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December 30, 2009

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VIA OVERNIGHT MAIL

Mr. Eugene Santa Croce
Utica Department of Engineering
1 Kennedy Plaza
Utica, New York 13502

Re: Environmental Brownfield Site Investigation
26-28 Whitesboro Street Site
NYS Brownfields Site No. B00063-6
D&B Job No. 1909

Dear Mr. Santa Croce:

Enclosed for your use please find two (2) copies of the final Remedial Alternatives Analysis Report for the 26-28 Whitesboro Street Site, dated December 2009.

Three (3) copies of the above referenced document have also been transmitted to Mr. Philip Waite of the New York State Department of Conservation.

If you have any questions or comments, please contact me at (315) 437-1142.

Very truly yours,

James J. Magda
Project Manager

MS/jm
Enclosure
cc/encl.:
P. Waite, NYSDEC (Region 6)
R. Walka, D&B

♣\1909\091230 Santa Croce, E.doc

City of Utica

Remedial Alternatives Analysis Report

26-28 Whitesboro Street Site
City of Utica
Oneida County, New York
(Brownfields Site No. B00063-6)

December 2009

DVIRKA AND BARTILUCCI
CONSULTING ENGINEERS
A DIVISION OF WILLIAM F. COSULICH ASSOCIATES, P.C.

JOBS/UTCA1909(12/21/09)

REMEDIAL ALTERNATIVES ANALYSIS REPORT

26-28 WHITESBORO STREET SITE
CITY OF UTICA, ONEIDA COUNTY, NEW YORK

(BROWNFIELDS SITE No. B00063-6)

Prepared for:

CITY OF UTICA

AND

NEW YORK STATE DEPARTMENT OF
ENVIRONMENTAL CONSERVATION

Prepared by:

DVIRKA AND BARTILUCCI CONSULTING ENGINEERS
SYRACUSE, NEW YORK

DECEMBER 2009

REMEDIAL ALTERNATIVES ANALYSIS REPORT
26-28 WHITESBORO STREET SITE

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1.0 INTRODUCTION

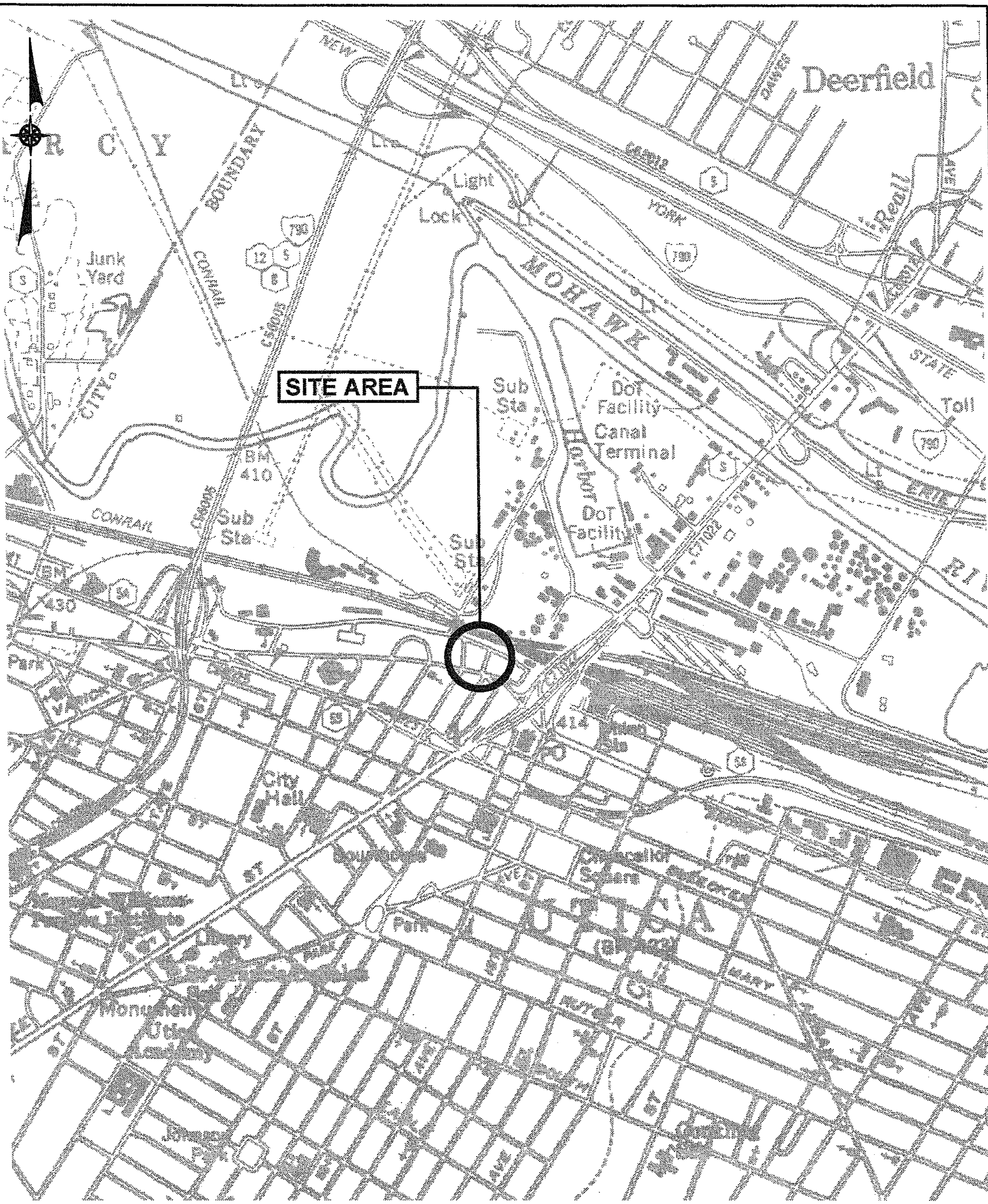
Dvirka and Bartilucci Consulting Engineers (D&B) was contracted by the City of Utica to conduct a Site Investigation (SI) and prepare a Remedial Alternatives Analysis Report (RAAR) under the City's Brownfield Program and the New York State 1996 Clean Water/Clean Air Bond Act Environmental Restoration Projects (ERP) Program. This SI/RAAR involved conducting a field investigation and remedial alternatives analysis for the 26-28 Whitesboro Street Site, New York State Department of Environmental Conservation (NYSDEC) Brownfields Site Number B00063-6 (Figure 1-1).

This section describes the purpose of the remedial alternatives analysis for the 26-28 Whitesboro Street Site, and provides a description of the site and site background, summary of the site investigation results and risk assessment, and description and approach to the remedial alternatives analysis.

1.1 Purpose and Organization of Report

The City of Utica Brownfields Initiative has been undertaken to assess abandoned properties currently owned by the city. In 1998, the city was awarded a $77,000 grant from the New York State ERP Program to conduct pre-remediation activities at the 26-28 Whitesboro Street Site. The objective of Utica's Brownfields Initiative is to cleanup properties and prepare them for redevelopment.

This remedial alternatives analysis has been prepared based on the results of the site investigation and in accordance with the NYSDEC Municipal Assistance for Environmental Restoration Projects Procedures Handbook, Federal Comprehensive Emergency Response, Compensation and Liability Act (CERCLA), Superfund Amendments and Reauthorization Act (SARA) and the New York State Superfund Program, including the NYSDEC Technical and



26–28 WHITESBORO STREET SITE
CITY OF UTICA, NEW YORK

SITE LOCATION MAP

Dvirka and Bartilucci
Consulting Engineers
A Division of William F. Cosulich Associates, P.C.

FIGURE 1–1

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Administrative Guidance Memorandum (TAGM HWR-90-4030) for "Selection of Remedial Actions at Inactive Hazardous Waste Sites."

The objectives of the SI/RAAR are to determine the nature, extent and source of contamination resulting from previous site activities; ascertain the threat to human health and the environment; and develop a long-term cost effective remedial action that would be protective of human health and the environment.

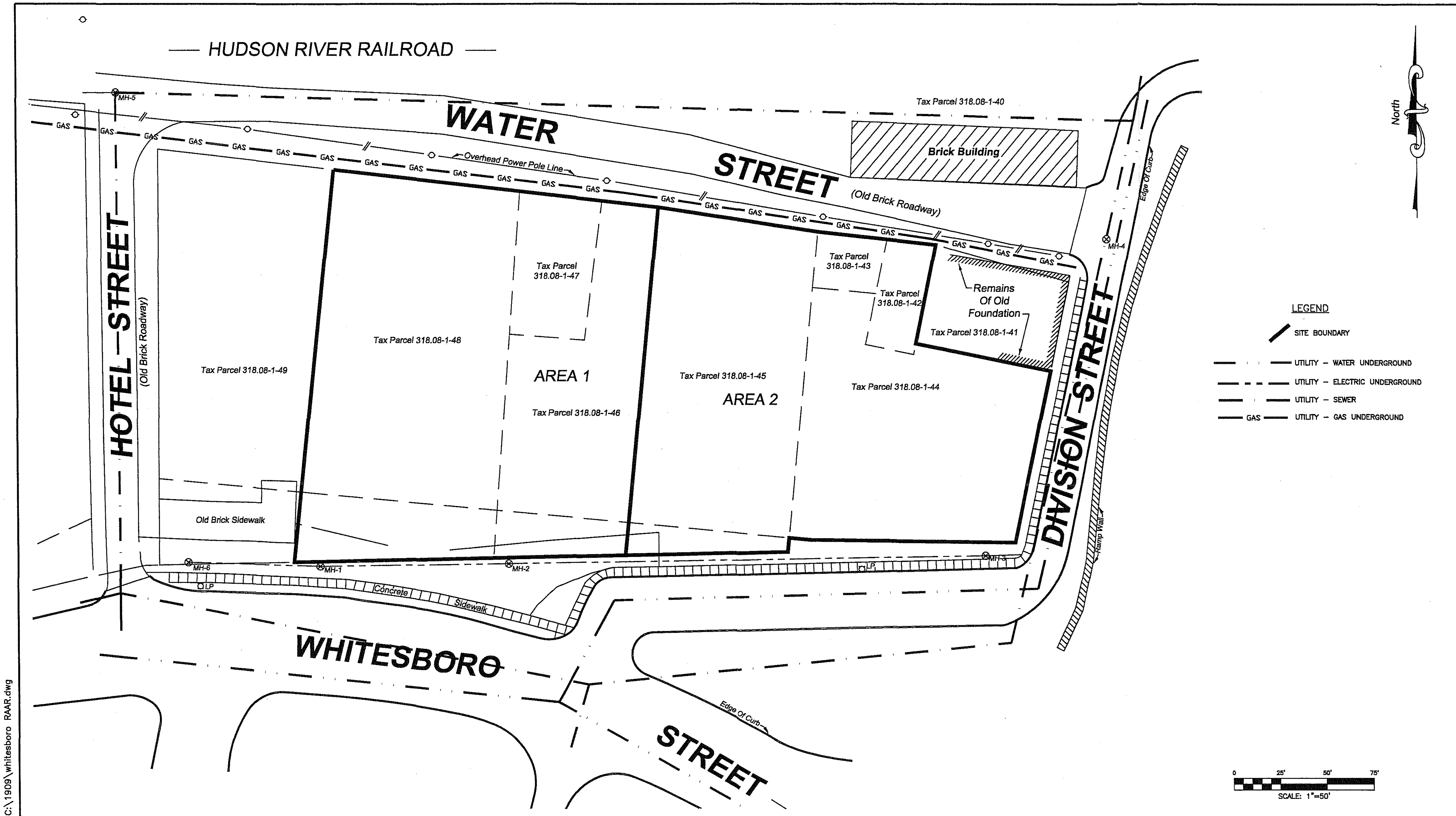
This report is presented in a format that allows for a logical and ordered progression of the descriptions and findings of the remedial alternatives analysis. Section 1.0 discusses the purpose, organization and background information. Sections 2.0 and 3.0 include the identification and development of alternatives, respectively. Section 4.0 presents a detailed analysis of alternatives.

1.2 Background Information

The following is a summary of the findings and conclusions resulting from the site investigation conducted for the 26-28 Whitesboro Street Site. These findings and conclusions are based on comparison of the investigation results to standards, criteria and guidance (SCGs) selected for the site as a function of the media investigated. The results of the investigation are described in detail in the Site Investigation Report, dated December 2008.

1.2.1 Site Description

The 26-28 Whitesboro Street Site is located in the City of Utica, Oneida County, New York. The site is located on the north side of Whitesboro Street and is bounded on the east by Division Street, north by Water Street and west by vacant land (see Figure 1-2). The site is owned by the City of Utica and consists of vacant land. Access to the site is unrestricted.



26-28 WHITESBORO STREET
UTICA, NEW YORK

SITE LAYOUT

Dvirka and Bartilucci
Consulting Engineers
A Division of William F. Cosulich Associates, P.C.

FIGURE 1-2

SEP 7, 2006 SEP C:\1909\whitesboro RAAR.dwg

The 26-28 Whitesboro Street Site is approximately 1.6 acres in size and consists of seven individual tax parcels. The property is relatively flat and contains no buildings or structures. The site is surrounded by a highway, commercial buildings and businesses in downtown Utica. Several sets of railroad tracks are located north of the site. Beyond the railroad tracks, the Mohawk River flows in an easterly direction. South of the site, the ground surface elevation rises gradually into the City of Utica.

1.2.2 Site History

Historic records indicate that as of 1883, the property was listed as part of the Butterfield estate and had been partially developed with brick and stone buildings of unknown use. By 1920, the western portion of the property (Area 1) was occupied by Horrocks Ibbotson and Company, a manufacturer of fishing rods. Use of the site for the manufacturing of fishing rods reportedly continued until 1982. Between 1983 and 1993, the property was owned by various companies, including the Baggs Square Corporation from 1983 to 1991, and the Cajan Realty Corporation from 1991 to 1993. In 1993, the City of Utica acquired the western property in lieu of back taxes. In 1994 the existing building was destroyed by fire and subsequently demolished.

The eastern portion of the property (Area 2) was occupied by various hotels from at least 1925 until at least 1973. Property ownership information is unknown. In 1993, the City of Utica acquired the eastern property in lieu of back taxes. The NYSDEC site designation for Areas 1 and 2 is B00063-6.

In 1997, a Phase I Environmental Site Assessment (ESA) was prepared by Dames and Moore, Inc. for the 26-28 Whitesboro Street Site. Subsequently, a limited Phase II ESA was conducted in Area 1 of the site in 1997. The Phase II ESA included excavation of eight test pits and construction of twelve soil borings. Total volatile organic compounds (VOCs) measured in headspace from soil samples collected from the test pits and soil borings indicated the presence of contaminated soil in the north central portion of Area 1. Five soil samples were collected for laboratory analyses during the Phase II ESA. One of these samples exceeded NYSDEC Recommended Soil Clean-up Objectives for acetone and trans-1,2-dichloroethene. Based on these results, Spill Number 97-09722 was issued by NYSDEC for the site. Analytical results from one groundwater sample collected from the middle of Area 1 showed that groundwater was not impacted at levels above New York State Class GA groundwater standards.

In 1999, a second Phase II ESA was conducted at the site by Hygeia of New York, Inc. Thirteen additional soil borings were advanced and three temporary wells were installed in Area 1. In addition, three test pits were excavated and fifteen soil borings were advanced in Area 2. Samples collected from Area 1 confirmed the presence of soil contamination by petroleum related VOCs and semi-volatile organic compounds (SVOCs), and indicated limited groundwater contamination by petroleum related VOCs and SVOCs near the northern property boundary. Analytical results for soil samples collected from the soil/groundwater interface in Area 2 contained compounds typically found in gasoline. Groundwater flow is to the north toward the Mohawk River. The Phase II report (Hygeia, 1999) concluded that the detected contamination in Area 1 was the result of a fuel oil release and that the central portion of Area 2 had been impacted by a gasoline spill.

1.2.3 Nature and Extent of Contamination

The purpose of this section is to discuss the results of the sampling program conducted at the 26-28 Whitesboro Street Site. The sample analytical results are compared to SCGs selected for the site to determine potential impacts on human health and the environment. Specifically, soil sample analytical results are compared to 6 NYCRR Part 375 Regulations, dated December 2006, while groundwater sample analytical results are compared to NYSDEC Technical and Operational Guidance Series (TOGS) 1.1.1, “Ambient Water Quality Standards and Guidance Values”, dated June 1998. The nature and extent of contamination found at, and in the vicinity of the site during the site investigation is described below.

Environmental samples were collected during the site investigation, which included twenty surface soil samples (including five background samples), thirty subsurface soil samples and twenty-eight groundwater samples. These samples were analyzed at a New York State

Department of Health Environmental Laboratory Approval Program certified laboratory. Data usability summary reports were prepared for all samples collected and the data was deemed usable for environmental assessment purposes.

Surface Soil Contamination

Twenty surface soil samples were collected for laboratory analysis from fifteen on-site locations (SS-1 through SS-15) and five off-site background locations (BSS-1 and BSS-5). Surface soil samples were collected from 0-0.2 feet bgs. All surface soil samples were analyzed for Target Compound List (TCL) SVOCs and Target Analyte List (TAL) metals. Eight on-site surface soil samples (SS-1 through SS-8) from the site were evaluated by laboratory analyses for TCL pesticides, TCL polychlorinated biphenyls (PCBs) and cyanide. Figure 1-3 summarizes exceedances of SCGs in surface soil based on laboratory data. Surface soil analytical results are summarized in Appendix A.

Ten SVOCs were detected above Soil Cleanup Objectives (SCOs) in the surface soil samples that were collected from the site. The Unrestricted Use (UU) -SCO for phenol (330 µg/kg) was exceeded in one of the fifteen on-site samples at a concentration of 360 µg/kg (SS-11). The UU-SCO, Residential Use (RU) -SCO, and Restricted Residential Use (RRU) -SCO for fluoranthene (100,000 µg/kg) were exceeded in one surface soil sample (SS-3) at a concentration of 200,000 µg/kg. The UU-SCO, RU-SCO, and RRU-SCO for pyrene (100,000 µg/kg) were exceeded in one surface soil sample (SS-3) at a concentration of 170,000 µg/kg.

The UU-SCO, RU-SCO, RRU-SCO, and Protection of Groundwater (POG) -SCO for benzo (a) anthracene (1,000 µg/kg) were exceeded in ten of the fifteen on-site samples at concentrations ranging from 1,200 µg/kg (SS-5) to 79,000 µg/kg (SS-3). The CU-SCO for benzo (a) anthracene (5,600 µg/kg) was exceeded in three of the fifteen on-site samples at concentrations ranging from 7,200 µg/kg (SS-10) to 79,000 µg/kg (SS-3).

North

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■ SURFACE SOIL SAMPLE LOCATION
SS-5 (BSS = BACKGROUND SURFACE SOIL LOCATI

SITE BOUNDARY

Abbreviation	Analyte	Unrestricted Use Soil Cleanup Objectives	Restricted Use Soil Cleanup Objectives – Protection of Public Health: Residential	Restricted Use Soil Cleanup Objectives – Protection of Public Health: Restricted-Residential	Restricted Use Soil Cleanup Objectives – Protection of Public Health: Commercial	Restricted Use Soil Cleanup Objectives: Protection of Groundwater
		(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)
Phenol	Phenol	330	100,000	100,000	500,000	330
Phenanthrene	Phenanthrene	100,000	100,000	100,000	500,000	1,000,000
Fluoranthene	Fluoranthene	100,000	100,000	100,000	500,000	1,000,000
Pyrene	Pyrene	100,000	100,000	100,000	500,000	1,000,000
Bnz (a) anth	Benzo (a) anthracene	1,000	1,000	1,000	5,600	1,000
Chrysene	Chrysene	1,000	1,000	3,900	56,000	1,000
Bnz(b)fluor	Benzo(b)fluoranthene	1,000	1,000	1,000	5,600	1,700
Benz(k)fluor	Benzo(k)fluoranthene	800	1,000	3,900	56,000	1,700
Benz(a)pyr	Benzo(a)pyrene	1,000	1,000	1,000	1,000	22,000
Indeno	Indeno(1,2,3-cd)pyrene	500	500	500	5,600	8,200
Dbnzo(a,h)	Dibenzo(a,h)anthracene	330	330	330	56,000	1,000,000
4,4-DDE	4,4-1,1-dichloro-2,2- bis(p -chlorophenyl)ethylene	3.3	1,800	8,900	62,000	17,000
4,4-DDD	4,4-1,1-dichloro-2,2- bis(p-chlorophenyl)ethane	3.3	2,600	13,000	92,000	14,000
4,4-DDT	4,4-1,1,1-trichloro-2,2- bis(p-chlorophenyl)ethane	3.3	1,700	7,900	47,000	136,000
Aroclor-1260	Aroclor-1260	100	1,000	1,000	1,000	3,200
Arsenic	Arsenic	13	16	16	16	16
Barium	Barium	350	350	400	400	820
Copper	Copper	50	270	270	270	1,720
Lead	Lead	63	400	400	1,000	450
Mercury	Mercury	0.18	1	1	3	0.73
Nickel	Nickel	30	140	310	310	130
Zinc	Zinc	109	2,200	10,000	10,000	2,480

BOLD	Indicates the value exceeds the NYSDEC Unrestircted Use SCOs
(box)	Indicates the value exceeds the NYSDEC Residential Use SCO
(shaded)	Indicates the value exceeds the NYSDEC Restricted-Residential Use SCO
Underline	Indicates the value exceeds the NYSDEC Commercial Use SCO
Italics	Indicates the value exceeds the NYSDEC Protection of Groundwater SCO

J = estimated concentration
NE = no exceedances

SAMPLE ID — DATE SAMPLED
ANALYTE — CONCENTRATION organics (ug/kg) inorganics (mg/kg)

SCALE
30 0 30 FT.

F:\1909\dwg\1909 FIGURES.dwg, FIG 1-3, 2/12/2009 3:18:41 PM, PMarbrano

NO.	DATE	REVISION	INT.

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A DIVISION OF WILLIAM F. COSULICH ASSOCIATES, P.C.

CITY OF UTICA
ONEIDA COUNTY NEW YORK
26-28 WHITESBORO STREET

EXCEEDANCES IN SURFACE SOIL

PROJECT NO. 1909
DATE: FEBRUARY 2009
SCALE: 1" = 30'
FIGURE 1-3

The UU-SCO, RU-SCO, and POG-SCO for chrysene (1,000 µg/kg) were exceeded in ten of the fifteen on-site samples at concentrations ranging from 1,200 µg/kg (SS-5) to 75,000 µg/kg (SS-3). The RRU-SCO for chrysene (3,900 µg/kg) was exceeded in four of the fifteen on-site samples at concentrations ranging from 5,600 µg/kg (SS-8 and SS-10) to 75,000 µg/kg (SS-3). The CU-SCO for chrysene (56,000 µg/kg) was exceeded in one surface soil sample (SS-3) at a concentration of 75,000 µg/kg.

The UU-SCO, RU-SCO, and RRU-SCO for benzo (b) fluoranthene (1,000 µg/kg) were exceeded in fourteen of the fifteen on-site samples at concentrations ranging from 1,200 µg/kg (SS-4) to 110,000 µg/kg (SS-3). The POG-SCO for benzo (b) fluoranthene (1,700 µg/kg) was exceeded in ten of the fifteen on-site samples at concentrations ranging from 2,000 µg/kg (SS-5) to 110,000 µg/kg (SS-3). The CU-SCO for benzo (b) fluoranthene (5,600 µg/kg) was exceeded in five of the fifteen on-site samples at concentrations ranging from 5,900 µg/kg (SS-13) to 110,000 µg/kg (SS-3).

The UU-SCO for benzo (k) fluoranthene (800 µg/kg) was exceeded in seven of the fifteen on-site samples at concentrations ranging from 1,400 µg/kg (SS-9) to 33,000 µg/kg (SS-3). The RU-SCO for benzo (k) fluoranthene (1,000 µg/kg) was exceeded in seven of the fifteen on-site samples at concentrations ranging from 1,400 µg/kg (SS-9) to 33,000 µg/kg (SS-3). The RRU-SCO for benzo (k) fluoranthene (3,900 µg/kg) was exceeded in three of the fifteen on-site samples at concentrations ranging from 4,700 µg/kg (SS-10) to 33,000 µg/kg (SS-3). The POG-SCO for benzo (k) fluoranthene (1,700 µg/kg) was exceeded in six of the fifteen on-site samples at concentrations ranging from 1,800 µg/kg (SS-12) to 33,000 µg/kg (SS-3).

The UU-SCO, RU-SCO, RRU-SCO, and CU-SCO for benzo (a) pyrene (1,000 µg/kg) were exceeded in eleven of the fifteen on-site samples at concentrations ranging from 100 µg/kg (SS-7 and SS-14) to 76,000 µg/kg (SS-3). The POG-SCO for benzo (a) pyrene (22,000 µg/kg) was exceeded in one surface soil sample (SS-3) at a concentration of 76,000 µg/kg.

The UU-SCO, RU-SCO, and RRU-SCO for indeno (1,2,3-cd) pyrene (500 µg/kg) were exceeded in ten of the fifteen on-site samples at concentrations of 550 µg/kg (SS-9) and 4,400 µg/kg (SS-11). The CU-SCO for indeno (1,2,3-cd) pyrene (5,600 µg/kg) was exceeded in one surface soil sample (SS-3) at a concentration of 38,000 µg/kg. The POG-SCO for indeno (1,2,3-cd) pyrene (8,200 µg/kg) was exceeded in one surface soil sample (SS-3) at a concentration of 38,000 µg/kg.

The UU-SCO, RU-SCO, and RRU-SCO for dibenzo (a,h) anthracene (330 µg/kg) were exceeded in four of the fifteen samples at concentrations ranging from 500 µg/kg (SS-10) to 1,400 µg/kg (SS-3).

Three pesticides were detected above SCOs in the eight surface soil samples that were collected from the site. The UU-SCO for 4,4-DDE (3.3 µg/kg) was exceeded in one of the eight samples at a concentration of 5.1 µg/kg (SS-6). The UU-SCO for 4,4-DDD (3.3 µg/kg) was exceeded in one of the eight samples at a concentration of 7.8 µg/kg (SS-3). The UU-SCO for 4,4-DDT (3.3 µg/kg) was exceeded in six of the eight samples at concentrations ranging from 6.8 µg/kg (SS-7) to 26 µg/kg (SS-8). The UU-SCO for Aroclor-1260 (100 µg/kg) was exceeded in three of the eight samples at concentrations ranging from 100 µg/kg (SS-4) to 350 µg/kg (SS-3).

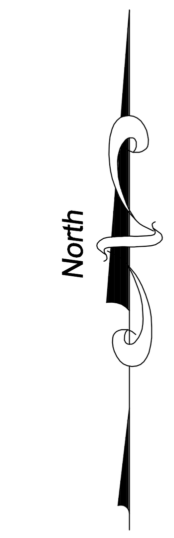
SCOs were exceeded in metals analyses for copper, lead, mercury, nickel, and zinc in at least one of the fifteen on-site soil samples that were collected and analyzed during the June 2003 and June 2005 sampling events. The UU-SCO for copper (50 µg/kg) was exceeded in four of the fifteen on-site samples at concentrations ranging from 61 µg/kg (SS-10) to 397 µg/kg (SS-9). The RU-SCO, RRU-SCO, and CU-SCO for copper (270 µg/kg) were exceeded in one surface soil sample (SS-9) at a concentration of 397 µg/kg. The UU-SCO for lead (63 µg/kg) was exceeded in thirteen of the fifteen on-site samples at concentrations ranging from 84.2 µg/kg (SS-11) to 1,290 µg/kg (SS-13). The RU-SCO and RRU-SCO for lead (400 µg/kg) were exceeded in six of the fifteen on-site samples at concentrations ranging from 413 µg/kg (SS-15) to 1,290 µg/kg (SS-13). The CU-SCO for lead (1,000 µg/kg) was exceeded in one surface soil sample (SS-13) at a concentration of 1,290 µg/kg. The POG-SCO for lead (450 µg/kg) was exceeded in five of the fifteen on-site samples at concentrations ranging from 501 µg/kg (SS-3) to 1,290 µg/kg (SS-13). The UU-SCO for mercury (0.18 µg/kg) was exceeded in nine of the fifteen on-site samples at concentrations ranging from 0.19 µg/kg (SS-3) to 8.9 µg/kg (SS-12).

The RU-SCO and RRU-SCO for mercury (0.81 µg/kg) were exceeded in two of the fifteen on-site samples at concentrations of 1.1 µg/kg (SS-9) and 8.9 µg/kg (SS-12). The CU-SCO for mercury (2.8 µg/kg) was exceeded in one surface soil sample (SS-12) at a concentration of 8.9 µg/kg. The POG-SCO for mercury (0.73 µg/kg) was exceeded in two of the fifteen on-site samples at concentrations of 1.1 µg/kg (SS-9) and 8.9 µg/kg (SS-12). The UU-SCO for nickel (30 µg/kg) was exceeded in one surface soil sample (SS-3) at a concentration of 39.9 µg/kg. The UU-SCO for zinc (109 µg/kg) was exceeded ten of the fifteen on-site samples at concentrations ranging from 112 µg/kg (SS-14) to 315 µg/kg (SS-3).

Subsurface Soil Contamination

A total of thirty-seven subsurface soil samples were collected in association with the site during this investigation. Twelve subsurface soil samples obtained in 2003 were analyzed for TCL VOCs, TCL SVOCs, TCL pesticides/PCBs, TAL metals and cyanide. Seventeen subsurface soil samples from on-site locations and one subsurface soil sample from an off-site location collected in June 2005 were analyzed for TCL VOCs and TCL SVOCs. Figure 1-4 summarizes exceedances of SCGs in subsurface soil based on laboratory data. Subsurface soil analytical results are summarized in Appendix B.

Seven VOCs were detected above SCOs in the subsurface soil samples that were collected from the site. The UU-SCO and POG-SCO for vinyl chloride (20 µg/kg) were exceeded in one subsurface soil sample [B18 (4-6 ft)] at a concentration of 260 µg/kg. The RU-SCO for vinyl chloride (210 µg/kg) was exceeded in one subsurface soil sample [B18 (4-6 ft)] at a concentration of 260 µg/kg. The UU-SCO and POG-SCO for methylene chloride (50 µg/kg) were exceeded in two subsurface soil samples [B3 (4-6 ft) and B11 (2-4 ft)] at concentrations of 81 µg/kg and 84 µg/kg, respectively. Methylene chloride was also detected in the laboratory method blank. The UU-SCO and POG-SCO for cis-1,2-dichlochloroethene (250 µg/kg) were exceeded in one subsurface soil sample [B18 (4-6 ft)] at a concentration of 1,500 µg/kg.



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SITE BOUNDARY

B-5 BORING LOCATION– D&B 2003

H-4 WELL LOCATION– PREVIOUS (H = HYGEIA 1999, MWB = DAMES & MOORE 1997)

H-6 BORING LOCATION– PREVIOUS (H = HYGEIA 1999, B = DAMES & MOORE 1997)

		Unrestricted Use Soil Cleanup Objectives	Restricted Use Soil Cleanup Objectives			
			Protection of Public Health			Protection of Groundwater
			Residential	Restricted-Residential	Commercial	
Abbreviation	Analyte	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)
vinyl chloride	vinyl chloride	20	210	900	13,000	20
acetone	acetone	50	100,000	100,000	500,000	50
meth chlor	methylene chloride	50	51,000	100,000	500,000	50
cis-1,2-DCE	cis-1,2-dichloroethene	250	59,000	100,000	500,000	250
TCE	trichloroethene	470	10,000	21,000	200,000	470
1,2,4-trimethylbnz	1,2,4-trimethylbenzene	3,600	47,000	52,000	190,000	3,600
1,3,5-trimethylbnz	1,3,5-trimethylbenzene	8,400	47,000	52,000	190,000	8,400
phenol	phenol	330	100,000	100,000	500,000	330
phenanthrene	phenanthrene	100,000	100,000	100,000	500,000	1,000,000
fluoranthene	fluoranthene	100,000	100,000	100,000	500,000	1,000,000
pyrene	pyrene	100,000	100,000	100,000	500,000	1,000,000
bnz (a) anth	benzo (a) anthracene	1,000	1,000	1,000	5,600	1,000
chrysene	chrysene	1,000	1,000	3,900	56,000	1,000
bnz(b)fluor	benzo(b)fluoranthene	1,000	1,000	1,000	5,600	1,700
bnz(k)fluor	benzo(k)fluoranthene	800	1,000	3,900	56,000	1,700
bnz(a)pyr	benzo(a)pyrene	1,000	1,000	1,000	1,000	22,000
indeno	indeno(1,2,3-cd)pyrene	500	500	500	5,600	8,200
dbnzo(a,h)	dibenzo(a,h)anthracene	330	330	330	56,000	1,000,000
4,4-DDE	4,4-1,1-dichloro-2,2-bis(p-chlorophenyl)ethylene	3.3	1,800	8,900	62,000	17,000
4,4-DDD	4,4-1,1-dichloro-2,2-bis(p-chlorophenyl)ethane	3.3	2,600	13,000	92,000	14,000
4,4-DDT	4,4-1,1,1-trichloro-2,2-bis(p-chlorophenyl)ethane	3.3	1,700	7,900	47,000	136,000
aroclor-1260	aroclor-1260	100	1,000	1,000	1,000	3,200
arsenic	arsenic	13	16	16	16	16
barium	barium	350	350	400	400	820
copper	copper	50	270	270	270	1,720
lead	lead	63	400	400	1,000	450
mercury	mercury	0.18	1	1	3	0.73
nickel	nickel	30	140	310	310	130
zinc	zinc	109	2,200	10,000	10,000	2,480

BOLD Indicates the value exceeds the NYSDEC Unrestricted Use SCOs
(box) Indicates the value exceeds the NYSDEC Residential Use SCO
(shaded) Indicates the value exceeds the NYSDEC Restricted-Residential Use SCO
Underline Indicates the value exceeds the NYSDEC Commercial Use SCO
Italics Indicates the value exceeds the NYSDEC Protection of Groundwater SCO

J = estimated concentration
VOCs = volatile organic compounds
SVOCs = semivolatile organic compounds
NE = no exceedances
TCLP = toxicity characteristic leaching procedure

SAMPLE ID — DEPTH SAMPLED
ANALYTE — CONCENTRATION organics (ug/kg) TCLP (ug/l)

SCALE
30 0 30 FT.

NO.	DATE	REVISION	INT.

UNAUTHORIZED ALTERATION OR ADDITION TO THIS DOCUMENT IS A VIOLATION OF SECTION 7209 OF THE NEW YORK STATE EDUCATION LAW.

PROJECT ENGINEER: BMV	DRAWN BY: PSM
DESIGNED BY: DB	CHECKED BY: DB

Dvirka and Bartilucci
CONSULTING ENGINEERS
A DIVISION OF WILLIAM F. COSULICH ASSOCIATES, P.C.

CITY OF UTICA
ONEIDA COUNTY NEW YORK
26-28 WHITESBORO STREET

EXCEEDANCES IN SUBSURFACE SOIL

PROJECT NO. 1909
DATE: FEBRUARY 2009
SCALE: 1" = 30'
FIGURE 1-4

F:\1909\dwg\1909 FIGURES.dwg, FIG 1-4, 12/22/2009 2:12:15 PM, dbcadd

The UU-SCO and POG-SCO for trichloroethene (470 µg/kg) were exceeded in one subsurface soil sample [B18 (4-6 ft)] at a concentration of 5,700 µg/kg. The UU-SCO for total xylenes (260 µg/kg) was exceeded in one subsurface soil sample [MW-6 (6-8 ft)] at a concentration of 270 µg/kg. The UU-SCO and POG-SCO for 1,2,4-trimethylbenzene (3,600 µg/kg) were exceeded in one subsurface soil sample [MW-6 (6-8 ft)] at a concentration of 3,900 µg/kg. The UU-SCO and POG-SCO for napththalene (12,000 µg/kg) were exceeded in one subsurface soil sample [MW-6 (6-8 ft)] at a concentration of 56,000 µg/kg.

Thirteen SVOCs were detected above SCOs in the subsurface soil samples that were collected from the site. The UU-SCO and POG-SCO for phenol (330 µg/kg) were exceeded in one subsurface soil sample [MW-6 (6-8 ft)] at a concentration of 1,800 µg/kg.

The UU-SCO and POG-SCO for napththalene (12,000 µg/kg) were exceeded in two subsurface soil samples [B17 (2-4 ft) and MW-6 (6-8 ft)] at a concentration of 1,700 and 61,000 µg/kg, respectively.

The UU-SCO for acenaphthene (20,000 µg/kg) was exceeded in one subsurface soil sample [MW-6 (6-8 ft)] at a concentration of 36,000 µg/kg. No concentrations of acenaphthene were detected in the twenty-nine subsurface soil samples in excess of the RU-SCO, RRU-SCO, CU-SCO, and POG-SCO.

The UU-SCO, RU-SCO, and RRU-SCO for phenanthrene (100,000 µg/kg) were exceeded in one subsurface soil sample [MW-6 (6-8 ft)] at a concentration of 410,000 µg/kg. No concentrations of phenanthrene were detected in the twenty-nine subsurface soil samples in excess of the CU-SCO and POG-SCO.

The UU-SCO, RU-SCO, and RRU-SCO for fluoranthrene (100,000 µg/kg) were exceeded in one subsurface soil sample [MW-6 (6-8 ft)] at a concentration of 470,000 µg/kg. No concentrations of fluoranthrene were detected in the twenty-nine subsurface soil samples in excess of the CU-SCO and POG-SCO.

The UU-SCO, RU-SCO, and RRU-SCO for pyrene (100,000 µg/kg) were exceeded in one subsurface soil sample [MW-6 (6-8 ft)] at a concentration of 430,000 µg/kg.

The UU-SCO, RU-SCO, RRU-SCO, and POG-SCO and for benzo (a) anthracene (1,000 µg/kg) were exceeded in seven samples at concentrations ranging from 1,100 µg/kg [B4 (8-10 ft)] to 200,000 µg/kg [MW-6 (6-8 ft)]. The CU-SCO for benzo (a) anthracene (5,600 µg/kg) was exceeded in two of the twenty-nine samples at concentrations of 20,000 µg/kg [B17 (2-4 ft)] and 200,000 µg/kg [MW-6 (6-8 ft)].

The UU-SCO, RU-SCO, and POG-SCO and for chrysene (1,000 µg/kg) were exceeded in nine of the twenty-nine samples at concentrations ranging from 1,100 µg/kg [B4 (8-10 ft), B11 (2-4 ft), and B15 (2-4 ft)] to 210,000 µg/kg [MW-6 (6-8 ft)]. The RRU-SCO for chrysene (3,900 µg/kg) was exceeded in two of the twenty-nine samples at concentrations of 19,000 µg/kg [B17 (2-4 ft)] and 210,000 µg/kg [MW-6 (6-8 ft)]. The CU-SCO for chrysene (56,000 µg/kg) was exceeded one of the twenty-nine samples [MW-6 (6-8 ft)] at a concentration of 210,000 µg/kg.

The UU-SCO, RU-SCO, and RRU-SCO and for benzo (b) fluoranthene (1,000 µg/kg) were exceeded in nine of the twenty-nine samples at concentrations ranging from 1,200 µg/kg [B15 (2-4 ft)] to 150,000 µg/kg [MW-6 (6-8 ft)]. The POG-SCO and for benzo (b) fluoranthene (1,700 µg/kg) was exceeded in seven of the twenty-nine samples at concentrations ranging from 2,700 µg/kg [B3 (4-6 ft) and B14 (6-8 ft)] to 150,000 µg/kg [MW-6 (6-8 ft)]. The CU-SCO for benzo (b) fluoranthene (5,600 µg/kg) was exceeded in two of the twenty-nine samples at concentrations of 23,000 µg/kg [B17 (2-4 ft)] and 150,000 µg/kg [MW-6 (6-8 ft)].

The UU-SCO for benzo (k) fluoranthene (800 µg/kg) was exceeded in six of the twenty-nine samples at concentrations ranging from 860 µg/kg [B3 (4-6 ft)] to 91,000 µg/kg [MW-6 (6-8 ft)]. The RU-SCO for benzo (k) fluoranthene (1,000 µg/kg) was exceeded in five of the twenty-nine samples at concentrations ranging from 1,400 µg/kg [B14 (6-8 ft)] to 91,000 µg/kg [MW-6 (6-8 ft)]. The POG-SCO for benzo (k) fluoranthene (1,700 µg/kg) was exceeded in two of the twenty-nine samples at concentrations of 10,000 µg/kg [B17 (2-4 ft)] and 91,000 µg/kg [MW-6 (6-8 ft)]. The

CU-SCO for benzo (k) fluoranthene (56,000 µg/kg) was exceeded in one subsurface soil sample [MW-6 (6-8 ft)] at a concentration of 91,000 µg/kg.

The UU-SCO, RU-SCO, RRU-SCO, and CU-SCO for benzo (a) pyrene (1,000 µg/kg) were exceeded in seven of the twenty-nine samples at concentrations ranging from 1,000 µg/kg [B4 (8-10 ft)] to 130,000 µg/kg [MW-6 (6-8 ft)]. The POG-SCO and for benzo (a) pyrene (22,000 µg/kg) was exceeded in one subsurface soil sample [MW-6 (6-8 ft)] at a concentration of 130,000 µg/kg.

The UU-SCO, RU-SCO, and RRU-SCO and for indeno (1,2,3-cd) pyrene (500 µg/kg) were exceeded in seven of the twenty-nine samples at concentrations ranging from 620 µg/kg [B4 (8-10 ft)] to 59,000 µg/kg [MW-6 (6-8 ft)]. The CU-SCO for benzo (b) fluoranthene (5,600 µg/kg) was exceeded in one subsurface soil sample [MW-6 (6-8 ft)] at a concentration of 59,000 µg/kg. The POG-SCO for indeno (1,2,3-cd) pyrene (8,200 µg/kg) was exceeded in one subsurface soil sample [MW-6 (6-8 ft)] at a concentration of 59,000 µg/kg.

The UU-SCO, RU-SCO, and RRU-SCO and for dibenzo (a,h) anthracene (330 µg/kg) were exceeded in two subsurface soil samples [B17 (2-4 ft) and MW-6 (6-8 ft)] at concentrations of 1,400 µg/kg and 15,000 µg/kg, respectively.

Four pesticides were detected above SCOs in the twelve subsurface soil samples that were collected from the site. No PCB aroclors were detected above SCOs in the twelve subsurface soil samples. The UU-SCO for 4,4-DDE (3.3 µg/kg) was exceeded three of the twelve samples at concentrations ranging from 3.4 µg/kg [B4 (8-10 ft)] to 9.6 µg/kg [B6 (8-10 ft)]. The UU-SCO for endrin (14 µg/kg) was exceeded in one of the twelve samples at a concentration of 9.9 µg/kg [B12 (8-10 ft)]. The UU-SCO for 4,4-DDD (3.3 µg/kg) was exceeded in two of the twelve samples at concentrations of 4.0 µg/kg [B12 (8-10 ft)] and 5.3 µg/kg [B2 (6-8 ft)]. The UU-SCO for 4,4-DDT (3.3 µg/kg) was exceeded in five of the twelve samples at concentrations ranging from 4.6 µg/kg [B5 (8-10 ft)] to 44.0 µg/kg [B2 (6-8 ft)].

SCOs were exceeded in metals analyses for arsenic, barium, chromium, copper, lead, mercury, nickel, and zinc in at least one of the twelve subsurface soil samples that were collected and analyzed during the June 2003 sampling event. The UU-SCO for arsenic (13 µg/kg) was exceeded in one subsurface soil sample [B11 (2-4 ft)] at a concentration of 16.7 µg/kg. The RU-SCO, RRU-SCO, CU-SCO, and POG-SCO for arsenic (16 µg/kg) was exceeded in one of the twelve samples [B11 (2-4 ft)] at a concentration of 16.7 µg/kg. The UU-SCO and RU-SCO for barium (350 µg/kg) was exceeded in one subsurface soil sample [B1 (6-8 ft)] at a concentration of 884 µg/kg. The RRU-SCO and CU-SCO for barium (400 µg/kg) were exceeded in one subsurface soil sample [B1 (6-8 ft)] at a concentration of 884 µg/kg. The POG-SCO for barium (820 µg/kg) was exceeded in one subsurface soil sample [B1 (6-8 ft)] at a concentration of 884 µg/kg.

The UU-SCO for chromium (30 µg/kg) were exceeded in one subsurface soil sample [B1 (6-8 ft)] at a concentration of 55.4 µg/kg. The RR-SCO for chromium (36 µg/kg) were exceeded in one subsurface soil sample [B1 (6-8 ft)] at a concentration of 55.4 µg/kg. The UU-SCO for copper (50 µg/kg) was exceeded two of the twelve samples at concentrations of 50.2 µg/kg [B3 (4-6 ft)] and 180 µg/kg [B1 (6-8 ft)]. The UU-SCO for lead (63 µg/kg) was exceeded two of the twelve samples at concentrations of 65.8 µg/kg [B11 (2-4 ft)] and 314 µg/kg [B1 (6-8 ft)].

The UU-SCO for mercury (0.18 µg/kg) was exceeded in five of the twelve samples at concentrations ranging from 0.22 µg/kg [B7 (2-4 ft)] to 12.4 µg/kg [B4 (8-10 ft)]. The RU-SCO and RRU-SCO for mercury (0.81 µg/kg) were exceeded in one subsurface soil sample [B4 (8-10 ft)] at a concentration of 12.4 µg/kg. The CU-SCO for mercury (2.8 µg/kg) was exceeded in one subsurface soil sample [B4 (8-10 ft)] at a concentration of 12.4 µg/kg. The POG-SCO for mercury (0.73 µg/kg) were exceeded in one subsurface soil sample [B4 (8-10 ft)] at a concentration of 12.4 µg/kg.

The UU-SCO for nickel (30 µg/kg) was exceeded in two of the twelve samples at concentrations of 73.5 µg/kg [B1 (6-8 ft)] and 551 µg/kg [B4 (8-10 ft)]. The RU-SCO for nickel (140 µg/kg) was exceeded in one subsurface soil sample [B4 (8-10 ft)] at a concentration of 551 µg/kg. The CU-SCO and RRU-SCO for nickel (310 µg/kg) were exceeded in one subsurface soil sample [B4 (8-10 ft)] at a concentration of 551 µg/kg. The POG-SCO for nickel (130 µg/kg) was exceeded in one subsurface soil sample [B4 (8-10 ft)] at a concentration of 551 µg/kg. The UU-SCO for zinc (109 µg/kg) was exceeded in one surface soil sample [B1 (6-8 ft)] at a concentration of 639 µg/kg.

Groundwater Contamination

Groundwater samples were collected from each of the ten temporary wells in Area 1 of the site and the two temporary wells in Area 2 on June 10, 2003. Groundwater samples were collected from each of the eight permanent wells on June 6, 2005 and July 5, 2006. Groundwater samples from each of the temporary wells in June 2003 were analyzed for TCL VOCs and TCL SVOCs. Groundwater samples from three temporary wells within Area 1 (B-1, B-3 and B-10) and two temporary wells within Area 2 (B-11 and B-12) collected in June 2003 were also analyzed for TAL metals. Groundwater samples collected from the permanent wells in June 2005 were analyzed for TCL VOCs and TAL metals (both filtered and unfiltered). Groundwater samples collected from the permanent wells in June and July 2006 were analyzed for TAL metals (both filtered and unfiltered). Groundwater analytical results are summarized in Appendix C.

VOCs exceeded SCGs in six of the seventeen on-site groundwater samples collected from the site. The SCG for cis-1,2-dichloroethene was exceeded in three samples. The SCG for trichloroethene was exceeded in five samples. VOCs exceeding SCGs were detected at the northern portion of Area 1, which is the hydraulically downgradient portion of the site.

SVOCs exceeded SCGs in three of the twelve groundwater samples collected from the site. Six individual SVOCs exceeded SCGs in one groundwater sample, one SVOC exceeded SCGs in another groundwater sample and three SVOCs exceeded SCGs in another groundwater sample. The site is located in close proximity to railroad tracks and several streets, and the SVOCs detected at the site were polycyclic aromatic hydrocarbons (PAHs), which may be the by-products of the combustion of fossil fuels or leachate from fill. Therefore, it is possible that the source of SVOCs detected in groundwater samples is not site related.

Seventeen metals, including antimony, arsenic, barium, beryllium, cadmium, chromium, copper, iron, lead, magnesium, manganese, mercury, nickel, selenium, sodium, thallium and zinc, were detected above SCGs. Unfiltered groundwater samples were collected from the site and the results reported are concentrations of total metals. It is likely that the metals concentrations observed are largely a result of turbidity in the water samples. In addition, the concentrations for these metals in upgradient and downgradient samples are similar, and do not appear to increase in the direction of groundwater flow and, therefore, are likely background. Sixteen filtered groundwater samples were collected at the site and results are indicative of dissolved metals in groundwater. Eight metals, including antimony, chromium, iron, magnesium, manganese, selenium, sodium and thallium were detected above SCGs in filtered groundwater samples.

Groundwater samples were collected from the first water bearing zone encountered at the site; however, this zone would not likely be developed for water supply purposes because of the low yield (less than 0.5 gallons per minute). In addition, potable water is readily available from municipal sources at and around the site. Based on the low levels of VOCs detected and the unlikely use of groundwater at the site, VOCs under current conditions are of little concern at the site. SVOCs are of low concern in groundwater at the site. Because metals are likely the result of turbid samples and the use of groundwater at the site is unlikely, metals in groundwater are not a concern at the site.

1.2.4 Risk Assessment Results

Risks at in the vicinity of the 26-28 Whitesboro Street Site were evaluated on the basis of the site environmental setting and information on the nature and extent of contamination. The risk assessment addresses the current and potential human contact with contaminants of concern at potential locations where human exposure could occur. The risk assessment is included in the

Site Investigation Report, dated December 2008. The following provides a summary of the findings and conclusions of the risk assessment.

The results of the site investigation indicate that SVOCs and metals are the primary contaminants of concern and that surface and subsurface soil are the primary media of concern at the 26-28 Whitesboro Street Site. VOCs in subsurface soil, and VOCs, SVOCs and metals in groundwater are a concern, to a lesser extent.

Potential human receptors at the 26-28 Whitesboro Street Site include trespassers and construction workers. The site is located in a commercial area of an urban community.

There are no buildings located at the site. To the south and west of the property are commercial properties. Several railroad tracks are located to the north of the site. To the east is a major roadway (NYS Route 5) and ramps associated with that roadway.

Individuals could access the site and encounter impacted surface soil. Individuals conducting potential future construction at the site could encounter impacted surface and subsurface soils.

Exposure to contaminants originating from the 26-28 Whitesboro Street Site can result from any one of four media, which include surface soil, subsurface soil, groundwater and soil vapors. Based on the site investigation results and qualitative risk assessment, current and future exposure to SVOCs and metals contaminated surface soil poses a moderate potential risk to human health at the site. Exposure to SVOCs and metals contaminated subsurface soil is unlikely under current site conditions, however, exposure to contaminated subsurface soil poses a moderate risk to human health if the subsurface soil is exposed (i.e. during site development). Exposure to VOCs, SVOCs and metals contaminated groundwater is unlikely, both under current and future conditions. Exposure to VOCs in soil vapors is possible under future conditions. Table 1-1 provides a summary status of exposure pathways identified at the site.

TABLE 1-1
26-28 WHITESBORO STREET SITE
REMEDIAL ALTERNATIVES ANALYSIS
EXPOSURE PATHWAY STATUS FOR HUMAN RECEPTORS

Media	Exposure Point	Route of Exposure	Current Pathway Status	Future Pathway Status
Surface Soil	Site surface	Ingestion	Potentially complete	Potentially complete
	Site surface	Inhalation	Potentially complete	Potentially complete
	Site surface	Dermal Contact	Potentially complete	Potentially complete
Subsurface Soil	Subsurface	Ingestion	Potentially complete, but unlikely	Potentially complete
	Subsurface	Inhalation	Potentially complete, but unlikely	Potentially complete
	Subsurface	Dermal Contact	Potentially complete, but unlikely	Potentially complete
Groundwater	Monitoring wells or Construction Water	Ingestion	Potentially complete, but unlikely	Potentially complete
	Monitoring wells or Construction Water	Inhalation	Potentially complete, but unlikely	Potentially complete
	Monitoring wells or Construction Water	Dermal Contact	Potentially complete, but unlikely	Potentially complete
Soil Vapors	Open excavations or future basements	Ingestion	Incomplete	Incomplete
	Open excavations or future basements	Inhalation	Potentially complete	Potentially complete
	Open excavations or future basements	Dermal Contact	Potentially complete, but unlikely	Potentially complete

A soil vapor investigation was not completed as part of the site investigation activities. As a result, a soil vapor investigation task is included as part of each remedial alternative. The soil vapor investigation was developed in accordance with NYSDOH's "Guidance for Evaluating Soil Vapor Intrusion in the State of New York", dated October 2006 and will be performed during implementation of the selected remedial alternative.

1.3 Remedial Action Objectives

Remedial action objectives (RAOs) are goals developed for the protection of human health and the environment. Definition of these objectives requires an assessment of the contaminants and media of concern, migration pathways, exposure routes and potential receptors. Typically, remediation goals are established based on SCGs to protect human health and the environment. SCGs for the 26-28 Whitesboro Street Site, include 6 NYCRR Part 375 Regulations, dated December 2006 and NYSDEC TOGS 1.1.1, "Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations", dated June 1998.

Screening levels for concentrations of compounds in soil vapor are not published. Rather, NYSDOH guidance indicates that each site should be treated on a case-by-case basis and evaluated individually. As a result, the soil vapor data should be compared to site-specific background data and groundwater data.

Based on these SCGs, the results of the site investigation, and the risk assessment, the primary RAOs developed for the site is the following:

1. Prevention of direct contact (dermal absorption, inhalation and incidental ingestion) with surface soil;
2. Prevention of direct contact (dermal absorption, inhalation and incidental ingestion) with subsurface soil; and,
3. Protection of ecological resources through prevention of migration by runoff of contaminants to surface water.

In addition, as a result of exceedances of VOCs, SVOCs and metals in groundwater samples, a secondary RAO was developed for the site, which includes the following:

1. Reduction of infiltration of precipitation through contaminated soil and adverse impacts to groundwater.

In addition to consideration of SCGs to meet the RAOs, Applicable or Relevant and Appropriate Requirements (ARARs) are considered when formulating, screening and evaluating remedial alternatives, and selecting a remedial action. ARARs may be categorized as contaminant-specific, location-specific or action-specific. Federal statutes, regulations and programs may apply to the site where state or local standards do not exist. Potentially applicable contaminant-specific, location-specific and action-specific ARARs for the site, along with guidance, advisories, criteria, memoranda and other information issued by regulatory agencies to be considered (TBC), are presented in Tables 1-2, 1-3 and 1-4. As a note, many of the NYSDEC ARARs include federal requirements, which have been delegated to New York State. Generally, federal ARARs are referenced when state requirements do not exist.

1.4 Remedial Alternatives Analysis Description

NYSDEC TAGM No. 4030 entitled, "Selection of Remedial Actions at Inactive Hazardous Waste Sites", dated 1990, describes the remedial alternatives analysis as a process to identify and screen potentially applicable remedial technologies, combine technologies into alternatives and evaluate appropriate alternatives in detail, and select an appropriate remedial action plan. The objective of this remedial alternatives analysis is to meet the goal of this guidance document, as well as United States Environmental Protection Agency (USEPA) guidance in a focused, concise manner.

Under current conditions and use, the site poses a threat to human health and the environment. Exposure to SVOCs and metals contaminated surface and subsurface soil poses a risk to human health at the site. Based on the unlikely development of groundwater at the site as a supply source for groundwater, exposure to VOCs, SVOCs and metals contaminated groundwater poses little risk to human health at the site. Because of these potential impacts, the focus of this remedial alternatives analysis will include an evaluation of cover options, removal options and treatment options. Cover options would minimize contact with contaminated soil, runoff to surface water, and, as an additional benefit, reduce infiltration of precipitation. Removal options would mitigate contact with contaminated soil, runoff to surface water and reduce the infiltration of precipitation through the contaminated soil and potential impacts to groundwater. Similarly, treatment options would reduce contaminants in the soil, thereby mitigating contact with contaminated soil, runoff to surface water and mitigating the infiltration of precipitation through the contaminated soil and potential impacts to groundwater.

TABLE 1-2
REMEDIAL ALTERNATIVES ANALYSIS REPORT
26-28 WHITESBORO STREET SITE
POTENTIALLY APPLICABLE CHEMICAL-SPECIFIC ARARs/TBCs

Citation/ Reference	Title	Applicable Media	Potential ARAR/TBC	Regulatory Agency
6 NYCRR 371	Identification and Listing of Hazardous Waste	Hazardous Waste	ARAR	NYSDEC
6 NYCRR 375-1 through 375-4	Environmental Remediation Programs	Soil	ARAR	NYSDEC
6 NYCRR 375-6	Remedial Program Soil Cleanup Objectives	Soil	ARAR	NYSDEC
6 NYCRR 376	Land Disposal Restrictions	Hazardous Waste	ARAR	NYSDEC
6 NYCRR 700-705	Surface Water and Groundwater Classifications and Standards	Surface Water/ Groundwater	ARAR	NYSDEC
6 NYCRR 750-758	State Pollutant Discharge Elimination System	Wastewater Discharge	TBC	NYSDEC
State Sanitary Code - Part 5	Drinking Water Supply	Water Supply	ARAR	NYSDOH
TOGS 1.1.1	Ambient Water Quality Standards and Guidance Values	Surface Water/ Groundwater	TBC	NYSDEC
TOGS 1.3.1	Waste Assimilative Capacity Analysis & Allocation for Setting Water Quality Based Effluent Limits	Wastewater Discharge	TBC	NYSDEC
TOGS 1.3.1C	Development of Water Quality Based Effluent Limits for Metals Amendment	Wastewater Discharge	TBC	NYSDEC
TOGS 1.3.2	Toxicity Testing in the SPDES Program	Wastewater Discharge	TBC	NYSDEC
Air Guide No. 1	Guideline for the Control of Toxic Ambient Air Contaminants	Air	TBC	NYSDEC
6 NYCRR 360	Solid Waste Management Facilities	Solid Waste	TBC	NYSDEC

TABLE 1-3
REMEDIAL ALTERNATIVES ANALYSIS REPORT
26-28 WHITESBORO STREET SITE
POTENTIALLY APPLICABLE LOCATION SPECIFIC ARARs/TBCs

Citation/ Reference	Title	Applicable Media	Potential ARAR/TBC	Regulatory Agency
6 NYCRR 608	Use and Protection of Waters	Surface Water	ARAR	NYSDEC
6 NYCRR 256	Air Quality Classification System	Air	ARAR	NYSDEC
N/A	Fish and Wildlife Impact Analysis for Inactive Hazardous Waste Sites	Hazardous Waste Sites	TBC	NYSDEC

TABLE 1-4
REMEDIAL ALTERNATIVES ANALYSIS REPORT
26-28 WHITESBORO STREET SITE
POTENTIALLY APPLICABLE ACTION SPECIFIC ARARs/TBCs

Citation / Reference	Title	Applicable Media	Potential ARAR/TBC	Regulatory Agency
6 NYCRR 200	General Provision	Air	TBC	NYSDEC
6 NYCRR 201	Permits and Registrations	Air	TBC	NYSDEC
6 NYCRR 211	General Prohibitions	Air	TBC	NYSDEC
6 NYCRR 212	General Process Emission Sources	Air	TBC	NYSDEC
6 NYCRR 364	Waste Transporter Permits	Solid/Hazardous Waste	ARAR	NYSDEC
6 NYCRR 370	Hazardous Waste Management System – General	Hazardous Waste	ARAR	NYSDEC
6 NYCRR 372	Hazardous Waste Manifest Sys. & Related Standards for Generators, Transporters and Facilities	Hazardous Waste	ARAR	NYSDEC
6 NYCRR 373	Hazardous Waste Management Facilities	Hazardous Waste	ARAR	NYSDEC
6 NYCRR 375	Environmental Remediation Programs	Hazardous Waste	ARAR	NYSDEC
6 NYCRR 376	Land Disposal Restrictions	Hazardous Waste	ARAR	NYSDEC
6 NYCRR 617 and 618	State Environmental Quality Review	All Media	ARAR	NYSDEC
6 NYCRR 621	Uniform Procedures	All Media	ARAR	NYSDEC
6 NYCRR 624	Permit Hearing Procedures	All Media	ARAR	NYSDEC
6 NYCRR 700-705	Classifications and Standards of Quality and Purity	Surface Water/ Groundwater	ARAR	NYSDEC
Air Guide No. 1	Guideline for the Control of Toxic Ambient Air Contaminants	Air	TBC	NYSDEC
TAGM HWR-4030	Selection of Remedial Actions at Inactive Hazardous Waste Disposal Sites	Hazardous Waste	TBC	NYSDEC
TAGM HWR-4031	Fugitive Dust Suppression and Particulate Monitoring Programs at Inactive Hazardous Waste Sites	Air	TBC	NYSDEC
6 NYCRR 375-6	Remedial Program Soil Cleanup Objectives	Soil	TBC	NYSDEC
TOGS 2.1.2	UIR at Groundwater Remediation Sites	Groundwater	TBC	NYSDEC
TOGS 2.1.3	Primary & Principal Aquifer Determinations	Groundwater	TBC	NYSDEC
29 CFR 1910.120	Hazardous Waste Operations and Emergency Response	NA	ARAR	USDOL

In the initial phase of the remedial alternatives analysis, identified remedial technologies which are not technically applicable to contamination found, or are unproven and/or are not commercially available, are eliminated from further consideration. The technologies remaining after initial screening are assembled into remedial alternatives for evaluation. Preliminary evaluation of alternatives considers effectiveness, implementability and relative costs.

Effectiveness evaluation includes consideration of the following:

- The potential effectiveness of process options in handling the estimated areas or volumes of contaminated media, and meeting the remediation goals identified by the RAOs;
- The potential impacts to human health and the environment during the construction and implementation phase; and
- The proven effectiveness and reliability of the process with respect to the contaminants and conditions at the site.

Implementability includes both the technical and administrative feasibility of utilizing the technology or alternative. Administrative feasibility considers institutional factors, such as the ability to obtain necessary permits for on-site or off-site actions, and the ability to restrict land use based on specific remediation measures. Technical feasibility considers such aspects as the ability to comply with SCGs, availability and capacity of treatment, storage and disposal facilities, the availability of equipment and skilled labor to implement the technology, the ability to design, construct and operate the alternative, and acceptability to the regulatory agencies and the public.

Preliminary costs are considered at this stage of the feasibility study process for the purpose of relative cost comparison among the alternatives.

The results of the preliminary evaluation include potentially viable technologies or combinations of technologies/alternatives for the site which will be carried forward for detailed evaluation. The guidance requires that a remedial alternatives analysis provide a detailed analysis of the potential remedial alternatives based on consideration of the following evaluation criteria for each alternative.

- Threshold Criteria

  - Compliance with SCGs/ARARs
  - Protection of human health and the environment

- Balancing Criteria

  - Short-term impacts and effectiveness
  - Long-term effectiveness and permanence
  - Reduction in toxicity, mobility and/or volume of contamination
  - Implementability
  - Cost

In addition to the above listed Threshold and Balancing Criteria, the guidance also provides the following modifying criteria:

- Modifying criteria

  - Community acceptance

Compliance with applicable regulatory SCGs applies the federal and New York State ARARs/SCGs identified for the 26-28 Whitesboro Street Site to provide both action-specific guidelines for remedial work at the site and contaminant-specific cleanup standards for the alternatives under evaluation. In addition to action-specific and contaminant-specific guidelines, there are also location-specific guidelines that pertain to such issues as restrictions on actions at historic sites. These guidelines and standards are considered a minimum performance specification for each remedial action alternative under consideration.

Protection of human health and the environment is evaluated on the basis of estimated reductions in both human and environmental exposure to contaminants for each remedial action alternative. The evaluation focuses on whether a specific alternative achieves adequate protection, and how site risks are eliminated, reduced or controlled through treatment, engineering or institutional controls. An integral part of this evaluation is an assessment of long-term residual risks to be expected after remediation has been completed. Evaluation of the human health and environmental protection factor is generally based, in part, on the findings of an exposure assessment. The exposure assessment performed for this site incorporates the qualitative estimation of the risk posed by carcinogenic and non-carcinogenic contaminants detected during the site investigation.

Evaluation of short-term impacts and effectiveness of each alternative examines health and environmental risks likely to exist during the implementation of a particular remedial action. Principal factors for consideration include the expediency with which a particular alternative can be completed, potential impacts on the nearby community and on-site workers, and mitigation measures for short-term risks required by a given alternative during the necessary implementation period.

Examination of long-term impacts and effectiveness for each alternative requires an estimation of the degree of permanence afforded by each alternative. To this end, the anticipated service life of each alternative must be estimated, together with the estimated quantity and characterization of residual contamination remaining on-site at the end of this service life. The magnitude of residual risks must also be considered in terms of the amount and concentrations of contaminants remaining following implementation of a remedial action, considering the persistence, toxicity and mobility of these contaminants, and their propensity to bioaccumulate.

Reduction in toxicity, mobility and volume of contaminants is evaluated on the basis of the estimated quantity of contamination treated or destroyed, together with the estimated quantity of waste materials produced by the treatment process itself. Furthermore, this evaluation considers whether a particular alternative would achieve the irreversible destruction of contaminants, treatment of the contaminants or merely removal of contaminants for disposal elsewhere.

Evaluation of implementability examines the difficulty associated with the installation and/or operation of each alternative on-site and the proven or perceived reliability with which an alternative can achieve system performance goals (primarily the SCGs discussed above). The evaluation examines the potential need for future remedial action, the level of oversight required by regulatory agencies, the availability of certain technology resources required by each alternative and community acceptance of the alternative.

Cost evaluations presented in this document estimate the capital, and operation and maintenance (O&M) costs, including monitoring, associated with each remedial action alternative. From these estimates, a total present worth for each option is determined.

Community acceptance evaluates the technical and administrative issues and concerns which the community may have regarding each of the alternatives.

1.5 Remedial Alternatives Analysis Approach

The approach to this remedial alternatives analysis will be to evaluate technologies that would meet the RAOs developed for the site. Since these RAOs focus on elimination of contact with contaminated soil and runoff of contaminated soil to surface water and, as a secondary benefit, reduction of infiltration of precipitation through the contaminated soil, the technologies that would meet these objectives would be treatment, removal and capping/cover technologies.

As discussed previously, the use of groundwater at the site as a source of water is unlikely, therefore, active groundwater remediation will not be evaluated. Only groundwater monitoring as part of each of the alternatives will be evaluated. Reduction of infiltration of precipitation through the contaminated soil or removal or treatment of contaminated soil would mitigate potential impacts to groundwater.

2.0 DESCRIPTION OF FOCUSED REMEDIAL TECHNOLOGIES

2.1 Introduction

In general, response actions that satisfy remedial objectives for a site include institutional, containment, isolation, removal or treatment actions. In addition to evaluating appropriate institutional, containment, isolation, removal and treatment technologies, USEPA guidance under the CERCLA requires the evaluation and comparison of a no-action alternative to the action alternatives. Each response action for each medium of interest must satisfy the RAOs for the site or the specific area of concern. Technologies and process options, which are available commercially and have been demonstrated successfully, are identified in this feasibility study along with certain selected emerging technologies. The screening of process options or technology types is performed by evaluating the ability of each technology to meet specific RAOs, technical implementability, and short-term and long-term effectiveness. A discussion of selected response actions and their applicability to the site is provided below. Preliminary evaluation/screening of the response action and remedial technologies will be based on technical effectiveness as it relates to the site-specific characteristics of the site. However, where appropriate, consideration will also be given to implementability and cost.

2.2 No Action

The no-action alternative will be considered, and as described above, would serve as a baseline to compare and evaluate the effectiveness of other alternatives. Under the no-action alternative, only groundwater monitoring will be considered as a limited remedial response action. Monitoring would consist of periodic groundwater sampling to evaluate changes in conditions at the site over time and to ascertain the level of any natural attenuation, which may occur, or any increase in contamination, which may necessitate remedial action. Natural attenuation (under the no-action alternative), as opposed to active remediation, relies entirely on naturally occurring physical, chemical and biological processes (e.g., dilution, dispersion and degradation) to reduce contaminant concentrations.

2.3 Institutional Controls

Institutional controls may include access restrictions and deed restrictions. Access restrictions, such as eliminating access to the site by fencing and posting of signs warning of the presence of contamination/hazardous waste, are considered potentially applicable to the site, or to a portion of the site, since part of the property is developed and actively used. Deed restrictions could be imposed to limit uses of and activities at the site, and possibly around the site. Restrictions could be developed by the City of Utica and implemented through the building permit approval process and changes in zoning. The implementation and enforcement of the restrictions essentially would be the responsibility of the City of Utica. Deed restrictions, in addition to zoning changes which could prohibit/restrict future use and development of the site, would be a potentially applicable institutional control.

2.4 Soil Remediation Technologies

2.4.1 Isolation/Containment

Potentially applicable isolation and containment technologies include surface barriers, such as permeable covers and low permeability caps. These technologies are designed to prevent direct contact with and migration of contaminants from the area of concern, and do not provide any treatment of contaminated soil/sediment. Various forms of surface barriers currently exist to minimize surface runoff and contact with contaminated soil/sediment, and significantly reduce the infiltration of precipitation into contaminated soil/sediment. Isolation and containment technologies are potentially applicable for soil at the 26-28 Whitesboro Street Site.

Low permeability caps have an advantage over permeable covers in that this technology would limit infiltration by precipitation in addition to mitigating direct contact with contaminated soil. However, low permeability caps are more costly, require a sloped surface to promote runoff and may preclude/limit the use of the capped area and require additional maintenance. The following is a discussion of various low permeability and permeable caps.

2.4.1.1 - RCRA Cap

Technology Description: This technology consists of constructing a cap over contaminated materials as defined in the Resource Conservation and Recovery Act (RCRA) Subpart N, 40 CFR 264.300.

A RCRA cap consists of three sections. The top section consists of a 2-foot vegetated topsoil and a soil layer. A geotextile is placed between the top section and middle section. The middle section contains a 1-foot sand and gravel filter, which prevents clogging of the underlying drainage layer. The bottom section is a flexible membrane liner (FML), which overlies and protects a second low permeability 2-foot compacted soil/clay layer.

These caps are typically used for closure of landfills used for the disposal of hazardous wastes. The cap would prevent direct contact with contaminated soil, and would preclude contaminated runoff. It would also minimize infiltration of precipitation through contaminated soil and potential impacts to groundwater. The thickness (5 feet), maintenance requirements and slope (a minimum of 4%) of this type of cap would limit potential future land use options.

Initial Screening Results: A RCRA cap would prevent direct contact with and migration of contaminated soil, and also provide significant protection from infiltration of precipitation into the contaminated subsurface. A RCRA cap provides additional protection over other types of low permeability caps presented below. However, because of its high cost, other less costly caps being nearly as effective, and loss of potential future land use, this technology will not be retained for further consideration.

2.4.1.2 - Part 360 Cap

Technology Description: This technology consists of constructing a cap over waste materials as defined in 6 NYCRR Part 360 and is generally used to cap non-hazardous waste landfills. This cap consists of a four-layered system comprised, from top to bottom, of a vegetated topsoil upper layer, underlain by a drainage/barrier protection layer followed by a low permeability layer (10^{-7}

cm/sec) comprised of clay (18 inches) or a FML, followed by a gas venting layer. The thickness of the Part 360 cap with a FML is 3 to 4 feet. Similar to the RCRA cap described above, this cap also mitigates direct contact with contaminated soil, runoff of contaminants and infiltration of precipitation. The thickness, required maintenance and slope of the cap (minimum 4%) would also significantly restrict utilization of the capped area.

Initial Screening Results: A Part 360 of cap would prevent direct contact with and migration of contaminated soil, and would also provide significant protection from infiltration, and although it is thinner than the RCRA cap, it would also reduce utilization of the capped area. Therefore, because of its high cost, other less costly caps being nearly as effective and loss of potential future land use, this technology will not be retained for further consideration.

2.4.1.3 - Pavement Cap

Technology Description: An asphalt or concrete surface would significantly reduce contact with contaminated soil and surface runoff of contaminants from the site, as well as reduce the amount of infiltration into contaminated soil. In addition, it could be implemented as part of site development, such as construction of buildings, roadways and parking areas. Drainage systems may need to be constructed to collect and direct surface runoff that currently infiltrates the area. This type of cover, which would be about 1 foot in thickness, would not be as thick as the RCRA cap (5 feet) or the Part 360 cap (3 to 4 feet), and the slope could be reduced to 2% to promote runoff. Maintenance would be required in order to ensure that cracks due to weathering, settlement or traffic are repaired.

Initial Screening Results: Although current and anticipated future use of the property would not likely require significant asphalt or concrete surface for development, since a pavement cap would limit contact with and migration of contaminated soil, and infiltration of precipitation, this technology will be considered further.

2.4.1.4 - Semi-permeable Cover

Technology Description: This technology provides for the placement of an 18-inch semi-permeable soil cover (10^{-5} cm/sec hydraulic conductivity). This type of cover would mitigate direct contact with contaminated soil and runoff of contaminated surface soil, but would not preclude infiltration of precipitation into contaminated soil.

Initial Screening Results: Since a semi-permeable cover would not provide any significant additional benefit over a permeable cover at the 26-28 Whitesboro Street Site and would be more costly, this technology will not be considered further.

2.4.1.5 - Permeable Cover

Technology Description: This technology provides for the placement of a 2-foot soil ($>10^{-5}$ cm/sec hydraulic conductivity) or gravel/stone cover. This type of cover would mitigate direct contact with contaminated soil and runoff of contaminated surface soil, but would not mitigate infiltration of precipitation into contaminated soil.

Initial Screening Results: Although a permeable cover would not reduce infiltration of precipitation, it would provide protection against direct contact with and runoff of contaminated soil, and therefore, this technology will be considered further.

2.4.2 Treatment

There are a number of demonstrated/commercially available technologies for the treatment of contaminated soil. Some treatment technologies can be performed in-situ and other technologies require ex-situ treatment. Ex-situ soil treatment processes would require excavation of soil prior to treatment. Provided below is a discussion of a number of soil treatment technologies.

2.4.2.1 - Solvent Extraction

Technology Description: The solvent extraction process, as it applies to soil remediation, utilizes a solvent to extract organic components from a solid matrix into a liquid solution. Physical separation steps are often used before extraction to grade the soil into coarse and fine fractions, with the assumption that the fines contain most of the contamination. The process typically utilizes a single vessel in which the solvent is placed into contact with excavated soil. The solvent is then recovered and recycled, and the extracted organic contaminants are either disposed or recycled. The decontaminated soils can be backfilled on-site or landfilled depending on the removal efficiency of the process and/or land disposal restrictions. Extraction solvents are not currently available for all contaminants and extraction efficiencies may vary for different types of soils and levels of contaminants.

One of the limitations of the solvent extraction technology is that soil containing more than 20% moisture must be dried prior to treatment because excess water dilutes the solvent, reducing contaminant solubilization and transport efficiency. Solvent extraction would require excavation and extensive handling of the soils. Organically bound metals can be extracted with the organic contaminants, which may complicate handling and disposal of the residuals. Once removed and treated, there would still be the extracted residuals requiring additional treatment or off-site disposal.

Solvent extraction has been utilized to treat VOC and SVOC contaminated soil at several sites. Removal efficiencies of 95% to 99% have been achieved. This technology is also applicable to organically bound metals. High moisture content, such as that associated with soil near the water table at the site, would reduce the process efficiency and increase the complexity of residuals management, or would result in a high cost to dry the soil. In addition, traces of solvent may remain in the treated soil.

Initial Screening Results: Solvent extraction may require drying for soils with greater than 20% moisture. This technology may not be effective at remediation of metals contaminated soil unless the metals are organically bound. This process also has significant space requirements for the treatment system. Therefore, this technology will not be considered further.

2.4.2.2 - In-Situ Soil Washing (Soil Flushing)

In-situ soil washing is a process by which water or water containing a surfactant is applied to the unsaturated soil or injected into the groundwater to raise the water table into the contaminated soil zone. The process includes extraction of the groundwater and treatment/removal of the leached contaminants before the water/groundwater is recirculated. This technology has also been combined with the use of a cosolvent to extract organic contaminants.

Soil washing has been developed to treat nonhalogenated volatile organic compounds and inorganics. It may also be applicable to treat SVOCs, fuels, PCBs and pesticides. This technology is only applicable at sites where flushed contaminants and soil flushing fluid can be contained and recaptured. Therefore, a low permeability boundary is generally required.

Limitations of soil flushing include the potential of washing the contaminant beyond the capture zone and concerns by regulatory agencies with the introduction of cosolvents into the subsurface. Aboveground separation and treatment costs for the recovered water and cosolvent can be costly. Soil flushing is still a developing technology and has been in limited use in the United States.

Initial Screening Results: Due to the potential for mobilization of contaminants, difficulties with separation and treatment of the flushing fluids, and limited use on a full-scale level, in-situ soil washing will not be considered further.

2.4.2.3 – Ex-Situ Soil Washing

Technology Description: Soil washing technologies physically separate soils so that the contaminants, which are primarily associated with the fine size fraction of the soil, are separated from the uncontaminated larger size fraction. The washing fluid may be composed of water and/or a surfactant capable of removing the contaminants from the smaller size fraction. Either a solid-solid or liquid-solid separation is conducted where the fluid can leach the contaminant, or the contaminant is stripped from the particles with which it is associated. Soil would require excavation prior to treatment, and therefore, would require handling of the soil.

The products of the soil washing process are clean soil, wash water, dissolved contaminants and/or precipitated solids, and a finer fraction containing adsorbed organics and precipitated soils. The result is high levels of contaminants concentrated into a relatively small volume of material, thereby simplifying the ultimate treatment or disposal of the contaminated media. Soil washing technologies can be effective for removing organics and inorganics from the soils depending on contaminant concentrations, soil characteristics and process capability.

Soil washing has been successfully utilized to treat VOC and SVOC contaminated soil at several sites. However, the success of soil washing is largely dependent upon contaminant concentrations and the degree to which contaminants are sorbed to the soil particles. Reduction efficiencies are typically on the order of 85% to 99%. However, in order to determine potential reduction efficiency for the 26-28 Whitesboro Street Site, bench scale and/or pilot studies would likely be necessary.

Initial Screening Results: Due to the difficulties with separation and treatment of the flushing fluids and limited use on a full-scale level, soil washing will not be considered further.

2.4.2.4 – Soil Vapor Extraction

Technology Description: Soil vapor extraction is an in-situ unsaturated (vadose) zone soil remediation technology in which a vacuum is applied to the soil to induce the controlled flow of air and remove volatile and some semivolatile contaminants from the soil. The gas leaving the soil may be treated to recover or destroy the contaminants, depending on local and state air discharge regulations. Vertical extraction vents are typically used at depths of 5 feet or greater and have been successfully applied as deep as 300 feet. Horizontal extraction vents (installed in trenches or horizontal borings) can be used as warranted by contaminant zone geometry, drill rig access, or other site-specific factors.

For soil surface, geomembrane covers are often placed over soil surface to prevent short circuiting and to increase the radius of influence of the wells. Ground water depression pumps may be used to reduce ground water upwelling induced by the vacuum or to increase the depth of the vadose zone. Air injection is effective for facilitating extraction of deep contamination, contamination in low permeability soils, and contamination in the saturated zone. The duration of operation and maintenance for in-situ SVE is typically medium- to long-term.

Soil vapor extraction at the 26-28 Whitesboro Street Site would involve the installation of vertical extraction wells and construction of a vacuum system. Soil vapor extraction technologies are effective for removing VOC and SVOC contaminants from the soils, but would not address inorganic contaminants.

Initial Screening Results: Since this technology will not result in the removal of inorganic contaminants, soil vapor extraction will not be considered further.

2.4.2.5 - Bioremediation

Technology Description: Bioremediation is a process in which microorganisms degrade organic contaminants. The degradation of the contaminants is accomplished by metabolizing the contaminants and either using them as a source of carbon or energy, or possibly not as a source of nutrients at all. Microorganisms can adapt to degrade synthetic compounds depending on whether or not the compound is toxic, or whether or not it is in high enough concentration to support microbial growth. Many different methodologies have been utilized to identify applicable microorganisms, including isolation of pure strains from current contaminated situations to utilizing genetic engineering to produce a microorganism capable of degrading a specific compound. Bioremediation also comprises the stimulation of indigenous microorganisms.

Bioremediation is effective for the treatment of organic materials, such as VOCs, SVOCs, PCBs and pesticides, but is not effective in treatment of inorganics, such as metals. In-situ bioremediation generally requires the addition of nutrients, oxygen, moisture and possibly microbes to the soil through wells or spread on the surface for infiltration into the contaminated material. Ex-situ bioremediation requires the addition of water and nutrients, as well as possibly microbes, to excavated soils, and rotating the soils to introduce oxygen and provide adequate contact to allow degradation of the contaminants.

One of the most important factors affecting bioremediation is the ability to biodegrade the soil contaminants. In addition, the solubility of the contaminant is also an important factor. A contaminant that is tightly adsorbed onto the particle surface, or has a very low diffusivity through the aqueous medium, can prolong the treatment time.

Bioremediation has been utilized to effectively degrade VOCs and SVOCs at a number of sites. Specific microorganisms have been developed to treat VOCs and SVOCs. Degradation may be inhibited based on environmental factors, such as temperatures, and the specific contaminants present, however, studies have proven that bioremediation is applicable to the remediation of VOCs and SVOCs. However, bioremediation is ineffective at degrading inorganic contaminants.

<u>Initial Screening Results</u>: Since this technology will not result in the removal of inorganic contaminants, bioremediation will not be considered further.

2.4.2.6 - <u>Thermal Separation/Desorption</u>

<u>Technology Description</u>: Thermal separation processes have proven effective in removing VOCs, SVOCs, PCBs, pesticides and some heavy metals from soil by volatilization. Thermal separation would require excavation and extensive handling of the soils. Treatment would be conducted on-site. The contaminants are condensed and the condensate is typically treated or disposed off-site. The concentrations of organic compounds in the soil are typically reduced to

levels at which the soil could be backfilled on-site. Although the levels of organics are reduced, the levels of most heavy metals would remain unchanged. This process would typically not be affected by soil moisture content, although soil moisture content greater than 40% may reduce the process efficiency.

Thermal separation of VOC and SVOC contaminated soil has been achieved at several full-scale projects. Test results from USEPA Superfund Innovative Technology Evaluation (SITE) demonstration projects indicate that thermal separation can remove over 99 percent of the VOC and SVOC contaminants in the soil. However, thermal separation is ineffective at removal of inorganic contaminants.

Initial Screening Results: Since this technology will not result in the removal of inorganic contaminants, thermal separation/desorption will not be considered further.

2.4.2.7 – Chemical Treatment (Oxidation/Reduction)

Technology Description: Chemical oxidation processes utilize oxidants to destroy contaminants, including fuels, solvents, PCBs and pesticides. Oxidants react with contaminants and result in byproducts, such as water and carbon dioxide. Chemical oxidation is applied in-situ, and therefore, does not require the excavation of contaminated soil. Wells are drilled in the contaminated area and the oxidant is injected into the subsurface. The oxidant mixes with the contaminants and causes them to break down. When the process is complete, water and other inert chemicals remain. To expedite the remediation of a site, oxidants can be recirculated.

The most common oxidants are hydrogen peroxide and potassium permanganate, which are both applied in a liquid state. Both hydrogen peroxide and potassium permanganate have advantages depending on the site. Ozone is another strong oxidant, but because it is a gas, it can be difficult to use. A catalyst may also be used with the oxidant to increase the strength or speed of the process. For instance, if hydrogen peroxide is mixed with an iron catalyst, it produces free radicals that can degrade more harmful chemicals compared to hydrogen peroxide alone.

Depending on the oxidant utilized, some chemical oxidation processes can create significant heat that can cause the contaminants to evaporate, or change into gases. The gases rise through the soil to the ground surface where they are captured and treated. Chemical oxidation can be quite safe to use, but there are potential hazards, such as corrosivity and explosion. In general, chemical oxidation offers rapid cleanup times compared to other technologies.

Chemical treatment of VOC and SVOC contaminated soil has been achieved at several full-scale projects. However, chemical oxidation is ineffective at removal of inorganic contaminants.

Initial Screening Results: Since this technology will not result in the removal of inorganic contaminants, chemical treatment will not be considered further.

2.4.3 Solidification and Stabilization

Solidification technologies may significantly reduce the mobility of inorganic contaminants, but typically do not reduce the toxicity or volume of the contaminants. These technologies may not be considered as a permanent remedy. Solidification technologies are potentially applicable for soil at the 26-28 Whitesboro Street Site.

2.4.3.1 - Solidification

Technology Description: Solidification technologies generally utilize a cementitious matrix to encapsulate contaminants, thereby reducing their potential for leaching. These technologies treat contaminated soil with Portland cement, cement kiln dust, pozzolans, etc., to produce a stable material. The solidified material experiences a volume increase, generally in the range of 10% to 30%. If the solidification process is performed on-site, the stabilized material could be disposed on-site. This technology could result in a significant volume increase.

Initial Screening Results: Solidification of the soil at the site would likely result in a significant volume increase and would not reduce the toxicity of the soil. Therefore, this technology will not be considered further.

2.4.3.2 - Stabilization/Chemical Fixation

Technology Description: In contrast to solidification, the chemical fixation technologies utilize a process which involves more than immobilization. The process utilizes standard solidification processing, however, the volume expansion and the associated dilution are minimized. The process can be customized to form materials ranging from pebble-sized granules to solid concrete. Volume expansion is usually in the 10% to 20% range. Volatilization of organic compounds would likely not occur due to the low heat of reaction. Although the contaminants would be “fixed” the total concentrations of the contaminants of concern would likely not change. Therefore, although the contaminants may not leach into the groundwater, the soil could possibly still pose a health risk. Some type of low permeability cover over the material would likely be required to prevent direct contact with the stabilized material.

Initial Screening Results: Similar to solidification, implementation of stabilization/chemical fixation would result in a volume increase and would not reduce the toxicity of the soil. Therefore, this technology will not be considered further.

2.4.4 Excavation and Removal

Technology Description: Excavation and removal would require excavation of contaminated soil and transportation to an approved/permitted secure landfill or incinerator. Clean soil would be required to backfill the excavated area. This option also results in significant truck traffic.

Initial Screening Results: Since removal of the contaminated soil would eliminate the potential for exposure and impacts on groundwater, this technology will be considered further.

A summary of the identification and screening of the soil remediation technologies discussed above is presented in Table 2-1.

2.5 Summary Evaluation of Remedial Technologies

Based on the above screening of remedial technologies, the following technologies will be retained for further evaluation:

- Pavement Cap
- Permeable Cover
- Excavation and Removal

In addition to the above technologies, no action with groundwater monitoring will also be evaluated further.

TABLE 2-1
26-28 WHITESBORO STREET SITE
REMEDIAL ALTERNATIVES ANALYSIS
SUMMARY SCREENING OF SOIL REMEDIATION TECHNOLOGIES

General Response Action	Remedial Technology	Description	Summary of Initial Screening Results
Isolation/Containment	RCRA Cap	2-foot vegetated topsoil and soil layer above a geotextile over a 1-foot sand and gravel drainage layer which is underlain by a flexible membrane liner and 2-foot compacted soil/clay layer.	Not retained for further consideration since less costly, effective caps are available and impact to future land use.
	Part 360 Cap	A four-layered system: vegetated topsoil upper layer, underlain by a drainage/barrier layer followed by a low permeability clay layer or geosynthetic membrane followed by a gas venting layer.	Not retained for further consideration since less costly, effective caps are available and impact to future land use.
	Pavement Cap	An asphalt or concrete surface.	Retained for further consideration.
	Semi-permeable Cover	An 18-inch (10^{-5} cm/s) soil cover to mitigate direct contact with and runoff of contaminated surface soil, and reduce infiltration of precipitation.	Not retained for further consideration since the cover does not provide any significant additional benefit over a permeable cover and is more costly.
	Permeable Cover	A 2-foot ($>10^{-5}$ cm/s) soil and/or gravel/stone cover to mitigate direct contact with and runoff of contaminated surface soil.	Retained for further consideration.
Treatment	Solvent Extraction	Contaminants are extracted with a solvent and the solvent is recovered and recycled and the decontaminated soils are backfilled on-site or landfilled.	Not retained for further consideration since less costly, effective treatment methods are available and significant handling of contaminated soils.
	In-situ Soil Washing	Water is applied to the unsaturated soil or injected into the groundwater to raise the water table into the contaminated zone and leached contaminants are removed.	Not retained for further consideration due to the potential for mobilization of contaminants, difficulties with separation and treatment of the flushing fluids, and limited use on full-scale level.

TABLE 2-1 (cont.)
26-28 WHITESBORO STREET SITE
REMEDIAL ALTERNATIVES ANALYSIS
SUMMARY SCREENING OF SOIL REMEDIATION TECHNOLOGIES

Treatment (continued)	Soil Washing	Soil is physically separated and fine fraction is washed to transfer contaminants into solution.	Not retained for further consideration due to difficulties with separation and treatment of the flushing fluids and limited use on full-scale level.
	Soil Vapor Extraction	Vacuum is applied through extraction wells to create a pressure/concentration gradient that induces gas-phase contaminants to be removed.	Not retained for further consideration due to ineffectiveness for treating inorganic contaminants.
	Bioremediation	Microorganisms degrade organic contaminants.	Not retained for further consideration due to ineffectiveness for treating inorganic contaminants.
	Thermal Separation/ Desorption	Contaminants are thermally desorbed and condensed, and the condensate is treated or disposed off-site.	Not retained for further consideration due to ineffectiveness for treating inorganic contaminants.
	Chemical Treatment (Oxidation/Reduction)	Oxidant is applied to the unsaturated soil or injected into the groundwater to oxidize contaminants to inert compounds.	Not retained for further consideration due to ineffectiveness for treating inorganic contaminants.
Solidification and Stabilization	Solidification	A cementitious matrix is used to encapsulate contaminants and reduce leaching potential.	Not retained for further consideration due to significant handling of contaminated soils, resulting volume increase and no reduction in toxicity of soil.
	Stabilization/ Chemical Fixation	Chemical additives and processes are used to immobilize contaminants with minimum volume expansion.	Not retained for further consideration due to significant handling of contaminated soils and no reduction in toxicity of soil.
Excavation and Removal	Off-site Disposal	Waste and contaminated soil are excavated and transported to a permitted landfill or treatment facility.	Retained for further consideration.

3.0 DEVELOPMENT AND PRELIMINARY EVALUATION OF ALTERNATIVES

Based on the review of the technologies discussed in Section 2.0, the next phase of the remedial alternatives analysis process is to develop remedial alternatives for preliminary evaluation based on effectiveness, implementability and relative cost. Remedial alternatives can comprise individual technologies or a combination of technologies.

3.1 Description of Remedial Alternatives

3.1.1 Alternative 1 – No Action with Long-term Monitoring

This alternative provides no active remediation and relies solely on natural attenuation for remediation of contaminated soil. However, the "no action" alternative would provide for long-term monitoring of the groundwater to monitor the effectiveness of natural attenuation.

Long-term groundwater monitoring would consist of monitoring existing groundwater monitoring wells for a period of 30 years. Five existing groundwater monitoring wells (MW-1 through MW-4 and MW-8) would be sampled semi-annually for VOCs, SVOCs and metals for the first five years of the groundwater monitoring program. These same five wells would be sampled annually for VOCs, SVOCs and metals from years 6 through 30.

A soil vapor intrusion investigation would consist of the installation and sampling of five soil vapor probes. One probe would be installed at each of the four property corners. The fifth probe would be located in the center of the property. Each soil vapor probe would be installed to a depth of approximately 8 to 10 feet bgs, depending on the actual depth to groundwater, using direct push drilling techniques. An ambient air sample and five soil vapor samples would be analyzed for VOCs using USEPA TO-15.

3.1.2 Alternative 2 – Pavement Cap with Long-term Monitoring

This alternative includes placement of a 12-inch impermeable asphalt or concrete cover over the approximately 1.6 acre site. The pavement cap would consist of approximately 6 inches of gravel sub-base and approximately 6 inches of an asphalt cap to mitigate contact with and runoff of contaminated soil. Approximately 1,290 cubic yards of gravel sub-base and 69,700 square feet of asphalt would be required to implement this alternative. The existing topography of the site is generally flat and placement of an approximately 12-inch impermeable cap would not significantly affect the grade of the site.

Long-term groundwater monitoring, as described in Alternative 1, is included as part of this alternative to evaluate the effectiveness of the pavement cap and to control use of the site. This alternative would also include placement of institutional/land use controls on the site, such as deed restrictions and covenants, to ensure appropriate future use/control of the site that would protect human health and the environment. Maintenance of this alternative would include site inspections.

A soil vapor intrusion investigation would consist of the installation and sampling of five soil vapor probes. One probe would be installed at each of the four property corners. The fifth probe would be located in the center of the property. Each soil vapor probe would be installed to a depth of approximately 8 to 10 feet bgs, depending on the actual depth to groundwater, using direct push drilling techniques. An ambient air sample and five soil vapor samples would be analyzed for VOCs using USEPA TO-15.

3.1.3 Alternative 3 – Hot Spot Removal Meeting Commercial Use SCOs for all Contaminants Including PAHs and Permeable Cover with Monitoring

This alternative includes excavation of surface soils and subsurface soils with contaminant concentrations exceeding SCGs for off-site disposal followed by placement of a 24-inch permeable soil cover.

Appropriate precautions would be taken during excavation of contaminated soil to mitigate dust from migrating off-site and/or impacting on-site workers. It is anticipated that water would be adequate to control dust. Sediment control measures, such as silt fencing and/or hay bales, would be required to mitigate the release of soil to surface waters.

Long-term groundwater monitoring would consist of monitoring existing groundwater monitoring wells for a period of 30 years. Five existing groundwater monitoring wells (MW-1 through MW-4 and MW-8) would be sampled annually for VOCs, SVOCs and metals for the first five years of the groundwater monitoring program. These same five wells would be sampled biannually for VOCs, SVOCs and metals from years 6 through 30. This alternative would also include placement of institutional/land use controls on the site, such as deed restrictions and covenants, to ensure appropriate future use/control of the site that would protect human health and the environment. Maintenance of this alternative would include site inspections and cutting of the vegetated cover.

A soil vapor intrusion investigation would consist of the installation and sampling of five soil vapor probes. One probe would be installed at each of the four property corners. The fifth probe would be located in the center of the property. Each soil vapor probe would be installed to a depth of approximately 8 to 10 feet bgs, depending on the actual depth to groundwater, using direct push drilling techniques. An ambient air sample and five soil vapor samples would be analyzed for VOCs using USEPA TO-15.

Figure 3-1 illustrates areas of the site where contaminant concentrations exceed Part 375-6 CU-SCOs in surface and subsurface soils, which would be excavated and removed from the site. Approximately 4,400 cubic yards of surface soil (to a depth of 2.0 foot below grade) would require removal. In addition, subsurface soil requiring removal would include approximately 1,300 cubic yards to a maximum depth of 11.0 feet below grade. This would result in approximately 5,700 cubic yards of soil that would require off-site disposal. Excavated surface soil areas would be covered by a permeable cover material consisting of 18 inches of general fill

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REMEDIAL EXCAVATION MEETING PART 375-6 COMMERCIAL USE SCOs FOR ALL CONTAMINANTS INCLUDING PAHs

FIGURE 3-1

and 6 inches of a vegetative medium that would include topsoil and grass to mitigate contact with and runoff of contaminated soil. The excavated subsurface soil area would be backfilled from 11 feet below grade to 6 inches below grade with general fill followed by 6 inches of vegetative medium. The existing topography of the site is generally flat and placement of a 24-inch permeable soil cover would not affect the grade of the site.

3.1.4 Alternative 4 – Hot Spot Removal Meeting Commercial Use SCOs for all Contaminants Except PAHs and Permeable Cover with Monitoring

This alternative includes excavation of surface soils and subsurface soils with contaminant concentrations exceeding SCGs for off-site disposal followed by placement of a 24-inch permeable soil cover. Areas of the site were PAHs concentration exceed SCGs would not be excavated.

Appropriate precautions would be taken during excavation of contaminated soil to mitigate dust from migrating off-site and/or impacting on-site workers. It is anticipated that water would be adequate to control dust. Sediment control measures, such as silt fencing and/or hay bales, would be required to mitigate the release of soil to surface waters.

Long-term groundwater monitoring would consist of monitoring existing groundwater monitoring wells for a period of 30 years. Five existing groundwater monitoring wells (MW-1 through MW-4 and MW-8) would be sampled annually for VOCs, SVOCs and metals for the first five years of the groundwater monitoring program. These same five wells would be sampled biannually for VOCs, SVOCs and metals from years 6 through 30. This alternative would also include placement of institutional/land use controls on the site, such as deed restrictions and covenants, to ensure appropriate future use/control of the site that would protect human health and the environment. Maintenance of this alternative would include site inspections and cutting of the vegetated cover.

A soil vapor intrusion investigation would consist of the installation and sampling of five soil vapor probes. One probe would be installed at each of the four property corners. The fifth probe would be located in the center of the property. Each soil vapor probe would be installed to a depth of approximately 8 to 10 feet bgs, depending on the actual depth to groundwater, using direct push drilling techniques. An ambient air sample and five soil vapor samples would be analyzed for VOCs using USEPA TO-15.

Figure 3-2 illustrates areas of the site where all contaminant concentrations except PAHs exceed Part 375-6 CU-SCOs in surface and subsurface soils, which would be excavated and removed from the site. Approximately 4,150 cubic yards of surface soil (to a depth of 2.0 foot below grade) would require removal and off-site disposal. No subsurface soil would require removal for this alternative, since no VOCs, PCBs, pesticides, or metals concentrations exceed Part 375-6 CU-SCOs. Several PAH concentrations associated with subsurface soil exceed Part 375-6 CU-SCOs, however, this alternatives assumes that the PAHs are associated with historic fill, and not related to site activities.

Excavated surface soil areas would be covered by a permeable cover material consisting of 18 inches of general fill and 6 inches of a vegetative medium that would include topsoil and grass to mitigate contact with and runoff of contaminated soil. The excavated subsurface soil area would be backfilled from 6 feet below grade to 6 inches below grade with general fill followed by 6 inches of vegetative medium. The existing topography of the site is generally flat and placement of a 24-inch permeable soil cover would not affect the grade of the site.

3.1.5 Alternative 5 – Hot Spot Removal Meeting Protection of Groundwater SCOs for all Contaminants Including PAHs and Permeable Cover with Monitoring

This alternative includes excavation of surface soils and subsurface soils with contaminant concentrations exceeding SCGs for off-site disposal followed by placement of a 24-inch permeable soil cover.

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REMEDIAL EXCAVATION MEETING PART 375-6 COMMERCIAL USE SCOs FOR ALL CONTAMINANTS EXCEPT PAHs

FIGURE 3-2

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Appropriate precautions would be taken during excavation of contaminated soil to mitigate dust from migrating off-site and/or impacting on-site workers. It is anticipated that water would be adequate to control dust. Sediment control measures, such as silt fencing and/or hay bales, would be required to mitigate the release of soil to surface waters.

Long-term groundwater monitoring would consist of monitoring existing groundwater monitoring wells for a period of 30 years. Five existing groundwater monitoring wells (MW-1 through MW-4 and MW-8) would be sampled annually for VOCs, SVOCs and metals for the first five years of the groundwater monitoring program. These same five wells would be sampled biannually for VOCs, SVOCs and metals from years 6 through 30. This alternative would also include placement of institutional/land use controls on the site, such as deed restrictions and covenants, to ensure appropriate future use/control of the site that would protect human health and the environment. Maintenance of this alternative would include site inspections and cutting of the vegetated cover.

A soil vapor intrusion investigation would consist of the installation and sampling of five soil vapor probes. One probe would be installed at each of the four property corners. The fifth probe would be located in the center of the property. Each soil vapor probe would be installed to a depth of approximately 8 to 10 feet bgs, depending on the actual depth to groundwater, using direct push drilling techniques. An ambient air sample and five soil vapor samples would be analyzed for VOCs using USEPA TO-15.

Figure 3-3 illustrates areas of the site where contaminant concentrations exceed Part 375-6 POG-SCOs in surface and subsurface soils, which would be excavated and removed from the site. Approximately 3,900 cubic yards of surface soil (to a depth of 2.0 foot below grade) would require removal. In addition, subsurface soil requiring removal would include approximately 2,500 cubic yards to a maximum depth of 8.0 feet below grade. This would result in approximately 6,400 cubic yards of soil that would require off-site disposal.

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REMEDIAL EXCAVATION MEETING PART 375-6 PROTECTION OF GROUNDWATER SCOs FOR ALL CONTAMINANTS INCLUDING PAHs

FIGURE 3-3

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F:\1909\dwg\1909 FIGURES.dwg, FIG 3-3, 2/12/2009 11:37:44 AM, PMartorano

Excavated surface soil areas would be covered by a permeable cover material consisting of 18 inches of general fill and 6 inches of a vegetative medium that would include topsoil and grass to mitigate contact with and runoff of contaminated soil. The excavated subsurface soil area would be backfilled from 6 feet below grade to 6 inches below grade with general fill followed by 6 inches of vegetative medium. The existing topography of the site is generally flat and placement of a 24-inch permeable soil cover would not affect the grade of the site.

3.1.6 Alternative 6 – Hot Spot Removal Meeting Protection of Groundwater SCOs for all Contaminants Except PAHs and Permeable Cover with Monitoring

This alternative includes excavation of surface soils and subsurface soils with contaminant concentrations exceeding SCGs for off-site disposal followed by placement of a 24-inch permeable soil cover. Areas of the site were PAHs concentration exceed SCGs would not be excavated.

Appropriate precautions would be taken during excavation of contaminated soil to mitigate dust from migrating off-site and/or impacting on-site workers. It is anticipated that water would be adequate to control dust. Sediment control measures, such as silt fencing and/or hay bales, would be required to mitigate the release of soil to surface waters.

Long-term groundwater monitoring would consist of monitoring existing groundwater monitoring wells for a period of 30 years. Five existing groundwater monitoring wells (MW-1 through MW-4 and MW-8) would be sampled annually for VOCs, SVOCs and metals for the first five years of the groundwater monitoring program. These same five wells would be sampled biannually for VOCs, SVOCs and metals from years 6 through 30. This alternative would also include placement of institutional/land use controls on the site, such as deed restrictions and covenants, to ensure appropriate future use/control of the site that would protect human health and the environment. Maintenance of this alternative would include site inspections and cutting of the vegetated cover.

A soil vapor intrusion investigation would consist of the installation and sampling of five soil vapor probes. One probe would be installed at each of the four property corners. The fifth probe would be located in the center of the property. Each soil vapor probe would be installed to a depth of approximately 8 to 10 feet bgs, depending on depth to groundwater, using direct push drilling techniques. An ambient air sample and five soil vapor samples would be analyzed for VOCs using USEPA TO-15.

Figure 3-4 illustrates areas of the site where all contaminant concentrations except PAHs exceed Part 375-6 POG-SCOs in surface and subsurface soils, which would be excavated and removed from the site. Approximately 925 cubic yards of surface soil (to a depth of 2.0 foot below grade) would require removal. In addition, subsurface soil requiring removal would include approximately 500 cubic yards to a maximum depth of 7.0 feet below grade. This would result in approximately 1,425 cubic yards of soil that would require off-site disposal. Several PAH concentrations associated with surface and subsurface soil exceed Part 375 POG SCGs, however, this alternative assumes that the PAHs are associated with historic fill, and not related to site operations.

Excavated surface soil areas would be covered by a permeable cover material consisting of 18 inches of general fill and 6 inches of a vegetative medium that would include topsoil and grass to mitigate contact with and runoff of contaminated soil. The excavated subsurface soil area would be backfilled from 7 feet below grade to 6 inches below grade with general fill followed by 6 inches of vegetative medium. The existing topography of the site is generally flat and placement of a 24-inch permeable soil cover would not affect the grade of the site.

3.1.7 Alternative 7 – Excavation and Off-Site Disposal Meeting Unrestricted Use SCOs for all Contaminants Including PAHs and Short-term Monitoring

Soil exceeding UU-SCOs would be excavated from the 26-28 Whitesboro Street Site. Based on the distribution of VOC, SVOC and metals contaminated surface and subsurface soil,

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REMEDIAL EXCAVATION MEETING PART 375-6 PROTECTION OF GROUNDWATER SCOs FOR ALL CONTAMINANTS EXCEPT PAHs

FIGURE 3-4

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this alternative would include the excavation of soil from the approximately 1.6 acre site. All excavated areas would be backfilled with clean soil to existing grade.

Appropriate precautions would be taken during excavation of contaminated soil to mitigate dust from migrating off-site and/or impacting on-site workers. It is anticipated that water would be adequate to control dust.

Groundwater monitoring would include monitoring of five groundwater monitoring wells on an annual basis for a minimum of five years. Samples would be analyzed for VOCs, SVOCs and metals for the five years of the groundwater monitoring.

A soil vapor intrusion investigation would consist of the installation and sampling of five soil vapor probes. One probe would be installed at each of the four property corners. The fifth probe would be located in the center of the property. Each soil vapor probe would be installed to a depth of approximately 8 to 10 feet bgs, depending on the actual depth to groundwater, using direct push drilling techniques. An ambient air sample and five soil vapor samples would be analyzed for VOCs using USEPA TO-15.

Figure 3-5 illustrates areas of the site where contaminant concentrations exceed Part 375-6 UU-SCOs in surface and subsurface soils, which would be excavated and removed from the site. Approximately 4,950 cubic yards of surface soil (to a depth of 2.0 foot below grade) would require removal. In addition, subsurface soil requiring removal would include approximately 3,550 cubic yards to a maximum depth of 11.0 feet below grade. This would result in approximately 8,500 cubic yards of soil that would require off-site disposal.

Excavated areas would be backfilled to 6 inches below grade with general fill followed by 6 inches of vegetative medium consisting of topsoil and grass.

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REMEDIAL EXCAVATION MEETING PART 375-6 UNRESTRICTED USE SCOs FOR ALL CONTAMINANTS INCLUDING PAHs

FIGURE 3-5

3.1.8 Alternative 8 - Excavation and Off-Site Disposal Meeting Unrestricted Use SCOs for all Contaminants Except PAHs and Short-term Monitoring

Soil exceeding UU-SCOs, except PAHs, would be excavated from the 26-28 Whitesboro Street Site. All excavated areas would be backfilled with clean soil to existing grade. Areas of the site where PAH concentrations exceed SCGs would not be excavated.

Appropriate precautions would be taken during excavation of contaminated soil to mitigate dust from migrating off-site and/or impacting on-site workers. It is anticipated that water would be adequate to control dust.

Groundwater monitoring would include monitoring of five groundwater monitoring wells on an annual basis for a minimum of five years. Samples would be analyzed for VOCs, SVOCs and metals for the five years of the groundwater monitoring. This alternative would also include placement of institutional/land use controls on the site, such as deed restrictions and covenants, to ensure appropriate future use/control of the site that would protect human health and the environment.

A soil vapor intrusion investigation would consist of the installation and sampling of five soil vapor probes. One probe would be installed at each of the four property corners. The fifth probe would be located in the center of the property. Each soil vapor probe would be installed to a depth of approximately 8 to 10 feet bgs, depending on the depth to groundwater, using direct push drilling techniques. An ambient air sample and five soil vapor samples would be analyzed for VOCs using USEPA TO-15.

Figure 3-6 illustrates areas of the site where all contaminant concentrations except PAHs exceed Part 375-6 UU-SCOs in surface and subsurface soils, which would be excavated and removed from the site. Approximately 4,950 cubic yards of surface soil (to a depth of 2.0 foot below grade) would require removal. In addition, subsurface soil requiring removal would

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REMEDIAL EXCAVATION MEETING PART 375-6 UNRESTRICTED USE SCOs FOR ALL CONTAMINANTS EXCEPT PAHs

FIGURE 3-6

include approximately 2,900 cubic yards to a maximum depth of 11.0 feet below grade. This would result in approximately 7,850 cubic yards of soil that would require off-site disposal.

Excavated areas would be backfilled to 6 inches below grade with general fill followed by 6 inches of vegetative medium consisting of topsoil and grass. The excavated subsurface soil area would be backfilled to 6 inches below grade with general fill followed by 6 inches of vegetative medium.

3.2 Evaluation of Remedial Alternatives

3.2.1 Alternative 1 – No Action with Long-term Monitoring

Effectiveness

Alternative 1 would not meet any of the remedial action objectives which have been established for the 26-28 Whitesboro Street Site as discussed in Section 1.4 of this document, since no physical remedial action would be performed. Based on the results of the exposure assessment, the site poses a significant potential risk to human health and the environment, although there is not an immediate acute health hazard. This alternative does not prevent direct contact with contaminated soil or infiltration of precipitation through the contaminated soil. Therefore, there would be potential impacts on groundwater. This alternative relies solely on natural attenuation, which would likely take many decades to be effective. As a result, this alternative is not effective.

Implementability

The no action alternative is readily implementable physically, however, since this alternative does not mitigate the potential for contact with contaminated soil and does not mitigate infiltration of precipitation and potential contamination of groundwater, it is not implementable from a regulatory perspective.

Cost

The cost associated with this alternative includes the cost for long-term groundwater monitoring. Therefore, the cost for this alternative would be significantly lower than the "action" alternatives discussed below.

3.2.2 Alternative 2 – Pavement Cap with Long-term Monitoring

Effectiveness

Alternative 2 would meet all of the remedial action objectives for the site. It would be effective at mitigating direct contact with contaminated soil and preventing runoff of contaminated soil. In addition, placement of a pavement cap would reduce infiltration of precipitation. Therefore, Alternative 2 would meet the remedial action objectives for the site by mitigating contact with contaminated soil, preventing runoff of contaminated soil, and reducing infiltration of precipitation.

This alternative does not remediate the site to "unrestricted levels". As such, an environmental easement would be required, at a minimum, to limit future use of the property and groundwater and restrict the manner in which soils are managed. The cap would be inspected on a regular basis to determine integrity, operability, and effectiveness of the engineering controls.

Implementability

All the necessary labor, equipment, materials and supplies for placement of a pavement cap are readily available and easy to construct. It is estimated that 1,290 cubic yards of sub-base material and 69,700 square feet of asphalt would need to be brought to the site for construction of the pavement cap, which would result in increased truck traffic in the vicinity of the site.

Cost

The cost for Alternative 2 would be moderate. The material needed for construction of the cap is readily available locally. The cost of this alternative would be greater than Alternative 1 and Alternative 6, but significantly lower than Alternatives 3, 4, 5, 7, and 8.

3.2.3 Alternative 3 - Hot Spot Removal Meeting Commercial Use SCOs for all Contaminants Including PAHs and Permeable Cover with Monitoring

Effectiveness

Alternative 3 would meet all of the primary remedial action objectives for the site by effectively mitigating contact with contaminated soil and mitigating migration by runoff of contaminants to surface water. This alternative would only partially meet the secondary remedial action objective for the site in that a limited quantity of contaminated soil would be removed and infiltration of precipitation would continue through remaining contaminated soil.

This alternative does not remediate the site to "unrestricted levels". As such, an environmental easement would be required, at a minimum, to limit future use of the property and groundwater and restrict the manner in which soils are managed. The final cover system would be inspected on a regular basis to determine integrity, operability, and effectiveness of the engineering control.

Implementability

All the necessary labor, equipment, materials and supplies for excavation of contaminated soil to depth of 11 feet are readily available. All the necessary labor, equipment, materials and supplies for placement of a permeable cover are readily available. It is estimated that 5,700 cubic yards of soil would be excavated and transported for off-site disposal. An equal volume of clean backfill material would need to be brought to the site for construction of the permeable cover, which would result in increased truck traffic in the vicinity of the site.

Cost

The cost for Alternative 3 would be high. The cost of this alternative would be greater than Alternatives 1, 2, 4, and 6, but lower than Alternatives 5, 7, and 8.

3.2.4 Alternative 4 - Hot Spot Removal Meeting Commercial Use SCOs for all Contaminants Except PAHs and Permeable Cover with Monitoring

Effectiveness

Alternative 4 would meet all of the primary remedial action objectives for the site by effectively mitigating contact with contaminated soil and mitigating migration by runoff of contaminants to surface water. This alternative would only partially meet the secondary remedial action objective for the site in that a limited quantity of contaminated soil would be removed and infiltration of precipitation would continue through remaining contaminated soil.

This alternative does not remediate the site to “unrestricted levels”. As such, an environmental easement would be required, at a minimum, to limit future use of the property and groundwater and restrict the manner in which soils are managed. The final cover system would be inspected on a regular basis to determine integrity, operability, and effectiveness of the engineering controls.

Implementability

All the necessary labor, equipment, materials and supplies for excavation of contaminated soil to depth of 2 feet are readily available. All the necessary labor, equipment, materials and supplies for placement of a permeable cover are readily available. It is estimated that 4,150 cubic yards of soil would be excavated and transported for off-site disposal. An equal volume of clean backfill material would need to be brought to the site for construction of the permeable cover, which would result in increased truck traffic in the vicinity of the site.

Cost

The cost for Alternative 4 would be moderate. The cost of this alternative would be greater than Alternatives 1, 2, and 6, but lower than Alternatives 3, 5, 7, and 8.

3.2.5 Alternative 5 - Hot Spot Removal Meeting Protection of Groundwater SCOs for all Contaminants including PAHs and Permeable Cover with Monitoring

Effectiveness

Alternative 5 would partially meet the primary remedial action objectives for the site since the area of excavation would be limited. This alternative would only partially meet the secondary remedial action objective for the site as infiltration of precipitation would continue through remaining contaminated soil.

This alternative does not remediate the site to "unrestricted levels". As such, an environmental easement would be required, at a minimum, to limit future use of the property and groundwater and restrict the manner in which soils are managed. The final cover system would be inspected to determine integrity, operability, and effectiveness of the engineering controls.

Implementability

All the necessary labor, equipment, materials and supplies for excavation of contaminated soil to depth of 8 feet are readily available. All the necessary labor, equipment, materials and supplies for placement of a permeable cover are readily available. It is estimated that 6,400 cubic yards of soil would be excavated and transported for off-site disposal. An equal volume of clean backfill material would need to be brought to the site for construction of the permeable cover, which would result in increased truck traffic in the vicinity of the site.

Cost

The cost for Alternative 5 would be high. The cost of this alternative would be greater than Alternatives 1, 2, 3, 4, and 6, and comparable to Alternative 8, but significantly lower than Alternative 7.

3.2.6 Alternative 6 - Hot Spot Removal Meeting Protection of Groundwater SCOs for all Contaminants except PAHs and Permeable Cover with Monitoring

Effectiveness

Alternative 6 would not meet any of the remedial action objectives for the site. A limited area of contaminated soil would be excavated and, subsequently, a limited area of permeable cover would be placed at the site. This alternative would not be effective in reducing infiltration of precipitation through the contaminated soil and potential impacts to groundwater.

Implementability

All the necessary labor, equipment, materials and supplies for excavation of contaminated soil to depth of 7 feet are readily available. All the necessary labor, equipment, materials and supplies for placement of a permeable cover are readily available. It is estimated that 1,425 cubic yards of soil would be excavated and transported for off-site disposal. An equal volume of clean backfill material would need to be brought to the site for construction of the permeable cover, which would result in increased truck traffic in the vicinity of the site.

Cost

The cost for Alternative 6 would be low. The cost of this alternative would be greater than Alternative 1, but significantly lower than Alternatives 2, 3, 4, 5, 7, and 8.

3.2.7 Alternative 7 – Excavation and Off-Site Disposal Meeting Unrestricted Use SCOs for all Contaminants Including PAHs and Short-term Monitoring

Alternative 7 would meet all of the remedial action objectives for the site by effectively mitigating contact with contaminated soil, mitigating migration of contaminants to surface water, and mitigating infiltration of precipitation through the contaminated soil to groundwater. This alternative would be protective of human health and the environment. Excavation and off-site disposal is an effective and proven technology for site remediation of VOC, SVOC and metals contaminated soil.

Implementability

Excavation of unsaturated contaminated soil to a depth of approximately 11 feet is readily performed. All necessary labor, equipment, materials and supplies are readily available. Potential difficulties may arise with transportation of the contaminated soil off-site and clean soil on-site as a result of truck traffic. Systems to control air emissions, such as dust suppressants, may be required during construction.

Cost

The cost of this alternative is high. Off-site transportation and disposal of the contaminated soil is the most significant cost of this alternative. The cost of this alternative would be significantly higher than the other alternatives.

3.2.8 Alternative 8 – Excavation and Off-Site Disposal Meeting Unrestricted Use SCOs for all Contaminants Except PAHs and Short-term Monitoring

Alternative 8 would meet all of the primary remedial action objectives for the site by effectively mitigating contact with contaminated soil and mitigating migration of contaminants by runoff to surface water. This alternative would only partially meet the secondary remedial action objective for the site in that a limited quantity of contaminated subsurface soil would be removed and infiltration of precipitation would continue through remaining contaminated soil.

This alternative would be protective of human health and the environment. Excavation and off-site disposal is an effective and proven technology for site remediation of VOC, SVOC and metals contaminated soil.

Implementability

Excavation of unsaturated contaminated soil to a depth of approximately 11 feet is readily performed. All necessary labor, equipment, materials and supplies are readily available. Potential difficulties may arise with transportation of the contaminated soil off-site and clean soil on-site as a result of truck traffic. Systems to control air emissions, such as dust suppressants, may be required during construction.

Cost

The cost of Alternative 8 is high. Off-site transportation and disposal of the contaminated soil is the most significant cost of this alternative. The cost of this alternative would be greater than Alternatives 1, 2, 3, 4, and 6, and comparable to Alternative 5, but significantly lower than Alternative 7.

3.3 Summary Evaluation of Alternatives

Provided in Table 3-1 is a summary of the preliminary evaluation of the remedial alternatives developed for the 26-28 Whitesboro Street Site. With regard to the selection of alternatives to be evaluated further in detail in order to select a remedial plan for the site, Alternatives 2, 3, 4, 7 and 8 are considered viable and will be evaluated further in Section 4.0, together with the no action alternative (Alternative 1) as required by CERCLA and the New York Superfund Program.

TABLE 3-1

REMEDIAL ALTERNATIVES ANALYSIS REPORT

26-28 WHITESBORO STREET SITE

SUMMARY OF PRELIMINARY COMPARATIVE EVALUATION OF REMEDIAL ALTERNATIVES

Remedial Alternative		Effectiveness	Ease of Implementation	Cost	Retained
Alternative 1	No Action and Long-term Monitoring	Low	High (however, likely would not be acceptable to regulatory agencies or the public)	Low	Yes (required by guidance)
Alternative 2	Pavement Cap with Long-term Monitoring	Moderate	High	Moderate	Yes
Alternative 3	Hot Spot Removal Meeting Commercial Use SCOs for all Contaminants Including PAHs and Permeable Cover with Monitoring	Moderate	Moderate (requires handling of soil)	High	Yes
Alternative 4	Hot Spot Removal Meeting Commercial Use SCOs for all Contaminants Except PAHs and Permeable Cover with Monitoring	Moderate	Moderate (requires handling of soil)	Moderate	Yes
Alternative 5	Hot Spot Removal Meeting Protection of Groundwater SCOs for all Contaminants including PAHs and Permeable Cover with Monitoring	Low	Moderate (requires handling of soil)	High	No
Alternative 6	Hot Spot Removal Meeting Protection of Groundwater SCOs for all Contaminants except PAHs and Permeable Cover with Monitoring	Low	Moderate (requires handling of soil)	Low	No
Alternative 7	Excavation and Off-Site Disposal Meeting Unrestricted Use SCOs for all Contaminants Including PAHs and Short-term Monitoring	High	Moderate (requires significant handling of soil)	High	Yes
Alternative 8	Excavation and Off-Site Disposal Meeting Unrestricted Use SCOs for all Contaminants Except PAHs and Short-term Monitoring	High	Moderate (requires significant handling of soil)	High	Yes

4.0 DETAILED ANALYSIS OF ALTERNATIVES

Based on the preliminary evaluation of the remedial alternatives developed for the 26-28 Whitesboro Street Site in Section 3.0, the following are the alternatives to be evaluated in detail in this section:

Alternative 1 – No Action with Long-term Monitoring

Alternative 2 – Pavement Cap with Long-term Monitoring

Alternative 3 – Hot Spot Removal Meeting Commercial Use SCOs for all Contaminants Including PAHs and Permeable Cover with Monitoring

Alternative 4 – Hot Spot Removal Meeting Commercial Use SCOs for all Contaminants Except PAHs and Permeable Cover with Monitoring

Alternative 7 – Excavation and Off-Site Disposal Meeting Unrestricted Use SCOs for all Contaminants Including PAHs and Short-term Monitoring

Alternative 8 – Excavation and Off-Site Disposal Meeting Unrestricted Use SCOs for all Contaminants Except PAHs and Short-term Monitoring

No Action provides no remedial action and depends completely on natural attenuation for effectiveness. A pavement cap is a minimal action for remediation of a contaminated site. Hot spot removal and permeable cover is a demonstrated, proven technology for the remediation of contaminated soil. Excavation and off-site disposal is a demonstrated, proven technology for the remediation of contaminated soil.

Provided below is a detailed evaluation of each of the alternatives. Based on this detailed evaluation, a remedial plan for the site will be selected for public comment. In accordance with federal (USEPA) and New York State guidance, the following evaluation criteria will be addressed in the detailed evaluation of alternatives:

- Threshold Criteria
  - Protection of human health and the environment
  - Compliance with applicable regulatory SCGs/ARARs

- Balancing Criteria
  - Short-term impacts and effectiveness
  - Long-term effectiveness and permanence
  - Reduction in toxicity, mobility and/or volume of contamination
  - Implementability
  - Cost
- Modifying Criteria
  - Community acceptance

A detailed description of each of these criteria is provided in Section 1.4 of this document. Provided below is a comparative analysis of the remedial alternatives to each of the evaluation criteria presented above.

4.1 Overall Protection of Human Health and the Environment

Alternative 1, No Action with Long-term Groundwater Monitoring, is not protective of human health and the environment. Based on the results of the site investigation and exposure assessment, there currently is a potential significant health hazard at the site. This alternative does not mitigate potential contact with or runoff of contaminated soil. In addition, without mitigation of infiltration of precipitation through the contaminated soil there would be continued potential impacts on groundwater. Access to the site is not restricted and people are able to enter the site and potentially come into contact with contaminated soil. In addition, although land use and activity restrictions can be put in place, long-term implementation and effectiveness of these restrictions cannot be guaranteed. Therefore, this alternative is not currently protective of human health and the environment nor would it be protective in the future.

Alternative 2, Pavement Cap with Long-term Monitoring, would be somewhat protective of human health and the environment through placement of a pavement cap to mitigate contact with and runoff of contaminated soil. By placing an impermeable cover at the site, infiltration of precipitation through contaminated soil would be reduced, which would reduce the potential impacts to groundwater.

Alternative 3, Hot Spot Removal Meeting Commercial Use SCOs for all Contaminants Including PAHs and Permeable Cover with Monitoring, would provide protection of human health and the environment through removal of some contaminated soil and would mitigate contact with and runoff of remaining contaminated soil. In addition, without mitigation of infiltration of precipitation through the contaminated soil there would be continued potential impacts on groundwater.

Alternative 4, Hot Spot Removal Meeting Commercial Use SCOs for all Contaminants Except PAHs and Permeable Cover with Monitoring, would provide protection of human health and the environment through removal of some contaminated soil and would mitigate contact with and runoff of remaining contaminated soil. PAH contaminant concentrations exceeding Commercial Use SCOs would remain at the site. In addition, without mitigation of infiltration of precipitation through the contaminated soil there would be continued potential impacts on groundwater.

Alternative 7, Excavation and Off-Site Disposal Meeting Unrestricted Use SCOs for all Contaminants Including PAHs and Short-term Monitoring, would be the most protective of human health and the environment by the removal of contaminated soil and disposal off-site. Removal of contaminants would mitigate migration of contaminants to groundwater.

Alternative 8, Excavation and Off-Site Disposal Meeting Unrestricted Use SCOs for all Contaminants Except PAHs and Short-term Monitoring, would provide protection of human health and the environment through removal of the contaminated soil and would mitigate contact with and runoff of remaining contaminated soil. PAH contaminant concentrations exceeding Commercial Use SCOs would remain at the site.

Alternative 1 would not be protective of human health and the environment. Alternatives 2 and 3 are equally protective of human health and the environment, since the potential exposure to contaminated soil and the infiltration of precipitation would be reduced. Alternative 4 is less protective of human health and the environment given that PAH contaminants would remain at the site. Based on this comparative analysis, Alternative 7 would be the most protective of human health and the environment followed by Alternatives 8, 3, 4, 2, and 1, respectively.

4.2 Compliance with Standards, Criteria and Guidance

Alternative 1, No Action with Long-term Groundwater Monitoring, would not be compliant with any of the SCGs, ARARs or RAOs established for the site as described in Section 1. In particular, it would not provide any protection with regard to contact with or runoff of contaminated soil, nor would it mitigate potential impacts to groundwater.

Alternative 2, Pavement Cap with Long-term Monitoring, would be compliant with some of the SCGs, ARARs and RAOs for the site. This alternative would mitigate contact with contaminated soil, but would not significantly reduce infiltration of precipitation, and therefore, the potential impacts to groundwater, although reduced, would likely continue.

Alternative 3, Hot Spot Removal Meeting Commercial Use SCOs for all Contaminants Including PAHs and Permeable Cover with Monitoring, would be compliant with some of the SCGs, ARARs and RAOs for the site. This alternative would mitigate contact with and runoff of contaminated soil, but would not significantly reduce infiltration of precipitation, and therefore, the potential impacts to groundwater would likely continue. This alternative would be more compliant than Alternative 2 as the result of the removal of some contaminants from the site.

Alternative 4, Hot Spot Removal Meeting Commercial Use SCOs for all Contaminants Including PAHs and Permeable Cover with Monitoring, would be compliant with some of the SCGs, ARARs and RAOs for the site. This alternative would mitigate contact with and runoff of contaminated soil, but would not significantly reduce infiltration of precipitation, and therefore, the potential impacts to groundwater would likely continue. This alternative would be more compliant than Alternative 2, but less compliant than Alternative 3 since PAH contaminants would not be removed from the site.

Alternative 7, Excavation and Off-Site Disposal Meeting Unrestricted Use SCOs for all Contaminants Including PAHs and Short-term Monitoring, would be compliant with the SCGs, ARARs and RAOs established for the site. Contaminants would be removed from the site. This alternative would eliminate contact with and runoff of contaminated soil and would mitigate the potential impacts to groundwater.

Alternative 8, Excavation and Off-Site Disposal Meeting Unrestricted Use SCOs for all Contaminants Except PAHs and Short-term Monitoring, would be compliant with some SCGs, ARARs and RAOs established for the site. The majority of contaminants would be removed from the site. This alternative would eliminate contact with and runoff of contaminated soil and would reduce the potential impacts to groundwater.

In summary, Alternative 7, Excavation and Off-Site Disposal Meeting Unrestricted Use SCOs for all Contaminants Including PAHs and Short-term Monitoring, would be the most compliant with the SCGs, ARARs and RAOs for the site, followed by Alternatives 8, 3, 4, 2, and 1, respectively.

4.3 Short-term Impacts and Effectiveness

Alternative 1, No Action with Long-term Groundwater Monitoring, would not have any short-term construction related impacts and can be fully implemented immediately, however, this alternative would not be effective in the short term in preventing potential contact with or runoff of contaminated soil. It would also not be effective at mitigating potential impacts on groundwater.

Alternative 2, Pavement Cap with Long-term Monitoring, would require 1 month for design and 1 month for construction after selection of this alternative and issuance of a Record of Decision, and would be immediately effective in the short term in reducing the potential for direct contact with contaminated soil. As discussed previously, placement of pavement cap would have limited effectiveness with regard to potential impacts on groundwater. With proper implementation of a construction health and safety plan, and construction quality assurance plan, there would be no adverse impacts on human health and the environment during implementation of this alternative. The approximately 3,800 square foot area of the site would be paved, which would require that appropriate sub-base material and asphalt be brought to the site. Placement of this material would result in a slight increase in site elevation which may adversely impact future use of the site. Short-term impacts associated with construction, such as generation of dust, can be controlled through proper use of dust suppressants. Other than an increase in truck traffic, no other significant disruption to the surrounding community is expected with implementation of this alternative.

Alternative 3, Hot Spot Removal Meeting Commercial Use SCOs for all Contaminants Including PAHs and Permeable Cover with Monitoring, would require 1 month for design and 1 month for construction after selection of this alternative and issuance of the Record of Decision. Through excavation of contaminated soil and disposal off-site, this alternative would be effective in the short-term in mitigating direct contact with and runoff of contaminated soil. As discussed previously, placement of permeable cover would have limited effectiveness with regard to potential impacts on groundwater. Short-term impacts associated with excavation and backfilling activities, such as generation of dust, can be controlled through proper use of dust suppressants. Other than an increase in truck traffic, no other significant disruption to the surrounding community is expected with implementation of this alternative.

Alternative 4, Hot Spot Removal Meeting Commercial Use SCOs for all Contaminants Except PAHs and Permeable Cover with Monitoring, would require 1 month for design and 1 month for construction after selection of this alternative and issuance of the Record of Decision. Through excavation of contaminated soil and disposal off-site, this alternative would be effective in the short-term in mitigating direct contact with and runoff of contaminated soil. As discussed previously, placement of permeable cover would have limited effectiveness with regard to potential impacts on groundwater. Short-term impacts associated with excavation and backfilling activities, such as generation of dust, can be controlled through proper use of dust suppressants. Other than an increase in truck traffic, no other significant disruption to the surrounding community is expected with implementation of this alternative.

Alternative 7, Excavation and Off-Site Disposal Meeting Unrestricted Use SCOs for all Contaminants Including PAHs and Short-term Monitoring, would require 1 month for design and 3 months for construction after selection of this alternative and issuance of the Record of Decision. Through excavation of contaminated soil and disposal off-site, this alternative would be effective in the short-term in mitigating direct contact with and runoff of contaminated soil. Removal of contaminated soil to levels below SCGs would mitigate potential impacts on groundwater. Short-term impacts associated with excavation and backfilling activities, such as generation of dust, can be controlled through proper use of dust suppressants. Other than an increase in truck traffic, no other significant disruption to the surrounding community is expected with implementation of this alternative.

Alternative 8, Excavation and Off-Site Disposal Meeting Unrestricted Use SCOs for all Contaminants Except PAHs and Short-term Monitoring, would require 1 month for design and 3 months for construction after selection of this alternative and issuance of the Record of Decision. Through excavation of contaminated soil and disposal off-site, this alternative would be effective in the short-term in mitigating direct contact with and runoff of contaminated soil. Removal of contaminated soil would reduce potential impacts on groundwater. Short-term impacts associated with excavation and backfilling activities, such as generation of dust, can be controlled through proper use of dust suppressants. Other than an increase in truck traffic, no other significant disruption to the surrounding community is expected with implementation of this alternative.

Alternative 1 would have the least adverse short-term impacts as a result of no site construction activities associated with this alternative. Alternatives 3, 4, 7, and 8 would have the most significant short-term impacts, as a result of the significant truck traffic associated with each of these alternatives. However, Alternatives 3 and 4 would have less short-term impacts than Alternatives 7 and 8, since less material would be required for Alternatives 3 and 4. Based on the above discussion, Alternative 1 would have the least adverse short-term impacts followed by Alternatives 2, 4, 3, 8, and 7, respectively.

Alternative 7 would have the greatest short-term effectiveness, since all contaminated soil exceeding SCGs would be removed from the site, Alternative 8 would follow, since some contaminants would be reduced to concentrations below SCGs with this alternative. However, since some contaminants would remain at levels above SCGs, this alternative would have less short-term effectiveness than Alternative 7. Alternative 3, Alternative 4, and Alternative 2 would follow since contaminants would remain on-site at concentrations exceeding SCGs, even though the time required to implement these alternative is less than other alternatives. Alternative 1 would have the least short-term effectiveness, since none of the RAOs would be achieved by this alternative. Based on the above discussion, Alternative 7 would have the greatest short-term effectiveness followed by Alternatives 8, 3, 4, 2, and 1, respectively.

4.4 Long-term Effectiveness and Permanence

Alternative 1, no action, would not provide for long-term effectiveness and permanence, since remediation of the contaminated soil would not occur, contaminants would continue to be accessible and may migrate, and potential impacts to groundwater would continue.

Alternatives 2, 3, and 4 would provide less long-term effectiveness and permanence compared to Alternative 7, since placement of a pavement cap or permeable cover would not remove all contaminants exceeding SCGs from the site. In addition, these alternatives would not be as effective in the long-term in reducing potential impacts to groundwater as compared to removal technologies. Alternatives 2, 3, and 4 can be considered somewhat permanent if properly maintained, since contact with contaminated soil would be mitigated.

Alternative 7 would provide long-term effectiveness and permanence in protecting human health and the environment by eliminating exposure to and release of contaminants exceeding SCGs from the site, Alternative 8 would follow since some contaminants exceeding SCGs would remain.

Based on this comparative analysis, Alternative 7 would be the most effective in the long-term for remediation of the site by providing the greatest degree of long-term effectiveness and permanence relative to the 26-28 Whitesboro Street Site. Of the remaining alternatives, Alternatives 8, 3 and 4 (equally), and 2 provide greater long-term effectiveness and permanence compared to Alternative 1. Alternative 1 would be the least effective in the long-term.

4.5 Reduction of Toxicity, Mobility or Volume Through Treatment

Alternative 1 would not be effective in reducing the toxicity, mobility or volume of contaminated soil, and as a result, contaminants would continue to be accessible, released to and migrate in the environment.

Alternative 2 also would not reduce the toxicity or volume of the contaminated soil. This alternative would slightly reduce the mobility, since placement of the pavement cap would reduce migration to groundwater through isolation and reduction of infiltration of precipitation through the contaminated soil. Since this alternative would not treat or destroy the contaminants in soil, it is considered potentially reversible.

Alternative 3 also would somewhat reduce the toxicity or volume of the contaminated soil. This alternative would also slightly reduce the mobility, since placement of the permeable cover would reduce migration to groundwater through reduction of infiltration of precipitation through the contaminated soil. Since this alternative would not treat or destroy the remaining contaminants in soil, it is considered potentially reversible.

Alternative 4 would somewhat reduce the toxicity or volume of the contaminated soil, however, some contaminants would remain in excess of SCGs. This alternative would also slightly reduce the mobility, since placement of the permeable cover would reduce migration to groundwater through reduction of infiltration of precipitation through the contaminated soil. Since this alternative would not treat or destroy the remaining contaminants in soil, it is considered potentially reversible.

Alternative 7 would not reduce the toxicity or volume of contaminated soil through disposal of the contaminated material off-site. Toxicity and volume of contaminated soil would be reduced at the site, since the contaminants would no longer be present at the site. This alternative would reduce the mobility of contaminated soil, since the material would be disposed in a permitted disposal facility. Since this alternative would remove the contaminated soil, it is considered irreversible with respect to the site.

Alternative 8 would not reduce the toxicity or volume of contaminated soil through disposal of the contaminated material off-site. Toxicity and volume of contaminated soil would be reduced at the site, however, some contaminants would remain in excess of SCGs. This alternative would reduce the mobility of contaminated soil, since the material would be disposed in a permitted disposal facility. Since this alternative would remove the contaminated soil, it is considered irreversible with respect to the site.

Based on the above comparative analysis, Alternative 7 would be the most effective at reducing the toxicity, mobility and volume of contaminants to the environment, followed by Alternatives 8, 3, 4, 2 and 1 respectively.

4.6 Implementability

As discussed in Section 3.2, although Alternative 1 is readily implementable physically, it is not implementable from a regulatory perspective, since it does not eliminate contact with contaminated soil, or provide for mitigation of infiltration of precipitation. Therefore, the 26-28 Whitesboro Street Site would continue to potentially impact groundwater.

All of the necessary labor, equipment, materials and supplies for implementation of Alternative 2, pavement cap, are readily available. Material would need to be transported to the site, thereby increasing truck traffic in the surrounding community. Once the pavement cap is installed, future use of the site would need to be restricted in order to ensure the integrity of the cap.

All of the necessary labor, equipment, materials and supplies for implementation of Alternative 3, hot spot removal meeting commercial use SCOs for all contaminants including PAHs and permeable cover with monitoring, are readily available. Up to 5,700 cubic yards of soil would require off-site disposal and an equal volume of material would need to be transported to the site for backfill, thereby increasing truck traffic in the surrounding community. Once the permeable cover is installed, future use of the site would need to be restricted in order to ensure the integrity of the cover.

All of the necessary labor, equipment, materials and supplies for implementation of Alternative 4, hot spot removal meeting commercial use SCOs for all contaminants except PAHs and permeable cover with monitoring, are readily available. Up to 4,150 cubic yards of soil would require off-site disposal and an equal volume of material would need to be transported to the site for backfill, thereby increasing truck traffic in the surrounding community. Once the permeable cover is installed, future use of the site would need to be restricted in order to ensure the integrity of the cover.

All of the necessary labor, equipment, materials and supplies for implementation of Alternative 7, excavation and off-site disposal meeting unrestricted use SCOs for all contaminants including PAHs and short-term monitoring, are readily available. Up to 8,500 cubic yards of soil would require off-site disposal and an equal volume of material would need to be transported to the site for backfill, thereby increasing truck traffic in the surrounding community. Excavation of contaminated soil associated with Alternative 7 may require emissions controls to mitigate off-site migration of dust. With the exception of the time required to implement this alternative, Alternative 7 would not have any long-term presence at the site. No delays regarding implementation of any of the alternatives is expected. Coordination with the appropriate regulatory agencies would be necessary for all of the alternatives, but is not expected to impede implementation.

All of the necessary labor, equipment, materials and supplies for implementation of Alternative 8, excavation and off-site disposal meeting unrestricted use SCOs for all contaminants except PAHs and short-term monitoring, are readily available. Up to 7,850 cubic yards of soil would require off-site disposal and an equal volume of material would need to be transported to the site for backfill, thereby increasing truck traffic in the surrounding community. Excavation of contaminated soil associated with Alternative 8 may require emissions controls to mitigate off-site migration of dust. With the exception of the time required to implement this alternative, Alternative 8 would not have any long-term presence at the site. No delays regarding implementation of any of the alternatives are expected. Coordination with the appropriate regulatory agencies would be necessary for all of the alternatives, but is not expected to impede implementation.

Alternative 1, no action, is the easiest alternative to implement followed by Alternatives 2, 4, 3, 8 and 7, respectively.

4.7 Cost

The estimated capital costs, and long-term (30-year) O&M and monitoring present worth costs associated with each of the remedial alternatives are presented in Table 4-1. A detailed breakdown of each cost estimate is provided in Appendix D.

As can be seen in Table 4-1, Alternative 1 is the least costly, followed by Alternatives 2, 4, 3, 5, and 7, respectively.

TABLE 4-1
REMEDIAL ALTERNATIVES ANALYSIS REPORT
26-28 WHITESBORO STREET SITE
REMEDIAL ALTERNATIVES COST SUMMARY

Alternative	Estimated Capital Cost	Estimated Contingency and Engineering Fees	Operation Maintenance and Monitoring Costs (years 1-5)	Operation Maintenance and Monitoring Costs (years 6-30)	Total Estimated Costs Based on Present Worth
1	$10,000	$3,500	$41,000	$102,500	$94,300
2	$195,800	$68,600	$91,000	$355,500	$500,400
3	$451,200	$157,800	$78,000	$340,000	$827,000
4	$348,200	$121,800	$78,000	$340,000	$688,000
5	$490,500	$171,500	$78,000	$340,000	$880,000
6	$131,800	$46,200	$78,000	$340,000	$396,000
7	$703,600	$246,400	$20,500	NA	$968,000
8	$653,400	$228,600	$20,500	NA	$900,000

4.8 Community Acceptance

This section presents issues and concerns that the public may have regarding each of the alternatives presented. Actual community acceptance will be evaluated in the future based on comments received from the public.

Alternative 1 would not provide for protection from the potential for exposure to contaminated soil, and would not reduce the impacts to groundwater.

Since Alternative 2 provides protection against direct contact with contaminated soil and reduces impacts to the environment, this alternative may not be acceptable to the community.

Alternatives 3 and 4 would likely be more acceptable to the community than Alternatives 1 and 2, since they provide greater protection against direct contact with contaminated soil, and less potential impacts to the environment. Potential hazards associated with Alternatives 3 and 4, which are related to the community, include exposure to particulate matters released during soil excavation.

Alternatives 7 and 8 would likely be the most acceptable alternatives to the community, since they would provide for the greatest protection against exposure to contaminated soil, and would be the most effective alternative at reducing impacts to the environment. Significant truck traffic associated with these alternatives would potentially make these alternatives less acceptable to the community, however, since the site is situated in a commercial area that currently handles truck traffic, it is unlikely that this would be a significant issue. Therefore, Alternative 7 would likely be the most acceptable to the community, since it is the most permanent remedy for the site, followed by Alternatives 8, 3, 4, 2 and 1, respectively.

4.9 Recommended Alternative

Based on the preliminary evaluation of the remedial alternatives described in Section 3.0, and the detailed analysis of these alternatives in Section 4.0, Alternative 3, Hot Spot Removal

Meeting Commercial Use SCOs for all Contaminants including PAHs and Permeable Cover with Monitoring, is the recommended alternative for remediation of the 26-28 Whitesboro Street Site. This alternative meets most of the remedial action objectives and remedial alternatives analysis criteria, in particular, protection of human health and the environment established for the site.

Alternative 7, Excavation and Off-Site Disposal Meeting Unrestricted Use SCOs for all Contaminants Including PAHs and Short-term Monitoring, ranks higher than Alternative 3, although, Alternative 7 is approximately $140,000 more costly than Alternative 3. Alternative 7 would be more difficult to implement than Alternative 3 and likely would have more significant short-term impacts due to greater amounts of soil handling required and longer duration to complete the remediation.

Alternative 3, Hot Spot Removal Meeting Commercial Use SCOs for all Contaminants including PAHs and Permeable Cover with Monitoring, is a proven, effective and commercially available technology that can be implemented almost immediately without adverse impacts. A pilot study would not be required to complete this alternative.

5.0 REFERENCES

D&B, 2006. Site Investigation Report – 26-28 Whitesboro Street Site. Brownfields Site No. B00063-6. August 2006.

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NYSDEC, 1998. Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations. Division of Water Technical and Operational Guidance Series (TOGS) 1.1.1. June 1998 (April 2000 addendum).

NYSDEC, 1990. Selection of Remedial Actions at Inactive Hazardous Waste Sites. Division of Hazardous Waste Remediation Technical and Administrative Guidance Memorandum (TAGM) HWR-90-4030. May 15, 1990.

APPENDIX A

SURFACE SOIL ANALYTICAL RESULTS

TABLE 1-1a.
26-28 WHITESBORO STREET SITE
SITE INVESTIGATION
SURFACE SOIL SAMPLE RESULTS - JUNE 2003
SEMIVOLATILE ORGANIC COMPOUNDS

Sample Identification	**SS-1**	**SS-2**	**SS-3**	**SS-4**	**SS-5**	Contract Required Detection Limit	Unrestricted Use Soil Cleanup Objectives[1]	Restricted Use Soil Cleanup Objectives[2]			
Sample Depth (feet)	0-0.2	0-0.2	0-0.2	0-0.2	0-0.2			Protection of Public Health			Protection of Groundwater
Date of Collection	06/06/03	06/06/03	06/06/03	06/06/03	06/06/03			Residential	Restricted-Residential	Commercial	
Dilution Factor	1.0	1.0	1.0	1.0	1.0						
Percent Moisture	25	25	17	15	23						
Units	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)
Benzaldehyde	U	U	U	U	U	550	----	----	----	----	----
Phenol	U	U	U	U	U	550	330[b]	100,000[a]	100,000[a]	500,000[b1]	330[e]
bis(2-Chloroethyl)ether	U	U	U	U	U	550	----	----	----	----	----
2-Chlorophenol	U	U	U	U	U	550	----	----	----	----	----
2-Methylphenol	U	U	U	U	U	550	----	----	----	----	----
2,2-Oxybis (1-Chloropropane)	U	U	U	U	U	550	----	----	----	----	----
Acetophenone	U	U	U	U	U	550	----	----	----	----	----
4-Methylphenol	U	U	U	U	U	550	----	----	----	----	----
N-Nitroso-di-n-propylamine	U	U	U	U	U	550	----	----	----	----	----
Hexachloroethane	U	U	U	U	U	550	----	----	----	----	----
Nitrobenzene	U	U	U	U	U	550	----	----	----	----	----
Isophorone	U	U	U	U	U	550	----	----	----	----	----
2-Nitrophenol	U	U	U	U	U	550	----	----	----	----	----
2,4-Dimethylphenol	U	U	U	U	U	550	----	----	----	----	----
bis(2-Chloroethoxy)methane	U	U	U	U	U	550	----	----	----	----	----
2,4-Dichlorophenol	U	U	U	U	U	550	----	----	----	----	----
Naphthalene	70 J	U	1,300	U	U	550	12,000	100,000[a]	100,000[a]	500,000[b1]	12,000
4-Chloroaniline	U	U	U	U	U	550	----	----	----	----	----
Hexachlorobutadiene	U	U	U	U	U	550	----	----	----	----	----
Caprolactum	U	U	U	U	U	550	----	----	----	----	----
4-Chloro-3-methylphenol	U	U	U	U	U	550	----	----	----	----	----
2-Methylnaphthalene	U	U	710 J	U	U	550	----	----	----	----	----
Hexachlorocyclopentadiene	U	U	U	U	U	550	----	----	----	----	----
2,4,6-Trichlorophenol	U	U	U	U	U	1400	----	----	----	----	----
2,4,5-Trichlorophenol	U	U	U	U	U	550	----	----	----	----	----
1,1'-Biphenyl	U	U	90 J	U	U	1400	----	----	----	----	----
2-Chloronaphthalene	U	U	U	U	U	1400	----	----	----	----	----
2-Nitroaniline	U	U	U	U	U	550	----	----	----	----	----
Dimethylphthalate	U	U	U	U	U	550	----	----	----	----	----
Acenaphthylene	79 J	U	1,500	60 J	99 J	550	100,000[a]	100,000[a]	100,000[a]	500,000[b1]	107,000
2,6-Dinitrotoluene	U	U	U	U	U	550	----	----	----	----	----
3-Nitroaniline	U	U	U	U	U	1400	----	----	----	----	----
Acenaphthene	75 J	U	3,100	52 J	66 J	550	20,000	100,000[a]	100,000[a]	500,000[b1]	98,000
2,4-Dinitrophenol	U	U	U	U	U	1400	----	----	----	----	----
4-Nitrophenol	U	U	U	U	U	1400	----	----	----	----	----
Dibenzofuran	70 J	U	2,500	43 J	U	550	----	----	----	----	----

TABLE 1-1a. (CONTINUED)
26-28 WHITESBORO STREET SITE
SITE INVESTIGATION
SURFACE SOIL SAMPLE RESULTS - JUNE 2003
SEMIVOLATILE ORGANIC COMPOUNDS

Sample Identification	**SS-1**	**SS-2**	**SS-3**	**SS-4**	**SS-5**	Contract Required Detection Limit	Unrestricted Use Soil Cleanup Objectives[1]	Restricted Use Soil Cleanup Objectives[2]			
Sample Depth (feet)	0-0.2	0-0.2	0-0.2	0-0.2	0-0.2			Protection of Public Health			Protection of Groundwater
Date of Collection	6/6/2003	6/6/2003	6/6/2003	6/6/2003	6/6/2003			Residential	Restricted-Residential	Commercial	
Dilution Factor	1.0	1.0	1.0	1.0	1.0						
Percent Moisture	25	25	17	15	23						
Units	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)
2,4-Dinitrotoluene	U	U	U	U	U	550	----	----	----	----	----
Diethylphthalate	U	U	U	U	U	550	----	----	----	----	----
4-Chlorophenyl-phenylether	U	U	U	U	U	550	----	----	----	----	----
Fluorene	85 J	U	3,700	55 J	74 J	550	30,000	100,000[a]	100,000[a]	500,000[b1]	386,000
4-Nitroaniline	U	U	U	U	U	1400	----	----	----	----	----
4,6-Dinitro-2-methylphenol	U	U	U	U	U	1400	----	----	----	----	----
N-Nitrosodiphenylamine	U	U	U	U	U	550	----	----	----	----	----
4-Bromophenyl-phenylether	U	U	U	U	U	550	----	----	----	----	----
Hexachlorobenzene	U	U	U	U	U	550	----	----	----	----	----
Atrazine	U	U	U	U	U	550	----	----	----	----	----
Pentachlorophenol	U	U	U	U	U	1400	800[b]	2,400	6,700	6,700	800[e]
Phenanthrene	1,500	82 J	100,000 D	830	1,100	550	100,000	100,000[a]	100,000[a]	500,000[b1]	1,000,000[c1]
Anthracene	150 J	U	23,000 DJ	180 J	250 J	550	100,000[a]	100,000[a]	100,000[a]	500,000[b1]	1,000,000[c1]
Carbazole	220 J	U	14,000 DJ	120 J	140 J	550	----	----	----	----	----
Di-n-butylphthalate	U	U	U	U	U	550	----	----	----	----	----
Fluoranthene	2,800	270 J	**200,000 D**	1,500	2,600	550	100,000[a]	100,000[a]	100,000[a]	500,000[b1]	1,000,000[c1]
Pyrene	1,800	240 J	**170,000 D**	1,300	2,200	550	100,000	100,000[a]	100,000[a]	500,000[b1]	1,000,000[c1]
Butylbenzylphthalate	U	U	U	U	U	550	----	----	----	----	----
3,3'-Dichlorobenzidine	U	U	U	U	U	550	----	----	----	----	----
Benzo (a) anthracene	800	160 J	***79,000 D***	700	***1,200***	550	1,000[c]	1,000[f]	1,000[f]	5,600	1,000[f]
Chrysene	980	160 J	***75,000 D***	760	***1,200***	550	1,000[c]	1,000[f]	3,900	56,000	1,000[f]
bis(2-Ethylhexyl)phthalate	130 J	110 J	320 J	200 J	1,900	550	----	----	----	----	----
Di-n-octylphthalate	U	U	U	U	U	550	----	----	----	----	----
Benzo(b)fluoranthene	***2,100***	260 J	***110,000 D***	**1,200**	***2,000***	550	1,000[c]	1,000[f]	1,000[f]	5,600	1,700
Benzo(k)fluoranthene	670	81 J	***33,000 DJ***	420	640	550	800c	1,000	3,900	56,000	1,700
Benzo(a)pyrene	950	150 J	***76,000 D***	810	**1,300**	550	1,000[c]	1,000[f]	1,000[f]	1,000[f]	22,000
Indeno(1,2,3-cd)pyrene	**670**	92 J	***38,000 DJ***	490	**710**	550	500[c]	500[f]	500[f]	5,600	8,200
Dibenzo(a,h)anthracene	190 J	U	**1,400**	150 J	220 J	550	330[b]	330[e]	330[e]	56,000	1,000,000[c1]
Benzo(g,h,i)perylene	750	100 J	43,000 D	590	780	550	100,000	100,000[a]	100,000[a]	500,000[b1]	1,000,000[c1]
Total PAHs	13,669	1,595	958,000	9,097	14,439						
Total Carcinogen PAHs	6,360	903	412,400	4,530	7,270						
Total SVOCs	14,089	1,705	***975,620***	9,460	16,479		100,000	100,000	100,000	500,000	1,000,000
Total SVOC TICs	10,105	8,984	23,360	4,794	6,908						

QUALIFIERS:
B: Compound found in the method blank as well as the sample
D: Result taken from a reanalysis at a secondary dilution
J: Compound found at a concentration below the CRDL, value estimated
U: Compound analyzed for but not detected

BOLD Indicates the value exceeds the NYSDEC Unrestricted Use SCOs
(Box) Indicates the value exceeds the NYSDEC Residential SCO
(Shading) Indicates the value exceeds the NYSDEC Restricted-Residential SCO
Underline Indicates the value exceeds the NYSDEC Commercial SCO
Italics Indicates the value exceeds the NYSDEC Protection of Groundwater SCO

NOTES:
All concentrations are in micrograms per kilogram (ug/kg) or parts per billion (ppb)
1: 6 NYCRR PART 375 - Table 375-6.8(a): Unrestricted Use Soil Cleanup Objectives (SCOs)
2: 6 NYCRR PART 375 - Table 375-6.8(b): Restricted Use SCOs
a: The SCOs for unrestricted use, residential, restricted-residential and ecological resources use were capped at a maximum value of 100,000 ug/kg
b: For constituents where the calculated SCO was lower than the contract required quantification limit (CRQL), the CRQL is used as the Track 1 SCO value
b1: The SCOs for commercial use were capped at a maximum value of 500,000 ug/kg
c: For constituents where the calculated SCO was lower than the rural soil background concentrations as determined by the Department and the Department of Health rural soil survey, the rural soil background concentration is used as the Track 1 SCO value for this use of the site
c1: The SCOs for industrial use and the protection of groundwater were capped at a maximum value of 1,000,000
e: For constituents where the calculated SCO was lower than the CRQL, the CRQL is used as the SCO value
f: For constituents where the calculated SCO was lower than the rural soil background concentrations as determined by the Department and the Department of Health rural soil survey, the rural soil background concentration is used as the Track 2 SCO value for this use of the site
----: not established

TABLE 1-1a.
26-28 WHITESBORO STREET SITE
SITE INVESTIGATION
SURFACE SOIL SAMPLE RESULTS - JUNE 2003
SEMIVOLATILE ORGANIC COMPOUNDS

Sample Identification	**SS-6**	**SS-7**	**SS-8**	Contract Required Detection Limit	Unrestricted Use Soil Cleanup Objectives[1]	Restricted Use Soil Cleanup Objectives[2]			
Sample Depth (feet)	0-0.2	0-0.2	0-0.2			Protection of Public Health			Protection of Groundwater
Date of Collection	06/06/03	06/06/03	06/06/03			Residential	Restricted-Residential	Commercial	
Dilution Factor	1.0	1.0	1.0						
Percent Moisture	21	19	22						
Units	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)
Benzaldehyde	U	U	U	550	----	----	----	----	----
Phenol	U	U	U	550	330[b]	100,000[a]	100,000[a]	500,000[b1]	330[e]
bis(2-Chloroethyl)ether	U	U	U	550	----	----	----	----	----
2-Chlorophenol	U	U	U	550	----	----	----	----	----
2-Methylphenol	U	U	U	550	----	----	----	----	----
2,2-Oxybis (1-Chloropropane)	U	U	U	550	----	----	----	----	----
Acetophenone	U	U	U	550	----	----	----	----	----
4-Methylphenol	U	U	U	550	----	----	----	----	----
N-Nitroso-di-n-propylamine	U	U	U	550	----	----	----	----	----
Hexachloroethane	U	U	U	550	----	----	----	----	----
Nitrobenzene	U	U	U	550	----	----	----	----	----
Isophorone	U	U	U	550	----	----	----	----	----
2-Nitrophenol	U	U	U	550	----	----	----	----	----
2,4-Dimethylphenol	U	U	U	550	----	----	----	----	----
bis(2-Chloroethoxy)methane	U	U	U	550	----	----	----	----	----
2,4-Dichlorophenol	U	U	U	550	----	----	----	----	----
Naphthalene	62 J	U	150 J	550	12,000	100,000[a]	100,000[a]	500,000[b1]	12,000
4-Chloroaniline	U	U	U	550	----	----	----	----	----
Hexachlorobutadiene	U	U	U	550	----	----	----	----	----
Caprolactum	U	U	U	550	----	----	----	----	----
4-Chloro-3-methylphenol	U	U	U	550	----	----	----	----	----
2-Methylnaphthalene	56 J	U	140 J	550	----	----	----	----	----
Hexachlorocyclopentadiene	U	U	U	550	----	----	----	----	----
2,4,6-Trichlorophenol	U	U	U	1400	----	----	----	----	----
2,4,5-Trichlorophenol	U	U	U	550	----	----	----	----	----
1,1'-Biphenyl	U	U	U	1400	----	----	----	----	----
2-Chloronaphthalene	U	U	U	1400	----	----	----	----	----
2-Nitroaniline	U	U	U	550	----	----	----	----	----
Dimethylphthalate	U	U	U	550	----	----	----	----	----
Acenaphthylene	70 J	99 J	160 J	550	100,000[a]	100,000[a]	100,000[a]	500,000[b1]	107,000
2,6-Dinitrotoluene	U	U	U	550	----	----	----	----	----
3-Nitroaniline	U	U	U	1400	----	----	----	----	----
Acenaphthene	72 J	U	320 J	550	20,000	100,000[a]	100,000[a]	500,000[b1]	98,000
2,4-Dinitrophenol	U	U	U	1400	----	----	----	----	----
4-Nitrophenol	U	U	U	1400	----	----	----	----	----
Dibenzofuran	66 J	U	360 J	550	----	----	----	----	----

TABLE 1-1a. (CONTINUED)
26-28 WHITESBORO STREET SITE
SITE INVESTIGATION
SURFACE SOIL SAMPLE RESULTS - JUNE 2003
SEMIVOLATILE ORGANIC COMPOUNDS

Sample Identification	**SS-6**	**SS-7**	**SS-8**	Contract Required Detection Limit	Unrestricted Use Soil Cleanup Objectives[1]	Restricted Use Soil Cleanup Objectives[2]			
Sample Depth (feet)	0-0.2	0-0.2	0-0.2			Protection of Public Health			Protection of Groundwater
Date of Collection	6/6/2003	6/6/2003	6/6/2003			Residential	Restricted-Residential	Commercial	
Dilution Factor	1.0	1.0	1.0						
Percent Moisture	21	19	22						
Units	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)
2,4-Dinitrotoluene	U	U	U	550	----	----	----	----	----
Diethylphthalate	U	U	U	550	----	----	----	----	----
4-Chlorophenyl-phenylether	U	U	U	550	----	----	----	----	----
Fluorene	85 J	45 J	490	550	30,000	100,000[a]	100,000[a]	500,000[b1]	386,000
4-Nitroaniline	U	U	U	1400	----	----	----	----	----
4,6-Dinitro-2-methylphenol	U	U	U	1400	----	----	----	----	----
N-Nitrosodiphenylamine	U	U	U	550	----	----	----	----	----
4-Bromophenyl-phenylether	U	U	U	550	----	----	----	----	----
Hexachlorobenzene	U	U	U	550	----	----	----	----	----
Atrazine	U	U	U	550	----	----	----	----	----
Pentachlorophenol	U	U	U	1400	800[b]	2,400	6,700	6,700	800[e]
Phenanthrene	1,200	610	7,200 D	550	100,000	100,000[a]	100,000[a]	500,000[b1]	1,000,000[c1]
Anthracene	260 J	150 J	1,200	550	100,000[a]	100,000[a]	100,000[a]	500,000[b1]	1,000,000[c1]
Carbazole	170 J	83 J	990	550	----	----	----	----	----
Di-n-butylphthalate	U	U	44 J	550	----	----	----	----	----
Fluoranthene	2,100	2,000	11,000 D	550	100,000[a]	100,000[a]	100,000[a]	500,000[b1]	1,000,000[c1]
Pyrene	1,700	1,600	9,500 D	550	100,000	100,000[a]	100,000[a]	500,000[b1]	1,000,000[c1]
Butylbenzylphthalate	U	U	U	550	----	----	----	----	----
3,3'-Dichlorobenzidine	U	U	U	550	----	----	----	----	----
Benzo (a) anthracene	950	850	***5,200 D***	550	1,000[c]	1,000[f]	1,000[f]	5,600	1,000[f]
Chrysene	960	900	***5,600 D***	550	1,000[c]	1,000[f]	3,900	56,000	1,000[f]
bis(2-Ethylhexyl)phthalate	240 J	200 J	290 J	550	----	----	----	----	----
Di-n-octylphthalate	U	U	U	550	----	----	----	----	----
Benzo(b)fluoranthene	**1,600**	**1,600**	***9,700 D***	550	1,000[c]	1,000[f]	1,000[f]	5,600	1,700
Benzo(k)fluoranthene	540	510	***3,200 D***	550	800c	1,000	3,900	56,000	1,700
Benzo(a)pyrene	1,000	**1,100**	**6,700 D**	550	1,000[c]	1,000[f]	1,000[f]	1,000[f]	22,000
Indeno(1,2,3-cd)pyrene	**590**	**600**	85 J	550	500[c]	500[f]	500[f]	5,600	8,200
Dibenzo(a,h)anthracene	180 J	180 J	73 J	550	330[b]	330[e]	330[e]	56,000	1,000,000[c1]
Benzo(g,h,i)perylene	630	640	81 J	550	100,000	100,000[a]	100,000[a]	500,000[b1]	1,000,000[c1]
Total PAHs	11,999	10,884	60,659						
Total Carcinogen PAHs	5,820	5,740	30,558						
Total SVOCs	12,531	11,167	62,483		100,000	100,000	100,000	500,000	1,000,000
Total SVOC TICs	6,825	9,246	6,390						

QUALIFIERS:
B: Compound found in the method blank as well as the sample
D: Result taken from a reanalysis at a secondary dilution
J: Compound found at a concentration below the CRDL, value estimated
U: Compound analyzed for but not detected

BOLD Indicates the value exceeds the NYSDEC Unrestricted Use SCOs
[Box] Indicates the value exceeds the NYSDEC Residential SCO
[Shading] Indicates the value exceeds the NYSDEC Restricted-Residential SCO
Underline Indicates the value exceeds the NYSDEC Commercial SCO
Italics Indicates the value exceeds the NYSDEC Protection of Groundwater SCO

NOTES:
All concentrations are in micrograms per kilogram (ug/kg) or parts per billion (ppb)
1: 6 NYCRR PART 375 - Table 375-6.8(a): Unrestricted Use Soil Cleanup Objectives (SCOs)
2: 6 NYCRR PART 375 - Table 375-6.8(b): Restricted Use SCOs
a: The SCOs for unrestricted use, residential, restricted-residential and ecological resources use were capped at a maximum value of 100,000 ug/kg
b: For constituents where the calculated SCO was lower than the contract required quantification limit (CRQL), the CRQL is used as the Track 1 SCO value
b1: The SCOs for commercial use were capped at a maximum value of 500,000 ug/kg
c: For constituents where the calculated SCO was lower than the rural soil background concentrations as determined by the Department and the Department of Health rural soil survey, the rural soil background concentration is used as the Track 1 SCO value for this use of the site
c1: The SCOs for industrial use and the protection of groundwater were capped at a maximum value of 1,000,000
e: For constituents where the calculated SCO was lower than the CRQL, the CRQL is used as the SCO value
f: For constituents where the calculated SCO was lower than the rural soil background concentrations as determined by the Department and the Department of Health rural soil survey, the rural soil background concentration is used as the Track 2 SCO value for this use of the site
----: not established

TABLE 1-2b.
26-28 WHITESBORO STREET SITE
SITE INVESTIGATION
SURFACE SOIL SAMPLE RESULTS - JUNE 2005
INORGANIC PARAMETERS

Sample Identification	**SS-9**	**SS-10**	**SS-11**	**SS-12**	**SS-13**	Instrument Detection Limit	Unrestricted Use Soil Cleanup Objectives[1]	Restricted Use Soil Cleanup Objectives[2]			
Sample Depth (feet)	0-0.2	0-0.2	0-0.2	0-0.2	0-0.2			Protection of Public Health			Protection of Groundwater
Date of Collection	06/01/05	06/01/05	06/01/05	06/01/05	06/01/05			Residential	Restricted-Residential	Commercial	
Dilution Factor	1.0	1.0	1.0	1.0	1.0						
Percent Solids	90	92	89	78	79						
Units	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
Aluminum	4,960	3,830	3,140	1,650	3,930	13	----	----	----	----	----
Antimony	0.61 B	0.073 B	0.21 B	0.34 B	0.18 B	8	----	----	----	----	----
Arsenic	9.3	4.6	3.4	2.0	3.3	3	13[c]	16[f]	16[f]	16[f]	16[f]
Barium	186	90.9	121	288	215	1	350[c]	350[f]	400	400	820
Beryllium	0.31	0.20 B	0.15 B	0.080 B	0.20 B	1	7.2	14	72	590	47
Cadmium	0.91	0.72	0.76	0.26 B	0.54	1	2.5[c]	2.5[f]	4.3	9.3	7.5
Calcium	19,300	22,100	65,500	18,100	62,900	8	----	----	----	----	----
Chromium	8.4	7.8	8.0	4.5	7.4	1	30[c]	36	180	1,500	----
Cobalt	4.2	3.5	2.9	1.5 B	3.3	2	----	----	----	----	----
Copper	***397***	**61.0**	44.9	9.1	15.3	1	50	270	270	270	1,720
Iron	12,400	9,120	7,270	3,990	8,840	20	----	----	----	----	----
Lead	***674***	**176**	**84.2**	***980***	***1,290***	2	63[c]	400	400	1,000	450
Magnesium	2,300	3,330	3,240	1,240	4,360	8	----	----	----	----	----
Manganese	538	308	233	116	265	4	1,600[c]	2,000[f]	2,000[f]	10,000[d]	2,000[f]
Mercury	***1.1***	**0.38**	0.11	***8.9***	**0.48**	0.2	0.18[c]	0.81[j]	0.81[j]	2.8[j]	0.73
Nickel	22.9	23.8	19.4	4.4	10.0	2	30	140	310	310	130
Potassium	554	457	437	294	692	20	----	----	----	----	----
Selenium	U	U	0.24 B	0.21 B	0.49 B	4	3.9[c]	36	180	1,500	4[f]
Silver	U	U	U	U	U	1	2	36	180	1,500	8.3
Sodium	61.6	140	90.1	53.3	105	9	----	----	----	----	----
Thallium	U	0.19 B	0.91	0.58 B	1.3	5	----	----	----	----	----
Vanadium	12.9	9.8	9.4	5.8	13.6	1	----	----	----	----	----
Zinc	**280**	**121**	**184**	**162**	**177**	1	109[c]	2,200	10,000[d]	10,000[d]	2,480

QUALIFIERS:
B: Compound found in the method blank as well as the sample
D: Result taken from a reanalysis at a secondary dilution
J: Compound found at a concentration below the CRDL, value estimated
U: Compound analyzed for but not detected

BOLD Indicates the value exceeds the NYSDEC Unrestricted Use SCOs
[Box] Indicates the value exceeds the NYSDEC Residential SCO
[Shaded] Indicates the value exceeds the NYSDEC Restricted-Residential SCO
Underline Indicates the value exceeds the NYSDEC Commercial SCO
Italics Indicates the value exceeds the NYSDEC Protection of Groundwater SCO

NOTES:
All concentrations are in micrograms per kilogram (mg/kg) or parts per million (ppm)
1: 6 NYCRR PART 375 - Table 375-6.8(a): Unrestricted Use Soil Cleanup Objectives (SCOs)
2: 6 NYCRR PART 375 - Table 375-6.8(b): Restricted Use SCOs
c: For constituents where the calculated SCO was lower than the rural soil background concentrations as determined by the Department and the Department of Health rural soil survey, the rural soil background concentration is used as the Track 1
d: The SCOs for metals were capped at a maximum value of 10,000 ppm
f: For constituents where the calculated SCO was lower than the rural soil background concentrations as determined by the Department and the Department of Health rural soil survey, the rural soil background concentration is used as the Track 2 SCO value for this use of the site
j: This SCO is the lower of the values for mercury (elemental) or mercury (inorganic salts)
*: This SCO is the higher of the values for chromium (trivalent) SCO value for this use of the site
----: not established

TABLE 1-2b. (continued)
26-28 WHITESBORO STREET SITE
SITE INVESTIGATION
SURFACE SOIL SAMPLE RESULTS - JUNE 2005
INORGANIC PARAMETERS

Sample Identification	**SS-14**	**SS-15**	**BSS-1**	**BSS-2**	**BSS-3**	Instrument Detection Limit	Unrestricted Use Soil Cleanup Objectives[1]	Restricted Use Soil Cleanup Objectives[2]			
Sample Depth (feet)	0-0.2	0-0.2	0-0.2	0-0.2	0-0.2			Protection of Public Health			Protection of Groundwater
Date of Collection	06/01/05	06/01/05	06/02/05	06/02/05	06/02/05			Residential	Restricted-Residential	Commercial	
Dilution Factor	1.0	1.0	1.0	1.0	1.0						
Percent Solids	88	83	87	90	88						
Units	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
Aluminum	3,460	4,650	4,190	6,620	4,820	13	----	----	----	----	----
Antimony	0.26 B	U	0.097 B	U	0.19 B	8	----	----	----	----	----
Arsenic	7.1	6.2	2.1	5.4	11.3	3	13[c]	16[f]	16[f]	16[f]	16[f]
Barium	75.5	147	16.5	55.6	82.8	1	350[c]	350[f]	400	400	820
Beryllium	0.22 B	0.25 B	0.11 B	0.36	0.24	1	7.2	14	72	590	47
Cadmium	0.96	0.77	0.19 B	0.50	0.46	1	2.5[c]	2.5[f]	4.3	9.3	7.5
Calcium	46,600	41,000	2,870	15,400	14,900	8	----	----	----	----	----
Chromium	6.7	14.0	4.1	11.7	6.5	1	30[c]	36	180	1,500	----
Cobalt	3.3	5.0	2.0 B	6.4	4.1	2	----	----	----	----	----
Copper	39.5	39.7	10.1	**52.8**	25.8	1	50	270	270	270	1,720
Iron	8,380	9,850	7,780	14,900	10,100	20	----	----	----	----	----
Lead	**161**	**413**	52.1	**89.1**	**82.9**	2	63[c]	400	400	1,000	450
Magnesium	2,730	2,550	961	4,460	2,090	8	----	----	----	----	----
Manganese	172	305	222	589	712	4	1,600[c]	2,000[f]	2,000[f]	10,000[d]	2,000[f]
Mercury	**0.21**	**0.35**	0.068	0.13	0.16	0.2	0.18[c]	0.81[j]	0.81[j]	2.8[j]	0.73
Nickel	9.9	20.0	5.0	17.8	11.0	2	30	140	310	310	130
Potassium	583	628	236	788	512	20	----	----	----	----	----
Selenium	0.56 B	0.41 B	U	U	U	4	3.9[c]	36	180	1,500	4[f]
Silver	U	U	0.036	U	U	1	2	36	180	1,500	8.3
Sodium	108	110	33.1 B	50.0 B	53.3	9	----	----	----	----	----
Thallium	1.0	0.84 B	U	U	U	5	----	----	----	----	----
Vanadium	12.3	13.0	9.1	15.6	10.9	1	----	----	----	----	----
Zinc	**112**	**177**	40.5	87.8	74.1	1	109[c]	2,200	10,000[d]	10,000[d]	2,480

QUALIFIERS:
B: Compound found in the method blank as well as the sample
D: Result taken from a reanalysis at a secondary dilution
J: Compound found at a concentration below the CRDL, value estimated
U: Compound analyzed for but not detected

BOLD Indicates the value exceeds the NYSDEC Unrestricted Use SCOs
[boxed] Indicates the value exceeds the NYSDEC Residential SCO
[shaded] Indicates the value exceeds the NYSDEC Restricted-Residential SCO
Underline Indicates the value exceeds the NYSDEC Commercial SCO
Italics Indicates the value exceeds the NYSDEC Protection of Groundwater SCO

NOTES:
All concentrations are in micrograms per kilogram (mg/kg) or parts per million (ppm)
1: 6 NYCRR PART 375 - Table 375-6.8(a): Unrestricted Use Soil Cleanup Objectives (SCOs)
2: 6 NYCRR PART 375 - Table 375-6.8(b): Restricted Use SCOs
c: For constituents where the calculated SCO was lower than the rural soil background concentrations as determined by the Department and the Department of Health rural soil survey, the rural soil background concentration is used as the Track 1
d: The SCOs for metals were capped at a maximum value of 10,000 ppm
f: For constituents where the calculated SCO was lower than the rural soil background concentrations as determined by the Department and the Department of Health rural soil survey, the rural soil background concentration is used as the Track 2 SCO value for this use of the site
j: This SCO is the lower of the values for mercury (elemental) or mercury (inorganic salts)
*: This SCO is the higher of the values for chromium (trivalent)
SCO value for this use of the site
----: not established

TABLE 1-2b. (continued)
26-28 WHITESBORO STREET SITE
SITE INVESTIGATION
SURFACE SOIL SAMPLE RESULTS - JUNE 2005
INORGANIC PARAMETERS

Sample Identification	**BSS-4**	**BSS-5**	Instrument Detection Limit	Unrestricted Use Soil Cleanup Objectives[1]	Restricted Use Soil Cleanup Objectives[2]			
					Protection of Public Health			Protection of Groundwater
					Residential	Restricted-Residential	Commercial	
Sample Depth (feet)	0-0.2	0-0.2						
Date of Collection	06/02/05	06/01/05						
Dilution Factor	1.0	1.0						
Percent Solids	96	88						
Units	mg/kg	mg/kg	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
Aluminum	1,760	2,970	13	----	----	----	----	----
Antimony	0.13 B	1.5	8	----	----	----	----	----
Arsenic	2.4	**_18.0_**	3	13[c]	16[f]	16[f]	16[f]	16[f]
Barium	27.5	64.8	1	350[c]	350[f]	400	400	820
Beryllium	0.097 B	0.33	1	7.2	14	72	590	47
Cadmium	0.34	1.3	1	2.5[c]	2.5[f]	4.3	9.3	7.5
Calcium	73,100	14,600	8	----	----	----	----	----
Chromium	4.0	10.9	1	30[c]	36	180	1,500	----
Cobalt	1.5 B	5.5	2	----	----	----	----	----
Copper	22.3	**129**	1	50	270	270	270	1,720
Iron	4740	22,200	20	----	----	----	----	----
Lead	**70.1**	**173**	2	63[c]	400	400	1,000	450
Magnesium	2420	2,050	8	----	----	----	----	----
Manganese	107	234	4	1,600[c]	2,000[f]	2,000[f]	10,000[d]	2,000[f]
Mercury	0.16	**0.39**	0.2	0.18[c]	0.81[j]	0.81[j]	2.8[j]	0.73
Nickel	6.2	16.3	2	30	140	310	310	130
Potassium	420	338	20	----	----	----	----	----
Selenium	0.32 B	U	4	3.9[c]	36	180	1,500	4[f]
Silver	U	U	1	2	36	180	1,500	8.3
Sodium	78.4	74.7	9	----	----	----	----	----
Thallium	0.69 B	0.65 B	5	----	----	----	----	----
Vanadium	4.9	13.9	1	----	----	----	----	----
Zinc	53.7	**145**	1	109[c]	2,200	10,000[d]	10,000[d]	2,480

QUALIFIERS:
B: Compound found in the method blank as well as the sample
D: Result taken from a reanalysis at a secondary dilution
J: Compound found at a concentration below the CRDL, value estimated
U: Compound analyzed for but not detected

BOLD Indicates the value exceeds the NYSDEC Unrestricted Use SCOs
[Boxed] Indicates the value exceeds the NYSDEC Residential SCO
[Shaded] Indicates the value exceeds the NYSDEC Restricted-Residential SCO
Underline Indicates the value exceeds the NYSDEC Commercial SCO
Italics Indicates the value exceeds the NYSDEC Protection of Groundwater SCO

NOTES:
All concentrations are in micrograms per kilogram (mg/kg) or parts per million (ppm)
1: 6 NYCRR PART 375 - Table 375-6.8(a): Unrestricted Use Soil Cleanup Objectives (SCOs)
2: 6 NYCRR PART 375 - Table 375-6.8(b): Restricted Use SCOs
c: For constituents where the calculated SCO was lower than the rural soil background concentrations as determined by the Department and the Department of Health rural soil survey, the rural soil background concentration is used as the Track 1
d: The SCOs for metals were capped at a maximum value of 10,000 ppm
f: For constituents where the calculated SCO was lower than the rural soil background concentrations as determined by the Department and the Department of Health rural soil survey, the rural soil background concentration is used as the Track 2 SCO value for this use of the site
j: This SCO is the lower of the values for mercury (elemental) or mercury (inorganic salts)
*: This SCO is the higher of the values for chromium (trivalent)
SCO value for this use of the site
----: not established

APPENDIX B

SUBSURFACE SOIL ANALYTICAL RESULTS

TABLE 1-3d.
26-28 WHITESBORO STREET SITE
SITE INVESTIGATION
SUBSURFACE SOIL SAMPLE RESULTS - JUNE 2003
INORGANIC PARAMETERS

Sample Ident.	**B-1**	**B-2**	**B-3**	**B-4**	**B-5**	Instrument Detection Limit	Unrestricted Use Soil Cleanup Objectives[1]	Restricted Use Soil Cleanup Objectives[2]			
								Protection of Public Health			Protection of Groundwater
								Residential	Restricted-Residential	Commercial	
Sample Depth (ft)	6-8	6-8	4-6	8-10	8-10						
Date of Collection	06/05/03	06/05/03	06/06/03	06/05/03	06/05/03						
Dilution Factor	1.0	1.0	1.0	1.0	1.0						
Percent Solids	86	82	82	97	90						
Units	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
Aluminum	4,200	9,700	6,670	5,500	7,090	13	----	----	----	----	----
Antimony	3.1 B	U	0.78 B	0.79 B	U	8	----	----	----	----	----
Arsenic	3.0	4.7	6.9	4.9	5.1	3	13[c]	16[f]	16[f]	16[f]	16[f]
Barium	***884***	96.2	93.4	35.5 B	36.7 B	1	350[c]	350[f]	400	400	820
Beryllium	0.16 B	0.43 B	0.29 B	0.22 B	0.34 B	1	7.2	14	72	590	47
Cadmium	1.4	U	U	U	U	1	2.5[c]	2.5[f]	4.3	9.3	7.5
Calcium	38,100	18,000	42,900	2,600	24,000	8	----	----	----	----	----
Chromium	**55.4**	13.3	9.4	27.8	10.1	1	30[c]	36	180	1,500	----
Cobalt	3.9 B	9.3 B	6.4 B	3.8 B	5.1 B	2	----	----	----	----	----
Copper	**180**	33.0	**50.2**	37.8	25.5	1	50	270	270	270	1,720
Iron	13,800	22,400	17,200	17,100	15,900	20	----	----	----	----	----
Lead	**314**	41.4	97.1	22.9	11.4 B	2	63[c]	400	400	1,000	450
Magnesium	3,080	6,070	6,060	2,180	2,820	8	----	----	----	----	----
Manganese	251	1,170	725	332	523	4	1,600[c]	2,000[f]	2,000[f]	10,000[d]	2,000[f]
Mercury	0.16	**0.36**	**0.42**	***12.4***	U	0.2	0.18[c]	0.81[j]	0.81[j]	2.8[j]	0.73
Nickel	**73.5**	18.1	15.8	***551***	13.5	2	30	140	310	310	130
Potassium	820 B	1,890	1,150	1,080	1,290	20	----	----	----	----	----
Selenium	2.1	0.88 B	U	0.80 B	U	4	3.9[c]	36	180	1,500	4[f]
Silver	U	U	U	U	U	1	2	36	180	1,500	8.3
Sodium	255 B	138 B	124 B	93.4 B	114 B	9	----	----	----	----	----
Thallium	U	U	U	U	U	5	----	----	----	----	----
Vanadium	26.8	20.3	15.7	11.4	14.5	1	----	----	----	----	----
Zinc	**639**	79.2	90.6	122	53.9	1	109[c]	2,200	10,000[d]	10,000[d]	2,480
Cyanide	U	U	0.35 B	1.3	0.40 B	10	27	27	27	27	40

QUALIFIERS:
B: Compound found in the method blank as well as the sample
D: Result taken from a reanalysis at a secondary dilution
J: Compound found at a concentration below the CRDL, value estimated
U: Compound analyzed for but not detected

BOLD Indicates the value exceeds the NYSDEC Unrestircted Use SCOs
[box] Indicates the value exceeds the NYSDEC Residential SCO
[shaded] Indicates the value exceeds the NYSDEC Restricted-Residential SCO
Underline Indicates the value exceeds the NYSDEC Commercial SCO
Italics Indicates the value exceeds the NYSDEC Protection of Groundwater SCO

NOTES:
All concentrations are in micrograms per kilogram (mg/kg) or parts per million (ppm)
1: 6 NYCRR PART 375 - Table 375-6.8(a): Unrestricted Use Soil Cleanup Objectives (SCOs)
2: 6 NYCRR PART 375 - Table 375-6.8(b): Restricted Use SCOs
c: For constituents where the calculated SCO was lower than the rural soil background concentrations as determied by the Department and the Department of Health rural soil survey, the rural soil background concentration is used as the Track 1
d: The SCOs for metals were capped at a maximum value of 10,000 ppm
f: For constituents where the calculated SCO was lower than the rural soil background concentrations as determied by the Department and the Department of Health rural soil survey, the rural soil background concentration is used as the Track 2 SCO value for this use of the site
j: This SCO is the lower of the values for mercury (elemental) or mercury (inorganic salts)
*: This SCO is the higher of the values for chromium (trivalent) SCO value for this use of the site
----: not established

TABLE 1-3d.
26-28 WHITESBORO STREET SITE
SITE INVESTIGATION
SUBSURFACE SOIL SAMPLE RESULTS - JUNE 2003
INORGANIC PARAMETERS

Sample Ident.	**B-6**	**B-7**	**B-8**	**B-9**	**B-10**	Instrument Detection Limit	Unrestricted Use Soil Cleanup Objectives[1]	Restricted Use Soil Cleanup Objectives[2]			
Sample Depth (ft)	8-10	6-8	2-4	6-8	6-8			Protection of Public Health			Protection of Groundwater
Date of Collection	06/06/03	06/05/03	06/05/03	06/06/03	06/06/03			Residential	Restricted-Residential	Commercial	
Dilution Factor	1.0	1.0	1.0	1.0	1.0						
Percent Solids	86	86	85	87	87						
Units	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
Aluminum	6,990	6,680	10,000	9,930	6,200	13	----	----	----	----	----
Antimony	1.8 B	U	U	U	U	8	----	----	----	----	----
Arsenic	4.8	5.6	9.4	9.0	4.1	3	13[c]	16[f]	16[f]	16[f]	16[f]
Barium	45.1	38.2 B	63.6	25.9 B	15.3 B	1	350[c]	350[f]	400	400	820
Beryllium	0.30 B	0.29 B	0.44 B	0.45 B	0.27 B	1	7.2	14	72	590	47
Cadmium	U	U	U	U	U	1	2.5[c]	2.5[f]	4.3	9.3	7.5
Calcium	5,150	23,400	2,970	767 B	741 B	8	----	----	----	----	----
Chromium	9.2	10.5	13.2	14.0	8.9	1	30[c]	36	180	1,500	----
Cobalt	5.6 B	6.9 B	8.4 B	8.6 B	5.1 B	2	----	----	----	----	----
Copper	25.0	31.5	29.8	45.2	20.7	1	50	270	270	270	1,720
Iron	16,400	18,800	25,700	27,000	15,500	20	----	----	----	----	----
Lead	51.8	50.6	23.7	11.1 B	7.1 B	2	63[c]	400	400	1,000	450
Magnesium	2,710	9,680	2,970	3,610	2,050	8	----	----	----	----	----
Manganese	442	622	1,290	698	401	4	1,600[c]	2,000[f]	2,000[f]	10,000[d]	2,000[f]
Mercury	**0.33**	0.18	**0.22**	U	U	0.2	0.18[c]	0.81[j]	0.81[j]	2.8[j]	0.73
Nickel	12.0	15.3	20.1	17.9	10.8	2	30	140	310	310	130
Potassium	1,380	1,390	1,170	1,070 B	960 B	20	----	----	----	----	----
Selenium	U	U	0.66 B	0.85 B	U	4	3.9[c]	36	180	1,500	4[f]
Silver	U	U	U	U	U	1	2	36	180	1,500	8.3
Sodium	91.2 B	155 B	79.8 B	81.0 B	68.6 B	9	----	----	----	----	----
Thallium	U	U	U	U	U	5	----	----	----	----	----
Vanadium	16.2	15.7	21.7	20.9	13.9	1	----	----	----	----	----
Zinc	76.5	55.4	84.2	69.1	48.3	1	109[c]	2,200	10,000[d]	10,000[d]	2,480
Cyanide	U	0.82	0.51 B	U	U	10	27	27	27	27	40

QUALIFIERS:
B: Compound found in the method blank as well as the sample
D: Result taken from a reanalysis at a secondary dilution
J: Compound found at a concentration below the CRDL, value estimated
U: Compound analyzed for but not detected

BOLD Indicates the value exceeds the NYSDEC Unrestircted Use SCOs
[boxed] Indicates the value exceeds the NYSDEC Residential SCO
[shaded] Indicates the value exceeds the NYSDEC Restricted-Residential SCO
Underline Indicates the value exceeds the NYSDEC Commercial SCO
Italics Indicates the value exceeds the NYSDEC Protection of Groundwater SCO

NOTES:
All concentrations are in micrograms per kilogram (mg/kg) or parts per million (ppm)
1: 6 NYCRR PART 375 - Table 375-6.8(a): Unrestricted Use Soil Cleanup Objectives (SCOs)
2: 6 NYCRR PART 375 - Table 375-6.8(b): Restricted Use SCOs
c: For constituents where the calculated SCO was lower than the rural soil background concentrations as determied by the Department and the Department of Health rural soil survey, the rural soil background concentration is used as the Track 1
d: The SCOs for metals were capped at a maximum value of 10,000 ppm
f: For constituents where the calculated SCO was lower than the rural soil background concentrations as determied by the Department and the Department of Health rural soil survey, the rural soil background concentration is used as the Track 2 SCO value for this use of the site
j: This SCO is the lower of the values for mercury (elemental) or mercury (inorganic salts)
*: This SCO is the higher of the values for chromium (trivalent) SCO value for this use of the site
----: not established

TABLE 1-3d.
26-28 WHITESBORO STREET SITE
SITE INVESTIGATION
SUBSURFACE SOIL SAMPLE RESULTS - JUNE 2003
INORGANIC PARAMETERS

Sample Ident.	**B-11**	**B-12**	Instrument Detection Limit	Unrestricted Use Soil Cleanup Objectives[1]	Restricted Use Soil Cleanup Objectives[2]			
Sample Depth (ft)	2-4	8-10			Protection of Public Health			Protection of Groundwater
Date of Collection	06/06/03	06/06/03			Residential	Restricted-Residential	Commercial	
Dilution Factor	1.0	1.0						
Percent Solids	90	87						
Units	mg/kg	mg/kg	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
Aluminum	3,900	8,820	13	----	----	----	----	----
Antimony	1.0 B	U	8	----	----	----	----	----
Arsenic	***16.7***	8.3	3	13[c]	16[f]	16[f]	16[f]	16[f]
Barium	75.6	49.7	1	350[c]	350[f]	400	400	820
Beryllium	0.40 B	0.25 B	1	7.2	14	72	590	47
Cadmium	U	U	1	2.5[c]	2.5[f]	4.3	9.3	7.5
Calcium	51,400	1,530	8	----	----	----	----	----
Chromium	7.7	14.7	1	30[c]	36	180	1,500	----
Cobalt	5.8 B	5.0 B	2	----	----	----	----	----
Copper	25.6	31.8	1	50	270	270	270	1,720
Iron	10,300	26,900	20	----	----	----	----	----
Lead	**65.8**	11.5 B	2	63[c]	400	400	1,000	450
Magnesium	1,880	3,290	8	----	----	----	----	----
Manganese	102	94.0	4	1,600[c]	2,000[f]	2,000[f]	10,000[d]	2,000[f]
Mercury	**0.30**	U	0.2	0.18[c]	0.81[j]	0.81[j]	2.8[j]	0.73
Nickel	13.4	15.4	2	30	140	310	310	130
Potassium	928 B	1,420	20	----	----	----	----	----
Selenium	1.6 N	U	4	3.9[c]	36	180	1,500	4[f]
Silver	U	U	1	2	36	180	1,500	8.3
Sodium	199 B	370 B	9	----	----	----	----	----
Thallium	U	U	5	----	----	----	----	----
Vanadium	13.4	21.3	1	----	----	----	----	----
Zinc	46.1	54.5	1	109[c]	2,200	10,000[d]	10,000[d]	2,480
Cyanide	U	U	10	27	27	27	27	40

QUALIFIERS:
B: Compound found in the method blank as well as the sample
D: Result taken from a reanalysis at a secondary dilution
J: Compound found at a concentration below the CRDL, value estimated
U: Compound analyzed for but not detected

BOLD Indicates the value exceeds the NYSDEC Unrestircted Use SCOs
[box] Indicates the value exceeds the NYSDEC Residential SCO
[shaded] Indicates the value exceeds the NYSDEC Restricted-Residential SCO
Underline Indicates the value exceeds the NYSDEC Commercial SCO
Italics Indicates the value exceeds the NYSDEC Protection of Groundwater SCO

NOTES:
All concentrations are in micrograms per kilogram (mg/kg) or parts per million (ppm)
1: 6 NYCRR PART 375 - Table 375-6.8(a): Unrestricted Use Soil Cleanup Objectives (SCOs)
2: 6 NYCRR PART 375 - Table 375-6.8(b): Restricted Use SCOs
c: For constituents where the calculated SCO was lower than the rural soil background concentrations as determied by the Department and the Department of Health rural soil survey, the rural soil background concentration is used as the Track 1
d: The SCOs for metals were capped at a maximum value of 10,000 ppm
f: For constituents where the calculated SCO was lower than the rural soil background concentrations as determied by the Department and the Department of Health rural soil survey, the rural soil background concentration is used as the Track 2 SCO value for this use of the site
j: This SCO is the lower of the values for mercury (elemental) or mercury (inorganic salts)
*: This SCO is the higher of the values for chromium (trivalent) SCO value for this use of the site
----: not established

TABLE 1-4b.
26-28 WHITESBORO STREET SITE
SITE INVESTIGATION
SUBSURFACE SOIL SAMPLE RESULTS - JUNE 2005
SEMIVOLATILE ORGANIC COMPOUNDS

Sample Identification	**MW-1**	**MW-1**	**B14**	**B14**	**B15**	Contract Required Detection Limit	Unrestricted Use Soil Cleanup Objectives[1]	Restricted Use Soil Cleanup Objectives[2]			
								Protection of Public Health			Protection of Groundwater
Sample Depth (feet)	4-6	8-10	6-8	8-10	2-4			Residential	Restricted-Residential	Commercial	
Date of Collection	06/01/05	06/01/05	06/01/05	06/01/05	06/01/05						
Dilution Factor	1.0	1.0	1.0	5.0	1.0						
Percent Moisture	12	19	14	29	13						
Units	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)
Phenol	U	U	U	U	U	550	330[b]	100,000[a]	100,000[a]	500,000[b1]	330[e]
bis(2-Chloroethyl)ether	U	U	U	U	U	550	----	----	----	----	----
2-Chlorophenol	U	U	U	U	U	550	----	----	----	----	----
1,3-Dichlorobenzene	U	U	U	U	U	550	----	----	----	----	----
1,4-Dichlorobenzene	U	U	U	U	U	550	----	----	----	----	----
1,2-Dichlorobenzene	U	U	U	U	U	550	----	----	----	----	----
2-Methylphenol	U	U	U	U	U	550	----	----	----	----	----
2,2-Oxybis (1-Chloropropane)	U	U	U	U	U	550	----	----	----	----	----
4-Methylphenol	51 J	U	46 J	U	U	550	----	----	----	----	----
N-Nitroso-di-n-propylamine	U	U	U	U	U	550	----	----	----	----	----
Hexachloroethane	U	U	U	U	U	550	----	----	----	----	----
Nitrobenzene	U	U	U	U	U	550	----	----	----	----	----
Isophorone	U	U	U	U	U	550	----	----	----	----	----
2-Nitrophenol	U	U	U	U	U	550	----	----	----	----	----
2,4-Dimethylphenol	U	U	U	U	U	550	----	----	----	----	----
2,4-Dichlorophenol	U	U	U	U	U	550	----	----	----	----	----
1,2,4-Trichlorobenzene	U	U	U	U	U	550	----	----	----	----	----
Naphthalene	510	U	500	1,800	U	550	12,000	100,000[a]	100,000[a]	500,000[b1]	12,000
4-Chloroaniline	U	U	U	U	U	550	----	----	----	----	----
bis(2-Chloroethoxy)methane	U	U	U	U	U	550	----	----	----	----	----
Hexachlorobutadiene	U	U	U	U	U	550	----	----	----	----	----
4-Chloro-3-methylphenol	U	U	U	U	U	550	----	----	----	----	----
2-Methylnaphthalene	210 J	U	240 J	2,500	82 J	550	----	----	----	----	----
Hexachlorocyclopentadiene	U	U	U	U	U	550	----	----	----	----	----
2,4,6-Trichlorophenol	U	U	U	U	U	1400	----	----	----	----	----
2,4,5-Trichlorophenol	U	U	U	U	U	550	----	----	----	----	----
2-Chloronaphthalene	U	U	U	U	U	1400	----	----	----	----	----
2-Nitroaniline	U	U	U	U	U	550	----	----	----	----	----
Dimethylphthalate	U	U	U	U	U	550	----	----	----	----	----
Acenaphthylene	140 J	U	140 J	120 J	U	550	100,000[a]	100,000[a]	100,000[a]	500,000[b1]	107,000
2,6-Dinitrotoluene	U	U	U	U	U	550	----	----	----	----	----
3-Nitroaniline	U	U	U	U	U	1400	----	----	----	----	----
Acenaphthene	410	U	350 J	1,600	81 J	550	20,000	100,000[a]	100,000[a]	500,000[b1]	98,000
2,4-Dinitrophenol	U	U	U	U	U	1400	----	----	----	----	----
4-Nitrophenol	U	U	U	U	U	1400	----	----	----	----	----
Dibenzofuran	310 J	U	340 J	130 J	79 J	550	----	----	----	----	----

TABLE 1-4b. (CONTINUED)
26-28 WHITESBORO STREET SITE
SITE INVESTIGATION
SUBSURFACE SOIL SAMPLE RESULTS - JUNE 2005
SEMIVOLATILE ORGANIC COMPOUNDS

Sample Identification	**MW-1**	**MW-1**	**B14**	**B14**	**B15**	Contract Required Detection Limit	Unrestricted Use Soil Cleanup Objectives[1]	Restricted Use Soil Cleanup Objectives[2]			
								Protection of Public Health			Protection of Groundwater
								Residential	Restricted-Residential	Commercial	
Sample Depth (feet)	4-6	8-10	6-8	8-10	2-4						
Date of Collection	6/1/2005	6/1/2005	6/1/2005	6/1/2005	6/1/2005						
Dilution Factor	1	1	1	5	1						
Percent Moisture	12	19	14	29	13						
Units	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)
2,4-Dinitrotoluene	U	U	U	U	U	550	----	----	----	----	----
Diethylphthalate	U	U	U	U	U	550	----	----	----	----	----
4-Chlorophenyl-phenylether	U	U	U	U	U	550	----	----	----	----	----
Fluorene	390	U	460	530	100 J	550	30,000	100,000[a]	100,000[a]	500,000[b1]	1,000,000[c1]
4-Nitroaniline	U	U	U	U	U	1400	----	----	----	----	----
4,6-Dinitro-2-methylphenol	U	U	U	U	U	1400	----	----	----	----	----
N-Nitrosodiphenylamine	U	U	U	U	U	550	----	----	----	----	----
4-Bromophenyl-phenylether	U	U	U	U	U	550	----	----	----	----	----
Hexachlorobenzene	U	U	U	U	U	550	----	----	----	----	----
Pentachlorophenol	U	U	U	U	U	1400	800[b]	2,400	6,700	6,700	800[e]
Phenanthrene	5,200	130 J	4,200	2,500	1,100	550	100,000	100,000[a]	100,000[a]	500,000[b1]	1,000,000[c1]
Anthracene	1,000	U	930	670	290 J	550	100,000[a]	100,000[a]	100,000[a]	500,000[b1]	1,000,000[c1]
Carbazole	610	U	510	U	120 J	550	----	----	----	----	----
Di-n-butylphthalate	40 J	61 J	45 J	U	48 J	550	----	----	----	----	----
Fluoranthene	7,900 D	140 J	5,400	590	2,100	550	100,000[a]	100,000[a]	100,000[a]	500,000[b1]	1,000,000[c1]
Pyrene	5,800 D	100 J	5,000	1,000	1,400	550	100,000	100,000[a]	100,000[a]	500,000[b1]	1,000,000[c1]
Butylbenzylphthalate	U	U	U	U	U	550	----	----	----	----	----
3,3'-Dichlorobenzidine	U	U	U	U	U	550	----	----	----	----	----
Benzo (a) anthracene	***3,400***	58 J	***2,300***	450	1,000 J	550	1,000[c]	1,000[f]	1,000[f]	5,600	1,000[f]
Chrysene	***3,000***	57 J	***2,300***	460	***1,100***	550	1,000[c]	1,000[f]	3,900	56,000	1,000[f]
bis(2-Ethylhexyl)phthalate	120 J	500	860	56 J	160 J	550	----	----	----	----	----
Di-n-octylphthalate	U	U	U	U	U	550	----	----	----	----	----
Benzo(b)fluoranthene	***3,500***	54 J	***2,700***	180 J	**1,200**	550	1,000[c]	1,000[f]	1,000[f]	5,600	1,700
Benzo(k)fluoranthene	**1,500**	28 J	**1,400**	120 J	650 J	550	800c	1,000	3,900	56,000	1,700
Benzo(a)pyrene	**2,700**	44 J	**1,800**	250 J	880 J	550	1,000[c]	1,000[f]	1,000[f]	1,000[f]	22,000
Indeno(1,2,3-cd)pyrene	**900**	U	410	78 J	350 J	550	500[c]	500[f]	500[f]	5,600	8,200
Dibenzo(a,h)anthracene	290 J	U	130 J	U	110 J	550	330[b]	330[e]	330[e]	56,000	1,000,000[c1]
Benzo(g,h,i)perylene	810	U	390	95 J	340 J	550	100,000	100,000[a]	100,000[a]	500,000[b1]	1,000,000[c1]
Total PAHs	37,450	611	28,410	10,443	10,701						
Total Carcinogen PAHs	15,290	241	11,040	1,538	5,290						
Total SVOCs	38,791	1,172	30,451	13,129	11,190		100,000	100,000	100,000	500,000	1,000,000
Total SVOC TICs	5,210	210	5,890	1,314,100	1,780						

QUALIFIERS:
B: Compound found in the method blank as well as the sample
D: Result taken from a reanalysis at a secondary dilution
J: Compound found at a concentration below the CRDL, value estimated
U: Compound analyzed for but not detected

BOLD Indicates the value exceeds the NYSDEC Unrestricted Use SCOs
[box] Indicates the value exceeds the NYSDEC Residential SCO
[shaded] Indicates the value exceeds the NYSDEC Restricted-Residential SCO
Underlin Indicates the value exceeds the NYSDEC Commercial SCO
Italics Indicates the value exceeds the NYSDEC Protection of Groundwater SCO

NOTES:
All concentrations are in micrograms per kilogram (ug/kg) or parts per billion (ppb)
1: 6 NYCRR PART 375 - Table 375-6.8(a): Unrestricted Use Soil Cleanup Objectives (SCOs)
2: 6 NYCRR PART 375 - Table 375-6.8(b): Restricted Use SCOs
a: The SCOs for unrestricted use, residential, restricted-residential and ecological resources use were capped at a maximum value of 100,000 ug/kg
b: For constituents where the calculated SCO was lower than the contract required quantification limit (CRQL), the CRQL is used as the Track 1 SCO value
b1: The SCOs for commercial use were capped at a maximum value of 500,000 ug/kg
c: For constituents where the calculated SCO was lower than the rural soil background concentrations as determined by the Department and the Department of Health rural soil survey, the rural soil background concentration is used as the Track 1 SCO value for this use of the site
c1: The SCOs for industrial use and the protection of groundwater were capped at a maximum value of 1,000,000
e: For constituents where the calculated SCO was lower than the CRQL, the CRQL is used as the SCO value
f: For constituents where the calculated SCO was lower than the rural soil background concentrations as determined by the Department and the Department of Health rural soil survey, the rural soil background concentration is used as the Track 2 SCO value for this use of the site
----: not established

TABLE 1-4b. (continued)
26-28 WHITESBORO STREET SITE
SITE INVESTIGATION
SUBSURFACE SOIL SAMPLE RESULTS - JUNE 2005
SEMIVOLATILE ORGANIC COMPOUNDS

Sample Identification	**B15**	**MW-2**	**MW-2**	**B17**	**B17**	Contract Required Detection Limit	Unrestricted Use Soil Cleanup Objectives[1]	Restricted Use Soil Cleanup Objectives[2]			
								Protection of Public Health			Protection of Groundwater
Sample Depth (feet)	6-8	6-8	8-10	2-4	6-8			Residential	Restricted-Residential	Commercial	
Date of Collection	06/01/05	06/01/05	06/01/05	06/01/05	06/01/05						
Dilution Factor	1.0	1.0	1.0	1.0	1.0						
Percent Moisture	15	17	15	16	17						
Units	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)
Phenol	U	U	U	***1,700***	U	550	330[b]	100,000[a]	100,000[a]	500,000[b1]	330[e]
bis(2-Chloroethyl)ether	U	U	U	U	U	550	----	----	----	----	----
2-Chlorophenol	U	U	U	U	U	550	----	----	----	----	----
1,3-Dichlorobenzene	U	U	U	U	U	550	----	----	----	----	----
1,4-Dichlorobenzene	U	U	U	U	U	550	----	----	----	----	----
1,2-Dichlorobenzene	U	U	U	U	U	550	----	----	----	----	----
2-Methylphenol	U	U	U	U	U	550	----	----	----	----	----
2,2-Oxybis (1-Chloropropane)	U	U	U	U	U	550	----	----	----	----	----
4-Methylphenol	U	U	U	100 J	U	550	----	----	----	----	----
N-Nitroso-di-n-propylamine	U	U	U	U	U	550	----	----	----	----	----
Hexachloroethane	U	U	U	U	U	550	----	----	----	----	----
Nitrobenzene	U	U	U	U	U	550	----	----	----	----	----
Isophorone	U	U	U	U	U	550	----	----	----	----	----
2-Nitrophenol	U	U	U	U	U	550	----	----	----	----	----
2,4-Dimethylphenol	U	U	U	U	U	550	----	----	----	----	----
2,4-Dichlorophenol	U	U	U	U	U	550	----	----	----	----	----
1,2,4-Trichlorobenzene	U	U	U	U	U	550	----	----	----	----	----
Naphthalene	U	U	U	1,200	U	550	12,000	100,000[a]	100,000[a]	500,000[b1]	12,000
4-Chloroaniline	U	U	U	U	U	550	----	----	----	----	----
bis(2-Chloroethoxy)methane	U	U	U	U	U	550	----	----	----	----	----
Hexachlorobutadiene	U	U	U	U	U	550	----	----	----	----	----
4-Chloro-3-methylphenol	U	U	U	U	U	550	----	----	----	----	----
2-Methylnaphthalene	U	U	U	770	U	550	----	----	----	----	----
Hexachlorocyclopentadiene	U	U	U	U	U	550	----	----	----	----	----
2,4,6-Trichlorophenol	U	U	U	U	U	1400	----	----	----	----	----
2,4,5-Trichlorophenol	U	U	U	U	U	550	----	----	----	----	----
2-Chloronaphthalene	U	U	U	U	U	1400	----	----	----	----	----
2-Nitroaniline	U	U	U	U	U	550	----	----	----	----	----
Dimethylphthalate	U	U	U	U	U	550	----	----	----	----	----
Acenaphthylene	U	U	U	380 J	U	550	100,000[a]	100,000[a]	100,000[a]	500,000[b1]	107,000
2,6-Dinitrotoluene	U	U	U	U	U	550	----	----	----	----	----
3-Nitroaniline	U	U	U	U	U	1400	----	----	----	----	----
Acenaphthene	U	U	U	3,600	U	550	20,000	100,000[a]	100,000[a]	500,000[b1]	98,000
2,4-Dinitrophenol	U	U	U	U	U	1400	----	----	----	----	----
4-Nitrophenol	U	U	U	U	U	1400	----	----	----	----	----
Dibenzofuran	U	U	U	3,000	U	550	----	----	----	----	----

TABLE 1-4b. (CONTINUED)
26-28 WHITESBORO STREET SITE
SITE INVESTIGATION
SUBSURFACE SOIL SAMPLE RESULTS - JUNE 2005
SEMIVOLATILE ORGANIC COMPOUNDS

Sample Identification	**B15**	**MW-2**	**MW-2**	**B17**	**B17**	Contract Required Detection Limit	Unrestricted Use Soil Cleanup Objectives[1]	Restricted Use Soil Cleanup Objectives[2]			
Sample Depth (feet)	6-8	6-8	8-10	2-4	6-8			Protection of Public Health			Protection of Groundwater
Date of Collection	6/1/2005	6/1/2005	6/1/2005	6/1/2005	6/1/2005			Residential	Restricted-Residential	Commercial	
Dilution Factor	1	1	1	1	1						
Percent Moisture	15	17	15	16	17						
Units	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)
2,4-Dinitrotoluene	U	U	U	U	U	550	----	----	----	----	----
Diethylphthalate	U	U	U	U	U	550	----	----	----	----	----
4-Chlorophenyl-phenylether	U	U	U	U	U	550	----	----	----	----	----
Fluorene	U	U	U	4,500	U	550	30,000	100,000[a]	100,000[a]	500,000[b1]	1,000,000[c1]
4-Nitroaniline	U	U	U	U	U	1400	----	----	----	----	----
4,6-Dinitro-2-methylphenol	U	U	U	U	U	1400	----	----	----	----	----
N-Nitrosodiphenylamine	U	U	U	U	U	550	----	----	----	----	----
4-Bromophenyl-phenylether	U	U	U	U	U	550	----	----	----	----	----
Hexachlorobenzene	U	U	U	U	U	550	----	----	----	----	----
Pentachlorophenol	U	U	U	U	U	1400	800[b]	2,400	6,700	6,700	800[e]
Phenanthrene	190 J	U	150 J	43,000 D	U	550	100,000	100,000[a]	100,000[a]	500,000[b1]	1,000,000[c1]
Anthracene	53 J	U	U	7,800 DJ	U	550	100,000[a]	100,000[a]	100,000[a]	500,000[b1]	1,000,000[c1]
Carbazole	U	U	U	5,800	U	550	----	----	----	----	----
Di-n-butylphthalate	U	U	47 J	860	U	550	----	----	----	----	----
Fluoranthene	270 J	U	310 J	46,000 D	U	550	100,000[a]	100,000[a]	100,000[a]	500,000[b1]	1,000,000[c1]
Pyrene	250 J	U	270 J	43,000 D	U	550	100,000	100,000[a]	100,000[a]	500,000[b1]	1,000,000[c1]
Butylbenzylphthalate	U	U	U	U	U	550	----	----	----	----	----
3,3'-Dichlorobenzidine	U	U	U	U	U	550	----	----	----	----	----
Benzo (a) anthracene	160 J	U	160 J	***<u>20,000 D</u>***	U	550	1,000[c]	1,000[f]	1,000[f]	5,600	1,000[f]
Chrysene	140 J	U	180 J	***19,000 D***	U	550	1,000[c]	1,000[f]	3,900	56,000	1,000[f]
bis(2-Ethylhexyl)phthalate	290 J	59 J	150 J	860	45 J	550	----	----	----	----	----
Di-n-octylphthalate	U	U	U	U	U	550	----	----	----	----	----
Benzo(b)fluoranthene	160 J	U	150 J	***<u>23,000 D</u>***	U	550	1,000[c]	1,000[f]	1,000[f]	5,600	1,700
Benzo(k)fluoranthene	56 J	U	86 J	***10,000 D***	U	550	800c	1,000	3,900	56,000	1,700
Benzo(a)pyrene	110 J	U	120 J	**<u>16,000 D</u>**	U	550	1,000[c]	1,000[f]	1,000[f]	1,000[f]	22,000
Indeno(1,2,3-cd)pyrene	60 J	U	61 J	**4,300**	U	550	500[c]	500[f]	500[f]	5,600	8,200
Dibenzo(a,h)anthracene	U	U	U	**1,400**	U	550	330[b]	330[e]	330[e]	56,000	1,000,000[c1]
Benzo(g,h,i)perylene	66 J	U	62 J	3,700	U	550	100,000	100,000[a]	100,000[a]	500,000[b1]	1,000,000[c1]
Total PAHs	1,515	0	1,549	246,880	0						
Total Carcinogen PAHs	686	0	757	93,700	0						
Total SVOCs	1,805	59	1,746	259,970	45		100,000	100,000	100,000	500,000	1,000,000
Total SVOC TICs	0	0	0	22,580	170						

QUALIFIERS:
B: Compound found in the method blank as well as the sample
D: Result taken from a reanalysis at a secondary dilution
J: Compound found at a concentration below the CRDL, value estimated
U: Compound analyzed for but not detected

BOLD Indicates the value exceeds the NYSDEC Unrestricted Use SCOs
[boxed] Indicates the value exceeds the NYSDEC Residential SCO
[shaded] Indicates the value exceeds the NYSDEC Restricted-Residential SCO
<u>Underlin</u> Indicates the value exceeds the NYSDEC Commercial SCO
Italics Indicates the value exceeds the NYSDEC Protection of Groundwater SCO

NOTES:
All concentrations are in micrograms per kilogram (ug/kg) or parts per billion (ppb)
1: 6 NYCRR PART 375 - Table 375-6.8(a): Unrestricted Use Soil Cleanup Objectives (SCOs)
2: 6 NYCRR PART 375 - Table 375-6.8(b): Restricted Use SCOs
a: The SCOs for unrestricted use, residential, restricted-residential and ecological resources use were capped at a maximum value of 100,000 ug/kg
b: For constituents where the calculated SCO was lower than the contract required quantification limit (CRQL), the CRQL is used as the Track 1 SCO value
b1: The SCOs for commercial use were capped at a maximum value of 500,000 ug/kg
c: For constituents where the calculated SCO was lower than the rural soil background concentrations as determined by the Department and the Department of Health rural soil survey, the rural soil background concentration is used as the Track 1 SCO value for this use of the site
c1: The SCOs for industrial use and the protection of groundwater were capped at a maximum value of 1,000,000
e: For constituents where the calculated SCO was lower than the CRQL, the CRQL is used as the SCO value
f: For constituents where the calculated SCO was lower than the rural soil background concentrations as determined by the Department and the Department of Health rural soil survey, the rural soil background concentration is used as the Track 2 SCO value for this use of the site
----: not established

TABLE 1-4b. (continued)
26-28 WHITESBORO STREET SITE
SITE INVESTIGATION
SUBSURFACE SOIL SAMPLE RESULTS - JUNE 2005
SEMIVOLATILE ORGANIC COMPOUNDS

Sample Identification	**B18**	**B18**	**MW-3**	**MW-4**	**MW-4**	Contract Required Detection Limit	Unrestricted Use Soil Cleanup Objectives[1]	Restricted Use Soil Cleanup Objectives[2]			
Sample Depth (feet)	4-6	8-10	6-8	4-6	6-8			Protection of Public Health			Protection of Groundwater
Date of Collection	06/01/05	06/01/05	06/02/05	06/02/05	06/02/05			Residential	Restricted-Residential	Commercial	
Dilution Factor	1.0	1.0	1.0	1.0	1.0						
Percent Moisture	9	17	16	18	20						
Units	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)
Phenol	U	U	U	U	U	550	330[b]	100,000[a]	100,000[a]	500,000[b1]	330[e]
bis(2-Chloroethyl)ether	U	U	U	U	U	550	----	----	----	----	----
2-Chlorophenol	U	U	U	U	U	550	----	----	----	----	----
1,3-Dichlorobenzene	U	U	U	U	U	550	----	----	----	----	----
1,4-Dichlorobenzene	U	U	U	U	U	550	----	----	----	----	----
1,2-Dichlorobenzene	U	U	U	U	U	550	----	----	----	----	----
2-Methylphenol	U	U	U	U	U	550	----	----	----	----	----
2,2-Oxybis (1-Chloropropane)	U	U	U	U	U	550	----	----	----	----	----
4-Methylphenol	U	U	U	U	U	550	----	----	----	----	----
N-Nitroso-di-n-propylamine	U	U	U	U	U	550	----	----	----	----	----
Hexachloroethane	U	U	U	U	U	550	----	----	----	----	----
Nitrobenzene	U	U	U	U	U	550	----	----	----	----	----
Isophorone	U	U	U	U	U	550	----	----	----	----	----
2-Nitrophenol	U	U	U	U	U	550	----	----	----	----	----
2,4-Dimethylphenol	U	U	U	U	U	550	----	----	----	----	----
2,4-Dichlorophenol	U	U	U	U	U	550	----	----	----	----	----
1,2,4-Trichlorobenzene	U	U	U	U	U	550	----	----	----	----	----
Naphthalene	54 J	U	U	170 J	U	550	12,000	100,000[a]	100,000[a]	500,000[b1]	12,000
4-Chloroaniline	U	U	U	U	U	550	----	----	----	----	----
bis(2-Chloroethoxy)methane	U	U	U	U	U	550	----	----	----	----	----
Hexachlorobutadiene	U	U	U	U	U	550	----	----	----	----	----
4-Chloro-3-methylphenol	U	U	U	U	U	550	----	----	----	----	----
2-Methylnaphthalene	U	U	U	71 J	U	550	----	----	----	----	----
Hexachlorocyclopentadiene	U	U	U	U	U	550	----	----	----	----	----
2,4,6-Trichlorophenol	U	U	U	U	U	1400	----	----	----	----	----
2,4,5-Trichlorophenol	U	U	U	U	U	550	----	----	----	----	----
2-Chloronaphthalene	U	U	U	U	U	1400	----	----	----	----	----
2-Nitroaniline	U	U	U	U	U	550	----	----	----	----	----
Dimethylphthalate	U	U	U	U	U	550	----	----	----	----	----
Acenaphthylene	U	U	U	U	U	550	100,000[a]	100,000[a]	100,000[a]	500,000[b1]	107,000
2,6-Dinitrotoluene	U	U	U	U	U	550	----	----	----	----	----
3-Nitroaniline	U	U	U	U	U	1400	----	----	----	----	----
Acenaphthene	110 J	U	U	74 J	U	550	20,000	100,000[a]	100,000[a]	500,000[b1]	98,000
2,4-Dinitrophenol	U	U	U	U	U	1400	----	----	----	----	----
4-Nitrophenol	U	U	U	U	U	1400	----	----	----	----	----
Dibenzofuran	70 J	U	U	76 J	U	550	----	----	----	----	----

TABLE 1-4b. (CONTINUED)
26-28 WHITESBORO STREET SITE
SITE INVESTIGATION
SUBSURFACE SOIL SAMPLE RESULTS - JUNE 2005
SEMIVOLATILE ORGANIC COMPOUNDS

Sample Identification	B18	B18	MW-3	MW-4	MW-4	Contract Required Detection Limit	Unrestricted Use Soil Cleanup Objectives[1]	Restricted Use Soil Cleanup Objectives[2]			
								Protection of Public Health			Protection of Groundwater
Sample Depth (feet)	4-6	8-10	6-8	4-6	6-8			Residential	Restricted-Residential	Commercial	
Date of Collection	6/1/2005	6/1/2005	6/2/2005	6/2/2005	6/2/2005						
Dilution Factor	1	1	1	1	1						
Percent Moisture	9	17	16	18	20						
Units	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)
2,4-Dinitrotoluene	U	U	U	U	U	550	----	----	----	----	----
Diethylphthalate	U	U	U	U	U	550	----	----	----	----	----
4-Chlorophenyl-phenylether	U	U	U	U	U	550	----	----	----	----	----
Fluorene	110 J	U	U	89 J	U	550	30,000	100,000[a]	100,000[a]	500,000[b1]	1,000,000[c1]
4-Nitroaniline	U	U	U	U	U	1400	----	----	----	----	----
4,6-Dinitro-2-methylphenol	U	U	U	U	U	1400	----	----	----	----	----
N-Nitrosodiphenylamine	U	U	U	U	U	550	----	----	----	----	----
4-Bromophenyl-phenylether	U	U	U	U	U	550	----	----	----	----	----
Hexachlorobenzene	U	U	U	U	U	550	----	----	----	----	----
Pentachlorophenol	U	U	U	U	U	1400	800[b]	2,400	6,700	6,700	800[e]
Phenanthrene	1,100	45 J	130 J	1,100	U	550	100,000	100,000[a]	100,000[a]	500,000[b1]	1,000,000[c1]
Anthracene	240 J	U	U	230 J	U	550	100,000[a]	100,000[a]	100,000[a]	500,000[b1]	1,000,000[c1]
Carbazole	140 J	U	U	140 J	U	550	----	----	----	----	----
Di-n-butylphthalate	39 J	U	U	48 J	U	550	----	----	----	----	----
Fluoranthene	1,200	57 J	210 J	1,500	U	550	100,000[a]	100,000[a]	100,000[a]	500,000[b1]	1,000,000[c1]
Pyrene	1,000	45 J	170 J	1,200	U	550	100,000	100,000[a]	100,000[a]	500,000[b1]	1,000,000[c1]
Butylbenzylphthalate	U	U	U	U	U	550	----	----	----	----	----
3,3'-Dichlorobenzidine	U	U	U	U	U	550	----	----	----	----	----
Benzo (a) anthracene	540	U	110 J	810	U	550	1,000[c]	1,000[f]	1,000[f]	5,600	1,000[f]
Chrysene	570	U	80 J	680	U	550	1,000[c]	1,000[f]	3,900	56,000	1,000[f]
bis(2-Ethylhexyl)phthalate	74 J	210 J	110 J	150 J	110 J	550	----	----	----	----	----
Di-n-octylphthalate	U	U	U	U	U	550	----	----	----	----	----
Benzo(b)fluoranthene	590	U	88 J	800	U	550	1,000[c]	1,000[f]	1,000[f]	5,600	1,700
Benzo(k)fluoranthene	240 J	U	45 J	330 J	U	550	800c	1,000	3,900	56,000	1,700
Benzo(a)pyrene	430	U	71 J	550	U	550	1,000[c]	1,000[f]	1,000[f]	1,000[f]	22,000
Indeno(1,2,3-cd)pyrene	180 J	U	41 J	320 J	U	550	500[c]	500[f]	500[f]	5,600	8,200
Dibenzo(a,h)anthracene	54 J	U	U	89 J	U	550	330[b]	330[e]	330[e]	56,000	1,000,000[c1]
Benzo(g,h,i)perylene	180 J	U	46 J	320 J	U	550	100,000	100,000[a]	100,000[a]	500,000[b1]	1,000,000[c1]
Total PAHs	6,598	147	991	8,262	0						
Total Carcinogen PAHs	2,604	0	435	3,579	0						
Total SVOCs	6,921	357	1,101	8,747	110		100,000	100,000	100,000	500,000	1,000,000
Total SVOC TICs	1,220	0	1,460	2,730	0						

QUALIFIERS:
B: Compound found in the method blank as well as the sample
D: Result taken from a reanalysis at a secondary dilution
J: Compound found at a concentration below the CRDL, value estimated
U: Compound analyzed for but not detected

BOLD Indicates the value exceeds the NYSDEC Unrestricted Use SCOs
[box] Indicates the value exceeds the NYSDEC Residential SCO
[shaded] Indicates the value exceeds the NYSDEC Restricted-Residential SCO
Underlin Indicates the value exceeds the NYSDEC Commercial SCO
Italics Indicates the value exceeds the NYSDEC Protection of Groundwater SCO

NOTES:
All concentrations are in micrograms per kilogram (ug/kg) or parts per billion (ppb)
1: 6 NYCRR PART 375 - Table 375-6.8(a): Unrestricted Use Soil Cleanup Objectives (SCOs)
2: 6 NYCRR PART 375 - Table 375-6.8(b): Restricted Use SCOs
a: The SCOs for unrestricted use, residential, restricted-residential and ecological resources use were capped at a maximum value of 100,000 ug/kg
b: For constituents where the calculated SCO was lower than the contract required quantification limit (CRQL), the CRQL is used as the Track 1 SCO value
b1: The SCOs for commercial use were capped at a maximum value of 500,000 ug/kg
c: For constituents where the calculated SCO was lower than the rural soil background concentrations as determined by the Department and the Department of Health rural soil survey, the rural soil background concentration is used as the Track 1 SCO value for this use of the site
c1: The SCOs for industrial use and the protection of groundwater were capped at a maximum value of 1,000,000
e: For constituents where the calculated SCO was lower than the CRQL, the CRQL is used as the SCO value
f: For constituents where the calculated SCO was lower than the rural soil background concentrations as determined by the Department and the Department of Health rural soil survey, the rural soil background concentration is used as the Track 2 SCO value for this use of the site
----: not established

TABLE 1-4b. (continued)
26-28 WHITESBORO STREET SITE
SITE INVESTIGATION
SUBSURFACE SOIL SAMPLE RESULTS - JUNE 2005
SEMIVOLATILE ORGANIC COMPOUNDS

Sample Identification	**MW-6**	**MW-8**	**MW-8**	Contract Required Detection Limit	Unrestricted Use Soil Cleanup Objectives[1]	Restricted Use Soil Cleanup Objectives[2]			
Sample Depth (feet)	6-8	2-4	6-8			Protection of Public Health			Protection of Groundwater
Date of Collection	06/02/05	06/01/05	06/01/05			Residential	Restricted-Residential	Commercial	
Dilution Factor	1.0	1.0	1.0						
Percent Moisture	14	15	17						
Units	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)
Phenol	***1,800 J***	U	U	550	330[b]	100,000[a]	100,000[a]	500,000[b1]	330[e]
bis(2-Chloroethyl)ether	U	U	U	550	----	----	----	----	----
2-Chlorophenol	U	U	U	550	----	----	----	----	----
1,3-Dichlorobenzene	U	U	U	550	----	----	----	----	----
1,4-Dichlorobenzene	U	U	U	550	----	----	----	----	----
1,2-Dichlorobenzene	U	U	U	550	----	----	----	----	----
2-Methylphenol	1,300 J	U	U	550	----	----	----	----	----
2,2-Oxybis (1-Chloropropane)	U	U	U	550	----	----	----	----	----
4-Methylphenol	3,300	U	U	550	----	----	----	----	----
N-Nitroso-di-n-propylamine	U	U	U	550	----	----	----	----	----
Hexachloroethane	U	U	U	550	----	----	----	----	----
Nitrobenzene	U	U	U	550	----	----	----	----	----
Isophorone	U	U	U	550	----	----	----	----	----
2-Nitrophenol	U	U	U	550	----	----	----	----	----
2,4-Dimethylphenol	2,300 J	U	U	550	----	----	----	----	----
2,4-Dichlorophenol	U	U	U	550	----	----	----	----	----
1,2,4-Trichlorobenzene	U	U	U	550	----	----	----	----	----
Naphthalene	***61,000 D***	52 J	U	550	12,000	100,000[a]	100,000[a]	500,000[b1]	12,000
4-Chloroaniline	U	U	U	550	----	----	----	----	----
bis(2-Chloroethoxy)methane	U	U	U	550	----	----	----	----	----
Hexachlorobutadiene	U	U	U	550	----	----	----	----	----
4-Chloro-3-methylphenol	U	U	U	550	----	----	----	----	----
2-Methylnaphthalene	34,000	46 J	U	550	----	----	----	----	----
Hexachlorocyclopentadiene	U	U	U	550	----	----	----	----	----
2,4,6-Trichlorophenol	U	U	U	1400	----	----	----	----	----
2,4,5-Trichlorophenol	U	U	U	550	----	----	----	----	----
2-Chloronaphthalene	U	U	U	1400	----	----	----	----	----
2-Nitroaniline	U	U	U	550	----	----	----	----	----
Dimethylphthalate	U	U	U	550	----	----	----	----	----
Acenaphthylene	14,000	U	U	550	100,000[a]	100,000[a]	100,000[a]	500,000[b1]	107,000
2,6-Dinitrotoluene	U	U	U	550	----	----	----	----	----
3-Nitroaniline	U	U	U	1400	----	----	----	----	----
Acenaphthene	**36,000 DJ**	71 J	U	550	20,000	100,000[a]	100,000[a]	500,000[b1]	98,000
2,4-Dinitrophenol	U	U	U	1400	----	----	----	----	----
4-Nitrophenol	U	U	U	1400	----	----	----	----	----
Dibenzofuran	36,000 DJ	72 J	U	550	----	----	----	----	----

TABLE 1-4b. (CONTINUED)
26-28 WHITESBORO STREET SITE
SITE INVESTIGATION
SUBSURFACE SOIL SAMPLE RESULTS - JUNE 2005
SEMIVOLATILE ORGANIC COMPOUNDS

Sample Identification	MW-6	MW-8	MW-8	Contract Required Detection Limit	Unrestricted Use Soil Cleanup Objectives[1]	Restricted Use Soil Cleanup Objectives[2]			
Sample Depth (feet)	6-8	2-4	6-8			Protection of Public Health			Protection of Groundwater
Date of Collection	6/2/2005	6/1/2005	6/1/2005			Residential	Restricted-Residential	Commercial	
Dilution Factor	1	1	1						
Percent Moisture	14	15	17						
Units	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)
2,4-Dinitrotoluene	U	U	U	550	----	----	----	----	----
Diethylphthalate	U	U	U	550	----	----	----	----	----
4-Chlorophenyl-phenylether	U	U	U	550	----	----	----	----	----
Fluorene	**50,000 D**	90 J	U	550	30,000	100,000[a]	100,000[a]	500,000[b1]	1,000,000[c1]
4-Nitroaniline	U	U	U	1400	----	----	----	----	----
4,6-Dinitro-2-methylphenol	U	U	U	1400	----	----	----	----	----
N-Nitrosodiphenylamine	U	U	U	550	----	----	----	----	----
4-Bromophenyl-phenylether	U	U	U	550	----	----	----	----	----
Hexachlorobenzene	U	U	U	550	----	----	----	----	----
Pentachlorophenol	U	U	U	1400	800[b]	2,400	6,700	6,700	800[e]
Phenanthrene	**410,000 D**	840	U	550	100,000	100,000[a]	100,000[a]	500,000[b1]	1,000,000[c1]
Anthracene	**120,000 D**	220 J	U	550	100,000[a]	100,000[a]	100,000[a]	500,000[b1]	1,000,000[c1]
Carbazole	34,000 DJ	120 J	U	550	----	----	----	----	----
Di-n-butylphthalate	U	47 J	U	550	----	----	----	----	----
Fluoranthene	**470,000 D**	1,000	U	550	100,000[a]	100,000[a]	100,000[a]	500,000[b1]	1,000,000[c1]
Pyrene	**430,000 D**	1,000	U	550	100,000	100,000[a]	100,000[a]	500,000[b1]	1,000,000[c1]
Butylbenzylphthalate	U	U	U	550	----	----	----	----	----
3,3'-Dichlorobenzidine	U	U	U	550	----	----	----	----	----
Benzo (a) anthracene	***200,000 D***	550	U	550	1,000[c]	1,000[f]	1,000[f]	5,600	1,000[f]
Chrysene	***210,000 D***	540	U	550	1,000[c]	1,000[f]	3,900	56,000	1,000[f]
bis(2-Ethylhexyl)phthalate	8,700	440	90 J	550	----	----	----	----	----
Di-n-octylphthalate	U	U	U	550	----	----	----	----	----
Benzo(b)fluoranthene	***150,000 D***	740	U	550	1,000[c]	1,000[f]	1,000[f]	5,600	1,700
Benzo(k)fluoranthene	***91,000 D***	310 J	U	550	800c	1,000	3,900	56,000	1,700
Benzo(a)pyrene	***130,000 D***	470	U	550	1,000[c]	1,000[f]	1,000[f]	1,000[f]	22,000
Indeno(1,2,3-cd)pyrene	***59,000 D***	140 J	U	550	500[c]	500[f]	500[f]	5,600	8,200
Dibenzo(a,h)anthracene	**15,000**	U	U	550	330[b]	330[e]	330[e]	56,000	1,000,000[c1]
Benzo(g,h,i)perylene	69,000 D	140 J	U	550	100,000	100,000[a]	100,000[a]	500,000[b1]	1,000,000[c1]
Total PAHs	2,515,000	6,163	0						
Total Carcinogen PAHs	855,000	2,750	0						
Total SVOCs	2,636,400	6,888	90		100,000	100,000	100,000	500,000	1,000,000
Total SVOC TICs	1,314,100	2,060	230						

QUALIFIERS:
B: Compound found in the method blank as well as the sample
D: Result taken from a reanalysis at a secondary dilution
J: Compound found at a concentration below the CRDL, value estimated
U: Compound analyzed for but not detected

BOLD Indicates the value exceeds the NYSDEC Unrestricted Use SCOs
[Box] Indicates the value exceeds the NYSDEC Residential SCO
[Shaded] Indicates the value exceeds the NYSDEC Restricted-Residential SCO
Underline Indicates the value exceeds the NYSDEC Commercial SCO
Italics Indicates the value exceeds the NYSDEC Protection of Groundwater SCO

NOTES:
All concentrations are in micrograms per kilogram (ug/kg) or parts per billion (ppb)
1: 6 NYCRR PART 375 - Table 375-6.8(a): Unrestricted Use Soil Cleanup Objectives (SCOs)
2: 6 NYCRR PART 375 - Table 375-6.8(b): Restricted Use SCOs
a: The SCOs for unrestricted use, residential, restricted-residential and ecological resources use were capped at a maximum value of 100,000 ug/kg
b: For constituents where the calculated SCO was lower than the contract required quantification limit (CRQL), the CRQL is used as the Track 1 SCO value
b1: The SCOs for commercial use were capped at a maximum value of 500,000 ug/kg
c: For constituents where the calculated SCO was lower than the rural soil background concentrations as determined by the Department and the Department of Health rural soil survey, the rural soil background concentration is used as the Track 1 SCO value for this use of the site
c1: The SCOs for industrial use and the protection of groundwater were capped at a maximum value of 1,000,000
e: For constituents where the calculated SCO was lower than the CRQL, the CRQL is used as the SCO value
f: For constituents where the calculated SCO was lower than the rural soil background concentrations as determined by the Department and the Department of Health rural soil survey, the rural soil background concentration is used as the Track 2 SCO value for this use of the site
----: not established

APPENDIX C

GROUNDWATER ANALYTICAL RESULTS

TABLE 1-5c.
26-28 WHITESBORO STREET SITE
SITE INVESTIGATION
GROUNDWATER SAMPLE RESULTS - JUNE 2003
INORGANIC PARAMETERS - UNFILTERED

Sample Identification	B-1	B-3	B-10	B-11	B-12	Instrument Detection Limit	NYSDEC Class GA Groundwater Standard or Guidance Value
Date of Collection	06/10/03	06/10/03	06/10/03	06/10/03	06/10/03		
Dilution Factor	1.0	1.0	1.0	1.0	1.0		
Units	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)
Aluminum	286,000	22,300	228,000	116,000	490,000	9	----
Antimony	**65.1**	U	U	**3.1 B**	**6.9 B**	4	3 ST
Arsenic	**425**	**62.0**	**417**	**351**	**618**	2	25 ST
Barium	**6,430**	222	**3,100**	**2,330**	**3,600**	2	1,000 ST
Beryllium	**20.9**	2.0 B	**17.7**	**15.9**	**27.7**	0.2	3 GV
Cadmium	**33.0**	0.89 B	**19.9**	**28.1**	**47.8**	0.2	5 ST
Calcium	467,000	79,400	233,000	427,000	476,000	234	----
Chromium	**2,600**	**50.2**	**288**	**169**	**822**	0.6	50 ST
Cobalt	386	27.7 B	233	251	437	0.7	----
Copper	**3,570**	173	**1,950**	**1,750**	**4,190**	5	200 ST
Iron	**1,020,000**	**608,000**	**1,020,000**	**345,000**	**2,170,000**	2	300 ST ^
Lead	**2,250**	**88.3**	**644**	**1,380**	**1,730**	2	25 ST
Magnesium	**169,000**	22,900	**113,000**	**72,000**	**273,000**	2	35,000 GV
Manganese	**93,000**	**3,230**	**95,900**	**29,800**	**24,100**	0.9	300 ST ^
Mercury	**1.8**	U	**1.2**	**8.6**	**3.9**	0.1	0.7 ST
Nickel	**3,810**	66.4	**569**	**444**	**1,150**	0.9	100 ST
Potassium	43,700	30,100	28,200	32,900	56,700	320	----
Selenium	U	U	U	**72.7**	U	3	10 ST
Silver	U	2.2 B	U	U	U	2	50 ST
Sodium	**323,000**	**34,000**	**394,000**	**97,000**	**541,000**	132	20,000 ST
Thallium	U	U	U	U	U	2	0.5 GV
Vanadium	517	61.8	438	272	966	0.6	----
Zinc	**7,680**	359	**2,640**	1,830	**5,330**	2	2,000 GV

QUALIFIERS:
U: Compound analyzed for but not detected
B: Compound concentration is less than the CRDL but greater than the IDL.

NOTES:
^: The combined standard for iron and manganese is 500 ug/l
[boxed] Indicates value exceeds NYSDEC Class GA groundwater standard or guidance value

TABLE 1-6b.
26-28 WHITESBORO STREET SITE
SITE INVESTIGATION
GROUNDWATER SAMPLE RESULTS - JUNE 2005
INORGANIC PARAMETERS

Sample Identification	MW-1		MW-2		MW-3		MW-4			NYSDEC Class GA
Date of Collection	06/06/05	06/06/05	06/06/05	06/06/05	06/06/05	06/06/05	06/06/05	06/06/05	Instrument	Groundwater
Sample Type	total	dissolved	total	dissolved	total	dissolved	total	dissolved	Detection	Standard or
Dilution Factor	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	Limit	Guidance Value
Units	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)
Aluminum	1,640	51.8 B	2,280	27.9 B	8,000	38.5 B	1,560	48.8 B	9	----
Antimony	U	U	**4.7 B**	U	U	U	U	U	4	3 ST
Arsenic	5.1 B	U	7.0 B	U	22.4	U	6.4 B	U	2	25 ST
Barium	58.7 B	54.5 B	66.2 B	61.3 B	127 B	72.9 B	83.6 B	79.9 B	2	1,000 ST
Beryllium	U	U	U	U	0.50 B	U	U	U	0.2	3 GV
Cadmium	1.0 B	0.15 B	0.32 B	U	0.85 B	0.23 B	0.19 B	U	0.2	5 ST
Calcium	162,000	181,000	180,000	180,000	233,000	236,000	153,000	158,000	234	----
Chromium	2.5 B	0.58 B	3.6 B	U	**171**	**98.4**	1.2 B	U	0.6	50 ST
Cobalt	2.9 B	0.69 B	3.4 B	0.56 B	11.3 B	0.81 B	4.9 B	4.3 B	0.7	----
Copper	21.2 B	7.4 B	24.2 B	6.4 B	70.1	U	12.5 B	U	5	200 ST
Iron	**6,910**	89.4 B	**8,040**	38.6 B	**31,300**	81.7 B	**5,530**	32.9 B	2	300 ST ^
Lead	6.9 B	0.62 B	8.9 B	1.1 B	**27.5**	0.77 B	5.2 B	U	2	25 ST
Magnesium	**37,200**	**44,500**	34,300	**36,000**	**37,500**	**35,100**	**63,000**	**60,500**	2	35,000 GV
Manganese	**561**	9.6 B	**631**	29.8 B	**1,760**	204	**2,500**	**2,690**	0.9	300 ST ^
Mercury	U	U	U	U	0.068 B	0.30	U	U	0.1	0.7 ST
Nickel	5.2 B	1.4 B	7.5 B	2.2 B	**295**	99.9	6.1 B	3.0 B	0.9	100 ST
Potassium	15,100	16,400	14,300	14,400	15,500	14,400	23,100	21,800	320	----
Selenium	4.0 B	U	U	U	4.1 B	4.5 B	5.6 B	4.9 B	3	10 ST
Silver	U	U	U	U	U	U	U	U	2	50 ST
Sodium	**230,000**	**174,000**	**103,000**	**99,700**	**287,000**	**286,000**	**68,000**	**65,500**	132	20,000 ST
Thallium	**6.4 B**	**8.3 B**	**8.5 B**	**8.5 B**	**8.3 B**	**11.0 B**	**3.3 B**	**5.3 B**	2	0.5 GV
Vanadium	4.6 B	0.58 B	5.7 B	U	20.2 B	U	3.9 B	U	0.6	----
Zinc	38.0 B	12.6 B	42.2 B	9.5 B	120	17.1 B	23.1 B	4.8 B	2	2,000 GV

QUALIFIERS:
U: Compound analyzed for but not detected
B: Compound concentration is less than the CRDL but greater than the IDL.

NOTES:
^: The combined standard for iron and manganese is 500 ug/l
[boxed] Indicates value exceeds NYSDEC Class GA groundwater standard or guidance value

TABLE 1-6b. (continued)
26-28 WHITESBORO STREET SITE
SITE INVESTIGATION
GROUNDWATER SAMPLE RESULTS - JUNE 2005
INORGANIC PARAMETERS

Sample Identification	**MW-5**		**MW-6**		**MW-7**		**MW-8**			NYSDEC Class GA
Date of Collection	06/06/05	06/06/05	06/06/05	06/06/05	06/06/05	06/06/05	06/06/05	06/06/05	Instrument	Groundwater
Sample Type	total	dissolved	total	dissolved	total	dissolved	total	dissolved	Detection	Standard or
Dilution Factor	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	Limit	Guidance Value
Units	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)
Aluminum	2,070	U	3,170	62.1 B	10,400	19.0 B	61,300	45.9 B	9	----
Antimony	U	U	U	2.5 B	U	U	U	U	4	3 ST
Arsenic	19.0 B	1.8 B	11.7 B	4.0 B	19.1 B	U	**159**	U	2	25 ST
Barium	315	276	255	258	142 B	79.2 B	582	85.8 B	2	1,000 ST
Beryllium	U	U	0.15 B	U	0.59 B	U	**4.3 B**	U	0.2	3 GV
Cadmium	0.35 B	U	0.32 B	0.17 B	0.70 B	0.18 B	**6.4**	0.19 B	0.2	5 ST
Calcium	130,000	116,000	252,000	285,000	251,000	244,000	274,000	205,000	234	----
Chromium	2.9 B	U	3.2 B	U	14.2 B	U	**86.6**	U	0.6	50 ST
Cobalt	3.3 B	1.8 B	6.2 B	4.0 B	12.7 B	0.96 B	65.7	0.84 B	0.7	----
Copper	12.0 B	U	25.2 B	U	68.1	U	**514**	U	5	200 ST
Iron	**24,800**	**898**	**15,000**	**391**	**34,600**	27.1 B	**222,000**	90.8 B	2	300 ST ^
Lead	7.3 B	0.82 B	11.9	1.6 B	32.0	1.4 B	**800**	1.2 B	2	25 ST
Magnesium	24,700	21,200	28,900	31,200	29,800	23,900	**45,600**	20,900	2	35,000 GV
Manganese	**1,170**	**913**	**2,680**	**2,660**	**3,610**	**1,360**	**9,090**	**747**	0.9	300 ST ^
Mercury	U	U	U	U	0.32	U	**0.92**	U	0.1	0.7 ST
Nickel	5.2 B	2.0 B	13.7 B	9.0 B	27.0 B	3.4 B	**143**	2.5 B	0.9	100 ST
Potassium	19,200	17,200	10,100	11,300	13,200	11,500	23,500	15,600	320	----
Selenium	U	U	1.5 B	U	U	3.1 B	U	**11.3 B**	3	10 ST
Silver	U	U	U	U	U	U	U	U	2	50 ST
Sodium	**30,000**	**24,700**	**31,400**	**36,300**	**110,000**	**108,000**	**48,800**	**48,000**	132	20,000 ST
Thallium	**5.8 B**	**3.5 B**	**6.3 B**	**7.1 B**	**3.7 B**	**8.4 B**	U	**7.8 B**	2	0.5 GV
Vanadium	4.8 B	U	7.5 B	U	24.4 B	0.54 B	156	0.59 B	0.6	----
Zinc	32.8 B	5.2 B	56.1	6.9 B	125	12.7 B	869	8.1 B	2	2,000 GV

QUALIFIERS:
U: Compound analyzed for but not detected
B: Compound concentration is less than the CRDL but greater than the IDL.

NOTES:
^: The combined standard for iron and manganese is 500 ug/l
[boxed] Indicates value exceeds NYSDEC Class GA groundwater standard or guidance value

TABLE 1-7.
26-28 WHITESBORO STREET SITE
SITE INVESTIGATION
GROUNDWATER SAMPLE RESULTS - JULY 2006
INORGANIC PARAMETERS

Sample Identification	MW-1		MW-2		MW-3		MW-4			NYSDEC Class GA
Date of Collection	07/05/06	07/05/06	07/05/06	07/05/06	07/05/06	07/05/06	07/05/06	07/05/06	Instrument	Groundwater
Sample Type	total	dissolved	total	dissolved	total	dissolved	total	dissolved	Detection	Standard or
Dilution Factor	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	Limit	Guidance Value
Units	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)
Aluminum	1,430	U	2,400	U	9,690	U	1,980	U	9	----
Antimony	**5.7 B**	**9.5 B**	U	3.0 B	U	U	U	2.5 B	4	3 ST
Arsenic	6.2 B	4.7 B	6.6 B	U	20.7	2.7 B	4.2 B	U	2	25 ST
Barium	36.8 B	30.7 B	49.8 B	38.5 B	115 B	60.8 B	122 B	107 B	2	1,000 ST
Beryllium	U	U	U	U	0.55 B	U	U	U	0.2	3 GV
Cadmium	U	U	0.13 B	0.23 B	0.35 B	U	U	U	0.2	5 ST
Calcium	107,000	109,000	127,000	127,000	128,000	126,000	151,000	148,000	234	----
Chromium	3.2 B	0.93 B	4.2 B	0.87 B	**403**	**365**	4.8 B	1.9 B	0.6	50 ST
Cobalt	1.7 B	0.24 B	2.4 B	0.43 B	10.2 B	0.43 B	1.7 B	0.16 B	0.7	----
Copper	26.9 B	20.0 B	30.7	18.7 B	73.2	17 B	28.8 B	20 B	5	200 ST
Iron	**3,870**	130 B	**6,230**	U	**30,900**	23.0 B	**4,790**	U	2	300 ST ^
Lead	3.4 B	U	4.1 B	U	20.4	U	2.2 B	U	2	25 ST
Magnesium	**77,800**	**74,000**	**40,000**	**38,800**	24,100	21,200	**103,000**	**100,000**	2	35,000 GV
Manganese	230	3.1 B	**559**	116	**1,450**	90.3	**302**	37.9 B	0.9	300 ST ^
Mercury	U	U	U	U	U	U	U	U	0.1	0.7 ST
Nickel	3.2 B	1.4 B	5.4 B	1.7 B	**244**	68.1	4.1 B	1.7 B	0.9	100 ST
Potassium	22,000	21,700	15,200	14,400	12,000	10,200	18,900	17,800	320	----
Selenium	U	U	U	U	U	8.3 B	U	U	3	10 ST
Silver	1.8 B	U	U	U	U	U	U	U	2	50 ST
Sodium	**65,900**	**90,000**	**53,700**	**55,600**	**345,000**	**341,000**	**51,800**	**52,100**	132	20,000 ST
Thallium	**3.3 B**	U	**1.3 B**	U	**4.9 B**	U	**1.2 B**	U	2	0.5 GV
Vanadium	4.5 B	1.1 B	5.7 B	0.63 B	22.2 B	U	4.8 B	0.66 B	0.6	----
Zinc	97.3	71.0	85.9	60.7	153	51.7	61.9	49.3 B	2	2,000 GV

QUALIFIERS:
U: Compound analyzed for but not detected
B: Compound concentration is less than the CRDL
but greater than the IDL.

NOTES:
^: The combined standard for iron and manganese is 500 ug/l
[boxed] Indicates value exceeds NYSDEC Class GA groundwater standard or guidance value

TABLE 1-7. (continued)
26-28 WHITESBORO STREET SITE
SITE INVESTIGATION
GROUNDWATER SAMPLE RESULTS - JULY 2006
INORGANIC PARAMETERS

Sample Identification	MW-5		MW-6		MW-7		MW-8			NYSDEC Class GA
Date of Collection	07/05/06	07/05/06	07/05/06	07/05/06	07/05/06	07/05/06	07/05/06	07/05/06	Instrument	Groundwater
Sample Type	total	dissolved	total	dissolved	total	dissolved	total	dissolved	Detection	Standard or
Dilution Factor	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	Limit	Guidance Value
Units	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)
Aluminum	991	U	1,150	U	419	U	3,020	U	9	----
Antimony	U	2.9 B	1.8 B	**3.5 B**	U	U	U	1.6 B	4	3 ST
Arsenic	16.2 B	14.6 B	11.3 B	11.8 B	1.7 B	2.7 B	9.4 B	3.1 B	2	25 ST
Barium	306	285	104 B	97.4 B	41.2 B	37.4 B	78 B	63.3 B	2	1,000 ST
Beryllium	U	U	U	U	U	U	0.19 B	U	0.2	3 GV
Cadmium	0.25 B	U	U	U	0.18 B	U	0.20 B	0.13 B	0.2	5 ST
Calcium	126,000	123,000	91,600	92,700	97,000	97,000	178,000	174,000	234	----
Chromium	2.1 B	0.64 B	1.9 B	0.59 B	1.1 B	0.49 B	4.6 B	1.1 B	0.6	50 ST
Cobalt	1.2 B	0.73 B	2.1 B	1.5 B	0.42 B	0.53 B	2.4 B	0.31 B	0.7	----
Copper	18.1 B	14.4 B	23.6 B	15.4 B	15.9 B	14.5 B	33.5	18 B	5	200 ST
Iron	**15,400**	**7,380**	**3,890**	**469**	**977**	20.4 B	**8,290**	U	2	300 ST ^
Lead	1.4 B	U	2.9 B	U	U	U	**28.2**	U	2	25 ST
Magnesium	19,400	18,700	11,900	11,500	5,260	5,330	20,400	19,100	2	35,000 GV
Manganese	**1,260**	**1,180**	**1,380**	**1,290**	78.1	27.6 B	**377**	229	0.9	300 ST ^
Mercury	U	U	U	U	U	U	U	U	0.1	0.7 ST
Nickel	3.4 B	1.9 B	4.7 B	3.2 B	1.9 B	1.8 B	6.7 B	1.7 B	0.9	100 ST
Potassium	14,300	13,900	7,550	7,340	4,720	4,660	19,500	17,500	320	----
Selenium	U	U	U	U	U	4.9 B	U	3.9 B	3	10 ST
Silver	U	U	U	U	U	U	U	U	2	50 ST
Sodium	**35,500**	**35,400**	18,200	18,900	16,300	17,400	**22,600**	**24,900**	132	20,000 ST
Thallium	**3.9 B**	**5.2 B**	**8.1 B**	**5.5 B**	U	**1.7 B**	U	**2.3 B**	2	0.5 GV
Vanadium	3.1 B	0.73 B	3.7 B	0.85 B	1.3 B	0.55 B	8.1 B	0.72 B	0.6	----
Zinc	73.5	56.6	75.3	65.9	45.6 B	49.1 B	73.1	43.1 B	2	2,000 GV

QUALIFIERS:
U: Compound analyzed for but not detected
B: Compound concentration is less than the CRDL
but greater than the IDL.

NOTES:
^: The combined standard for iron and manganese is 500 ug/l
[boxed] Indicates value exceeds NYSDEC Class GA groundwater standard or guidance value

APPENDIX D

DETAILED COST ESTIMATE

Alternative 1 | **26-28 WHITESBORO STREET**
NO ACTION WITH LONG-TERM MONITORING | **COST ESTIMATE SUMMARY**

Description: No active remediation. Groundwater monitoring to be conducted at 5 monitoring wells. Samples to be collected semiannually for first 5 years and annually thereafter for the remainder of 30 years.

CAPITAL COSTS:

DESCRIPTION	QUANTITY	UNIT	UNIT COST	TOTAL	NOTES
Site Work					
Soil Vapor Intrusion Survey	1	lump sum	$10,000	$10,000	
SUBTOTAL				$10,000	Soil Vapor Sample: 6 samples for VOCs from 5 sub-surface probes and one ambient air location.
Contingency and Engineering Fees					
Contingency Allowance (20%)				$2,000	
Engineering Fees (15%)*				$1,500	
SUBTOTAL				$3,500	
TOTAL CAPITAL COSTS				**$13,500**	

ANNUAL O&M COSTS:

DESCRIPTION	QUANTITY	UNIT	UNIT COST	TOTAL	NOTES
Groundwater Monitoring Costs Years 1-5					Semiannual samples: 5 monitoring wells for VOCs, SVOCs and metals.
Groundwater sampling	2	mandays	$1,000	$2,000	
Equipment, materials and supplies	2	lump sum	$1,000	$2,000	
Sample analysis	10	samples	$420	$4,200	
SUBTOTAL (per year)				$8,200	
Groundwater Monitoring Costs Years 6-30					Annual samples: 5 monitoring wells for VOCs, SVOCs and metals.
Groundwater sampling	1	mandays	$1,000	$1,000	
Equipment, materials and supplies	1	lump sum	$1,000	$1,000	
Sample analysis	5	samples	$420	$2,100	
SUBTOTAL (per year)				$4,100	
TOTAL ANNUAL O&M COSTS:				$143,500	
PRESENT VALUE ANNUAL O&M COSTS (30 yrs, I=5%):				**$80,800**	
REMEDIAL ALTERNATIVE 1 TOTAL ESTIMATED COSTS				**$94,300**	

* - Includes design and construction inspection.

Description: Alternative includes placement of a 1-foot thick asphalt cap over entire site. Groundwater monitoring would be conducted as presented for Alternative 1. Implementation within 2 months.

CAPITAL COSTS:

DESCRIPTION	QUANTITY	UNIT	UNIT COST	TOTAL	NOTES
Preparation					
Contractor plans/submittals	1	lump sum	$10,000	$10,000	
SUBTOTAL				$10,000	
Mobilization/Demobilization					
Construction equipment	1	lump sum	$3,640	$3,640	loader,etc.
SUBTOTAL				$3,640	
Site Work					
Rough grading with Dozer	7,750	square yard	$3.52	$27,300	rough grading
Temporary facilities	1	lump sum	$900	$900	port-a-potty, field trailer
Soil Vapor Intrusion Survey	1	lump sum	$10,000	$10,000	Soil Vapor Sample: 6 samples for VOCs from 5 sub-surface probes and one ambient air location.
SUBTOTAL				$38,200	
Pavement Cap Installation					
Spread/Compact Subgrade	2,150	cubic yard	$5.00	$10,750	10-inch subgrade
Base Course	1,936	cubic yard	$14.60	$28,266	9-inch base
Grade SubBase	7,750	square yard	$5.72	$44,330	
Hot Mix Surface Course	609	ton	$54.90	$33,434	asphalt surface 1.5 inch
Surface Prime Coat	69,700	square feet	$0.39	$27,183	seal
SUBTOTAL				$143,963	
Contingency and Engineering Fees					
Contingency Allowance (20%)				$39,200	
Engineering Fees (15%)				$29,400	
SUBTOTAL				$68,600	
TOTAL CAPITAL COSTS				**$264,400**	

ANNUAL O&M COSTS:

DESCRIPTION	QUANTITY	UNIT	UNIT COST	TOTAL	NOTES
Cap					
Site Inspection	4	mandays	$1,000	$4,000	Quarterly inspections
Cap maintenance & materials	0.25	lump sum	$24,395	$6,099	req. every 4 years
SUBTOTAL (per year)				$10,099	
Groundwater Monitoring Costs Years 1-5					Semiannual samples: 5 monitoring wells for VOCs, SVOCs and metals.
Groundwater sampling	2	mandays	$1,000	$2,000	
Equipment, materials and supplies	2	lump sum	$1,000	$2,000	
Sample analysis	10	samples	$420	$4,200	
SUBTOTAL (per year)				$8,200	
Groundwater Monitoring Costs Years 6-30					Annual samples: 5 monitoring wells for VOCs, SVOCs and metals.
Groundwater sampling	1	mandays	$1,000	$1,000	
Equipment, materials and supplies	1	lump sum	$1,000	$1,000	
Sample analysis	5	samples	$420	$2,100	
SUBTOTAL (per year)				$4,100	
TOTAL ANNUAL O&M COSTS:				$446,500	
PRESENT VALUE ANNUAL O&M COSTS (30 yrs, I=5%):				**$236,000**	
REMEDIAL ALTERNATIVE 2 TOTAL ESTIMATED COSTS				**$500,400**	

Description: Alternative includes removal of surface soil and subsurface soils exceeding CU-SCOs for all contaminants including PAHs followed by placement of a 2-foot thick soil cover over excavated areas of the site. Groundwater monitoring to be conducted at 5 monitoring wells. Samples to be collected annually for first 5 years and bi-annually thereafter for the remainder of 30 years. Implementation within 6 to 9 months.

CAPITAL COSTS:

DESCRIPTION	QUANTITY	UNIT	UNIT COST	TOTAL	NOTES
Preparation					
Contractor plans/submittals	1	lump sum	$16,500	$16,500	
SUBTOTAL				$16,500	
Mobilization/Demobilization					
Construction equipment	1	lump sum	$1,000	$1,000	loader,etc.
SUBTOTAL				$1,000	
Site Work					
Clearing and grubbing	1.6	acre	$154	$200	brush, trees, clear & haul
Erosion controls	400	linear feet	$2	$800	silt fencing, etc.
Temporary facilities & utilities	1	lump sum	$2,000	$2,000	trailers, electric
SUBTOTAL				$3,000	
Excavation, Disposal, Backfill					
Excavation - soil	5,700	cubic yard	$2	$11,400	excavator, inc. loading
Transport and Disposal	8,550	ton	$38	$324,900	T&D nonhazardous
Consumables and Supplies	1	lump sum	$65	$100	PPE
Backfill	4,600	cubic yard	$6	$27,600	fine run of bank
Backfill Placement	6,550	square yard	$1	$6,600	spread fill
Analytical Services	4	sample	$540	$2,200	for landfill acceptance
				$372,800	
Soil Cover Installation					
Buy and haul 18" soil cover	2,900	cubic yard	$6	$17,400	bank run
Buy and haul 6" veg. growth cover	1,100	cubic yard	$16	$17,600	topsoil
Place 18" soil cover	6,550	square yard	$0.50	$3,275	spread fill
Place 6" vegetative growth cover	6,550	square yard	$0.50	$3,275	spread fill
Seed, fertilize and mulch	1.6	acre	$3,700	$5,920	seed, mulch & fertilize
Soil Vapor Intrusion Survey	1	lump sum	$10,000	$10,000	Soil Vapor Sample: 6 samples for VOCs from 5 sub-surface probes and one ambient air location.
SUBTOTAL				$57,470	
Contingency and Engineering Fees					
Contingency Allowance (20%)				$90,200	
Engineering Fees (15%)*				$67,600	
SUBTOTAL				$157,800	
TOTAL CAPITAL COSTS				**$609,000**	

* - Includes design and construction inspection.

ANNUAL O&M COSTS:

DESCRIPTION	QUANTITY	UNIT	UNIT COST	TOTAL	NOTES
Cover					
Site Inspection	4	mandays	$1,000	$4,000	Quarterly inspections
Vegetation maintenance & materials	1	lump sum	$7,500	$7,500	
SUBTOTAL (per year)				$11,500	
Groundwater Monitoring Costs Years 1-5					Annual samples: 5 monitoring wells for VOCs, SVOCs and metals.
Groundwater sampling	1	mandays	$1,000	$1,000	
Equipment, materials and supplies	1	lump sum	$1,000	$1,000	
Sample analysis	5	samples	$420	$2,100	
SUBTOTAL (per year)				$4,100	
Groundwater Monitoring Costs Years 6-30					
Groundwater sampling	0.5	mandays	$1,000	$500	Bi-annual samples: 5 monitoring wells for VOCs, SVOCs and metals.
Equipment, materials and supplies	0.5	lump sum	$1,000	$500	
Sample analysis	2.5	samples	$420	$1,100	
SUBTOTAL (per year)				$2,100	
TOTAL ANNUAL O&M COSTS:				$418,000	
PRESENT VALUE ANNUAL O&M COSTS (30 yrs, I=5%):				**$218,000**	
REMEDIAL ALTERNATIVE 3 TOTAL ESTIMATED COSTS				**$827,000**	

Description: Alternative includes removal of surface soil and subsurface soils exceeding CU-SCOs for all contaminants except PAHs followed by placement of a 2-foot thick soil cover over excavated areas of the site. Groundwater monitoring to be conducted at 5 monitoring wells. Samples to be collected annually for first 5 years and bi-annually thereafter for the remainder of 30 years. Implementation within 6 to 9 months.

CAPITAL COSTS:

DESCRIPTION	QUANTITY	UNIT	UNIT COST	TOTAL	NOTES
Preparation					
Contractor plans/submittals	1	lump sum	$13,800	$13,800	
SUBTOTAL				$13,800	
Mobilization/Demobilization					
Construction equipment	1	lump sum	$1,000	$1,000	loader,etc.
SUBTOTAL				$1,000	
Site Work					
Clearing and grubbing	1.6	acre	$154	$200	brush, trees, clear & haul
Erosion controls	400	linear feet	$2	$800	silt fencing, etc.
Temporary facilities & utilities	1	lump sum	$2,000	$2,000	trailers, electric
SUBTOTAL				$3,000	
Excavation, Disposal, Backfill					
Excavation - soil	4,150	cubic yard	$2	$8,300	excavator, inc. loading
Transport and Disposal	6,225	ton	$38	$236,550	T&D nonhazardous
Consumables and Supplies	1	lump sum	$65	$100	PPE
Backfill	3,100	cubic yard	$6	$18,600	fine run of bank
Backfill Placement	6,200	square yard	$1	$6,200	spread fill
Analytical Services	4	sample	$540	$2,200	for landfill acceptance
SUBTOTAL				$271,950	
Soil Cover Installation					
Buy and haul 18" soil cover	3,100	cubic yard	$6	$18,600	bank run
Buy and haul 6" veg. growth cover	1,100	cubic yard	$16	$17,600	topsoil
Place 18" soil cover	6,200	square yard	$0.50	$3,100	spread fill
Place 6" vegetative growth cover	6,200	square yard	$0.50	$3,100	spread fill
Seed, fertilize and mulch	1.6	acre	$3,700	$5,920	seed, mulch & fertilize
Soil Vapor Intrusion Survey	1	lump sum	$10,000	$10,000	Soil Vapor Sample: 6 samples for VOCs from 5 sub-surface probes and one ambient air location.
SUBTOTAL				$58,320	
Contingency and Engineering Fees					
Contingency Allowance (20%)				$69,600	
Engineering Fees (15%)*				$52,200	
SUBTOTAL				$121,800	
TOTAL CAPITAL COSTS				**$470,000**	

* - Includes design and construction inspection.

ANNUAL O&M COSTS:

DESCRIPTION	QUANTITY	UNIT	UNIT COST	TOTAL	NOTES
Cover					
Site Inspection	4	mandays	$1,000	$4,000	Quarterly inspections
Vegetation maintenance & materials	1	lump sum	$7,500	$7,500	
SUBTOTAL (per year)				$11,500	
Groundwater Monitoring Costs Years 1-5					Annual samples: 5 monitoring wells for VOCs, SVOCs and metals.
Groundwater sampling	1	mandays	$1,000	$1,000	
Equipment, materials and supplies	1	lump sum	$1,000	$1,000	
Sample analysis	5	samples	$420	$2,100	
SUBTOTAL (per year)				$4,100	
Groundwater Monitoring Costs Years 6-30					
Groundwater sampling	0.5	mandays	$1,000	$500	Bi-annual samples: 5 monitoring wells for VOCs, SVOCs and metals.
Equipment, materials and supplies	0.5	lump sum	$1,000	$500	
Sample analysis	2.5	samples	$420	$1,100	
SUBTOTAL (per year)				$2,100	
TOTAL ANNUAL O&M COSTS:				$418,000	
PRESENT VALUE ANNUAL O&M COSTS (30 yrs, I=5%):				**$218,000**	
REMEDIAL ALTERNATIVE 4 TOTAL ESTIMATED COSTS				**$688,000**	

Alternative 5 | **26-28 WHITESBORO STREET**

HOT SPOT REMOVAL AND PERMEABLE COVER WITH MONITORING | **COST ESTIMATE SUMMARY**

Description: Alternative includes removal of surface soil and subsurface soils exceeding POG-SCOs for all contaminants including PAHs followed by placement of a 2-foot thick soil cover over excavated areas of the site. Groundwater monitoring to be conducted at 5 monitoring wells. Samples to be collected annually for first 5 years and bi-annually thereafter for the remainder of 30 years. Implementation within 6 to 9 months.

CAPITAL COSTS:

DESCRIPTION	QUANTITY	UNIT	UNIT COST	TOTAL	NOTES
Preparation					
Contractor plans/submittals	1	lump sum	$17,600	$17,600	
SUBTOTAL				$17,600	
Mobilization/Demobilization					
Construction equipment	1	lump sum	$1,000	$1,000	loader,etc.
SUBTOTAL				$1,000	
Site Work					
Clearing and grubbing	1.6	acre	$154	$200	brush, trees, clear & haul
Erosion controls	400	linear feet	$2	$800	silt fencing, etc.
Temporary facilities & utilities	1	lump sum	$2,000	$2,000	trailers, electric
SUBTOTAL				$3,000	
Excavation, Disposal, Backfill					
Excavation - soil	6,400	cubic yard	$2	$12,800	excavator, inc. loading
Transport and Disposal	9,600	ton	$38	$364,800	T&D nonhazardous
Consumables and Supplies	1	lump sum	$65	$100	PPE
Backfill	5,370	cubic yard	$6	$32,200	fine run of bank
Backfill Placement	5,800	square yard	$1	$5,800	spread fill
Analytical Services	4	sample	$540	$2,200	for landfill acceptance
SUBTOTAL				$417,900	
Soil Cover Installation					
Buy and haul 18" soil cover	2,150	cubic yard	$6	$12,900	bank run
Buy and haul 6" veg. growth cover	1,000	cubic yard	$16	$16,000	topsoil
Place 18" soil cover	5,800	square yard	$0.50	$2,900	spread fill
Place 6" vegetative growth cover	5,800	square yard	$0.50	$2,900	spread fill
Seed, fertilize and mulch	1.6	acre	$3,700	$5,920	seed, mulch & fertilize
Soil Vapor Intrusion Survey	1	lump sum	$10,000	$10,000	Soil Vapor Sample: 6 samples for VOCs from 5 sub-surface probes and one ambient air location.
SUBTOTAL				$50,620	
Contingency and Engineering Fees					
Contingency Allowance (20%)				$98,000	
Engineering Fees (15%)*				$73,500	
SUBTOTAL				$171,500	
TOTAL CAPITAL COSTS				**$662,000**	

* - Includes design and construction inspection.

ANNUAL O&M COSTS:

DESCRIPTION	QUANTITY	UNIT	UNIT COST	TOTAL	NOTES
Cover					
Site Inspection	4	mandays	$1,000	$4,000	Quarterly inspections
Vegetation maintenance & materials	1	lump sum	$7,500	$7,500	
SUBTOTAL (per year)				$11,500	
Groundwater Monitoring Costs Years 1-5					Annual samples: 5 monitoring wells for VOCs, SVOCs and metals.
Groundwater sampling	1	mandays	$1,000	$1,000	
Equipment, materials and supplies	1	lump sum	$1,000	$1,000	
Sample analysis	5	samples	$420	$2,100	
SUBTOTAL (per year)				$4,100	
Groundwater Monitoring Costs Years 6-30					
Groundwater sampling	0.5	mandays	$1,000	$500	Bi-annual samples: 5 monitoring wells for VOCs, SVOCs and metals.
Equipment, materials and supplies	0.5	lump sum	$1,000	$500	
Sample analysis	2.5	samples	$420	$1,100	
SUBTOTAL (per year)				$2,100	

TOTAL ANNUAL O&M COSTS:	$418,000
PRESENT VALUE ANNUAL O&M COSTS (30 yrs, I=5%):	**$218,000**
REMEDIAL ALTERNATIVE 5 TOTAL ESTIMATED COSTS	**$880,000**

Description: Alternative includes removal of surface soil and subsurface soils exceeding POG-SCOs for all contaminants except PAHs followed by placement of a 2-foot thick soil cover over excavated areas of the site. Groundwater monitoring to be conducted at 5 monitoring wells. Samples to be collected annually for first 5 years and bi-annually thereafter for the remainder of 30 years. Implementation within 6 to 9 months.

CAPITAL COSTS:

DESCRIPTION	QUANTITY	UNIT	UNIT COST	TOTAL	NOTES
Preparation					
Contractor plans/submittals	1	lump sum	$7,900	$7,900	
SUBTOTAL				$7,900	
Mobilization/Demobilization					
Construction equipment	1	lump sum	$1,000	$1,000	loader,etc.
SUBTOTAL				$1,000	
Site Work					
Clearing and grubbing	1.6	acre	$154	$200	brush, trees, clear & haul
Erosion controls	400	linear feet	$2	$800	silt fencing, etc.
Temporary facilities & utilities	1	lump sum	$2,000	$2,000	trailers, electric
SUBTOTAL				$3,000	
Excavation, Disposal, Backfill					
Excavation - soil	1,425	cubic yard	$2	$2,850	excavator, inc. loading
Transport and Disposal	2,150	ton	$38	$81,700	T&D nonhazardous
Consumables and Supplies	1	lump sum	$65	$100	PPE
Backfill	1,200	cubic yard	$6	$7,200	fine run of bank
Backfill Placement	1,400	square yard	$1	$1,400	spread fill
Analytical Services	4	sample	$540	$2,200	for landfill acceptance
SUBTOTAL				$95,450	
Soil Cover Installation					
Buy and haul 18" soil cover	550	cubic yard	$6	$3,300	bank run
Buy and haul 6" veg. growth cover	250	cubic yard	$16	$4,000	topsoil
Place 18" soil cover	1,400	square yard	$0.50	$700	spread fill
Place 6" vegetative growth cover	1,400	square yard	$0.50	$700	spread fill
Seed, fertilize and mulch	1.6	acre	$3,700	$5,920	seed, mulch & fertilize
Soil Vapor Intrusion Survey	1	lump sum	$10,000	$10,000	Soil Vapor Sample: 6 samples for VOCs from 5 sub-surface probes and one ambient air location.
SUBTOTAL				$24,620	
Contingency and Engineering Fees					
Contingency Allowance (20%)				$26,400	
Engineering Fees (15%)*				$19,800	
SUBTOTAL				$46,200	
TOTAL CAPITAL COSTS				**$178,000**	

* - Includes design and construction inspection.

ANNUAL O&M COSTS:

DESCRIPTION	QUANTITY	UNIT	UNIT COST	TOTAL	NOTES
Cover					
Site Inspection	4	mandays	$1,000	$4,000	Quarterly inspections
Vegetation maintenance & materials	1	lump sum	$7,500	$7,500	
SUBTOTAL (per year)				$11,500	
Groundwater Monitoring Costs Years 1-5					Annual samples: 5 monitoring wells for VOCs, SVOCs and metals.
Groundwater sampling	1	mandays	$1,000	$1,000	
Equipment, materials and supplies	1	lump sum	$1,000	$1,000	
Sample analysis	5	samples	$420	$2,100	
SUBTOTAL (per year)				$4,100	
Groundwater Monitoring Costs Years 6-30					
Groundwater sampling	0.5	mandays	$1,000	$500	Bi-annual samples: 5 monitoring wells for VOCs, SVOCs and metals.
Equipment, materials and supplies	0.5	lump sum	$1,000	$500	
Sample analysis	2.5	samples	$420	$1,100	
SUBTOTAL (per year)				$2,100	

TOTAL ANNUAL O&M COSTS:	$418,000
PRESENT VALUE ANNUAL O&M COSTS (30 yrs, I=5%):	**$218,000**
REMEDIAL ALTERNATIVE 6 TOTAL ESTIMATED COSTS	**$396,000**

Description: Alternative includes removal of surface soil and subsurface soils exceeding UU-SCOs for all contaminants including PAHs, transportation and disposal off-site, and backfilling clean imported soil. Groundwater monitoring to be conducted at 5 monitoring wells. Samples to be collected annually for 5 years. Implemented within 2 months.

CAPITAL COSTS:

DESCRIPTION	QUANTITY	UNIT	UNIT COST	TOTAL	NOTES
Preparation					
Contractor plans/submittals	1	lump sum	$19,000	$19,000	
SUBTOTAL				$19,000	
Mobilization/Demobilization					
Construction equipment	1	lump sum	$13,400	$13,400	
SUBTOTAL				$13,400	
Site Work					
Temporary facilities & utilities	1	lump sum	$3,900	$3,900	trailers, electric
SUBTOTAL				$3,900	
Excavation, Disposal, Backfill					
Excavation	8,500	cubic yard	$4	$34,000	excavator, inc. loading
Transport and disposal - nonhaz	12,800	ton	$38	$486,400	T&D non.haz.
Consumables and supplies	1	lump sum	$750	$750	PPE
Backfill	7,250	cubic yard	$12	$87,000	bank run
Backfill Placement	7,400	square yard	$1	$7,400	backfill
Analytical services	23	sample	$540	$12,400	for landfill acceptance
Buy and haul 6" veg. growth cover	1,250	cubic yard	$16	$20,000	topsoil
Place 6" vegetative growth cover	7,400	square yard	$0.50	$3,700	spread fill
Seed, fertilize and mulch	1.6	acre	$3,700	$5,920	seed, mulch & fertilize
Soil Vapor Intrusion Survey	1	lump sum	$10,000	$10,000	Soil Vapor Sample: 6 samples for VOCs from 5 sub-surface probes and one ambient air location.
SUBTOTAL				$667,570	
Contingency and Engineering Fees					
Contingency Allowance (20%)				$140,800	
Engineering Fees (15%)				$105,600	
SUBTOTAL				$246,400	
TOTAL CAPITAL COSTS				**$950,000**	

ANNUAL O&M COSTS:

DESCRIPTION	QUANTITY	UNIT	UNIT COST	TOTAL	NOTES
Groundwater Monitoring Costs Years 1-5					
Groundwater sampling	1	mandays	$1,000	$1,000	Annual samples: 5 monitoring wells for VOCs, SVOCs and metals.
Equipment, materials and supplies	1	lump sum	$1,000	$1,000	
Sample analysis	5	samples	$420	$2,100	
SUBTOTAL (per event)				$4,100	
TOTAL ANNUAL O&M COSTS:				$20,500	
PRESENT VALUE ANNUAL O&M COSTS (5 yrs, I=5%):				**$18,000**	
REMEDIAL ALTERNATIVE 7 TOTAL ESTIMATED COSTS				**$968,000**	

Description: Alternative includes removal of surface soil and subsurface soils exceeding UU-SCOs for all contaminants except PAHs, transportation and disposal off-site, and backfilling clean imported soil. Groundwater monitoring to be conducted at 5 monitoring wells. Samples to be collected annually for 5 years. Implemented within 2 months.

CAPITAL COSTS:

DESCRIPTION	**QUANTITY**	**UNIT**	**UNIT COST**	**TOTAL**	**NOTES**
Preparation					
Contractor plans/submittals	1	lump sum	$17,600	$17,600	2% of total
SUBTOTAL				$17,600	
Mobilization/Demobilization					
Construction equipment	1	lump sum	$12,400	$12,400	2% of construction
SUBTOTAL				$12,400	
Site Work					
Temporary facilities & utilities	1	lump sum	$3,900	$3,900	trailers, electric
SUBTOTAL				$3,900	
Excavation, Disposal, Backfill					
Excavation	7,850	cubic yard	$4	$31,400	excavator, inc. loading
Transport and disposal - nonhaz	11,800	ton	$38	$448,400	T&D non.haz.
Consumables and supplies	1	lump sum	$750	$750	PPE
Backfill	6,600	cubic yard	$12	$79,200	bank run
Backfill Placement	7,400	square yard	$1	$7,400	backfill
Analytical services	23	sample	$540	$12,400	for landfill acceptance
Buy and haul 6" veg. growth cover	1,250	cubic yard	$16	$20,000	topsoil
Place 6" vegetative growth cover	7,400	square yard	$0.50	$3,700	spread fill
Seed, fertilize and mulch	1.6	acre	$3,700	$5,920	seed, mulch & fertilize
Soil Vapor Intrusion Survey	1	lump sum	$10,000	$10,000	Soil Vapor Sample: 6 samples for VOCs from 5 sub-surface probes and one ambient air location.
SUBTOTAL				$619,170	
Contingency and Engineering Fees					
Contingency Allowance (20%)				$130,600	
Engineering Fees (15%)				$98,000	
SUBTOTAL				$228,600	
TOTAL CAPITAL COSTS				**$882,000**	

ANNUAL O&M COSTS:

DESCRIPTION	**QUANTITY**	**UNIT**	**UNIT COST**	**TOTAL**	**NOTES**
Groundwater Monitoring Costs Years 1-5					
Groundwater sampling	1	mandays	$1,000	$1,000	Annual samples: 5 monitoring wells for VOCs, SVOCs and metals.
Equipment, materials and supplies	1	lump sum	$1,000	$1,000	
Sample analysis	5	samples	$420	$2,100	
SUBTOTAL (per event)				$4,100	
TOTAL ANNUAL O&M COSTS:				$20,500	
PRESENT VALUE ANNUAL O&M COSTS (5 yrs, I=5%):				**$18,000**	
REMEDIAL ALTERNATIVE 8 TOTAL ESTIMATED COSTS				**$900,000**	