

**NEW YORK STATE DEPARTMENT OF
ENVIRONMENTAL CONSERVATION**

Site Investigation - Scope of Work



**EIGHTEENMILE CREEK CORRIDOR:
NEW YORK STATE BARGE CANAL TO
NORTH TRANSIT ROAD**

City of Lockport, Niagara County

**August 2003
Revised February 2004**

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**EIGHTEENMILE CREEK CORRIDOR:
NEW YORK STATE BARGE CANAL TO NORTH TRANSIT ROAD
City of Lockport, Niagara County
Site Investigation - Scope of Work**

**New York State Department of Environmental Conservation
Division of Environmental Remediation
August 2003
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1.0 INVESTIGATION OBJECTIVES

The purpose of this Site Investigation is to further evaluate contamination in Eighteenmile Creek sediment from the New York State Barge Canal to North Transit Road, and to determine if this contamination has impacted residential properties along Water Street in the City of Lockport, Niagara County, New York (Figure 1-1). The specific objectives of this investigation are to:

- further evaluate the extent of PCB, copper, lead and zinc contamination in Eighteenmile Creek sediment in an attempt to determine the source or sources of these contaminants;
- further evaluate the extent of lead contamination in surface soil of residential properties along Water Street in an attempt to determine the source or sources of this contaminant;
- determine if subsurface soil of residential properties along Water Street is also contaminated; and
- further evaluate the nature and extent of the ash-cinder fill on the 131 and 143 Water Street properties.

These objectives will be determined through the analysis of waste, surface soil and subsurface soil samples collected from residential properties on Water Street, and sediment samples collected from Eighteenmile Creek and the millrace adjacent to the Former Flintkote Plant Site. The specific responsibilities of the New York State Department of Environmental Conservation (NYSDEC) and its Contractors are given in Section 3.0 of this Scope of Work. The NYSDEC is the lead agency for this investigation.

2.0 PROJECT BACKGROUND

During 2002 the NYSDEC, in consultation with the New York State Department of Health (NYSDOH) and Niagara County Health Department (NCHD), conducted three separate sampling events of Eighteenmile Creek and properties along Water Street in the City of Lockport, Niagara County, New York (Figure 2-1). The objective of the three sampling events was to obtain information sufficient to determine

if the properties along Water Street are being impacted by the Former Flintkote Plant Site and/or contaminated Eighteenmile Creek sediment. This objective was evaluated through the analysis of waste, surface soil and sediment samples obtained from Water Street properties, Eighteenmile Creek and wooded property south of the Former Flintkote Plant Site.

Five waste samples (SS-3, SS-5, SS-6, SS-7 and SS-13) were collected by the NYSDEC during 2002 at the locations shown on Figure 2-2. The analytical results for these samples are summarized in Table 2-1, and indicate that PCBs were not present in the waste, but that lead was detected in all five samples at concentrations ranging from 4.5 to 4,250 mg/kg (parts per million). Only the lead concentration in sample SS-3, however, exceeded the NYSDEC's TAGM 4046 soil cleanup objective for this contaminant. This sample also exceeded the TCLP Regulatory Limit for lead (Table 2-1), indicating that this ash is a characteristic hazardous waste (D008).

During 2002 the NYSDEC also collected eighteen surface soil samples. The locations of these samples are shown on Figure 2-2, with the analytical results summarized in Tables 2-2 thru 2-4. The analytical results for these samples indicate that the lead concentration in thirteen samples exceeded the TAGM 4046 soil cleanup objective for this contaminant. The concentration of lead in these samples ranged from 549 to 4,630 mg/kg. PCBs were detected in all eight surface soil samples collected from properties along Water Street with four of the eight samples exceeding the TAGM 4046 surface soil cleanup objective (1,000 Fg/kg) for this contaminant. The concentration of PCBs in all samples ranged from 24 to 17,400 Fg/kg (parts per billion).

The NYSDOH sent letters to Water Street residents informing them of their sampling results and that lead concentrations in some surface soil exceeded the United States Environmental Protection Agency's (EPA) residential soil lead hazard standard for bare soil in children's play areas.

Between 1987 and 2002 the NYSDEC collected twenty sediment samples from fifteen locations in Eighteenmile Creek between Remick Parkway (south of the New York State Barge Canal; Figure 1-1) and the Former Flintkote Plant Site (Figure 2-1). The locations of these samples, with the exception of the two Remick Parkway samples, are shown on Figure 2-3. The analytical results for these samples are summarized in Table 2-5, and indicate that PCBs were detected in eighteen of nineteen samples (the twentieth sample was not analyzed for PCBs) at concentrations ranging from 13.3 to 24,926 Fg/kg. All eighteen concentrations exceed the sediment criteria (0.8 Fg/kg) for human health bioaccumulation. Thirteen of these concentrations also exceed the TAGM 4046 surface soil cleanup objective of 1,000 Fg/kg. These results also indicate that

lead was detected in all fifteen samples in which this contaminant was analyzed at concentrations ranging from 103 to 25,400 mg/kg. Although fourteen of these concentrations exceed the sediment criteria (110 mg/kg) for the severe effect level, only six concentrations exceed the TAGM 4046 soil cleanup objective. Table 2-5 also shows that other inorganic contaminants are present in Eighteenmile Creek sediment. Metal concentrations that exceed sediment criteria include arsenic (1 sample), cadmium (1 sample), chromium (1 sample), copper (9 samples), iron (1 sample), mercury (3 samples), nickel (2 samples), silver (4 samples) and zinc (10 samples).

The sources of lead and PCBs that were detected in surface soil at the Water Street properties are unknown, but could include surface water/solids runoff from an ash ridge along Eighteenmile Creek adjacent to the 143 Water Street property, the presence of ash fill in the garden at 143 Water Street, and the deposition of contaminated sediments from Eighteenmile Creek during flood events. The available analytical data indicates, however, that the ash, slag and cinder fill that was collected from inside the garage (SS-5) at 131 Water Street and from a shallow depression (SS-13) in the side yard of 143 Water Street is not the source of lead as this waste contained relatively low (29.8 to 140 mg/kg) concentrations of this contaminant. Also, anthropogenic lead sources do not appear to be a significant source of lead as a background sample (SS-14) collected from the 143 Water Street property contained a relatively low (172 mg/kg) concentration of lead.

The sources of lead and PCBs in Eighteenmile Creek sediment are also unknown. PCBs and lead were detected in creek sediment from Remick Parkway to the confluence with the millrace adjacent to the Former Flintkote Plant Site. Plots of these data from upstream to downstream locations (Figures 2-4 and 2-5) did not reveal any trends with respect to lead, but did reveal a general trend with respect to PCBs. Upstream of the Clinton Street dam, PCB concentrations were relatively low, ranging from 13.3 to 361 Fg/kg. Immediately downstream of the dam, PCB concentrations increase substantially (840 to 3,662 Fg/kg), and remain elevated throughout the portion of Eighteenmile Creek evaluated in the 2002 study. These data suggest a source of PCBs near the Clinton Street dam. This source, however, does not appear to be a former transformer area near the dam or the extensive ash fill that was observed south of the Former Flintkote Plant Site, as PCBs were not detected at these areas. At this time the source remains unknown.

3.0 SCOPE OF WORK

Initially, a soil boring program will be completed at properties along Water Street for the purpose of collecting subsurface soil and waste samples for chemical analysis, and for delineating the areal extent of the ash-cinder fill at the 131 and 143 Water Street properties. In addition, sediment samples will be collected from Eighteenmile Creek between the New York State Barge Canal and North Transit Road, and from the

millrace adjacent to the Former Flintkote Plant Site. The map of the project area will be modified to include all soil boring locations and all samples collected as part of this investigation. Specific details of the work to be performed are described in the following sections.

3.1 Soil Boring Program

To determine the areal extent of contaminated soil and the ash-cinder waste, a series of borings will be completed during the investigation. Initially, soil borings will be completed at the approximate locations shown on Figure 3-1. The rationale for these locations is as follows:

- borings SB-1 thru SB-7 will be completed for the purpose of delineating the ash-cinder fill at the 131 and 143 Water Street properties;
- borings SB-8 thru SB-22 will be completed for the purpose of evaluating subsurface conditions at the remaining Water Street properties; and
- borings SB-23 thru SB-26 will be completed for the purpose of evaluating the former transformer area near the Clinton Street dam.

Based upon visual and/or olfactory evidence, and at the direction of the NYSDEC field representative, additional soil borings may be completed to help delineate the areal extent of any waste materials or contaminated soil encountered during the investigation.

3.1.1 Type and Duration of the Soil Boring Program

The direct-push technique is the most cost and time effective method of conducting the soil boring program outlined above. Given the heavily wooded nature of some areas of the Site, it is anticipated that a special access mounted direct push vehicle will be required. It is estimated that the proposed activities can be completed during five (5) days of field work.

3.1.2 Sample Collection

Using direct-push technology, continuous soil samples will be collected with dedicated acetate liners in a Geoprobe MacroCore sampling system, or equivalent. Each boring will be advanced to a depth of 4 feet below ground surface (bgs) or to native soil if waste material is encountered, for the purpose of geologic logging and subsurface soil/waste collection. Although the presence of volatile organic compounds is not anticipated during this investigation, soil samples will be screened for organic vapors using either a flame ionization detector (FID) or a photoionization detector (PID) as required by standard operating procedures for investigations at hazardous waste and hazardous substance sites. One sample from each location will be

collected from the most contaminated interval (based upon instrument readings, visible staining or odors) and submitted to an analytical laboratory for chemical analysis. If no gross contamination or waste is observed or detected, the sample will be collected from the midpoint of the sample (i.e., at 2 feet depth if a full sample is retrieved). In the event that multiple or distinct zones of gross contamination are encountered, additional samples will be collected for chemical analysis. The NYSDEC's Consultant, in consultation with NYSDEC personnel, will select the samples to be submitted to the lab for chemical analysis. All samples will be analyzed for arsenic, chromium, copper, lead, zinc and PCBs, with volatile organic compounds included if organic vapors are detected at significant levels during field screening. Chromium, copper and zinc have been added to the parameter list because, like lead, the sediment criteria for these contaminants were exceeded in a large number of sediment samples from Eighteenmile Creek and the millrace (Table 2-5). Arsenic has been added to the parameter list because this contaminant was detected in a large percentage of waste samples collected from the Former Flintkote Plant Site.

In addition, at least two samples of the ash-cinder fill at the 131 and 143 Water Street properties will be analyzed for semivolatile compounds to more fully characterize this material. Any other waste material encountered that is different from that previously detected will also be analyzed for semivolatile compounds, with volatile organic compounds included if organic vapors are detected at significant levels during field screening.

3.1.3 Completion of the Soil Boring Program

Upon completion of the soil boring program, the Direct-Push Contractor will backfill each soil boring with the remaining sample material to within 1 foot of the ground surface. At the residential properties, the remaining space in each boring will be filled with topsoil or other clean soil. At the wooded properties, the remaining space in each boring can be filled with topsoil, clean soil, bentonite pellets or grout, whichever is less expensive. To the extent possible, the Contractor shall also restore the project area to conditions similar to those encountered prior to the start of the investigation. This is critical at the residential properties. All excess soil/waste samples will be containerized in 55-gallon drums for later disposal.

3.1.4 Geologic Logging

All geologic logging will be completed by the Department's Consultant in consultation with Department personnel.

3.2 Surface Soil/Waste Samples

To further evaluate the extent of PCB and lead contamination of residential properties along Water

Street, additional surface soil and waste samples will be collected for chemical analysis. The NYSDEC proposes to collect samples from each Water Street property at the approximate locations shown on Figure 2-2. These locations were selected to compliment the locations sampled in 2002. NYSDEC personnel, in consultation with NYSDOH personnel, will select the final sample locations in the field. All samples will be analyzed for arsenic, chromium, copper, lead, zinc and PCBs, and will be collected from 0" - 2" depth.

3.3 Sediment Samples

Because sediment of Eighteenmile Creek was sampled over a 15 year period, it is difficult to evaluate spatial trends in the existing data set. As a result, sediment samples will be collected from Eighteenmile Creek between the New York State Barge Canal and North Transit Road, and from the millrace adjacent to the Former Flintkote Plant Site. These samples will be collected from the approximate locations shown on Figure 3-2, and analyzed for arsenic, chromium, copper, lead, zinc and PCBs. All samples will be collected with a sediment corer or bucket auger to a depth of 1 foot. One sample from each location will be collected from 0" - 2" depth to evaluate exposure to a direct contact with creek sediments and light flooding events. At half of the locations a second sample will be collected from 2" - 6" depth to characterize the total "reservoir" of what may be suspended during a large flood event or has been deposited over time. A third sample from the remainder of the core (6" - 12" depth) may be collected based upon the presence of organic vapors, visible staining or odors.

3.4 Sampling and Sample Analysis

With the exception of the sample collection (soil cores) discussed in Section 3.1 above, all sampling will be performed by NYSDEC personnel utilizing Department owned equipment. Sample analysis will be completed by a NYSDEC contract laboratory.

3.5 Mapping

A map of the Former Flintkote Plant Site was prepared by the NYSDEC as part of its 1999 Site Investigation. The area mapped included the Flintkote property boundaries; Flintkote buildings; the shoreline of the island, millrace, and Eighteenmile Creek in the vicinity of the Site; all soil boring and monitoring well locations; and the locations of all samples collected as part of the Site Investigation. For the March 2003 Sampling Report concerning the Water Street properties, the Flintkote map was expanded to the New York State Barge Canal by digitizing City of Lockport tax maps. All samples collected during 2002 were located using a tape measure and plotted on the expanded map. As part of this Site Investigation, the map will be further modified to include the locations of all borings completed and samples collected as part of the investigation.

3.6 Health & Safety

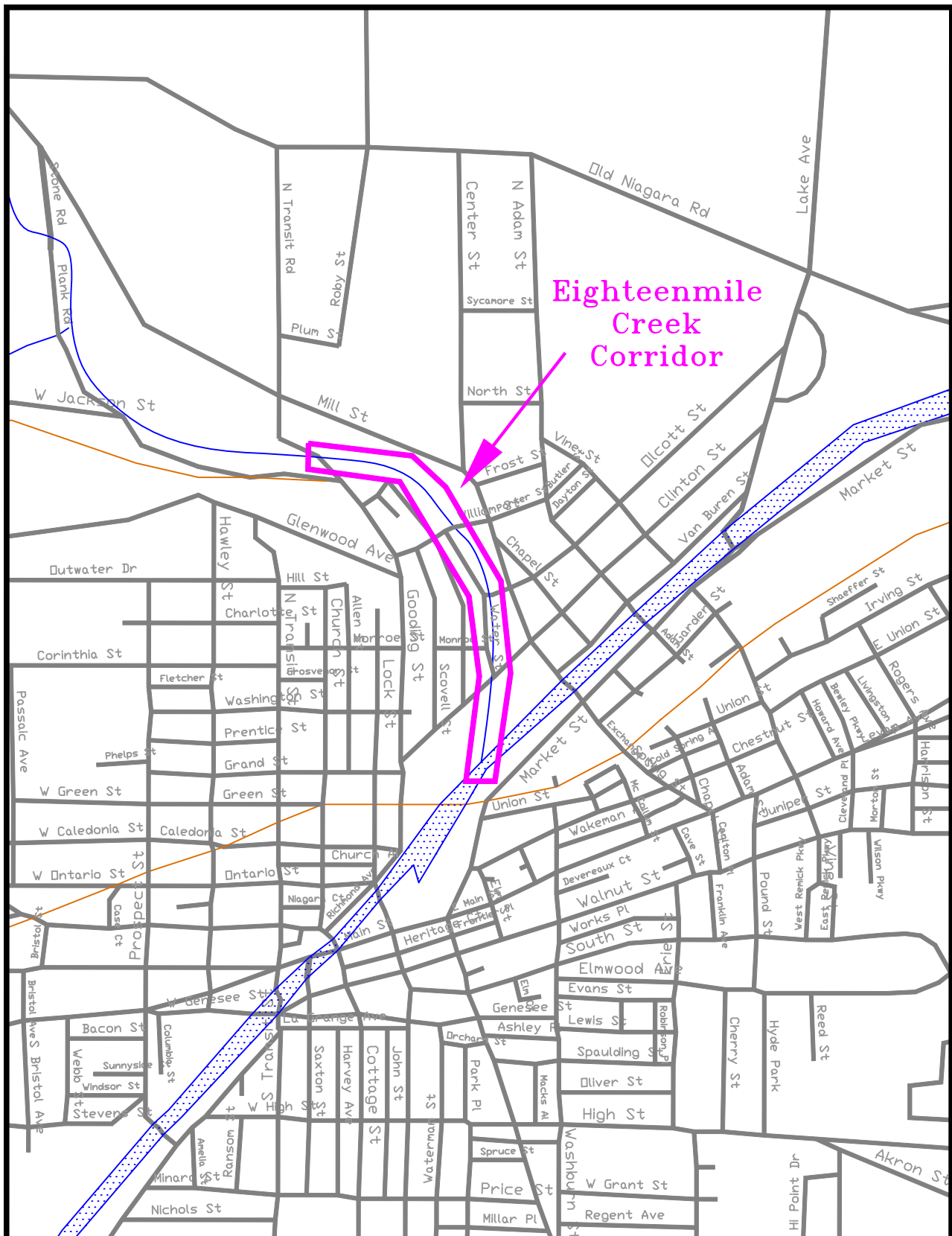
It is anticipated that all field work can be performed in Level D personal protective equipment with Level C backup. All field work should be conducted in accordance with the Health and Safety Plan included as Appendix A. The Direct-Push Contractor will be responsible for providing its employees with the appropriate personal protective equipment (PPE) suitable for working in and around contaminated liquids, wastes and soils. The NYSDEC's Consultant will be responsible for conducting the on-site air monitoring as described in this section and in more detail in Appendix B.

All field personnel shall be informed of the locations of the two hospitals listed in Appendix A, and be made aware of the list of emergency contacts contained therein. Field supervisory personnel shall become thoroughly familiar with the routes to both hospitals listed in Appendix A.

The Direct-Push Contractor shall identify and avoid all underground utility lines in the areas where soil borings are to be completed. The work areas will be clearly delineated to prevent unauthorized access. During all intrusive activities, continuous air monitoring will be conducted for organic vapors, flammability, O₂ and particulates. The air monitoring data will be utilized to determine the necessity to upgrade personal protective equipment requirements and to implement community air monitoring requirements.

3.7 Decontamination

The direct-push vehicle and sampling equipment will be decontaminated prior to the implementation of any field activities. This equipment will also be decontaminated between sampling locations. Decontamination wastes and used (spent) PPE and sampling equipment will be bagged and secured at the end of each work day. Construction of a decon pad will not be required for this project.



**Eighteenmile
Creek
Corridor**

Lockport Quadrangle

Scale Depends on Final Plotted Size

PROJECT LOCATION MAP

DIVISION OF ENVIRONMENTAL REMEDIATION

DATE: 02/20/03

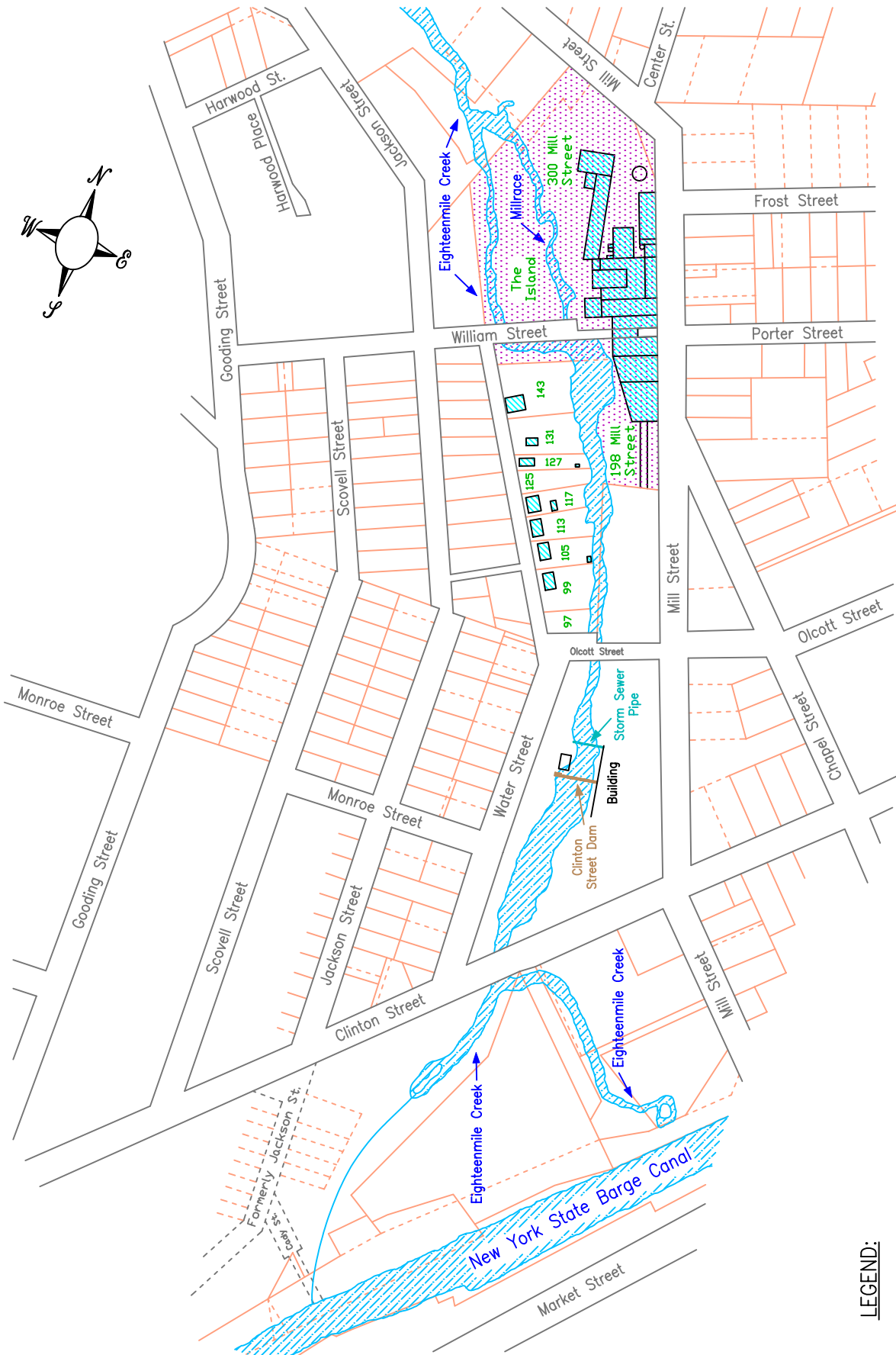
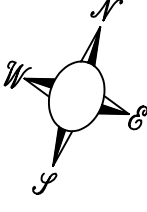
DRAWING: Location Map 3.dwg

SITE:

EIGHTEENMILE CREEK CORRIDOR

FIGURE 1-1





STUDY AREA SITE MAP

DIVISION OF ENVIRONMENTAL REMEDIATION

DATE: 01/15/03 DRAWING: SOW Figures.dwg

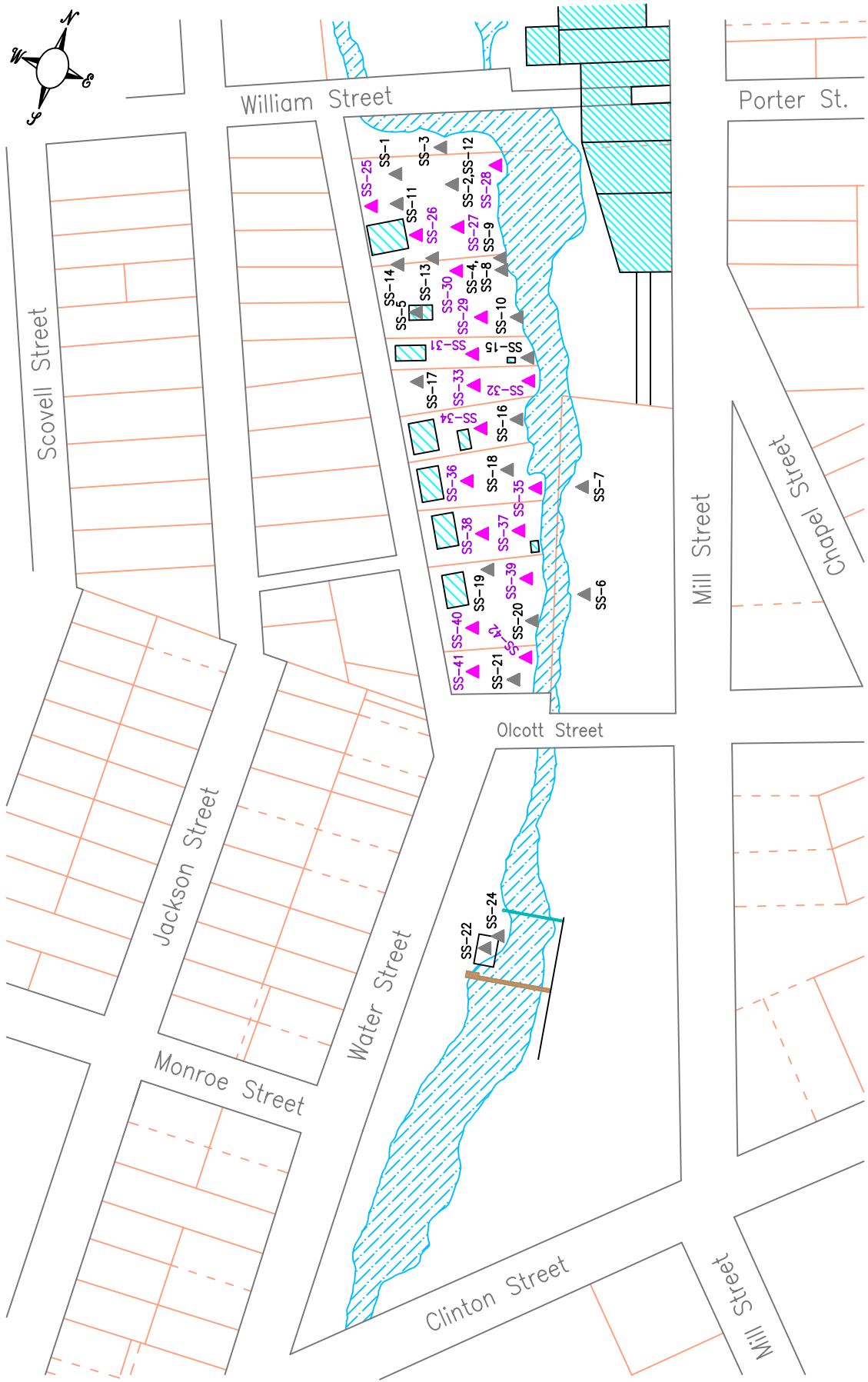
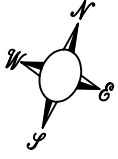
SITE NAME: EIGHTEENMILE CREEK CORRIDOR

FIGURE 2-1

LEGEND:

- PROPERTY LINE
- - - ORIGINAL LOT LINE
- ▨ FORMER FLINTKOTE PLANT SITE





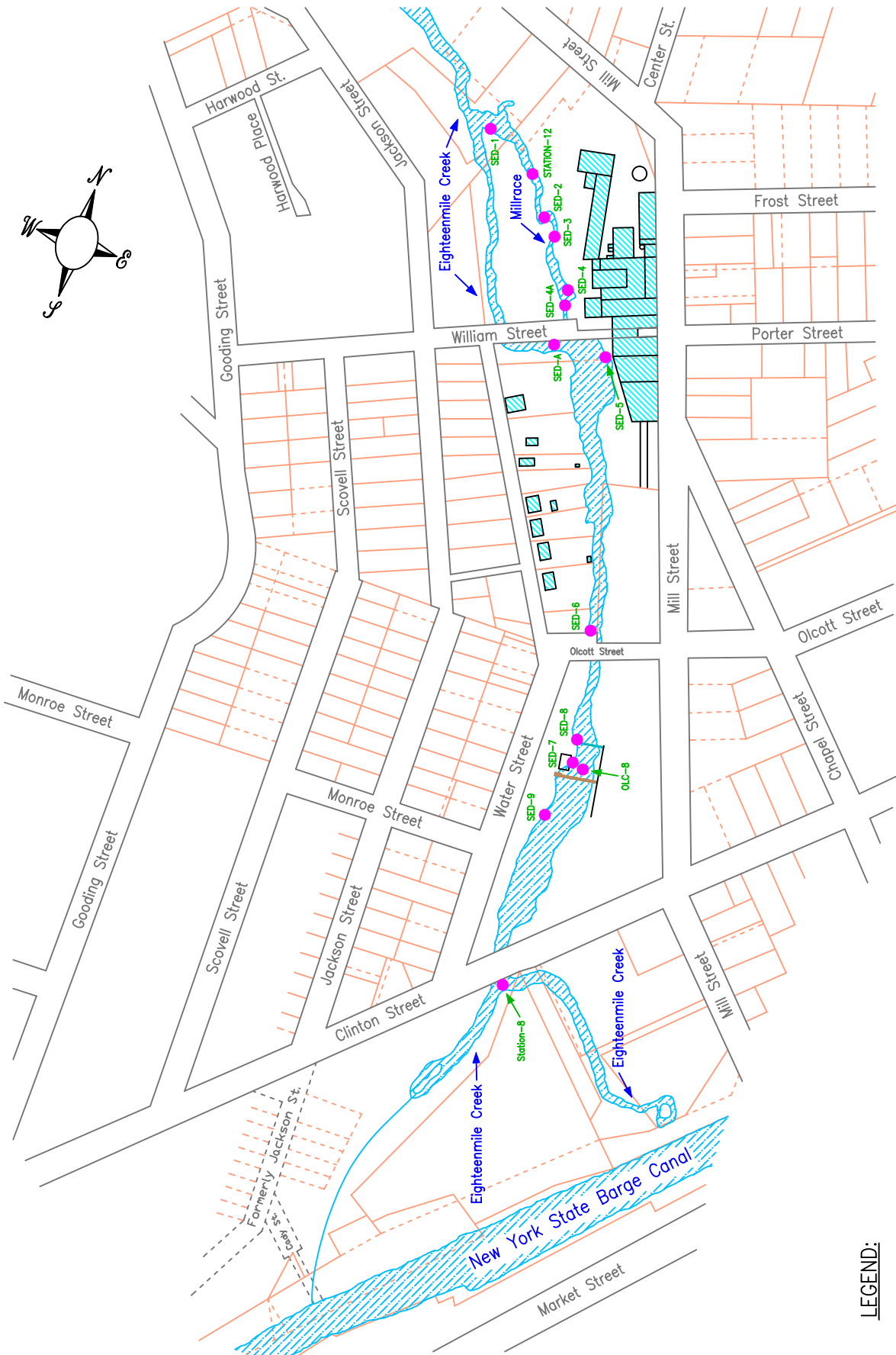
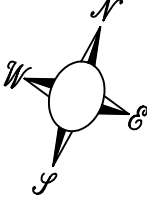
LEGEND:

- PROPERTY LINE
- - - ORIGINAL LOT LINE
- ▲ SURFACE SOIL & WASTE SAMPLE LOCATION (2002)
- ▲ PROPOSED SURFACE SOIL & WASTE SAMPLE LOCATION



SURFACE SOIL & WASTE SAMPLE LOCATION MAP
 DIVISION OF ENVIRONMENTAL REMEDIATION
 DATE: 01/15/03 DRAWING: SOW Figures.dwg
 SITE NAME: EIGHTEENMILE CREEK CORRIDOR

FIGURE 2-2



SEDIMENT SAMPLE LOCATION MAP
 DIVISION OF ENVIRONMENTAL REMEDIATION
 DATE: 01/15/03 DRAWING: SOW Figures.dwg
 SITE NAME: EIGHTEENMILE CREEK CORRIDOR

FIGURE 2-3

LEGEND:

- PROPERTY LINE
- - - ORIGINAL LOT LINE
- SEDIMENT SAMPLE LOCATION (1987 - 2002)



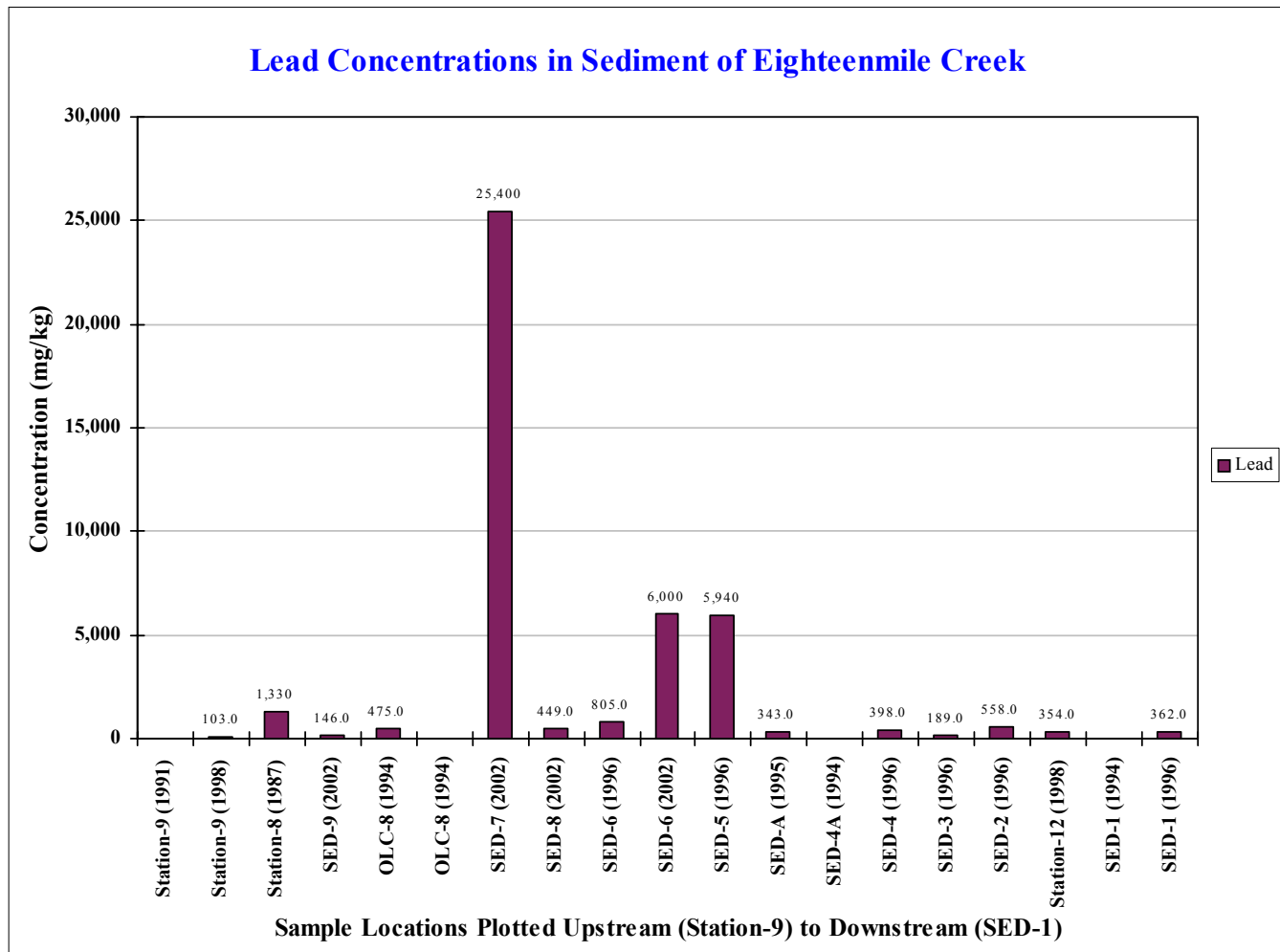


Figure 2-4. Lead concentrations in sediment of Eighteenmile Creek from Remick Parkway (Station-9) to the Former Flintkote Plant Site (SED-5 to SED-1).

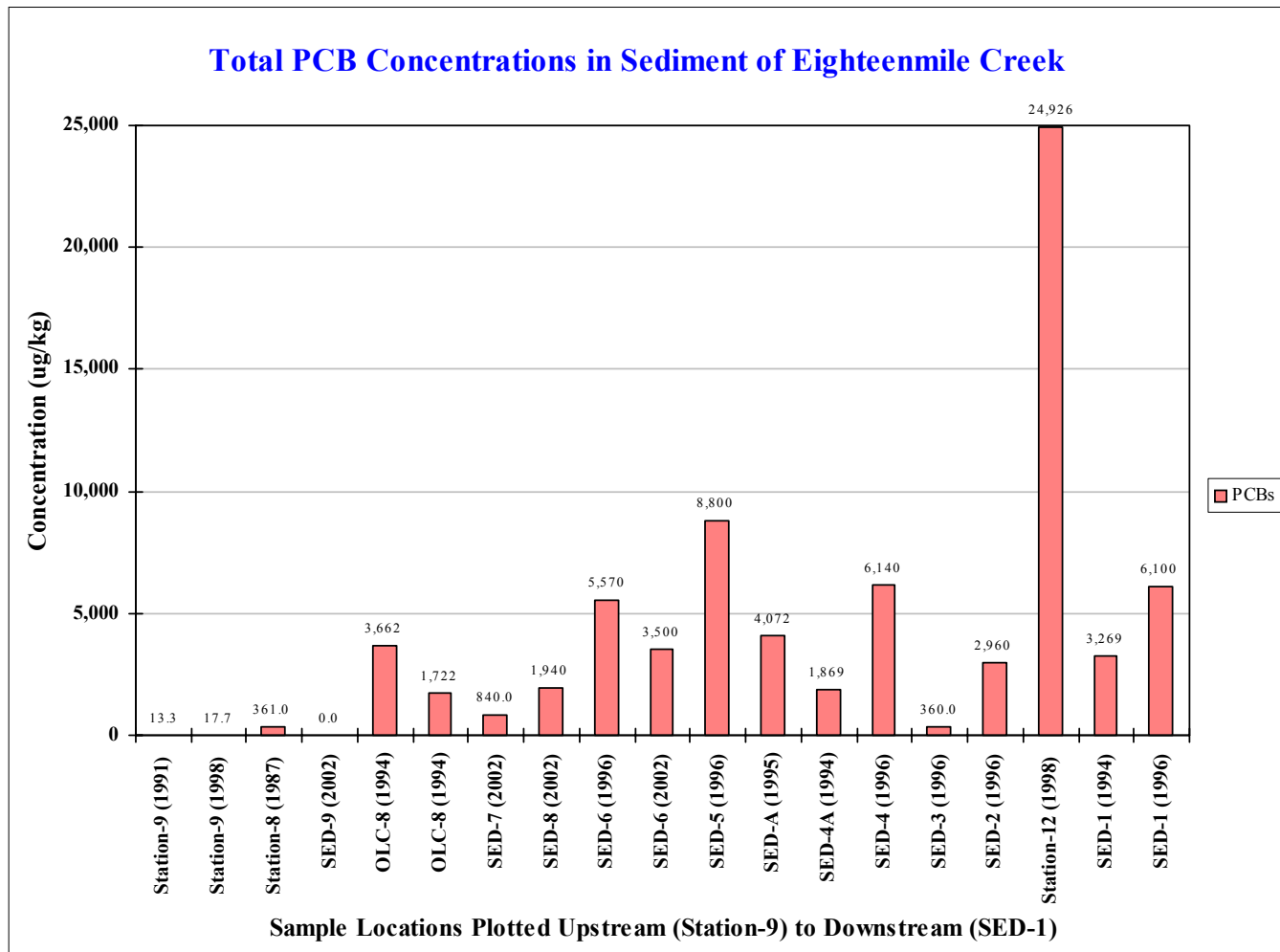
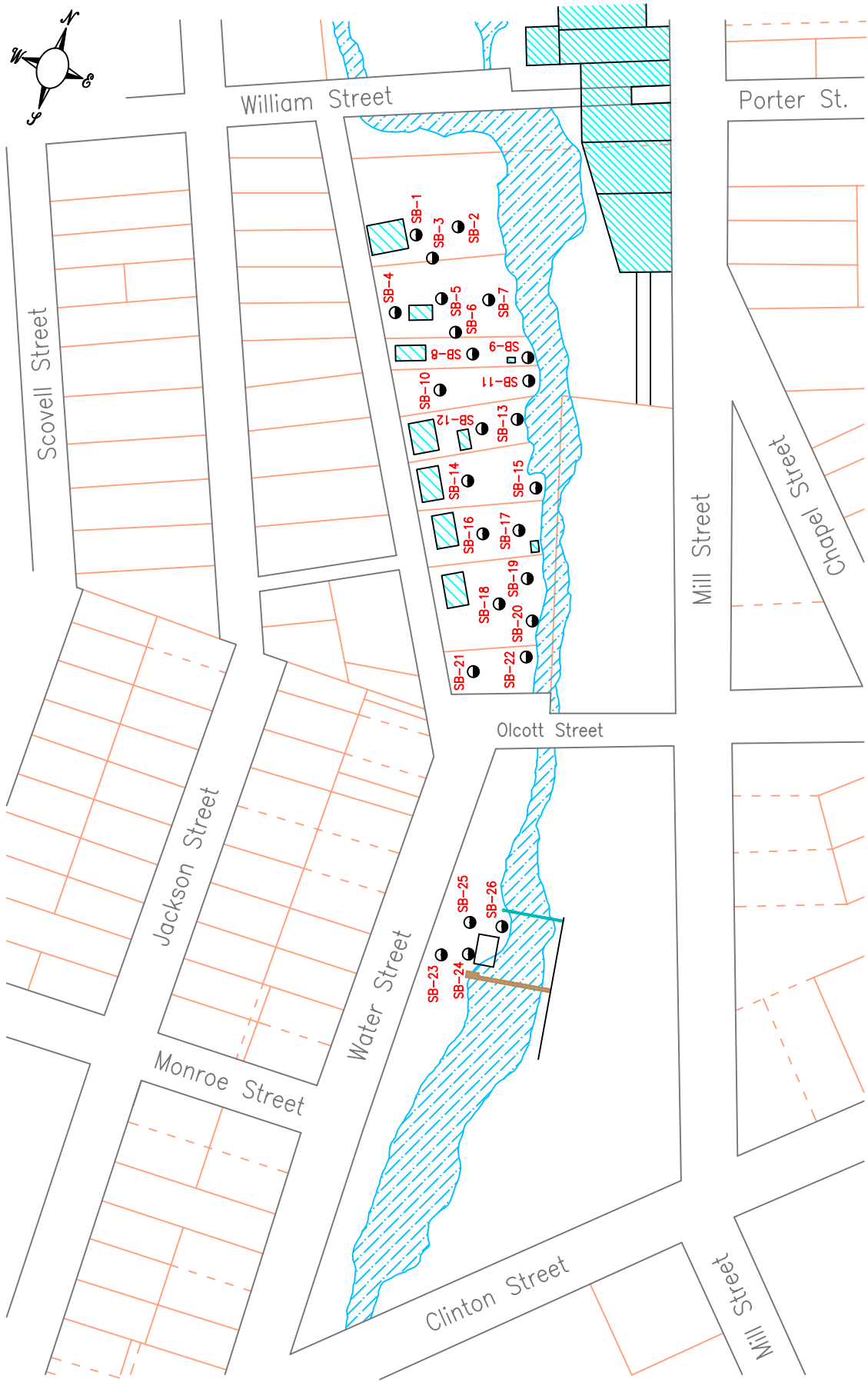
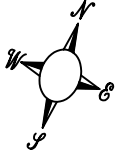


Figure 2-5. PCB concentrations in sediment of Eighteenmile Creek from Remick Parkway (Station-9) to the Former Flintkote Plant Site (SED-5 to SED-1).



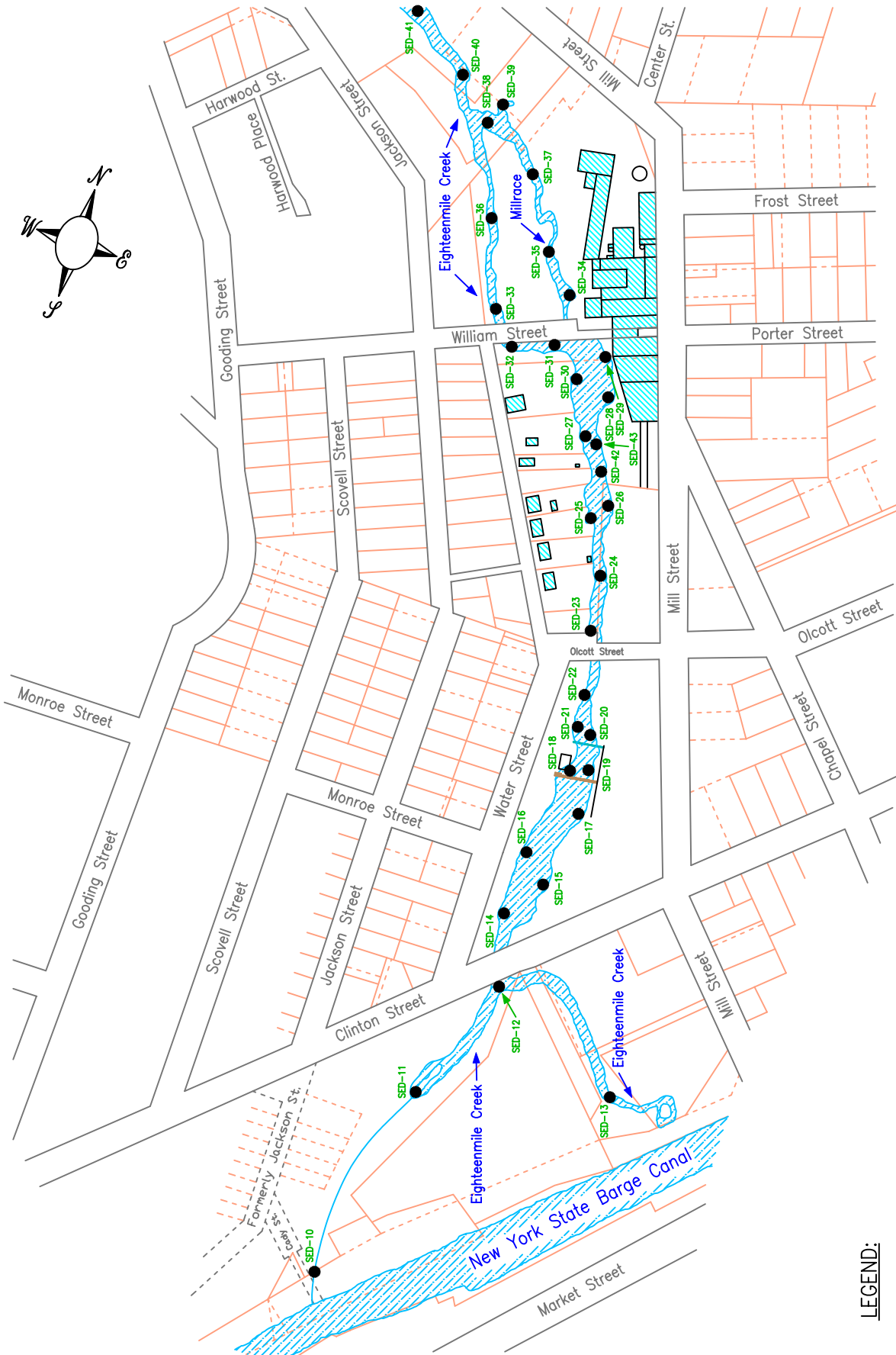
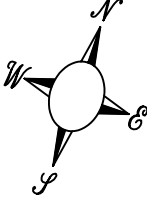
LEGEND:

- PROPERTY LINE
- - - ORIGINAL LOT LINE
- PROPOSED SOIL BORING LOCATION



**PROPOSED SOIL BORING
LOCATION MAP**

DIVISION OF ENVIRONMENTAL REMEDIATION	
DATE: 01/15/03	DRAWING: SOW Figures.dwg
SITE NAME: EIGHTEENMILE CREEK CORRIDOR	



PROPOSED SEDIMENT SAMPLE LOCATION MAP

DIVISION OF ENVIRONMENTAL REMEDIATION
 DATE: 01/15/03 DRAWING: SOW Figures.dwg
 SITE NAME: EIGHTEENMILE CREEK CORRIDOR

FIGURE 3-2

LEGEND:

- PROPERTY LINE
- - - ORIGINAL LOT LINE
- PROPOSED SEDIMENT SAMPLE LOCATION



**Table 2-1.
Analytical Results of Waste Samples Collected from Properties along Eighteenmile Creek in the City of Lockport.**

Sample Number Date Sampled Sample Depth Sample Location	Soil Cleanup Objective * or Regulatory Limit +	SS-3 04/16/02 0"-2" Ash Ridge	SS-5 07/23/02 0"-2" Garage	SS-6 07/23/02 0"-2" Woods	SS-7 07/23/02 0"-2" Woods	SS-13 7/23/02 0"-2" Depression
PCBs (Fg/kg or ppb)						
Aroclor-1248						
Aroclor-1254						
Aroclor-1260						
Total PCBs	1,000	ND		ND	ND	
Inorganic Compounds (mg/kg or ppm unless otherwise noted)						
Lead - Total	500 **	4,250 E	29.8 E	4.5 E	226 E	140 E
Lead - TCLP (mg/l)	5.0	355.0	0.020	0.003	0.057	
<p>* NYSDEC Technical and Guidance Memorandum (TAGM) 4046: Determination of Soil Cleanup Objectives and Cleanup Levels, 1995.</p> <p>+ 6 NYCRR Part 371: Identification and Listing of Hazardous wastes, January 14, 1995.</p> <p>E Estimated concentration due to the presence of interference.</p> <p>ND Compound was analyzed for but not detected.</p> <p>** The TAGM 4046 soil cleanup objective for lead is site background. In general, background concentrations vary widely, with average concentrations in undeveloped, rural areas ranging from 4-61 ppm, and from 200-500 ppm in metropolitan or suburban areas. A specific site background concentration for the Former Flintkote Plant Site has not been determined, so a 500 ppm value has been utilized for screening purposes.</p> <p>Blanks indicate that the sample was not analyzed for the associated compound.</p> <p>Shaded values equal or exceed the TAGM 4046 soil cleanup objectives or TCLP Regulatory Limits.</p>						

**Table 2-2.
Analytical Results of Surface Soil Samples Collected from the Property at 143 Water Street.**

Sample Number	Soil Cleanup Objective *	SS-1 04/16/02 0"-2" Shallow Swale	SS-2 04/16/02 0"-2" Garden	SS-12 + 7/23/02 0"-2" Garden	SS-11 7/23/02 0"-2" Dog Trail	SS-14 07/23/02 0"-2" Background
PCBs (Fg/kg or ppb)						
Aroclor-1248						
Aroclor-1254		64 J	24 J			
Aroclor-1260						
Total PCBs	1,000	64 J	24 J			
Inorganic Compounds (mg/kg or ppm unless otherwise noted)						
Lead - Total	500 **	887 E	686 E	1,330 E	913 E	172 E
<p>* NYSDEC Technical and Guidance Memorandum (TAGM) 4046: Determination of Soil Cleanup Objectives and Cleanup Levels, 1995.</p> <p>J Compound reported at an estimated concentration below the reporting limit.</p> <p>E Estimated concentration due to the presence of interference.</p> <p>ND Compound was analyzed for but not detected.</p> <p>** The TAGM 4046 soil cleanup objective for lead is site background. In general, background concentrations vary widely, with average concentrations in undeveloped, rural areas ranging from 4-61 ppm, and from 200-500 ppm in metropolitan or suburban areas. A specific site background concentration for the Former Flintkote Plant Site has not been determined, so a 500 ppm value has been utilized for screening purposes.</p> <p>+ Sample collected near the location of sample SS-2.</p> <p>Blanks indicate that the sample was not analyzed for the associated compound.</p> <p>Shaded values equal or exceed the TAGM 4046 soil cleanup objectives.</p>						

**Table 2-3.
Analytical Results of Surface Soil Samples Collected from the Property at 131 Water Street.**

Sample Number Date Sampled Sample Depth Sample Location or Type	Soil Cleanup Objective * or Regulatory Limit +	SS-4 04/16/02 0"-2" Creek Bank	SS-8 ++ 07/23/02 0"-2" Creek Bank	SS-9 07/23/02 0"-2" Creek Bank	SS-10 07/23/02 0"-2" Creek Bank
PCBs (Fg/kg or ppb)					
Aroclor-1248			2,800	3,700	220 J
Aroclor-1254		9,400	3,500	4,300	240 J
Aroclor-1260		8,000			
Total PCBs	1,000	17,400	6,300	8,000	460 J
Inorganic Compounds (mg/kg or ppm unless otherwise noted)					
Lead - Total	500 **	1,270 E	1,100 E	1,360 E	4,630 E
Lead - TCLP (mg/l)	5.0	1.54			
<p>* NYSDEC Technical and Guidance Memorandum (TAGM) 4046: Determination of Soil Cleanup Objectives and Cleanup Levels, 1995.</p> <p>+ 6 NYCRR Part 371: Identification and Listing of Hazardous wastes, January 14, 1995.</p> <p>J Compound reported at an estimated concentration below the reporting limit.</p> <p>E Estimated concentration due to the presence of interference.</p> <p>** The TAGM 4046 soil cleanup objective for lead is site background. In general, background concentrations vary widely, with average concentrations in undeveloped, rural areas ranging from 4-61 ppm, and from 200-500 ppm in metropolitan or suburban areas. A specific site background concentration for the Former Flintkote Plant Site has not been determined, so a 500 ppm value has been utilized for screening purposes.</p> <p>++ Sample collected at the location of sample SS-4.</p> <p align="center">Blanks indicate that the sample was not analyzed for the associated compound.</p> <p align="center">Shaded values equal or exceed the TAGM 4046 soil cleanup objectives.</p>					

Table 2-4. Analytical Results of Surface Soil Samples Collected from Other Water Street Properties.						
Sample Number Date Sampled Sample Depth Sample Location	Soil Cleanup Objective *	SS-15 7/23/02 0"-2" 127 Water St.	SS-16 7/23/02 0"-2" 117 Water St.	SS-17 7/23/02 0"-2" 125 Water St.	SS-18 7/23/02 0"-2" 113 Water St.	SS-19 7/23/02 0"-2" 99 Water St.
PCBs (Fg/kg or ppb)						
Aroclor-1248						
Aroclor-1254						
Aroclor-1260						
Total PCBs	1,000					
Inorganic Compounds (mg/kg or ppm)						
Lead - Total	500 **	1,110 E	438 E	56.2 E	227 E	549 E

Table 2-4 (Continued). Analytical Results of Surface Soil Samples Collected from Other Water Street Properties.					
Sample Number Date Sampled Sample Depth Sample Location	Soil Cleanup Objective *	SS-20 7/23/02 0"-2" 99 Water St.	SS-21 07/23/02 0"-2" 97 Water St.	SS-22 11/26/02 0"-2" Transformer Area	SS-24 11/26/02 0"-2" Transformer Area
PCBs (Fg/kg or ppb)					
Aroclor-1248				99 J	520.0
Aroclor-1254				240 J	490.0
Aroclor-1260				160 J	200 J
Total PCBs	1,000			499 J	1,210
Inorganic Compounds (mg/kg or ppm)					
Lead - Total	500 **	936 E	3,680 E	1,060	344.0

Table 2-4 (Continued).
Analytical Results of Surface Soil Samples Collected from Other Water Street Properties.

* E J **	<p>NYSDEC Technical and Guidance Memorandum (TAGM) 4046: Determination of Soil Cleanup Objectives and Cleanup Levels, 1995.</p> <p>Estimated concentration due to the presence of interference.</p> <p>Compound reported at an estimated concentration below the reporting limit.</p> <p>The TAGM 4046 soil cleanup objective for lead is site background. In general, background concentrations vary widely, with average concentrations in undeveloped, rural areas ranging from 4-61 ppm, and from 200-500 ppm in metropolitan or suburban areas. A specific site background concentration for the Former Flintkote Plant Site has not been determined, so a 500 ppm value has been utilized for screening purposes.</p> <p>Blanks indicate that the sample was not analyzed for the associated compound.</p> <p>Shaded values equal or exceed the TAGM 4046 soil cleanup objectives.</p>
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<p align="center">Table 2-5. Analytical Results of Sediment Samples Collected from the Erie Canal, Eighteenmile Creek and the Millrace at the Former Flintkote Plant Site. Results for Eighteenmile Creek are Summarized from Upstream (Station-9) to Downstream (SED-1) Locations. The Two Erie Canal Samples Were Collected Upstream of Eighteenmile Creek.</p>								
Sample Number	Sediment Criteria *	Station-8A 08/20/98 0"-4" Erie Canal	SED-B 03/22/94 5.5"-7.3" Erie Canal	Station-9 07/11/91 0"-0.5" Remick Pkwy.	Station-9 08/17/98 0"-2" Remick Pkwy.	Station-8 1987 Unknown Clinton St.	SED-9 11/26/02 0"-2" Dam ■	OLC-8 1994 0"-2" Dam ●
PCBs (Fg/kg or ppb)								
Aroclor-1242								
Aroclor-1248			420.0					
Aroclor-1254								
Aroclor-1260								
Total PCBs	0.8 **	122.6 @	420.0	13.3	17.7 @	361.0 +	ND (140)	3,662
Inorganic Compounds (mg/kg or ppm)								
Arsenic	33.0	5.7			7.7	4.7		3.6
Barium	NS	NR			NR	158.0		NR
Cadmium	9.0	0.24 B			0.86 B	2.9		2.0
Chromium	110.0	29.4			17.9	95.0		44.8
Cobalt	NS	NR			NR	5.3		NR
Copper	110.0	40.0			20.2	650.0		238.0
Iron	40,000	29,300			24,900	27,600		14,400
Lead	110.0	33.6			103.0	1,330	146.0	475.0
Mercury	1.3	0.12			NR	1.8		0.66
Nickel	50.0	32.1			22.9	50.0		31.8
Selenium	NS	NR			NR	ND		1.4
Silver	2.2	0.33 B			ND	4.0		2.1
Zinc	270.0	212.0			170.0	833.0		423.0

Table 2-5 (Continued).								
Analytical Results of Sediment Samples Collected from the Erie Canal, Eighteenmile Creek and the Millrace at the Former Flintkote Plant Site.								
Results for Eighteenmile Creek are Summarized from Upstream (Station-9) to Downstream (SED-1) Locations.								
The Two Erie Canal Samples Were Collected Upstream of Eighteenmile Creek.								
Sample Number	Sediment Criteria *	OLC-8 10/12/94 0"-4" Dam ●	SED-7 11/26/02 0"-2" Dam ●	SED-8 11/26/02 0"-2" Dam ●	SED-6 08/07/96 0"-2" Olcott St.	SED-6 07/23/02 0"-2" Olcott St.	SED-5 08/07/96 0"-2" 300 Mill	SED-A 10/27/95 0"-2" William St.
PCBs (Fg/kg or ppb)								
Aroclor-1242			600.0					
Aroclor-1248				830.0	4,800 X	1,800	4,900 PX	
Aroclor-1254			240.0	760.0	770 PX	1,700	3,900 PX	
Aroclor-1260				350.0				
Total PCBs	0.8 **	1,722 @	840.0	1,940	5,570	3,500	8,800	4,072 (2,138)
Inorganic Compounds (mg/kg or ppm)								
Arsenic	33.0				3.5		36.8	4.7
Barium	NS				142 E		784 E	NA
Cadmium	9.0				3.0		26.3	1.3
Chromium	110.0				18.5		167.0	28.2
Cobalt	NS				3.5 B		23.4 B	NA
Copper	110.0				388 EN		7,550 EN	244.0
Iron	40,000				16,200 E		293,000 E	13,600
Lead	110.0		25,400	449.0	805 E	6,000 E	5,940 E	343.0
Mercury	1.3				ND		4.9 N	1.025
Nickel	50.0				11.8 B		333.0	29.9
Selenium	NS				1.4 B		14.5	0.95
Silver	2.2				0.66 B		15.4	1.4
Zinc	270.0				905.0		13,000	483.0

<p align="center">Table 2-5 (Continued). Analytical Results of Sediment Samples Collected from the Erie Canal, Eighteenmile Creek and the Millrace at the Former Flintkote Plant Site. Results for Eighteenmile Creek are Summarized from Upstream (Station-9) to Downstream (SED-1) Locations. The Two Erie Canal Samples Were Collected Upstream of Eighteenmile Creek.</p>								
Sample Number	Sediment Criteria *	SED-4A 1994 Unknown Millrace	SED-4 08/07/96 0"-2" Millrace	SED-3 08/07/96 0"-2" Millrace	SED-2 08/07/96 0"-2" Millrace	Station-12 08/19/98 0"-7" Millrace	SED-1 1994 Unknown Millrace	SED-1 08/07/96 0"-2" Downstream
PCBs (Fg/kg or ppb)								
Aroclor-1242								
Aroclor-1248			5,700 PX		2,100 X			4,100 X
Aroclor-1254			440 JPX	360.0	860 JPX			2,000 PX
Aroclor-1260								
Total PCBs	0.8 **	1,869	6,140	360.0	2,960	24,926 @	3,269	6,100
Inorganic Compounds (mg/kg or ppm)								
Arsenic	33.0		6.3	2.1 B	4.8 B	6.2		3.6 B
Barium	NS		167 E	100 E	322 E	NR		142 E
Cadmium	9.0		0.12 B	0.2 B	3.1 B	1.3 B		1.5 B
Chromium	110.0		43.9	20.7	74.0	42.6		36.0
Cobalt	NS		9.8 B	6.6 B	6.2 B	NR		8.3 B
Copper	110.0		181 EN	108 EN	415 EN	252.0		352 EN
Iron	40,000		30,400 E	16,300 E	13,900 E	16,600		19,800 E
Lead	110.0		398 E	189 E	558 E	354.0		362 E
Mercury	1.3		0.69 N	0.26 N	2.1 N	NR		0.73 N
Nickel	50.0		32.7	20.2	31.1	25.5		29.8
Selenium	NS		3.0 B	ND	4.0	NR		3.0
Silver	2.2		1.1 B	0.86 B	3.9 B	1.5 B		2.6 B
Zinc	270.0		723.0	427.0	1,020	640.0		712.0

Table 2-5 (Continued).

Analytical Results of Sediment Samples Collected from the Erie Canal, Eighteenmile Creek and the Millrace at the Former Flintkote Plant Site.
Results for Eighteenmile Creek are Summarized from Upstream (Station-9) to Downstream (SED-1) Locations.
The Two Erie Canal Samples Were Collected Upstream of Eighteenmile Creek.

*	NYSDEC Technical Guidance for Screening Contaminated Sediments, January 1999. Sediment criteria given are for the severe effect level unless otherwise noted.
■	Sample collected upstream of the Clinton Street dam.
●	Sample collected downstream of the Clinton Street dam.
**	Sediment criteria for human health bioaccumulation.
@	Total PCB concentration calculated from the results of different PCB congeners.
+	Results from a sediment sample collected on July 11, 1991.
ND (3)	The compound was analyzed for but not detected at the detection limit in parentheses (if known).
NS	No standard or guidance value available.
NR	Not reported.
NA	Not analyzed.
J	Compound reported at an estimated concentration below the reporting limit.
P	>25% difference between the analytical results on two GC columns. The lower value is reported.
X	Manually integrated and calculated.
N	Spike sample recovery is not within control limits (inorganics).
E	Estimated concentration due to the presence of interference (inorganics).
B	Value greater than or equal to the instrument detection limit, but less than the contract required detection limit (inorganics).
	 Blanks indicate that the sample was not analyzed for the associated compound or that the results were not reported (e.g., in the Eighteenmile Creek Remedial Action Plan dated August 1997).
	 Shaded values equal or exceed the DEC sediment criteria.

APPENDIX A

HEALTH AND SAFETY PLAN

This Health and Safety Plan was developed for use by all personnel involved in the Site Investigation of the Eighteenmile Creek Corridor. This plan provides only general guidance that should be supplemented by the Contractor's detailed Health and Safety Plan.

General Health and Safety Guidelines

All work should be conducted in accordance with standard health and safety procedures for hazardous waste site work. All Personnel must have the 40-hour HAZWOPER training certification as required by 29 CFR 1910.120, and maintain this training by taking the annual 8-hour Refresher Course. All Contractors should provide, as necessary, appropriate personal protective equipment (PPE) suitable for working in and around contaminated liquids and organic vapors, and on-site air monitoring equipment that will be utilized to determine the necessity to upgrade PPE requirements.

It is anticipated that all field work can be performed in Level D personal protective equipment: steel toe shoes/boots, hard hat and latex gloves. All Contractors should ensure that sufficient personal protective equipment is available for all personnel prior to entering the exclusion zone. All appropriate PPE should be donned, used and removed as described in the 40-hour training course. Air monitoring with a photo- (PID) or flame- (FID) ionization detector must be conducted to determine the necessity to upgrade PPE requirements. An air-purifying respirator must be worn whenever there are sustained organic vapor concentrations of 5 ppm or above in the breathing zone.

Emergency Telephone Numbers

This section includes a list of emergency telephone numbers for use by all personnel involved in the Site Investigation.

Niagara County Sheriff's Department	(716) 439-9393
Emergency Services	911
Lockport Memorial Hospital	(716) 434-9111
Inter-Community Memorial Hospital	(716) 778-5111
National Poison Control Center	(800) 492-2414

New York Poison Control Center	(516) 542-2323
National Response Center	(800) 424-8802
Chemical Manufacturers Association Chemical Referral Center	(800) 262-8200
NYSDEC Region 9: Glenn May, project manager	(716) 851-7220
NYSDOH Western Regional Office: Matthew Forcucci	(716) 847-4500
NYSDOH Troy Office: Charlotte Bethoney	(518) 402-7860
Niagara Company Health Department: Paul Dicky	(716) 439-7595
Dig Safe (underground utilities clearance)	(716) 893-1133

Medical Assistance

Two hospitals are located within 10 miles of the Former Flintkote Plant Site. This section contains the names, addresses and telephone numbers of those hospitals. All personnel should be familiar with these locations and know how to get there from the Site. The primary source of medical assistance is:

- Lockport Memorial Hospital
521 East Ave.
Lockport, New York
Phone: (716) 434-9111

Directions: From the site, go south on Water Street to Clinton Street. Turn left (east) on Clinton Street and travel to North Adam Street (3 blocks). Turn right (south) on North Adam Street, cross Clinton Street (NY State Route 78), continue south across the Erie/NY State Barge Canal and Market Street to the end of North Adam Street at Garden Street. Turn left (east) on Garden Street and travel one block to Vine Street. Turn right (south) on Vine Street and travel four blocks to East Avenue (NY State Route 31). Turn left (east) on East Avenue (this turn is marked on Vine Street by the standard blue and white “H” logo hospital sign), and continue five blocks to the hospital at 521 East Avenue.

The alternate source of medical assistance for personnel involved in the Site Investigation is:

- Inter-Community Memorial Hospital
2600 William Street
Newfane, New York 14108
Phone: (716) 778-5111

Directions: From the site, go south on Water Street to Clinton Street (NY State Route 78). Turn left (east) on Clinton St./Route 78 and travel five blocks east to Lake Street, where Route 78 continues northward. Turn left (north) on Lake Street/Route 78 and travel approximately five miles north on NY State Route 78 to the Village of Newfane. Turn right (east) on Ketchum Street in the village, travel two blocks to William Street and turn left (north). The hospital is one block north at the end of William Street.

APPENDIX B

AIR MONITORING PLAN

Site Ambient Air Monitoring

Ambient air monitoring will be conducted on a real time basis using an HNu-PID organic vapor meter. Baseline conditions will be measured at proposed soil boring locations prior to the commencement of operations. Readings will be taken at a frequency of one reading every hour taken within the breathing zone of the Exclusion Zone and at point sources of emission. Ambient air monitoring will be used to determine the appropriate level of worker protection.

Instrument readings will be recorded in a field notebook. Battery/charge level for each instrument will be checked at the beginning and end of each working day.

Community Air Monitoring

The proximity of private residences to the soil boring locations necessitates that ambient air quality monitoring be performed during the soil boring program. This is in addition to the normal monitoring of the work area for worker health and safety. Real time monitoring for volatile organics and particulate levels will be measured utilizing a HNu-PID and dust/aerosol monitor respectively.

A. Vapor Monitoring

Organic Vapor Initial Monitoring

Volatile organic compounds will be monitored hourly upwind and downwind at the perimeter of the work area. If total organic vapor levels at the perimeter downwind location exceed the perimeter upwind location by 5 ppm, the Vapor Emission Response Plan must be implemented.

Vapor Emission Response Plan

If the downwind work area perimeter organic vapor concentration exceeds the upwind work area perimeter concentration by 5 ppm but less than 25 ppm, the following action will be taken:

- Every 30 minutes monitor the perimeter work area location.
- Every 30 minutes monitor the organic vapor concentration 200 feet downwind of the perimeter work area or half the distance to the nearest receptor, whichever is less. If this reading exceeds

the perimeter work area upwind organic vapor concentration by 5 ppm, all work must halt and monitoring increased to every 15 minutes. If, at any time, this reading exceeds the perimeter work area upwind concentration by 10 ppm, the Major Vapor Emissions Response Plan will be initiated.

- If organic vapor levels 200 feet downwind of the perimeter work area or half the distance to the nearest downwind receptor, whichever is less, exceeds by 5 ppm the work area perimeter upwind concentration persistently, then air quality monitoring must be performed within 20 feet of the nearest downwind receptor (20 foot zone). If the readings in the 20 foot zone exceed the perimeter work area upwind concentration by 5 ppm for more than 30 minutes, then the Major Vapor Emission Response Plan will be implemented.
- Work activities can resume only after the downwind 200 foot reading and the 20 foot zone reading are <5 ppm above the perimeter work area upwind concentration. In addition, the downwind perimeter work area concentration must be <25 ppm above the upwind work area perimeter concentration.

Major Vapor Emission Response Plan

If the downwind work area perimeter organic vapor concentration exceeds the upwind work area perimeter concentration by more than 25 ppm, then the Major Vapor Emission Response Plan will be activated. Upon activation, the following activities will be undertaken:

- Halt work.
- The NYSDEC, NYSDOH and NCHD will be notified and advised of the situation.
- Local police and fire department contacts will be notified and advised of the situation.
- Frequent air monitoring will be conducted at 30 minute intervals within the 20 foot zone. If two successive readings below action levels are measured, air monitoring may be halted or modified by the Safety Officer and work may resume.

B. Particulate Monitoring

- Particulates will be monitored upwind and downwind at points 25 feet from the perimeter of the work area every 30 minutes during soil boring activities. If the difference between the measured

upwind and downwind concentrations is greater than or equal to 100 micrograms per cubic meter, all work activities must be stopped and dust suppression methods employed. Work can continue or resume only if the measured upwind/downwind difference is or has been reduced to less than 100 micrograms per cubic meter.