples from the area between Clinton Street and the Former Flintkote Plant Site. PCBs were detected in all 15 samples analyzed. PCB levels in 11 of these samples exceeded NYSDEC's sediment criteria (606.0 micrograms per kilogram [$\mu\text{g}/\text{kg}$]) for chronic toxicity to benthic aquatic life and the NYSDEC's Technical and Administrative Guidance Memorandum (TAGM) No. 4046 surface soil cleanup objective (1,000 $\mu\text{g}/\text{kg}$). Lead was detected in all 11 samples analyzed, with concentrations exceeding the sediment criteria (110 milligrams per kilogram [mg/kg]) for the severe effect level in 10 samples and concentrations exceeding the TAGM 4046 soil cleanup objective (400 mg/kg) in five samples. Other inorganic contaminants also present in Eighteenmile Creek sediment at concentrations exceeding sediment criteria include arsenic, cadmium, chromium, and iron (once); nickel (twice); mercury (three samples); silver (four samples); copper (nine samples); and zinc (ten samples) (NYSDEC, 2006a). The most contaminated sample was a sediment sample collected near the Former Flintkote Plant Site. In April 2002, the owner of the 143 Water Street property submitted a request to the Niagara County Health Department (NCHD) for sample collection and evaluation of soils from their property. In response to this request, NCHD conducted an inspection of the property. Discussions with the property owners revealed that: (1) a family case of cancer inspired research into available environmental data regarding the

creek; (2) due to debris or ice blocking the cross culverts under William Street, Eighteenmile Creek occasionally floods the yard of 143 Water Street (severe flooding once every two years and lesser flooding several times per year); (3) a small strip of wooded property (about 20 feet wide) between Eighteenmile Creek and the 143 Water Street property also frequently floods. The property owners raised concerns over possible contaminant migration from Eighteenmile Creek (especially elevated PCB levels) and over the poor maintenance of the creek by the City of Lockport that contributes to the flooding issues. During the site visit the NCDH identified a portion of the 143 Water Street yard that would flood during high water events and a small vegetable garden was observed within the reported flood area. Per the NCHD's request, NYSDEC collected four samples from the property at 143 Water Street. Based upon the results of this sampling event, the NYS Department of Health (NYSDOH) requested 15 additional samples from properties along Water Street, including one sediment sample from Eighteenmile Creek and two waste samples from wooded property south of the Former Flintkote Plant site on Mill Street (NYSDEC, 2002). These samples were collected on July 23, 2002. Two soil samples and three sediment samples near the Clinton Street dam from an area identified as a potential source of PCBs to Eighteenmile Creek were collected in November 2002 by NYSDEC.

In the fall of 2005 NYSDEC completed a Remedial Investigation (RI) of the Eighteenmile Creek Corridor Site in order to better define the nature and extent of sediment contamination in Eighteenmile Creek and the millrace, to further evaluate the impact of creek flooding on residential properties along Water Street, and to evaluate potential sources of contaminants to the creek (NYSDEC, 2006a). These source areas included the Former Flintkote Plant Site, the White Transportation property, the Former United Paperboard Company property, Upson Park, and the Barge Canal. During this RI, elevated concentrations of PCBs and metals (i.e., arsenic, chromium, copper, lead, and zinc) were found in sediment samples from Eighteenmile Creek and the millrace. Additionally, contaminated sediment was found in the Barge Canal upstream of Eighteenmile Creek. PCBs, arsenic, chromium, copper, lead, and zinc levels detected in the fill at Upson Park, the White Transportation property, the Former United Paperboard Company property, and the Former Flintkote Plant Site may also adversely impact Eighteenmile Creek. However, these potential source areas were not fully investigated and the volume of contaminated sediment requiring remediation was not quantified during the RI. The NYSDEC RI identified several sites adjacent to the Eighteenmile Creek Corridor Site as potential suspected contributors of contaminants to Eighteenmile Creek. A brief description of previous evaluations and investigations completed at these sites is presented below.

A Phase I ESA for the United Paperboard Company and Upson Park was prepared by EEEPC for

NYSDEC (EEEEPC, 2007a). No other previous investigations have been completed at these properties. As stated above, a Phase I ESA of the White Transportation property was completed in 2002 by TVGA Consultants for the Niagara County Department of Planning, Development, and Tourism (TVGA Consultants, 2002). On November 3, 2005, a Site reconnaissance was conducted by NYSDEC as part of the Eighteenmile Creek Corridor RI. In early 2007, EEEPC updated the Phase I ESA (EEEEPC, 2007a).

The Former Flintkote Plant Site was cited by the NYSDEC Division of Water as a potential source of contaminants to Eighteenmile Creek based on analytical results for two ash samples collected by NYSDEC (NYSDEC, 1996). Two more samples from the island collected by the DER in August 1996 failed the Toxicity Characteristic Leaching Procedure (TCLP) regulatory limit for lead (characteristic hazardous waste D008). A site investigation of the Flintkote property conducted in 1999 by NYSDEC determined that the Flintkote property had received various wastes, refuse, and debris over the years, with much of the waste being visible at the surface and along the Eighteenmile Creek embankments and millrace (NYSDEC, 2000). In 2003, a Site Investigation of the Former Flintkote Plant Site was conducted by Niagara County under NYSDEC's Environmental Restoration Grant Program to fill in data gaps in NYSDEC's 1999 investigation. The results of the Niagara County Site Investigation were consistent with the NYSDEC Site Investigation results. A Record of Decision was issued by NYSDEC in March 2006.

New York State Barge Canal

Sediment Sampling - URS

During April 2005 the URS Corporation collected nine sediment samples from five locations in the Barge Canal immediately upstream of Eighteenmile Creek. These samples were collected as part of the Remedial Investigation of the NYSEG Substation at South Transit Street and State Road in the City of Lockport, Niagara County, New York. The locations of these samples are shown on Figure 3-4, while the analytical results are summarized in Table 5-11 of the Eighteenmile Creek Corridor Site RI report. PCBs were detected in all nine samples at concentrations ranging from 7.0J to 310,000 µg/kg . The principal aroclors detected were 1248 and 1254, although aroclor 1242 was detected in three of the samples. Six of the samples contained PCBs at concentrations that exceeded the NYSDEC sediment criterion for chronic toxicity to benthic aquatic life (606 µg/kg) and the NYSDEC Part 375 surface soil cleanup objective (1,000 µg/kg). Additionally, two contained PCBs at concentrations that exceeded the 50,000 µg/kg hazardous waste criterion. Results of the entire NYSEG Substation Remedial Investigation can be found in the report entitled, *Final Remedial Investigation Report, Former Transit Street Manufactured Gas Plant, Lockport, New York*, (Site No. 932098), August 2007 by URS Corporation.

As part of NYSDEC's Supplemental Remedial Investigation of the Eighteenmile Creek Corridor Site, EEEPC conducted further sampling of sediment in the Canal to evaluate possible discharge into Eighteenmile Creek.

PISCES sampling

As part of EEEPC's Supplemental Remedial Investigation, Passive In Situ Chemical Extraction Sampler (PISCES) sampling was conducted using Hassett samplers deployed in the Barge Canal at the confluence of the two channels downstream of the lock and Power Plant, and near the spillway to Eighteenmile Creek. PISCES were also deployed in Eighteenmile Creek in approximately the midpoint of the East Branch, the midpoint of the West Branch, and downstream of the Clinton Street Dam. PISCES deployment was timed so that the samplers were in place two weeks before the canal was drained. PISCES sampling was performed in accordance with the June 2007 NYSDEC Bureau of Habitat, Division of Fish, Wildlife and Marine Resources Contaminant Track-down with PISCES Standard Operating Procedure.

The results of the PISCES sampling determined there were no PCBs detected above the reporting limit of 500 nanograms per sample (ng/sample) for the five PISCES samples. To confirm these results, the sample collected near the Clinton Street Dam was analyzed for additional low PCBs (congener analysis). This sample was selected for the PCB congener analyses because it was collected adjacent to the SRI transect line that exhibited the highest PCB concentrations in the sediment samples collected during the SRI. Congener analysis identified one congener (PCB52) in the sample at a concentration of 11 ng/sample, just above the reporting limit of 10 ng/sample. The PISCES technique identifies the dissolved or soluble PCBs that can pass through the apparatus membrane and provide an indication of the PCB concentrations in the surface water. This technique does not capture PCBs transported on suspended solids. PISCES results are an indication of potential exposure of fish to PCBs in the water column. The data indicated no potential exposure.

Sediment Sampling

During the EEEPC Supplemental and Additional Remedial Investigations activities, ten sediment core samples were collected from the Barge Canal. Cores were established at various cross sections from the base of the locks to the area adjacent to the Spillway structure. The results of the PCB analysis of the fractionated sediment sample indicated that most of the PCBs are in the medium and coarse sand (sample fraction C). Fractions A and B (fines [clay and silt-size] and fine sand) contained PCBs at concentrations

three to eight times less than what was found in fraction C. The gravel size fraction (D) contained PCBs barely above the detection limit at concentrations of two orders of magnitude less than what was found in the rest of the fractions. This indicates that most of the PCB contamination in the sediments is associated with the heavier sands. During the EEEPC sampling total PCBs were detected in sediment samples at concentrations of ranging from 0.0066 mg/kg to 110 mg/kg. The specific details of both the above water and sediment sampling by EEEPC can be found in the reports entitled, *Final Supplemental Remedial Investigation Report for the Eighteenmile Creek Corridor Site* (Site No. 932121) City of Lockport, New York July 2009, by Ecology and Environment Engineering, P.C. and *Final Additional Investigation Addendum to the Supplemental Remedial Investigation Report for the Eighteenmile Creek Corridor Site* (Site No. 932121), City of Lockport, New York, July 2009, by Ecology and Environment Engineering, P.C.

3.0 Sampling Methods

3.1 Suspended Sediment

Total suspended sediments were collected from the discharge of the Canal into 18-Mile Creek utilizing a Grundfos pump powered by a portable generator. A constant flow of 5 gallons per minute (measured) was pumped through a Pe-5-P2S - 5 micron 7"x32" polyester felt filter bag, as shown in Photos 2 and 3. Filtered water was allowed to re-enter the Canal at the surface and downstream of the sample point.

It was hoped that sufficient quantity of sediment (4 oz.) could be collected using this sampling method to submit to an analytical laboratory for sediment analysis. The system was operated for a period of approximately 5 hours for a total flow of approximately 1500 gallons passing through the filter media. While the filter was severely stained dark brown with collected suspended sediment after this period, no free, collectable sediment was observed in the filter bag. As an alternative sampling method, the bag media was cut into six, four inch square pieces, and submitted to the laboratory for PCB analysis. These samples were extracted, analyzed and reported similar to a "wipe" type sample providing a qualitative indication of the presence of PCBs within the suspended sediment collected on the filter material.

3.2 Water for Total Suspended Sediment and PCBs

Water samples were collected at one location in the Barge Canal and four locations in Eighteenmile Creek (see Figure 3 and 4). The purpose of the sampling was to evaluate sediment transport and possible contribution of PCB contamination from the Barge Canal to Eighteenmile Creek. All six

locations were sampled during normal Barge Canal operations and dry weather flow conditions. As shown in the Photos 10 through 13, the canal locks were in normal operation and overflows to the system were occurring on a regular basis due to the operation of the lock system up stream. This would indicate a worse case condition when Canal sediments have the greatest chance of disturbance from surcharges created when locks are filled and emptied during the passage of boats. The water samples were collected from just below the water surface. The unfiltered sample from the canal was submitted for total suspended solids (TSS) analysis by EPA Method SM2540D (see Tables 1) and PCB analysis by EPA Method 8082 (see Table 2).

The four unfiltered surface water samples from Eighteenmile Creek were also collected and submitted for only PCB analysis by EPA Method 8082. The water samples were collected from just below the water surface. These samples were located at points in the stream that have been identified as being downstream of areas previously shown to have elevated levels of PCBs in stream sediment; ie: Olcott Street Bridge, North end of Flintkote Millway, Transit Road Bridge, and Stone Road bridge. The purpose was to determine if re-suspension of contamination is occurring through these areas, conveying PCB contamination downstream from the Eighteenmile Creek Corridor Site. Sample locations are shown in photos 4 through 8, and on Figures 3 and 4.

4.0 ANALYTICAL RESULTS

4.1 Surface Water Suspended Solids Results - Barge Canal Water

The results of the collection and analysis of water samples from the Barge Canal showed low levels of Suspended Sediments at a concentration of 6.0 mg/l. There is no water quality standard for Total Suspended Solids. Sample results are shown in Table 1 below.

Table 1
Suspended Solids Sample Results
Erie Barge Canal

Analyte	RL	Sample ID: Location:	N39801 Canal
		Date:	08/19/09
TSS by method 2540D (mg/l)			
Total Suspended Solids	0.050		6.0

ND = Not Detected above reporting limit
mg/l = Micrograms per liter

4.2 Surface Water Results - Barge Canal and Eighteenmile Creek Water

The results of the collection and analysis of water samples from both the Barge Canal and Eighteenmile Creek showed low concentrations of PCBs (aroclor 1248) within the water column downstream of Flintkote. Samples collected from the Barge canal (N39801) and upstream (N39802) of Flintkote did not detect PCBs at levels above the reporting limit of 0.050 ug/l. Samples collected directly below Flintkote in the adjacent millrace (N39803) and at Transit Street (N39804) and Stone Road (N39805) all showed PCB levels of aroclor 1248 at levels of 0.33 ug/l, 0.084 ug/l and 0.11 ug/l respectively. All three levels are above the water quality standard of 0.065 ug/l. Sample results are shown in Table 2 below.

Table 2
Water Sample Results
Eighteen Mile Creek / Erie Barge Canal

Analyte	Water Quality Limit	RL	Date:	Sample ID:	N39801	N39802	N39803	N39804	N39805
				Location:	Canal	Olcott Street	Mill Stream	Transit Street	Stone Road
PCBs by method SW8082 (ug/L)				08/19/09	08/19/09	08/19/09	08/19/09	08/19/09	08/19/09
Aroclor 1016	0.0650	0.058		ND	ND	ND	ND	ND	ND
Aroclor 1221	0.0650	0.058		ND	ND	ND	ND	ND	ND
Aroclor 1232	0.0650	0.058		ND	ND	ND	ND	ND	ND
Aroclor 1242	0.0650	0.058		ND	ND	ND	ND	ND	ND
Aroclor 1248	0.0650	0.058		ND	ND	0.33	0.084	0.11	
Aroclor 1254	0.0650	0.058		ND	ND	ND	ND	ND	ND
Aroclor 1260	0.0650	0.058		ND	ND	ND	ND	ND	ND
Aroclor 1262	0.0650	0.058		ND	ND	ND	ND	ND	ND
Aroclor 1268	0.0650	0.058		ND	ND	ND	ND	ND	ND
TOTAL PCBs	0.0650	0.058		ND	ND	ND	ND	ND	ND

ND = Not Detected above reporting limit
ug/l = Micrograms per liter.

0.065 Shaded cells indicate that values exceed Water Quality Limit

4.3 Suspended Sediment PCB Results

As discussed in section 3.1 above, the sample effort was unsuccessful in collecting suspended sediment from the discharge of the Canal into Eighteenmile Creek. In lieu of the collection and analysis of bulk sediment, the actual filter media containing filtered suspended sediment was extracted and analyzed. The results of the collection and analysis of the filter media (N39806) did not detect PCBs at levels above the reporting limit of 0.050 ug/l. Sample results are shown in Table 3 below.

Table 3
Water Sample Results
Eighteen Mile Creek / Erie Barge Canal

		Sample ID:	N39801
		Location:	Canal
Analyte	RL	Date:	08/19/09

PCBs by method SW8082 (ug/wipe)			
Aroclor 1016	0.050		ND
Aroclor 1221	0.050		ND
Aroclor 1232	0.050		ND
Aroclor 1242	0.050		ND
Aroclor 1248	0.050		ND
Aroclor 1254	0.050		ND
Aroclor 1260	0.050		ND
Aroclor 1262	0.050		ND
Aroclor 1268	0.050		ND
TOTAL PCBs			ND

ND = Not Detected above reporting limit
ug/wipe = Micrograms per wipe sample

5.0 DISCUSSION AND CONCLUSIONS

Based upon the results of this sampling event the following conclusions can be made:

- PCBs were not detected in the Barge Canal waters during the EEEPC PIECES sampling in 2008. This was confirmed during this most recent NYSDEC sampling within the Barge Canal and Eighteenmile Creek Corridor Site upstream of areas of sediment contamination.
- Although it was not possible to collect bulk quantities of suspended sediments from the Canal water discharge to Eighteenmile Creek, the collection and analysis of the collected sediment material on the filter media provides a qualitative result that PCBs are not present in the suspended sediment and therefore are not being conveyed into Eighteenmile Creek under normal operational flow conditions.
- PCBs were detected within the Eighteenmile Creek water column downstream of areas of known sediment contamination. This detection of contaminants continued beyond the boundaries of the site indicating there is significant off-site (downstream) transport of contaminants occurring.
- It was not determined in this study if the PCBs detected in water samples collected downstream of Flintkote were in the actual water or suspended sediment fraction of the sample.

6.0 REFERENCES

- *Final Additional Investigation Addendum to the Supplemental Remedial Investigation Report for the Eighteenmile Creek Corridor Site* (Site No. 932121), City of Lockport, New York, July 2009, by Ecology and Environment Engineering, P.C.
- *Final Supplemental Remedial Investigation Report for the Eighteenmile Creek Corridor Site* (Site No. 932121) City of Lockport, New York July 2009, by Ecology and Environment Engineering, P.C.
- *Remedial Investigation Report, Eighteenmile Creek Corridor, Lockport, Niagara County, New York*, (Site No. 932121), September 2006, by NYSDEC
- *Summary Report for PCBs Detected in New York State Barge Canal Sediments During Investigation of NYSEG's Transit Road and State Road MGP Sites*, (Site Nos.932098 and 932109), Lockport, New York, by URS Corporation
- *Final Remedial Investigation Report, Former Transit Street Manufactured Gas Plant, Lockport, New York*, (Site No. 932098), August 2007 by URS Corporation
- *Phase I Environmental Site Assessment for the Upson Park, White Transportation and Former United Paperboard Company Properties*, 2007, by Ecology and Environment Engineering, P.C.
- *Phase I Environmental Site Assessment (ESA) White Transportation Property* , by TVGA Consultants ,2002

FIGURES



Lockport Quadrangle

Scale Depends on Fhol Plotted Size

SITE LOCATION MAP

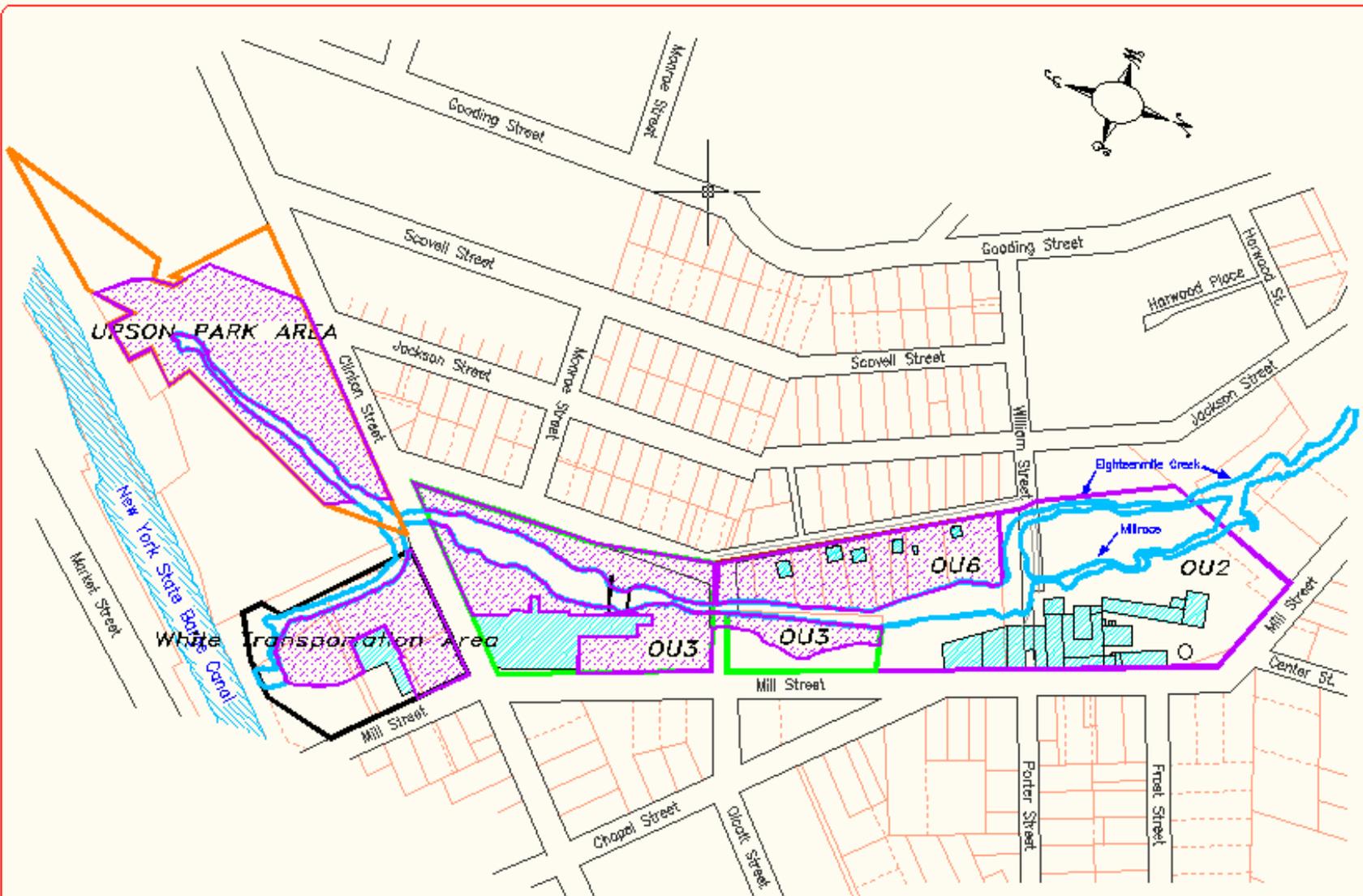
DIVISION OF ENVIRONMENTAL REMEDIATION

DATE: 05/20/88 PROJECT: Lockport Map, Proj



EIGHTEENMILE CREEK CORRIDOR

FIGURE 1



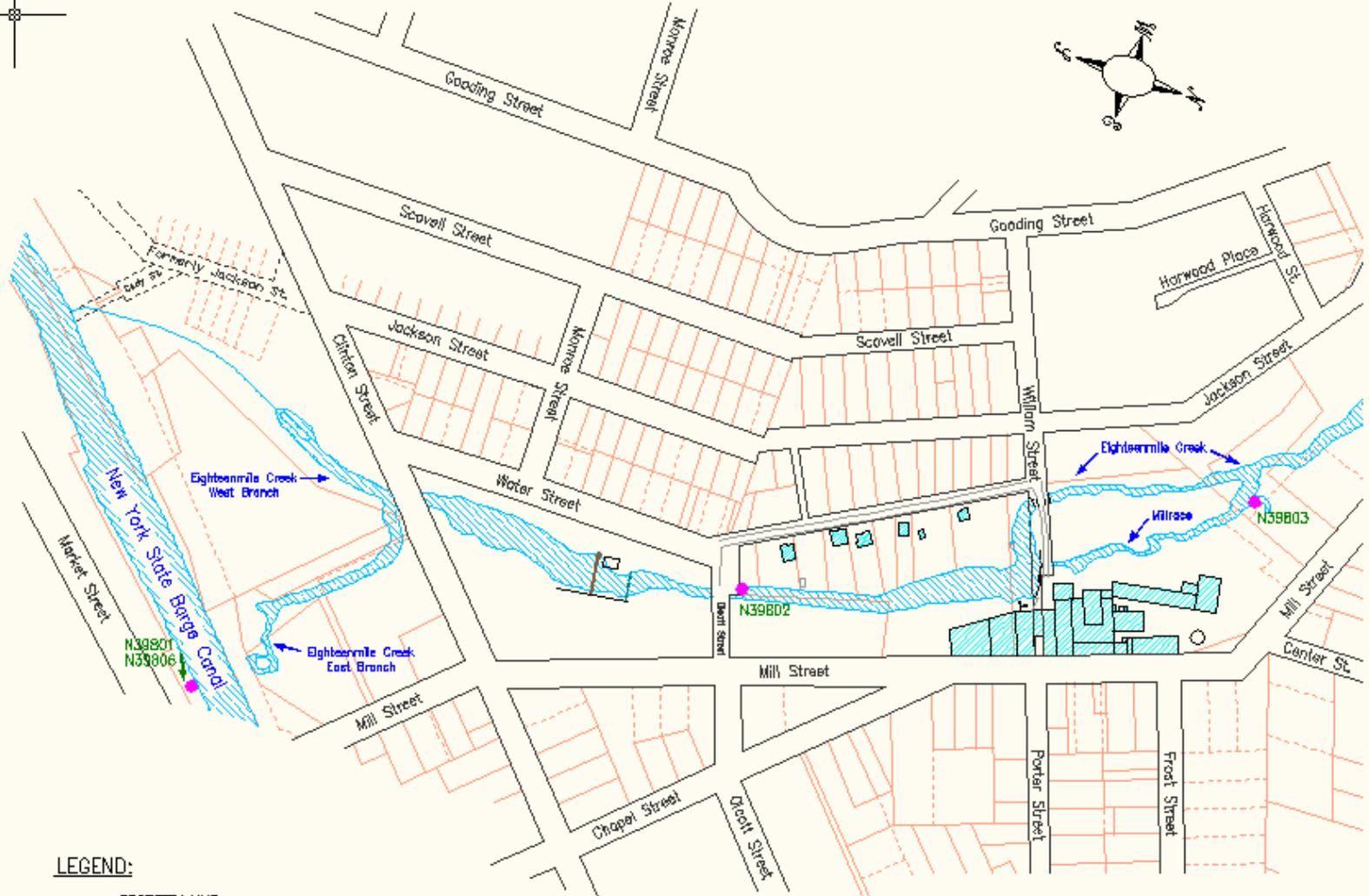
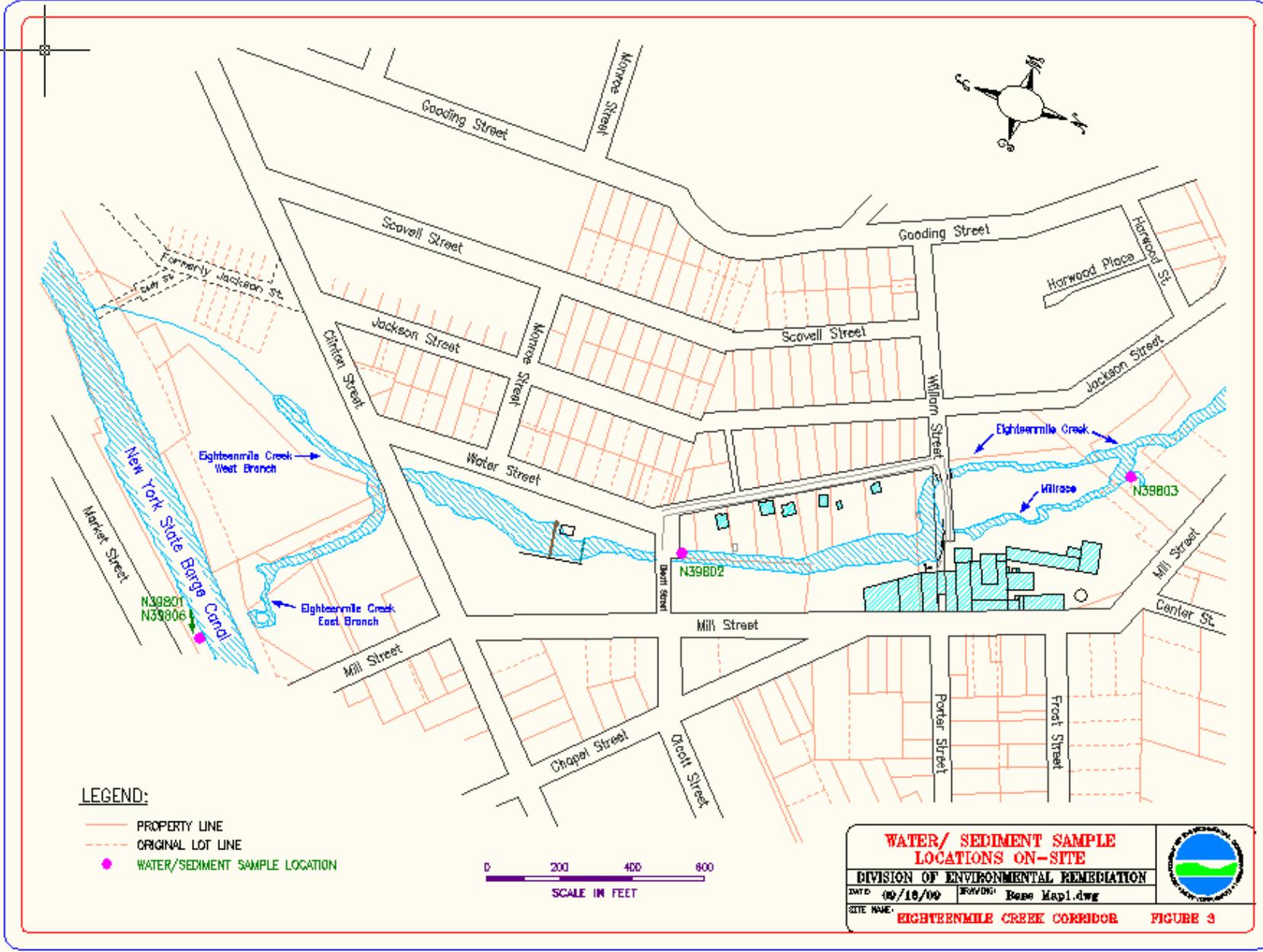
LEGEND

 EXCAVATION AREAS

0 200 400 600
SCALE IN FEET

SITE MAP		
DIVISION OF ENVIRONMENTAL REMEDIATION		
DATE: 08/18/09	DRAWING: Site Wide Map.dwg	
SITE NAME: EIGHTEENMILE CREEK CORRIDOR		

FIGURE 2



APPENDIX A

PHOTO LOGS



Photo 1

Sluice Gate Structure on Canal within Hall Spillway, combining with discharge from 18-Mile Creek.



Photos 2 & 3

50 micron Filter Sock & Sampling Drum with Filter Inserted.



NYSDEC – Region 9

Eighteen Mile Creek Corridor Site
No. 931212

Canal Sediment & Creek Water
PCB analysis Project

August 19, 2009



Photo 4

Canal Sample Location
at base of sluiceway
discharge (N39801).



Photo 5

18-Mile Creek Sample
Location (N39802)
downstream of Olcott
Street Bridge.



NYSDEC – Region 9

Eighteen Mile Creek Corridor Site
No. 931212

Canal Sediment & Creek Water
PCB analysis Project

August 19, 2009

2 | Page



Photo 6

18-Mile Creek Sample Location (N39803) at terminus of Mill way side channel into main creek.



Photo 7

18-Mile Creek Sample Location (N39804) upstream of Transit Street bridge.



NYSDEC – Region 9

Eighteen Mile Creek Corridor Site
No. 931212

Canal Sediment & Creek Water
PCB analysis Project

August 19, 2009

3 | Page



Photo 8

18-Mile Creek
Sample Location
(N39805) upstream
of Stone Road
bridge.

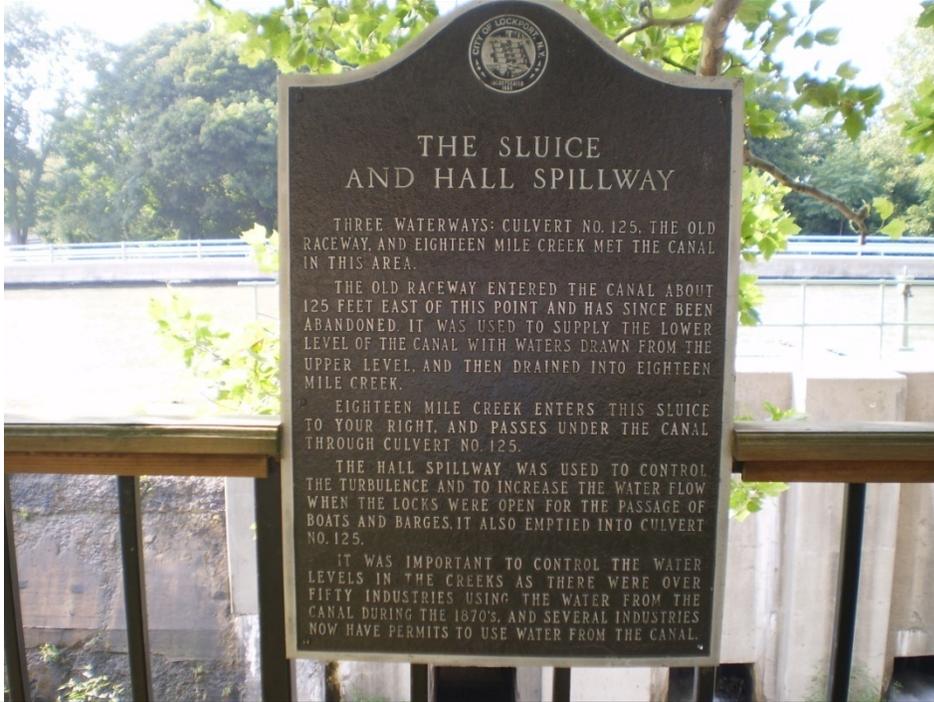


Photo 9

Historic Plaque.



NYSDEC – Region 9

Eighteen Mile Creek Corridor Site
No. 931212

Canal Sediment & Creek
Water PCB analysis Project

August 19, 2009

4 | Page



Photo 10

Canal Weir overflow structure before lock opening events.



Photo 11

Canal Weir overflow structure during lock opening events.



NYSDEC – Region 9

Eighteen Mile Creek Corridor Site
No. 931212

Canal Sediment & Creek Water
PCB analysis Project

August 19, 2009

5 | Page



Photo 12

Discharge to Creek from Canal Weir overflow structure before lock operating event.



Photo 13

Discharge to Creek from Canal Weir overflow structure during lock operating event.



NYSDEC – Region 9

Eighteen Mile Creek Corridor Site
No. 931212

Canal Sediment & Creek Water
PCB analysis Project

August 19, 2009

6 | Page



Photo 14

Sampler Set-up on edge of canal.

Photo 15



NYSDEC – Region 9

Eighteen Mile Creek Corridor Site
No. 931212

Canal Sediment & Creek
Water PCB analysis Project

August 19, 2009

7 | Page

APPENDIX B

LABORATORY ANALYTICAL REPORT(CD)

APPENDIX C
COMPLETE CATEGORY B
DELIVERABLE LABORATORY
DATA (CD)