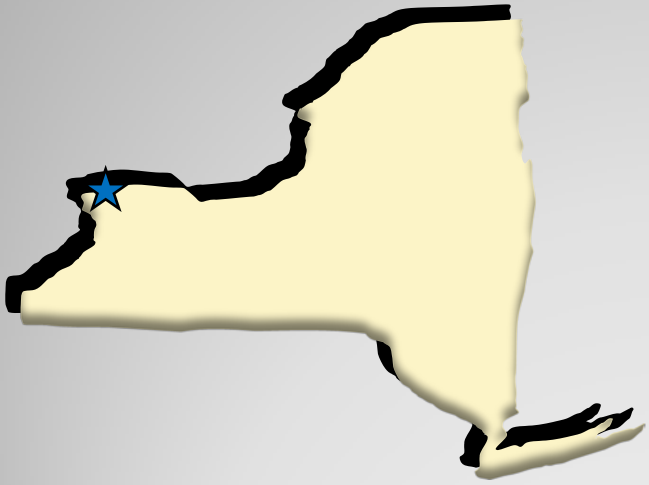
FINAL REMEDIAL INVESTIGATION REPORT

Old Upper Mountain Road Site (932112)
Lockport, Niagara County, New York



Prepared for:

New York State Department of Environmental Conservation
Division of Environmental Remediation

Prepared by:

EA ENGINEERING, P.C. and Its Affiliate
EA SCIENCE and TECHNOLOGY

April 2011

Final Remedial Investigation Report
Old Upper Mountain Road (932112)
Lockport, New York

Prepared for

New York State Department of Environmental Conservation
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CONTENTS

Page

Page

Page

Page

LIST OF FIGURES

LIST OF TABLES

LIST OF ACRONYMS

1,1-DCA	1,1-dichlorethane
1,1-DCE	1,1-dichlorethene
1,1,1-TCA	1,1,1-Trichloroethane
AEC	Anion Exchange Capacity
AMSL	Above Mean Sea Level
bgs	Below Ground Surface
BTEX	Benzene, toluene, ethylbenzene, and xylenes
C&D	Construction and debris
CEC	Cation Exchange Capacity
cis-1,2-DCE	cis-1,2-Dichloroethene
COC	Contaminants of Concern
CSM	Conceptual Site Model
CRDL	Contract Required Detection Limit
CVOC	Chlorinated Volatile Organic Compound
DDD	Dichlorodiphenyldichloroethane
DDE	Dichlorodiphenyldichloroethylene
DDT	Dichlorodiphenyltrichloroethane
D&M	D&M Landscavation
DUSR	Data Usability Summary Report
EA	EA Engineering, P.C. and its affiliate EA Science and Technology
ECD	Electron Capture Detector
EDR	Environmental Data Resources, Inc.
ELAP	Environmental Laboratory Approval Program
FS	Feasibility Study
GC	Gas Chromatography
GMCH	General Motors Components Holdings, LLC
HASP	Health and Safety Plan
HCV	Hampton Clarke-Veritech
HSA	Hollow Stem Auger
HQ	Hazard Quotient
ICP	Inductively Coupled Plasma
ICS	Interference Check Sample
ID	Inside Diameter

LCS	Laboratory Control Sample
LEL	Lowest Effect Levels
MDL	Method Detection Limit
MS	Mass Spectroscopy
NCWD	Niagara County Water District
NTU	Nephelometric Turbidity Units
NYCRR	New York Code of Rules and Regulations
NYSDEC	New York State Department of Environmental Conservation
NYSDOH	New York State Department of Health
ORP	Oxidation Reduction Potential
OU	Operable Unit
PAH	Polycyclic Aromatic Hydrocarbons
PCB	Polychlorinated Biphenyl
PCE	Tetrachloroethene
PID	Photoionization Detector
POTW	Publicly Owned Treatment Works
PSA	Preliminary Site Assessment
PVC	Polyvinyl Chloride
QAPP	Quality Assurance Project Plan
QA/QC	Quality Assurance/Quality Control
RI	Remedial Investigation
RV	Recreational Vehicle
SCG	Standards, Criteria, and Guidance
SCO	Soil Cleanup Objectives
SDG	Sample Delivery Group
SEL	Severe Effect Levels
SI	Site Investigation
SIU	Standard Industrial User
SPDES	State Pollutant Discharge Elimination System
SRI	Supplemental Remedial Investigation
SSURGO	Soil Service Geographic Database
SVOC	Semivolatile Organic Compound
TAL	Target Analyte List Metals
TCE	Trichloroethene
TCLP	Toxicity Characteristic Leaching Procedure
TOC	Total Organic Carbon
TOGS	Technical and Operational Guidance Series

trans-1,2-DCE	*trans*-1,2-dichloroethene
USEPA	United States Environmental Protection Agency
USCS	Unified Soil Classification System
USGS	United States Geological Survey
VC	Vinyl Chloride
VOC	Volatile Organic Compound
WA	Work Assignment

ES. EXECUTIVE SUMMARY

EA Engineering, P.C. and its affiliate EA Science and Technology (EA), under contract to the New York State Department of Environmental Conservation (NYSDEC) (Work Assignment No. D004438-41) was tasked to perform a Remedial Investigation (RI) and Feasibility Study (FS) at the Old Upper Mountain Road site (NYSDEC Site No. 932112) located in both the town and city of Lockport, Niagara County, New York.

The Old Upper Mountain Road site was reportedly operated as a municipal dump by the city of Lockport from 1921 to the 1950s. The site includes the former municipal dump area which covers approximately 7 acres northeast of the intersection between NYS Route 93 and NYS Route 31 and a ravine and Gulf Creek which lie north of the former dump and run northeast towards Eighteen Mile Creek. The site is currently divided by seven Niagara County tax parcels owned by various private owners and entities. The site is currently unoccupied and vacant.

The Old Upper Mountain Road site has undergone a number of environmental investigations since the site's discovery in 1993. The initial investigation of the site was initiated by NYSDEC, after the discovery of ash and glass debris, as well as surface dumping of tires, trash, and other wastes was observed on-site during a routine site inspection of the Lockport City Landfill, located north of the site. This investigation and subsequent investigations revealed the presence of metals, volatile organic compounds (VOCs) and semivolatile organic compounds (SVOCs) within various environmental media associated with the site. A site investigation (SI) conducted at the Old Upper Mountain Road site in 2007 revealed that consequential amounts of hazardous wastes (D008 - lead) were present at the site. It was suggested that these hazardous wastes had adversely impacted surface water and sediment in Gulf Creek adjacent to the site. As a result of the SI, the site was listed on the NYSDEC Registry of Inactive Hazardous Waste Disposal Sites in New York State as a Class 2 site (932112).

Environmental investigations conducted at the site since 1993 include:

- Preliminary Site Assessment (PSA) in November 1997 by NYSDEC.
- Surface soil and surface water sampling in October 1998 by New York State Department of Health (NYSDOH).
- Site Investigation in June 2007 by NYSDEC.

A more detailed review of the previous investigations conducted at the site is included in Section 1 of this RI report.

Prior to development of this RI report, it was determined based upon the previous investigations conducted at the site, and in consultation with NYSDEC, that impacts from contaminants of potential concern (COPCs) associated with the Old Upper Mountain Road site would be evaluated as three separate operable units defined as follows:

- Operable Unit 1 (OU 1) defined as the approximately 6 acres of land fill wastes which make up the Old Upper Mountain Road site. Impacts associated with OU 1 and evaluated in this RI include on-site surface and subsurface soil/fill material, and on-site groundwater.

- Operable Unit 1A (OU 1A) defined as the approximately 1 acre of land fill wastes that make up the portion of Old Upper Mountain Road site located south and west of the Somerset rail line. Impacts associated with OU 1A and evaluated in this RI include on-site surface and subsurface soil/fill material, and on-site groundwater.

- Operable Unit 2 (OU 2) defined as surface water and sediment within Gulf Creek, from the area located at the western origin of the ravine at the bulkhead outfall located to the north of the site to an area downstream where Gulf Creek meets Niagara Street. Because surface water within the creek receives discharge water from multiple sewer systems and groundwater flow from areas surrounding the site and the site itself, on-site groundwater at OU 1 and the sewer system evaluation will be utilized to characterize impacts to surface water and sediment within OU 2.

This RI Report was completed to assess the impacts associated with OU 1 and OU 1A, while ongoing work is currently being conducted under a supplemental RI (SRI) to assess impacts for OU 2.

ES.1 REMEDIAL INVESTIGATION

The objectives of the RI were to further define the nature and extent of contamination in fill material at the site, further define the nature and extent of contamination in surface water and sediment of Gulf Creek adjacent to the site, evaluate groundwater flow patterns across the site and assess bedrock groundwater quality, investigate the sewer system that discharges into Gulf Creek near Old Upper Mountain Road to determine the origin of this sewer and the possible upstream source of surface water contamination, quantify the volume of fill material throughout the site, assess the potential human exposure pathways to the contaminants, and complete a NYSDEC Fish and Wildlife Impact Analysis through Step 2A. In preparation for the RI/FS, a scoping session and site visit was conducted on 2 September 2009 between EA and NYSDEC. A work plan was developed by EA and approved by NYSDEC in November 2009. The RI field investigation activities were performed between November 2009 and May 2010. The RI activities included the following:

- Document reviews, site visit and work plan development and submittal – September October 2009

- Site Clearing and preliminary survey activities – November/December 2009

- Sediment, surface water, and manhole sampling – November 2009
- Sewer system tracer dye testing – November 2009
- Monitoring well installation and development – December 2009
- Monitoring well gauging event – January 2010
- Monitoring well gauging event – February 2010
- Groundwater Sampling Event – February 2010
- On-site subsurface soil evaluation program (test pitting, direct-push soil borings, and vertical profile borings) – May 2010
- On-site surface soil evaluation program– May 2010
- Sediment, surface water and manhole water sampling– May 2010
- Site sampling locations survey – May/June 2010
- Preparation and submittal of RI Report – September 2010 and January 2011.

ES.2 NATURE AND EXTENT OF AREAS OF CONCERN

The following bulleted items summarize the findings of the RI for OU 1 and OU 1A at the Old Upper Mountain Road site. The findings were based on all applicable and relevant standards, criteria, and guidance (SCGs) associated with RIs conducted under the NYSDEC Division of Environmental Remediation Draft DER-10 Technical Guidance for Site Investigation and Remediation (May 2010).

- Several target analyte list (TAL) metals were reported in on-site surface soil/fill above their applicable SCGs. TAL metal analytical results for surface soil samples collected during this RI are consistent with samples collected by the NYSDEC in 2007.

- Surface soil/fill material within OU 1 and OU 1A exhibited hazardous waste characteristics for lead (D008). Surface soil/fill material was identified as hazardous waste on both the main portion of the site (OU 1) and on the southeastern parcel (OU 1A) located south of the Somerset railroad tracks.

- The on-site subsurface soil/fill sampling program identified elevated concentrations of several TAL Metals. Concentrations of lead in exceedance of its SCG were detected in 107 of 116 (approximately 92 percent) subsurface soil samples collected under this evaluation. The deepest impacts to subsurface soil/fill were reported at a depth of 70-73 ft bgs. The metal contamination appears to be greatest within shallow subsurface soil/fill collected from the eastern portion of the site.

- It appears that the types and source(s) of waste dumped at the site, rather than migration of metals through the fill material, is the primary influence on metals concentration within the subsurface soil/fill material within OU 1 and OU 1A.

- Subsurface soil/fill material within OU 1 and OU 1A exhibited hazardous waste characteristics for lead (D008). Thirty-three out of 70 (approximately 44 percent) subsurface soil/fill samples submitted for TCLP lead analysis were identified as characteristic hazardous waste.

- The hydrogeologic data evaluated during this RI indicates that bedrock groundwater is in communication with the saturated zones observed within the overburden fill material.

- The groundwater flow direction, based on groundwater elevations, is towards the former ravine and eventually Gulf Creek. The former ravine identified during the subsurface investigation acts as a discharge point for bedrock groundwater within the vicinity of the site.

- Groundwater sampling data reported concentrations of TAL metals at each of the monitoring well locations. The highest overall concentrations of TAL metals were reported at monitoring wells MW-04 and MW-03, which are screened within the deepest portion of the on-site fill material (MW-04) and shallow bedrock just below the fill material (MW-03) and are located along the northern portion of the site. On-site subsurface fill material appears to be acting as a direct source of elevated metal concentrations to groundwater quality within OU 1.

- SVOCs that exceeded site SCGs, were detected at monitoring wells MW-04 and MW-03 as well. Because SVOC concentrations were not reported at monitoring well locations located upgradient of monitoring wells MW-03 and MW-04, it appears that SVOC contamination observed within the fill material are also impacting groundwater quality.

- Groundwater samples that exhibited CVOC concentrations above the SCGs were collected from monitoring wells MW-01, MW-02, MW-04, and MW-05. Groundwater samples collected at monitoring well MW-03 reported concentrations of toluene exceeding the SCG. VOC detections in groundwater at the site may be due to off-site sources.

The following bulleted items summarize the preliminary findings of the RI for OU 2 at the Old Upper Mountain Road site. The findings were based on all applicable and relevant standards, criteria, and guidance (SCGs) associated with RIs conducted under the NYSDEC Division of Environmental Remediation Draft DER-10 Technical Guidance for Site Investigation and

Remediation (May 2010). The full nature and extent of impacts within OU 2 will be determined during the course of the SRI and detailed in the SRI report.

- The sanitary sewer system that bisects the Old Upper Mountain Road site has been partially defined via liquid tracer dye testing. This sewer system receives discharge flow from a number of sewer lines including sewer lines that originate along Route 31 and Otto Park Place, and a Town of Lockport line that accepts discharge flow from the GMCH facility. These sewer lines combine flow at the sewer manhole located at the end of Old Upper Mountain Road and then travel to the city of Lockport's POTW via the "Gulf Interceptor", a sewer line that runs beneath portions of Gulf Creek and at the base of the ravine adjacent to the site. The sanitary sewer line cuts through the western portion of the site and is buried beneath the fill material.

- Analytical results of the water samples (SW-01 and SW-03, and MSW-03) collected from the sewer systems identified the compounds 1,2-DCE, PCE, TCE, and iron. These compounds were also reported in surface water samples collected at the bulkhead outfall and downstream sampling locations in Gulf Creek.

- Low level CVOCs and iron have been identified in surface water within Gulf Creek, the storm sewer system discharge water that flows into Gulf Creek, the sanitary sewer system that intersects the western portion of the site, and on-site groundwater. PCE and iron were detected above their respective SCG for Class D waters within surface water samples collected from Gulf Creek.

- Concentrations of six TAL metals were identified above the SELs in the sediment of Gulf Creek with the most prevalent metals being lead and zinc. Sediment with metal concentrations above the SELs are considered contaminated and significant harm to benthic aquatic life is possible. However, none of the sediment samples submitted for TCLP lead analysis were identified as hazardous waste.

- The specific TAL metals reported in sediment samples correlate with the TAL metals observed within the on-site fill material (OU 1 and OU 1A) and are likely migrating to the sediments of Gulf Creek via erosion runoff and groundwater transport pathways.

- Concentrations of TAL metals and SVOCs have been detected above applicable SELs or calculated sediment criteria at sediment sampling locations located furthest downgradient of the site. Additional downgradient sediment samples have been collected during SRI activities and will be summarized in the SRI report.

1. INTRODUCTION

1.1 SITE HISTORY

The Old Upper Mountain Road site is located along Old Upper Mountain Road in both the town and city of Lockport, Niagara County, New York (Figure 1-1). The property is an irregularly shaped property consisting of seven Niagara County tax parcels which is bisected by an operational railroad track along the southern portion of the site. Main access to the northern portion of the site is along Old Upper Mountain Road, while access to the southern portion of the site is through a viaduct under an additional railroad track, located just to the north of Otto Park Place. The site is bounded to the north by a ravine which includes Gulf Creek.

The Old Upper Mountain Road site was reportedly operated as a municipal dump by the city of Lockport from 1921 to the 1950s. Access to the landfill during that time was from the viaduct under the railroad track just north of Otto Park Place. Garbage and other wastes were apparently dumped at the landfill, burned, and then pushed into the ravine. The city of Lockport moved its dumping operations in the 1950s to the area known today as the Lockport City Landfill (New York State Department of Environmental Conservation [NYSDEC] Site No. 932010).

The Old Upper Mountain Road site was reportedly used by the same clientele as the Lockport City Landfill, as there was only a shift in location between the two landfills in the 1950s. Clientele reportedly included Harrison Radiator, VanDeMark Chemical, Milward Alloys, Vanchlor, Upson, and Cotton Batting. Different areas of the dump were reportedly assigned to different companies.

The site was initially discovered in 1993 during a routine inspection of the Lockport City Landfill located north of the Old Upper Mountain Road site and downstream of the site along Gulf Creek. Evidence of ash and glass debris was noted throughout the top portion of the landfill, while recent dumping of trash/rubbish/tires was noted at the southern portion of the site. It was also noted during the inspection that a significant quantity of waste had been pushed over the embankment into the ravine at the base of which Gulf Creek runs.

1.2 PURPOSE AND SCOPE

The NYSDEC issued a Work Assignment (WA) to EA Engineering, P.C. and its affiliate EA Science and Technology (EA) to perform a Remedial Investigation (RI)/Feasibility Study (FS) at the Old Upper Mountain Road site in Lockport, Niagara County, New York. The WA is being conducted under the NYSDEC State Superfund Standby Contract (WA No. D004438-41). This RI/FS WA consists of the following tasks:

- ***Task 1***—Project Setup/Administration and Work Plans
- ***Task 2***—Remedial Investigation and Reporting – Phase I
- ***Task 3***—RI and Reporting – Phase II (contingency)
- ***Task 4***—FS Report.

This RI Report has been prepared as part of Task 2 to discuss field investigation and monitoring activities, present tables and figures summarizing sample locations and analytical results, summarize the findings of the RI, present the conclusions of those findings, and evaluate the potential for impact to public health and the environment at the Old Upper Mountain Road site. The information obtained during this RI will be used in the evaluation, development, and selection of potential remedial alternatives to be included in the FS for the site.

1.3 REPORT ORGANIZATION

This RI report presents the overall approach and details specific activities that were performed during the RI. Chapter 1 provides a description of the site background including site history, physical characteristics of the site, and a summary of previous investigations conducted at the site. Chapter 2 provides a summary of the procedures and techniques used to complete the RI field investigation program. Chapter 3 provides a description of the site environmental and physical settings including geology, hydrogeology, climate and water supply. Chapter 4 presents a summary and discussion of the findings of the RI. Chapter 5 identifies the potential and actual fate and transport mechanisms that influence the distribution of contaminants of concern (COCs) identified during the RI. Chapter 6 presents a qualitative human exposure assessment based on current and future site use scenarios. Chapter 7 documents the results of the fish and wildlife resources impact analysis. Chapter 8 discusses the conclusions of this RI and provides recommendations based on the available data.

1.4 BACKGROUND

The following sections provide a brief discussion of the site background for the Old Upper Mountain Road site.

1.4.1 Site Location

The site is located along Old Upper Mountain Road, in both the town and city of Lockport, Niagara County, New York (Figure 1-1). The property is an irregular-shaped parcel that is approximately 7 acres in size. The main access to the site is located on Old Upper Mountain Road. The site sits northeast of the intersection between NYS Route 93 and NYS Route 31. An access road exists on Otto Park Place to the southeastern portion of the site. The site consists of seven Niagara County tax parcels and is located in a mixed use area including residential, industrial, and commercial properties. Somerset Railroad bounds the property to the south and the east. The north of the property is bounded by private property and a ravine containing Gulf Creek, referred to as the Gulf.

1.4.2 Property Information

Based upon a review of historical information presented in the Environmental Data Resources, Inc. (EDR) reports, Upper Mountain Road first appears on the 1897 United States Geological Survey (USGS) topographic map along with the New York Central and Hudson River railroads which run along the southern boundary of the site. Access to the dumping area was historically through a viaduct located under this railroad track. An additional railroad appears in the area to the east of the site, running north to south along Gulf Creek on the 1948 USGS topographical map.

The topographic maps also illustrate changes in elevation at the site which reflect changes in the size and shape of the Gulf resulting from the historic landfill operations at the site, and development of other areas surrounding the Gulf. Based upon a review of the topographic maps, the following is known regarding impacts to the ravine from landfill activities and other site development:

- According to the 1897 topographic map, the site was part of the Gulf, in which the ravine extended almost completely to the railroad track that currently serves as the southern boundary of the site. Elevation at the top of the ravine was approximately 600 ft, while the base of the ravine was approximately 520 ft.

- The 1899 topographic map illustrates no discernable changes in the shape of the Gulf, indicating that landfill operations had not yet begun.

- The 1948 topographic map shows a large portion of the site formerly within the Gulf ravine filled to grade (approximately 587 ft). Filling appears to have been completed from the southwest corner of the site to the northeast, as a small portion of the ravine remains visible just beyond the eastern edge of the filled landfill area. Additionally, an industrial structure appears in the area of the current General Motors Components Holdings, LLC (GMCH), recently the former Delphi Thermal Systems, on the 1948 USGS topographic map to the west of the site across Upper Mountain Road.

- Landfill operations at the site appear to have continued through at least 1949. The 1949 topographic map illustrates further dumping within the ravine, as the small portion along the eastern portion of the site that was unfilled in 1948 is visible as being brought to grade in this map.

- The site appears unchanged in the 1965 topographic map. However, it appears that overburden soil was removed from the northern edge of the ravine, directly across Gulf Creek from the site during this time, as the ravine is shown to be slightly wider than observed in the 1949 map. A section of Upper Mountain Road was also abandoned between 1949 and 1965 and a new section was developed along NYS Route 93. The old section of the road was left behind and named Old Upper Mountain Road. Additionally, 4 structures are visible along Old Upper Mountain Road directly to the north of the site, while the GMCH property is shown to have expanded from previous maps.

- The 1980 topographic map shows an expansion in the western portion of the ravine, which appears to have coincided with the installation of a bulkhead outfall along Old Upper Mountain Road, which discharges directly into the ravine and Gulf Creek. This map also denotes the presence of the GMCH wastewater treatment plant to the north of

> the site, in addition to another expansion at the facility across Upper Mountain Road. A large section of water is also shown within the ravine approximately 500 ft downgradient from the site.

GMCH was started in 1910 as Harrison Radiator and has expanded over the last 100 years going through several changes of management. Harrison Radiator and later Delphi Thermal Systems have historically made radiators for cars. A wastewater treatment plant was constructed between 1965 and 1972 across the street from the industrial facility and to the north of the Old Upper Mountain Road site. The wastewater treatment plant reportedly treated and discharged hazardous waste and chemicals including hexavalent chromium, used in coating processes, into Eighteen Mile Creek. The wastewater treatment plant was closed in 2006 when the use of hexavalent chromium was eliminated and an alternative aluminum material system was selected that replaced the previous coating processes.

Currently, two off-site houses are located between approximately 175 ft and 300 ft to the north of the former dumping area. The two houses are unoccupied and vacant at the time of this RI report and appear to be serviced by public water supply from the Town of Lockport. The Somerset Railroad that bisects the site and currently serves as the eastern border of the site was installed between 1980 and 1985, replacing the line initially shown on the 1948 USGS topographic map. In 2006, site vehicle tracks were found on the site indicating a potential for recent surface dumping; therefore, a fence was installed at the site to deter trespassers from dumping at the site. Copies of the EDR reports have been provided in Appendix A. Figure 1-2 illustrates an aerial view of the site and the surrounding area.

As mentioned earlier the site is currently consists of seven Niagara County tax parcels owned by various entities which include CSX Transportation, Inc. (CSX), Somerset Railroad Corporation, New York State Electric & Gas Corporation (NYSEG), the City of Lockport, Mr. Allen Penwright, Mr. Douglas Snow, and Mr. Robert H. Matheis. Most recently the site was used as a junkyard where abandoned vehicles, boats, concrete/asphalt debris, tires, and other surface dumping occurred. Most of the vehicles were removed from the site prior to the start of this RI. In its current state a majority of the site is unoccupied and not being used for residential or commercial purposes. The CSX and Somerset railroad lines are currently active and were observed with infrequent use during the field investigation efforts conducted during this RI. Figure 1-3 identifies the seven Niagara County tax parcels and their reputed owners as documented during an American Land Title Association (ALTA) survey completed by Popli Design Group (Popli).

1.4.3 Physiography

The subject site is located on the USGS Lockport, New York 7.5-minute topographic quadrangle map, dated 1980 (Figure 1-4).

Elevation at the site is approximately 587 ft above mean sea level. The Gulf ravine acts as the northern boundary of the site. The nearest surface water feature, as noted on the topographic map, is Gulf Creek, which is adjacent to the site along the base of the Gulf. Gulf Creek flows north towards Eighteen Mile Creek. Both creeks converge and flow north into Lake Ontario.

1.4.4 Site Geology

A review of the geologic map of New York, Niagara Sheet published by the University of the State of New York, the State Education Department and dated 1970, indicates that the subject site lies within the glacial deposits above the Guelph Dolostone, which is part of the Lockport Group. According to the EDR report, the subject site is located within the silty loams and bedrock associated with the Middle Silurian Period.

According to the Soil Service Geographic Database (SSURGO), the site is underlain by the Farmington silt loam . This soil, which has well drained, slow infiltration rates (Class C), is described as being soil with layers impeding downward movement of water, or soil with moderately fine or fine textures. Typically this soil is less than 46 in. thick, consisting of fine grained soil, silt and clay, lean clay.

Within 0.25 mi of the site lies the Rock land unit. This soil, which is somewhat excessively drained and has slow infiltration rates (Class C), is described as being soil with layers impeding downward movement of water, or soil with moderately fine or fine textures. Typically this soil is less than 13-in. thick.

Also within 0.25 miles of the site lies the Cayuga silty loam. This soil, which is moderately well drained and has slow infiltration rates (Class C), is described as being soil with layers impeding downward movement of water, or soil with moderately fine or fine textures. Typically this soil is less than 127 in. thick and consists of coarse-grained soil, sand, sand with fines, clayey sand, and silty sand.

1.4.5 Site Hydrogeology

Previous subsurface investigations at the site did not encounter saturated zones. As such, limited information was available regarding site hydrology prior to the completion of this RI. The following information is known regarding general hydrologic conditions in the area surrounding the site. A more detailed description of local hydrogeology is included in the Site Investigation (SI) Report issued by NYSDEC in December 2007, which is provided in Appendix B.

Unconsolidated, fine-grained glacial deposits in the southwestern Lockport area are relatively thin, and horizontal laminations and sand lenses are uncommon. As a result of these thin deposits, shallow, unconfined aquifer groundwater flow in the area surrounding the site is expected to be highly localized and discontinuous, with flow expected to be generally to the north towards Gulf Creek.

Groundwater in the Lockport Group bedrock is primarily influenced by vertical and horizontal fractures, particularly in the upper unit, which is extensively fractured. Other contributors to bedrock groundwater in the area surrounding the site are likely to include weathered surface fractures, bedding joints, vertical joints, and small cavities within the upper bedrock formation. In addition, bedrock groundwater flow is anticipated to be influenced by several natural and manmade structures in the area, including the Niagara Escarpment and the Gulf located north of and adjacent to the site, the former Frontier Stone Products Quarry located south of the site, and the Erie Barge canal located southeast of the site.

1.5 PREVIOUS INVESTIGATIONS

A number of investigations have been performed at the Old Upper Mountain Road site since the site's discovery in 1993. The initial investigation of the site had been initiated by NYSDEC, after the discovery of ash and glass debris, as well as surface dumping of tires, trash, and other wastes on-site during a routine site inspection of the Lockport City Landfill, located north of the site in 1993. These investigations are summarized in the remainder of this section. Detailed information regarding these investigations is included in the NYSDEC SI Report (Appendix B). The report also includes an analytical summary of environmental samples collected both historically and during the SI in table format.

1.5.1 New York State Department of Environmental Conservation – 1997

In November 1997, NYSDEC Central Office Division of Hazardous Site Control staff conducted a cursory sampling event at the Old Upper Mountain Road site as part of a Preliminary Site Assessment (PSA). Specifically, the purpose of this field sampling was to determine if chemical contamination existed at the site and, if so, the concentration levels of the contamination. One surface water sample and one sediment sample were collected from Gulf Creek, and 13 surface waste samples from various locations on-site were collected and analyzed as part of the PSA.

The 13 surface waste samples contained volatile organic compounds (VOCs) and semivolatile organic compounds (SVOCs), with the concentrations exceeding the NYSDEC Part 375 residential soil cleanup objectives. Twenty metals were detected in the waste samples collected from the site. Of these 20 metals, 16 were detected at concentrations above NYSDEC soil cleanup objectives and 11 are listed as U.S. Environmental Protection Agency (USEPA) priority pollutant metals.

The surface water sample contained VOCs at concentrations that exceeded the NYSDEC surface water standards or guidance values for Class A streams. The sediment sample collected from the same location reported VOCs, SVOCs, and target analyte list (TAL) metals at concentrations that exceeded the NYSDEC sediment criteria.

1.5.2 New York State Department of Health - 1998

In October 1998, the New York State Department of Health (NYSDOH) collected one surface water and five surface soil samples from the site. The surface water sample was collected upstream of the surface water sample collected by the NYSDEC the previous year and analyzed only for VOCs. This sample contained VOCs exceeding NYSDEC surface water standards and/or guidance values. The surface soil samples were only analyzed for metals. Seventeen metals were detected in these samples, with the concentrations of 13 metals exceeding the NYSDEC Part 375 residential soil cleanup objectives. Eight of these metals were USEPA priority pollutant metals.

1.5.3 New York State Department of Environmental Conservation – 2007

The NYSDEC conducted a SI at the Old Upper Mountain Road site between June and October 2007 with the specific objective of determining if hazardous wastes or substances were present at the site, and if present, determining approximate volumes of waste and the degree to which the waste had contaminated environmental media both at the site and areas immediately surrounding the site.

NYSDEC and its subcontractor advanced 16 soil borings to depths up to 36 ft to evaluate the stratigraphy of the site. Based on boring logs, the geologic units encountered during the SI included clean fill, waste, and glaciolacustrine silty clays and clayey silts. Clean fill consisted predominantly of imported native soil, while waste material consisted predominantly of multi-colored, layered ash. The bedrock underlying the site is the Guelph Dolostone of the Lockport Group. During the SI, no saturated subsurface zone was encountered; therefore, hydrogeology was not evaluated at the site. Based upon a regional groundwater flow map for the area, it was suspected that groundwater under the Old Upper Mountain Road site flows to the north towards Gulf Creek.

Based on the environmental samples collected during the SI, it was determined that the site had been contaminated with VOCs, SVOCs, and TAL metals due to the historical operations of the site as a landfill. The concentrations of some of these contaminants exceed the soil cleanup objectives by a factor of four or more. The same contaminants were detected in surface water and/or sediment at concentrations that exceeded the respective standards, criteria, and guidance values (SCGs). Eighteen Mile Creek, which receives water from Gulf Creek, has been identified by the International Joint Commission as one of the 43 Areas of Concern in the Great Lakes Basin. The data collected during the SI suggested that the Old Upper Mountain Road site is a potential contaminant contributor to Eighteen Mile Creek.

The SI conducted at the Old Upper Mountain Road site also revealed that consequential amounts of hazardous wastes (D008 - lead) were present at the site. It was suggested that these hazardous wastes had adversely impacted surface water and sediment in Gulf Creek adjacent to the site. As a result of the SI, the site was listed on the NYSDEC Registry of Inactive Hazardous Waste Disposal Sites in New York State as a Class 2 site (932112). The approximate locations of environmental samples collected during the SI are presented on Figure 1-5.

1.6 HISTORICAL DATA REVIEW SUMMARY

The initial soil and surface water investigation revealed elevated levels of VOCs, SVOCs, pesticides, and metals in surface water, sediment and soil samples. Further investigations revealed elevated levels of VOCs in surface water samples and metals in soil samples. In 2007, the NYSDEC conducted a SI. Soil borings were installed to determine the depth of fill material.

Samples collected showed elevated concentrations of VOCs, SVOCs, pesticides, and TAL metals. Lead was found to exceed the Toxicity Characteristic Leaching Procedure (TCLP) Regulatory Limit, thus resulting in characterizing the site as containing hazardous waste. Due to equipment limitations and depths of fill material encountered during the NYSDEC SI, a full evaluation of hydraulic conditions and delineation of soil/fill characteristics at the site, and accurate estimates of fill material volume was determined to be incomplete.

1.7 REMEDIAL INVESTIGATION OBJECTIVES

The objectives of this RI were as follows:

- Further define the nature and extent of contamination in fill material at the site and quantify the volume of fill material at the site.
- Further define the nature and extent of contamination in surface water and sediment of Gulf Creek adjacent to the site.
- Evaluate groundwater flow patterns across the site and assess bedrock groundwater quality.
- Investigate the sewer system that discharges into Gulf Creek near Old Upper Mountain Road to determine the origin of this sewer and the possible upstream source of surface water contamination.
- Quantify the volume of fill material throughout the site.
- Assess the potential human exposure pathways to the contaminants.
- Complete a NYSDEC Fish and Wildlife Impact Analysis through Step 2A.
- Develop a remedial approach to address the site contamination through the FS process.

RI field investigation activities included site clearing and grubbing, evaluation of on-site surface and subsurface soil, evaluation of groundwater, a hydrogeologic evaluation, off-site sediment and surface water sampling, storage and disposal of investigative-derived waste, a site survey, a qualitative human health exposure assessment, and a fish and wildlife resource impact analysis.

1.8 REMEDIAL INVESTIGATION OPERABLE UNITS

Based on the results of previous investigations undertaken at the site by the NYSDEC and NYSDOH, and in consultation with NYSDEC, impacts from COCs associated with the Old Upper Mountain Road site will be evaluated in this RI report as three separate operable units defined as follows:

- Operable Unit 1 (OU 1) defined as the approximately 6 acres of land fill wastes that include the portion of the Old Upper Mountain Road site located north of the Somerset rail line. Impacts associated with OU 1 and evaluated in this RI include on-site surface and subsurface soil/fill material, and on-site groundwater.

- Operable Unit 1A (OU 1A) defined as the approximately 1 acre of land fill wastes that include the portion of the Old Upper Mountain Road site located southeast of the Somerset rail line. Impacts associated with OU 1A and evaluated in this RI include on-site surface and subsurface soil/fill material, and on-site groundwater.

- Operable Unit 2 (OU 2) defined as surface water and sediment within Gulf Creek, from the area located at the western origin of the ravine at the bulkhead outfall located north of the site to an area downstream where Gulf Creek meets Niagara Street. Because surface water within the creek receives discharge water from multiple sewer systems and groundwater flow from areas surrounding the site and the site itself, on-site groundwater at OU 1 and the sewer system evaluation will be utilized to characterize impacts to surface water and sediment within OU 2.

Figure 1-6 identifies the approximate boundaries of the operable units as defined in the above bullets.

2. REMEDIAL INVESTIGATION ACTIVITIES

Field investigation activities were conducted in accordance with the RI/FS Work Plan (EA, 2009), with the exception of the deviations specifically identified in the following sections. In accordance with the site specific Health and Safety Plan (HASP), health and safety officer responsibilities were assigned to one of the team members throughout the field program to ensure that the personnel were protected from both physical and chemical health hazards. Appropriate protective clothing was worn by field personnel while performing each intrusive activity for protection against contamination and to prevent cross-contamination between sample locations and matrices.

The following field activities were completed under the field investigation program of the RI:

- Site clearing
- Initial site survey, grid layout/staking, and base map preparation
- Evaluation of on-site soil/fill material
- Evaluation of groundwater
- Sewer system and surface water sampling program
- Sediment sampling program
- Management of investigative-derived waste
- Site surveying.

Table 2-1 summarizes the field sampling and laboratory analyses performed on various environmental media during the RI. Daily Field Reports for RI field investigation activities are provided in Appendix C.

2.1 PRE-INVESTIGATION FIELD ACTIVITIES

Prior to the start of RI field activities (monitoring well installation), brush clearing, waste debris stockpiling, tire removal and disposal, set up of the decontamination pad, and preliminary site survey activities were completed. These activities were conducted to allow for access of equipment for installation of soil borings, monitoring wells and test pits, to provide an area for decontamination of subcontractor equipment during RI activities, and to aid in selection of site sampling locations.

2.1.1 Site Clearing Activities

Site clearing activities were completed from 16 to 24 November 2009 by D&M Landscavation (D&M) of Lockport, New York. Approximately 7 acres of the Old Upper Mountain Road site were cleared of tall grasses, brush, and woody plant growth. In addition, select trees were removed from the site and chipped into piles along an area within the central portion of the site where concrete debris piles existed. Trees larger than 6-in. in diameter at breast height in the central, western, and southern portions of the site, as well as additional trees located along the edge of the ravine and fence lines of the property remained. Trees to be removed from the site were selected in consultation with the NYSDEC. All green waste at the site was chipped or shredded and dispersed onto an area within the central portion of the site containing concrete debris, or consolidated into small piles with a bulldozer.

Onsite debris, consisting of construction and demolition (C&D) materials, boats, scrap wood and shingles, and landscaping refuse, were consolidated into piles to the extent practicable with a bulldozer. In addition, a recreational vehicle (RV) previously discarded onsite was removed from the site by a tow truck on 17 November 2009.

2.1.2 Decontamination Pad Installation

On 20 November 2009, D&M constructed a decontamination pad near the access gate located on the southwestern portion of the site. The decontamination pad was equipped with a drain system and holding tank. The decontamination pad was constructed to prevent migration or seepage of fluids and sediments into the ground, and had a curbed perimeter for splash and over spray protection.

2.1.3 Tire Removal

On 24 November 2009, EA oversaw the removal of approximately 19 tons of scrap tires that had been previously discarded on the Old Upper Mountain Road Site. D&M provided an excavator with operator, which collected consolidated tires and loaded them into an open top trailer for off-site tire recycling at High Tread International, Ltd. (High Tread) of Lockport, NY. A copy of the disposal record for the tires removed from the site is included as Appendix D.

2.1.4 Preliminary Site Survey

Popli Design Group (Popli) of Penfield, NY, a New York State licensed Land Surveyor completed a site survey and base map on 26 February 2010. All structures at or near the site, including all property boundaries, the ravine edge, Gulf Creek, railroad tracks, and nearby roadways and utilities (manholes, fire hydrants, utility poles, etc.) were added onto the base map based upon field observations of the survey crew and available historic documentation. Newly installed monitoring well locations were also surveyed at this time. The surveyor established elevations with respect to benchmarks previously installed at the site. Each vertical measurement was referenced to the National Geodetic Vertical Datum of 1988 and reported to the nearest 0.01 ft. In addition, a 50 ft × 50 ft grid, spanning across the entire site, was created and each grid node was staked and labeled in the field for visual identification. The grid pattern was utilized to select subsurface soil/fill material sampling locations and provide reference orientation during field activities.

The site survey base map is included as Appendix E.

2.2 EVALUATION OF ON-SITE SOIL

The purpose of the on-site soil evaluation was to delineate the nature and extent of contamination in fill material and subsurface soil at the site, and to quantify the volume of fill material throughout the site. Field investigation activities were performed to evaluate fill material historically dumped at the site, to determine the horizontal and vertical extent of on-site surface and subsurface soil/fill contamination, and to evaluate approximate volumes of waste disposed of at the site through laboratory analysis.

2.2.1 Surface Soil Sampling Program

The surface soil sampling program was implemented to delineate the nature and extent of impacts within the on-site surface soil. Figure 2-1 illustrates the locations where soil samples were collected. Surface soil sampling locations and results will be used to supplement the 2007 SI data with the purpose of evaluating the potential for adverse human health effects from direct contact exposure to site surface soil. Samples collected during the 2007 SI were shown on Figure 1-5.

Eleven surface soil samples, SS-07 through SS-17, were collected at various locations throughout the site on 12 May 2010. Sampling locations were selected based upon visual level of disturbance of the surface soil, proximity to waste/fill material, location relative to historic sampling locations, and in consultation with the NYSDEC representative. Surface soil samples were collected from 0 to 2 in. below ground surface (bgs) using stainless steel spoons. Surface soil sample homogenization for all parameters was accomplished by placing the samples into stainless steel mixing bowls and stirring the sample with a stainless steel spoon until the sample appeared consistent throughout. The surface soil samples were visually inspected and described according to the Unified Soil Classification System (USCS) on a surface soil sample form (Appendix F).

To avoid cross-contamination of samples, non-dedicated sampling equipment was cleaned initially and prior to being reused. The following decontamination procedures were performed between surface soil sampling locations:

- Wash and scrub with low-phosphate laboratory grade detergent
- Rinse with deionized water
- Air dry.

Once each surface soil sample had been collected, the stainless steel spoons and bowls were decontaminated and wrapped in aluminum foil for transport.

The samples were labeled, handled, and packaged following the procedures described in EA's Generic Quality Assurance Project Plan (QAPP) (EA, 2006) and site-specific QAPP Addendum. Quality Assurance (QA)/Quality Control (QC) samples were collected at the frequency detailed in the QAPP Addendum.

2.2.1.1 Laboratory Analysis

Surface soil samples were placed in appropriate sample containers, sealed, packed on ice and submitted under standard chain of custody to Hampton Clarke-Veritech (HCV). HCV analyzed the surface soil samples for SVOCs by USEPA Method 8270C, TAL metals and mercury by USEPA Method 6010B/7470, pesticides by USEPA Method 8081A, and polychlorinated biphenyls (PCBs) by USEPA Method 8082 in accordance with the NYSDEC Analytical Services Protocol. In addition, a portion of each sample was extracted and archived by the laboratory for potential TCLP lead analysis following review of the TAL metals analytical results.

2.2.2 Subsurface Soil Sampling Program

The subsurface soil sampling program was implemented to further delineate the nature and extent of contamination within on-site fill material and to quantify the volume of fill material throughout the site. Subsurface soil samples were collected at selected grid nodes of the 50 ft × 50 ft grid across the site, as established during the initial site survey. The grid was staked by the licensed surveyor (Popli) prior to the subsurface soil sampling program. Test pits, direct-push soil borings, and hollow stem auger (HSA) borings were completed as part of the subsurface soil sampling program to evaluate the nature, extent, and the lithologic stratigraphy of subsurface soil/fill material throughout the site. In addition, selected borings were completed as vertical profile locations, with continuous discreet sampling completed every 4 ft in order to delineate the vertical distribution of select TAL metals within the soil/fill material.

Figure 2-1 shows the locations of the soil borings and the test pits completed as part of the subsurface soil sampling program. Based on visual and/or olfactory evidence, and at the discretion of the NYSDEC representative, alternate and/or additional soil boring and test pit locations were completed or omitted to better delineate the areal extent of the subsurface fill material encountered during the subsurface soil sampling program. Table 2-2 identifies the subsurface soil sample location, the corresponding subsurface soil sampling depth interval, and analyses performed.

2.2.2.1 Test Pits

Test pits were completed on 3-7 May 2010, in areas where native soil/bedrock was anticipated to be less than 15 ft bgs. Exploratory test pits were completed in order to assess the nature and extent of contamination within shallow soil and fill material, and to quantify the volume of fill material in areas along the western, eastern, and southern portions of the site. The test pit locations are shown on Figure 2-1.

SJB Services, Inc. of Hamburg, New York supplied an on-site operator and excavator capable of reaching approximately 16 ft in depth. A total of 39 test pits were advanced at the selected locations for geologic logging and subsurface soil/fill material sample collection. Subsurface soil and fill material was collected at each test pit location using the excavator bucket. Samples were collected directly from the excavator bucket, or from the test pit spoils pile, and were homogenized before placing samples into glass jars. VOC samples were not homogenized prior to sample collection. Based upon visual observations, selected depth intervals were field screened using a photoionization detector (PID). The on-site geologist prepared test pit log descriptions for subsurface soil and fill material encountered at each of the test pit locations. Descriptions of soil sample texture, composition, color, consistency, moisture content, odor, PID readings, and staining were documented using the USCS. Test Pit sample logs are included as Appendix G. Table 2-2 identifies the test pit location, the corresponding subsurface soil sampling depth interval, and analyses performed.

Subsurface soil/fill material samples were collected based upon visual and olfactory observations, PID readings, and in consultation with the NYSDEC representative. After a sample was collected and the location was logged, each test pit location was backfilled with the excavated material to prevent on-site hazards. The corners of each test pit excavation were marked in the field following backfilling for surveying. Before moving to the next test pit location, the excavator bucket was cleaned using an Alconox mix and rinsed with potable water.

2.2.2.2 Soil Borings

Soil borings were completed from 10 to 21 May 2010 at on-site locations where the depth to native soil and/or bedrock was anticipated to be greater than 15 ft bgs. Soil borings were collected using a track mounted Geoprobe®, or 4¼ in. HSA using split spoons to collect continuous soil samples. The soil boring locations are shown on Figure 2-1. Table 2-2 identifies the soil boring location, the corresponding subsurface soil sampling depth intervals, and analyses performed.

2.2.2.2.1 On-site Direct-Push/Geoprobe® Program

A direct-push program was implemented as part of this RI to evaluate subsurface soil/fill material at selected locations where the depth to native soil/bedrock was estimated to be between 15 and 50 ft bgs. A total of 12 direct-push soil borings, SB-01 through SB-12, were advanced to depths up to 44 ft bgs from 10 to 11 May 2010 using a track mounted Geoprobe® (Figure 2-1).

Soil borings were completed by SJB Services, Inc. (SJB), of Hamburg, New York. Subsurface soil/fill samples from the borings were collected to assess the nature and extent of fill material at the site. Soil borings were advanced using direct-push technologies (Geoprobe®). Soil was collected continuously at each boring location using a 4-ft dedicated acetate sleeve liner and screened in the field using a PID. An on-site geologist prepared soil boring log descriptions for subsurface soil encountered at each of the boring locations. Descriptions of soil sample texture, composition, color, consistency, moisture content, recovery, odor, PID readings, and staining were documented using the USCS. Boring logs can be found in Appendix H.

Each soil boring location was advanced to bedrock refusal or to native soil for the purposes of geologic logging, determination of fill depth, and subsurface soil/fill sample collection. One subsurface soil/fill sample was collected from each soil boring location from the most contaminated interval based upon PID readings, visual and/or olfactory evidence, with the exception of soil borings SB-07 and SB-10, which were completed adjacent to previously completed test pits to determine the depth to bedrock in that area. Additional samples were collected if multiple or distinct zones of gross contamination were encountered or if native soils were encountered beneath fill material. If no obvious impact was observed, the soil samples were collected in consultation with the NYSDEC representative from various areas of the observed fill material in order to provide a site wide assessment of the vertical contamination of fill material. Table 2-2 identifies the soil boring location, the corresponding subsurface soil sampling depth interval, and analyses performed.

2.2.2.2.2 On-Site Hollow Stem Auger Program

The HSA program was implemented as part of this RI to evaluate subsurface soil/fill material at locations within the central portion of the site, where the depth to native soil/bedrock was estimated to be greater than 40 ft bgs. A total of 14 soil borings were advanced to depths up to 73 ft bgs by SJB from 13 to 21 May 2010 using a 4¼ in HSA (Figure 2-1).

Subsurface soil/fill samples from the borings were collected to assess the nature and extent of fill material at the site. Soil was collected continuously utilizing a 2-ft long split spoon at each boring location and screened in the field using a PID. At selected borings, split spoons were collected every 5 ft through a portion of the fill material to expedite the boring. An on-site geologist prepared soil boring log descriptions for subsurface soil/fill encountered at each of the boring locations. Descriptions of soil sample texture, composition, color, consistency, moisture content, recovery, odor, PID readings, and staining were documented using the USCS. Boring logs can be found in Appendix H.

Each soil boring location was advanced to bedrock refusal or to native soil for the purposes of geologic logging, determination of fill depth, and subsurface soil/fill sample collection. One subsurface soil/fill sample was collected from each soil boring location from the most contaminated interval based upon PID readings, visual and/or olfactory evidence. Additional samples were collected if multiple or distinct zones of gross contamination were encountered or if native soils were encountered beneath fill material. If no obvious impact was observed, the soil samples were collected in consultation with the NYSDEC representative from various areas of the observed fill material in order to provide a site wide assessment of the vertical contamination of fill material. Table 2-2 identifies the soil boring location, the corresponding subsurface soil sampling depth interval, and analyses performed.

2.2.2.2.3 Vertical Profiling Sampling Program

Four of the HSA soil borings were completed as vertical profile borings in order to delineate the vertical distribution of selected TAL metals within the fill material at areas across the site. Soil borings SB-13, SB-20, SB-21, and SB-22 were selected for vertical profile sampling based upon their anticipated depth of fill material and site location. The locations are shown of Figure 2-1.

The soil borings selected for vertical profile sampling were continuously sampled using a HSA with 2-ft long split spoons. An on-site geologist prepared soil boring log descriptions for subsurface soil encountered at each of the boring locations. Descriptions of soil sample texture, composition, color, consistency, moisture content, recovery, odor, PID readings and staining were documented using the USCS. Boring logs can be found in Appendix H.

After classification and screening, soil/fill samples were collected from approximately 4 ft intervals, dependent upon amount of recovery obtained within the split spoons. Table 2-2 identifies the soil boring location, the corresponding subsurface soil sampling depth interval, and analyses performed. Eleven to 18 samples were collected at each location, based upon total depth of boring, and amount of soil and fill material recovery encountered during sampling.

2.2.2.3 Laboratory Analysis

Subsurface soil/fill samples were placed in the laboratory provided sample containers, sealed, labeled, and packaged in a cooler packed with ice. The subsurface/fill samples were then submitted under standard chain of custody to HCV for laboratory analysis. The samples were labeled, handled, and packaged following the procedures described in the site-specific QAPP Addendum. QA/QC samples were collected at the frequency detailed in the QAPP Addendum.

A total of 39 test pit samples were submitted for analysis of TAL metals and mercury by USEPA Method 6010B/7470; 15 test pit samples were analyzed for SVOCs by USEPA Method 8270C, pesticides by USEPA Method 8081A, and PCBs by USEPA Method 8082. Based upon the PID screening results and visual observation, seven test pit samples were submitted for analysis of VOCs by USEPA Method 8260B.

A total of 21 soil boring samples were submitted for analysis of TAL metals and mercury by USEPA Method 6010B/7470; 7 subsurface soil boring samples were analyzed for SVOCs by USEPA Method 8270C, pesticides by USEPA Method 8081A, and PCBs by USEPA Method 8082. Based upon the PID screening results and visual observation, five subsurface soil samples were submitted for analysis of VOCs by USEPA Method 8260B.

A total of 56 vertical profile boring samples from discreet depth intervals within each of the selected soil boring locations were submitted for analysis of arsenic, barium, cadmium, chromium, lead, and mercury by USEPA Method 6010B/7470.

In addition, a portion of each metals sample was extracted and archived by the laboratory for potential TCLP lead analysis following review of the inorganic analytical results.

2.3 GROUNDWATER EVALUATION PROGRAM

The RI groundwater evaluation activities included the installation of six groundwater monitoring wells and the completion of one round of groundwater sampling. The purpose of the groundwater evaluation program was to evaluate local groundwater flow patterns and overall groundwater quality with respect to NYSDEC Ambient Water Quality Standards.

2.3.1 Monitoring Well Installation

The location of monitoring wells was based upon site field conditions and potential access restrictions to each location. The locations of the six monitoring wells are shown on Figure 2-2. The drilling subcontractor (SJB Services, Inc.) was responsible for identifying subsurface utility lines at the locations where the monitoring wells were to be installed. The drilling and installation of bedrock monitoring wells was supervised and documented by a field geologist.

The monitoring well drilling program included the installation of two overburden and four bedrock groundwater monitoring wells from 7 December 2009 to 4 January 2010. The monitoring wells range in depth from 36 ft bgs at MW-01 to 77.5 ft bgs at MW-04. The bedrock monitoring wells were drilled to the top of competent bedrock using 6-¼ in. inside diameter (ID) HSAs, with continuous 2-ft split-spoon sampling.

Once the top of competent bedrock was encountered, a 4-in. ID steel casing was set 1 to 2 ft into competent bedrock (i.e., a rock socket). To set the rock sockets, the core hole for the rock socket was advanced with a HQ core barrel (2.5 in. core diameter with a 3.8 in. hole diameter) using the hollow-stem augers as a temporary casing. Once the core hole was completed to the desired depth, the hole was opened to 6 in. utilizing a tri-cone roller bit to create a rock socket. A 4-in. ID steel casing was set in the rock socket and a cement/bentonite grout was injected around the casing through a tremie pipe. The HSAs were then withdrawn and the grout within the borehole was topped off, as necessary. The cement/bentonite grout was allowed to set for a minimum of 24 hours. Some of the grouted mixture was lost through the porous overburden and had to be refilled numerous times as a grouted seal was created down the inside of the borehole following the casing installation. Bedrock was continuously cored through the steel casing using a HQ core barrel until groundwater was encountered.

Saturated zones were observed in the overburden during split-spoon sampling at monitoring wells MW-04 and MW-06. After consultation with the NYSDEC representative, the decision was made to install these two locations as overburden wells screened within the saturated zones of the overburden fill material. Additionally, split-spoon samples collected from 74 to 78 ft bgs at monitoring well MW-04 illustrated black staining, a visible sheen, and elevated PID readings. As a result, a subsurface soil/fill sample was collected from this interval and submitted under standard chain of custody to HCV for analysis of VOCs by USEPA Method 8260B and SVOCs by UESPA Method 8270C.

Each monitoring well was constructed of 2-in. diameter threaded flush-joint Schedule PVC screen (10 slot), threaded bottom plug, and flush-joint threaded PVC riser pipe. Each well has a vented cap and a locking cover. The bedrock and overburden monitoring wells were constructed with either 5-ft, 10-ft, or 15-ft sections of screen dependent on the saturated thickness of the water bearing zone. Silica sand filter packs were placed around the screen and extended approximately 2 ft above the screened interval. A 2-ft thick seal of bentonite pellets was placed above the filter pack, followed by a cement/5 percent bentonite grout mixture to grade surface. The 2-ft bentonite seal was hydrated prior to placement of the cement/bentonite mixture above it. A 3-ft protective stick-up casing was installed around the PVC casing and grouted in place.

Monitoring well elevation data are presented in Table 2-3. Monitoring well construction logs are included in Appendix I.

2.3.2 Monitoring Well Development

Development of each newly installed monitoring well was performed on 13 January 2010. The monitoring wells were developed using surging and pumping techniques. Monitoring well development was considered complete when the groundwater pH in the well stabilized and a turbidity of less than 50 nephelometric turbidity units (NTUs) was achieved or when the well went dry. Development water from monitoring well MW-04 exhibited a visible sheen during well development. As such, development water from MW-04 was containerized and stored on-site for analysis and disposal. All other development water was discharged to the ground surface. Monitoring well development logs are included in Appendix J.

2.3.3 Groundwater Sampling

Groundwater sampling was completed at on-site locations to evaluate groundwater flow patterns across the site, assess groundwater quality, and to assess the potential impacts of on-site soil/fill contamination to groundwater quality at various locations. Groundwater samples were collected from six groundwater monitoring wells. The field procedures and techniques used to conduct the groundwater sampling are summarized in the following sections.

2.3.3.1 Monitoring Well Sampling

Groundwater samples were collected from six on-site monitoring wells from 10 to 12 February 2010. Figure 2-2 identifies the monitoring wells sampled as part of this RI. Prior to the start of the groundwater sampling event, a complete round of static water level measurements were taken from each monitoring well location to prepare a groundwater contour map and evaluate groundwater flow patterns. As part of the low-flow sampling procedures, each monitoring well was purged until groundwater parameters (pH, conductivity, oxygen reduction potential, temperature, dissolved oxygen and turbidity) stabilized or the monitoring well was purged dry, whichever occurred first.

During sampling, purge water was containerized and stored on-site for analysis and disposal if the water exhibited visual staining, sheen, or discernable odors; all other purge water was discharged to the ground surface. Details of the groundwater sampling methods are described as follows:

- Personal protective equipment was worn as specified in the Generic HASP and HASP Addendum. In addition, new sampling gloves were used for the collection of each sample.

- Monitoring locations were unlocked and the caps were removed, a PID head space reading from the well head was obtained and recorded.

- Static water levels were measured at each location using an oil/water interface probe. The interface probe was washed with Alconox detergent and water, then rinsed with deionized water between locations to prevent cross-contamination.

- Calculations were completed to determine the volume of water in the well.

- Low-flow purging techniques using a submersible grundfos pump were used to purge the wells. Dedicated polyethylene tubing was used at each monitoring well location. Dedicated polyethylene bailers were used if the pumps were unable to draw water to the surface.

- Field measurements of pH, dissolved oxygen, temperature, and specific conductivity were recorded on the monitoring well gauging, purging, and sampling forms. The field instruments were decontaminated between wells to prevent cross-contamination.

- Field groundwater parameters of pH, reduction-oxidation potential (ORP), dissolved oxygen, specific conductivity, and temperature were allowed to stabilize before sampling:

    - Consecutive pH readings were ±0.2 pH units of each other
    - Consecutive water temperatures were ±0.5°C of each other
    - Consecutive measured specific conductance, ORP, and dissolved oxygen was ±10 percent of each other
    - Turbidity measurement was below 50 NTU.

- Once groundwater quality field parameters had stabilized under low-flow pumping conditions, sampling was performed. If a flow rate of 250 mL/min could not be maintained without dropping the water level the monitoring well was purged dry during low flow purging or sampling, then the well was allowed to recharge to 90 percent of static conditions.

- Sample bottles containing appropriate preservative for the parameter to be analyzed were obtained from the laboratory.

- Analytical samples were placed in coolers and chilled to 4°C.

- The monitoring wells were capped and re-locked.

- Field logbook, sample log sheets, labels, and chain-of-custody forms were completed after sampling at each monitoring well location.

During groundwater purging and sampling, sheen was observed within purge water at monitoring well MW-04. Purge water from this location was containerized for analysis and disposal. Additionally, monitoring wells MW-03 and MW-04 were purged and sampled with dedicated disposable bailers due to an insufficient volume of water within the wells to purge with the grundfos pump.

Monitoring wells MW-03 and MW-05 were purged dry during purging and sampling. MW-05 was allowed to recharge for 20 minutes prior to continuing purging, MW-03 was allowed to recharge overnight in order to collect a sufficient volume for laboratory analysis. The low flow purging technique was successful on MW-01, MW-02, and MW-06.

Monitoring well gauging, purging, and sampling forms are provided in Appendix K. Groundwater samples were placed in appropriate sample containers, sealed, and submitted to the laboratory for analysis. The samples were labeled, handled, and packaged following the procedures described in Generic QAPP and site-specific QAPP Addendum. QA/QC samples were collected at the frequency detailed in the QAPP Addendum.

2.3.3.2 Laboratory Analysis of Groundwater Samples

Following sampling, groundwater samples were placed on ice and submitted under standard chain of custody to HCV. Groundwater samples were analyzed in accordance with the NYSDEC Analytical Services Protocol.

Each groundwater sample collected from the monitoring well network was analyzed for VOCs by USEPA Method 8260B, SVOCs by USEPA Method 8270C, TAL metals and mercury by USEPA Method 6010B/7471, pesticides by USEPA Method 8081A, and PCBs by USEPA Method 8082. In addition, groundwater samples were submitted for analysis of alkalinity by USEPA Method 2320B, chloride by USEPA Method 300.0, and sulfate by USEPA Method 300.0.

2.4 SEWER SYSTEM DYE TESTING AND SEWER AND SURFACE WATER SAMPLING PROGRAM

Sewer and surface water samples were collected from sampling locations within Gulf Creek adjacent to the site and from the nearby sewer system. Sampling locations were based on access limitations, the results of historic sampling and the results of tracer dye testing performed within the storm and sanitary sewer systems to the south and west of the site. Sewer and surface water samples were collected starting at the downstream locations first. Sewer and surface water samples were collected using a dipper if water was too deep for the field personnel to reach; otherwise, samples were collected using the container itself. Samples were collected on 19 November 2009 and 4 May 2010. Tracer dye testing was completed on 20 November 2009 and 5 May 2010 using a colored liquid tracing dye.

2.4.1 Sewer System Dye Testing

At the request of the NYSDEC, tracer dye testing was completed along a series of sewer lines located along Old Upper Mountain Road to the west of the site and Otto Park Place to the south of the site on 20 November 2009, and on Upper Mountain Road to the west of the site and Old

Saunders Settlement Road to the southwest of the site on 5 May 2010 (Figure 2-3). The tracer dye testing was completed to evaluate connections to the sanitary sewer system that intersects the western portion of the site, and the storm sewer system that discharges to the bulkhead outfall within the Gulf.

On 20 November 2009, tracer dye was initially placed into a sanitary sewer line located at the south end of Old Upper Mountain Road in order to determine if the sewer connected to a manhole observed at the base of the ravine in the Gulf. Upon injecting dye into the sewer, the dye water was visually observed within a few minutes in the manhole at the base of the ravine. This confirmed connection and indicated that a sanitary sewer line intersects the western portion of the site.

Dye was then placed within an observed storm sewer line located west of Old Upper Mountain Road, in an attempt to determine the source of the bulk head outfall located at the western portion of the ravine at the Old Upper Mountain Road site. Approximately 5 minutes after injecting the tracer dye into the sewer line along the west side of Old Upper Mountain Road, the dye was observed to be discharging from the bulkhead outfall and into Gulf Creek, which runs along the base of the ravine. The city of Lockport had no knowledge or maps depicting the storm sewer system along the west side of Old Upper Mountain Road. EA noted during inspection of the storm sewer manhole west of Old Upper Mountain Road that the manhole was receiving flow from the west in the direction of GMCH.

After the initial tracer dye testing, EA and NYSDEC received a sewer map from the city of Lockport which detailed the portions of the sanitary sewer system at the end of Old Upper Mountain Road and the associated connected sewer system. Further dye testing was completed based upon review of this map.

On 5 May 2010, the tracer dye was placed into the sanitary sewer line located on Old Saunders Settlement Road located southwest of the site. After 4 hours of waiting, the results of this test were found to be inconclusive as the dye was not detected. Tracer dye was also injected into a storm sewer located on Upper Mountain Road (NYS Route 93) and after approximately 35 minutes the dye was found in the two manholes located west of Old Upper Mountain Road and then discharged at the bulkhead. Figure 2-3 illustrates the sewer system on Old Saunders Settlement Road, Old Upper Mountain Road, Upper Mountain Road (NYS Route 93), NYS Route 31, and Otto Park Place based upon a review of historic mapping and the results of the tracer dye testing completed during this RI.

2.4.2 Surface Water and Sewer Water Sampling

Sewer and surface water samples were collected from locations within the storm sewer system nearby the site and in Gulf Creek. Samples were collected in order to further assess the impacts to surface water within Gulf Creek identified in the SI, and to determine if sewer systems near the site were contributing to the impacts within the creek. Sewer and surface water samples were collected in two separate sampling events in November 2009 and May 2010. Locations of the sewer and surface water samples were determined based on the results of the sewer system dye testing (Section 2.4.1) and are presented in Figure 2-4.

Two sewer water and two surface water samples were collected at the site on 19 November 2009. No precipitation occurred prior or during the sample collection event. Sewer water manhole sample SW-01 was collected from the storm sewer on the west side of Old Upper Mountain Road that receives discharge from the GMCH Plant located west of Upper Mountain Road (NYS Route 93). Sewer water manhole sample SW-03 was collected from the sewer manhole at the base of the ravine. Dye testing confirmed that the manhole receives discharge from the manhole located at the termination of Old Upper Mountain Road. Surface water from Gulf Creek was observed entering the manhole at the SW-03 location as well. The samples were collected using a telescoping dipper sampler and a dedicated 600 mil polypropylene ladle. Surface water sample SW-02 was collected from the bulk head outfall and dye testing confirmed that the outfall receives discharge from the sewer system connected to the manhole west of Old Upper Mountain Road. Surface water sample SW-04 was collected at the breach point of the beaver dam located within the base of the Gulf Creek ravine. An oily sheen was observed at this sampling location. These two surface water samples were collected using the sample containers.

One surface water sample (SW-02) and three sewer manhole water samples (MSW-03, MSW-04 and MSW-05) were collected at the site on 4 May 2010. The previous day's weather included 0.10 inches of precipitation in the form of rain that took place prior to collecting the samples. Surface water sample SW-02 was collected from the bulkhead outfall to provide data to compare to previous sample results. Historical data for the samples at the bulkhead outfall are presented in the 2007 SI report issued by the NYSDEC (Appendix B). Manhole sewer water sample MSW-03 was collected from a storm sewer located on Old Saunders Settlement Road, which is located upgradient of SW-02 and to the southwest of the site. Manhole sewer water sample MSW-04 was collected from a storm sewer line located south of the site on Otto Park Place. Manhole sewer water sample MSW-05 was collected from a sanitary sewer line located south of the site on Otto Park Place.

Field measurements of pH, dissolved oxygen, temperature, turbidity, ORP, and specific conductivity were obtained and recorded on the surface water sample logs during the November 2009 surface water sampling event and are provided in Appendix L.

Surface and sewer water samples were placed in appropriate sample containers, sealed, and submitted to the laboratory for analysis. The samples were labeled, handled, and packaged following the procedures described in Generic QAPP and site-specific QAPP Addendum. QA/QC samples were collected at the frequency detailed in the QAPP Addendum.

2.4.2.1 Laboratory Analysis

Surface and sewer water samples collected were submitted under standard chain of custody to HCV. Samples collected in November 2009 were analyzed for VOCs by USEPA Method 8260B, SVOCs by USEPA Method 8270C, and TAL metals and mercury by USEPA Method

6010B/7470 in accordance with the NYSDEC Analytical Services Protocol. Sewer and surface water samples collected in May 2010 were analyzed for VOCs by USEPA Method 8260B only.

2.5 SEDIMENT SAMPLING PROGRAM

Sediment samples were collected from locations in Gulf Creek adjacent to the site. The purpose of the sediment sampling was to assess the extent of contamination within the sediment of the creek at the base of the landfill. Sediment samples were collected in two separate sampling events in November 2009 and May 2010. Locations of the sediment samples are presented in Figure 2-5.

2.5.1 Sediment Sampling

A total of 15 sediment samples (SD-01 through SD-05) were collected from five sample locations within Gulf Creek on 20 November 2009. Three samples were collected from each location, including one sample from the 0-2 in. depth interval and one from the 2-6 in. depth interval. Material from both intervals was reserved in a stainless steel bowl and mixed to create a composite third sample from each location. The sediment samples were collected using a decontaminated hand auger or stainless steel spoon. The hand auger was advanced through the surface water into the sediment at the 0-2 in. depth interval. For most of the sample locations, the sediment from 0-2 in. was not cohesive enough to stay in the hand auger as it was lifted from the sampling location. In these instances, a decontaminated stainless steel spoon was used to collect the sample. The first sediment samples were collected from the location that was furthest downstream, and each consecutive sample was collected upstream from the last. The last sample collected was closest to the bulk head outfall from the site. This location was expected to be the most contaminated location being sampled.

Six sediment samples, SD-06 through SD-11, were collected from sample locations further downgradient from the previously collected samples in Gulf Creek on 4 May 2010. Sample locations are shown on Figure 2-5. The sediment samples were collected using a decontaminated hand auger or stainless steel spoon. The hand auger was advanced through the surface water into the sediment and the sample was collected from the 0-6 in. depth interval.

Sediment samples were placed in appropriate sample containers, sealed, and submitted to the laboratory for analysis. The samples were labeled, handled, and packaged following the procedures described in the Generic QAPP and site-specific QAPP Addendum. QA/QC samples were collected at the frequency detailed in the Generic QAPP and QAPP Addendum.

2.5.2 Laboratory Analysis

Sediment samples were sent to HCV of Fairfield, New Jersey for analysis. Each grab sample was analyzed for TAL metals and mercury by USEPA Method 6010B/7470. In addition, the 0-2 in. depth interval samples were analyzed for VOCs by USEPA Method 8260B, SVOCs by USEPA Method 8270C, pesticides by USEPA Method 8081A, and PCBs by USEPA Method 8082. Each composite sample was analyzed for total organic carbon by USEPA Method 9060.

The 2-6 in. depth interval samples were screened using a PID to determine which samples would be analyzed for VOCs. There were elevated PID readings in the 2-6 in. depth interval at locations SD-04 and SD-05; therefore, sediment samples 932112-SD-04-2-6 in. and 932112-SD-05-2-6 in. were analyzed for VOCs.

In addition, a portion of each sample was extracted and archived by the laboratory for potential TCLP lead analysis following review of the inorganic analytical results.

2.6 INVESTIGATIVE DERIVED WASTE

EA was responsible for the proper storage, handling, and disposal of investigative-derived waste; including personal protective equipment, and solids and liquids generated during the on-site soil sampling program, monitoring well installation, and purging and sampling activities. Drummed materials were labeled as to their contents and origin.

Handling and disposal of waste was completed as follows:

- Decontamination water utilized within the on-site decontamination pad was collected in a 55-gal drum at the completion of intrusive field activities.

- Liquid generated during monitoring well development and purging which exhibited a visible sheen was transferred into a 55-gal drum and stored in the staging area onsite. Liquid waste was analyzed for hazardous waste characteristics by HCV to determine a proper disposal method.

- Soil cuttings from on-site drilling operations that did not exhibit visible staining, sheen, or discernable odors were spread into the surrounding ground surface onsite.

- Trash and debris was placed in plastic bags and placed in a trash dumpster for disposed by a local garbage hauler.

- Protective clothing was packed in plastic bags and placed in a trash dumpster for disposal by a local garbage hauler.

One 55-gal drum of liquid was generated during groundwater developing and sampling activities. In addition, one 55-gal drum of liquid was generated during decontamination activities on the site decontamination pad. An appropriate treatment/disposal procedure will be determined following completion of the FS.

2.7 SITE SURVEY

Following completion of RI activities, Popli returned to the site to complete the site survey and expand upon the initial base map and survey activities discussed in Section 2.1.4. Surface soil sample locations, test pit locations, soil boring locations, and NYSDEC soil boring locations were surveyed upon completion of field activities on 19 and 24 May 2010. The surveyor established elevations with respect to benchmarks previously installed at the site. Each vertical measurement was referenced to the National Geodetic Vertical Datum of 1988 and reported to the nearest 0.01 ft. A copy of the completed survey map is provided in Appendix M.

Horizontal control was established by traverse runs to establish location with respect to the New York State planar horizontal coordinate grid system and provided in New York State Plane (NAD83). Horizontal traverses were tied into established permanent benchmarks. Horizontal traverse runs were tied back to initial control points as a check for closure and error of closure was recorded. The horizontal location of wells, soil borings and test pits were reported to within 0.1 ft.

2.8 DATA VALIDATION

Data validation is the assessment of data quality with respect to method requirements and technical performance of the analytical laboratory. The overall objective of the data validation process is to determine the degree of confidence in the analytical results. The validation process is designed to identify deviations from the method requirements, poor QC results, matrix interference, and other analytical problems that may compromise the potential use and integrity of the analytical data. Analytical data packages (also referred to as Sample Delivery Groups [SDG]) were reviewed to ensure that required laboratory components are included, QA/QC requirements were performed, and data use restrictions were well defined. The analytical data were qualified and appropriately flagged by the data validator. Analytical Form Is are provided in Appendix N. Analytical data that was qualified was taken into account during the interpretation of the data.

2.8.1 Data Validation Procedures

A separate Data Usability Summary Report (DUSR) was prepared for each of the SDGs associated with this RI. DUSRs are provided in Appendix O. The DUSRs were prepared according to the guidelines established by NYSDEC Division of Environmental Remediation QA Group and reviewed the following questions:

- Is the data package complete as defined under the requirements for the NYSDEC Analytical Services Protocol (ASP) Category B or USEPA CLP deliverables?

- Have all holding times been met?

- Do all the QC data: blanks, instrument tunings, calibration standards, calibration verifications, surrogate recoveries, spike recoveries, replicate analyses, laboratory controls and sample data fall within the protocol required limits and specifications?

- Have all of the data been generated using established and agreed upon analytical protocols?

- Does an evaluation of the raw data confirm the results provided in the data summary sheets and qualify control verification forms?

- Have the correct data qualifiers been used?

A preliminary review of the data was performed by EA to verify that all of the necessary paperwork, such as chain-of-custodies, traffic reports, analytical reports, and deliverable packages, were present. EA then sent the SDGs to ChemWorld Environmental, Inc. which verified the qualitative and quantitative reliability of the data as the laboratory provided it and then performed a detailed QA review.

The following items/criteria were reviewed for organics:

- Case narrative and deliverables compliance.

- Holding times both technical and procedural and sample preservation (including pH and temperature).

- System Monitoring Compound (Surrogate) recoveries and summaries.

- Matrix spike/matrix spike duplicate results, recoveries and summaries.

- Blank spike results, recoveries and summaries.

- Method blank results and summaries.

- Gas chromatography (GC)/mass spectroscopy (MS) tuning and performance.

- Initial and continuing calibration summaries.

- Internal standard areas, retention times and summaries.

- Field and Trip Blank Data when applicable.

- Blind Field Duplicate sample results when applicable.

- GC/Electron Capture Detector (ECD) Instrument Performance Check.

- Pesticide cleanup checks.

- Organic analysis data sheets (Form I).

- GC/MS and GC chromatograms, mass spectra and quantitation reports.

- Quantitation/detection limits.
- Qualitative and quantitative compound identification.

The following items/criteria were reviewed for the inorganics:

- Case narrative and deliverable requirements.
- Holding times and sample preservation.
- Detection limits.
- Inorganic analysis data sheets (Form I).
- Initial and continuing calibration verifications.
- Contract Required Detection Limit (CRDL) standard analysis.
- Lab blank data.
- Inductively Coupled Plasma (ICP) Spectroscopy interference check sample (ICS) analysis.
- Matrix Spike analysis.
- Matrix Duplicate analysis.
- Laboratory control sample (LCS) results.
- ICP serial dilution analysis.
- Field Blank results (rinsate blanks) when applicable.
- Field Duplicate results when applicable.

Based upon the results of the data review, ChemWorld prepared detailed DUSR/data validation summary reports. The DUSRs/reports consist of a section that contains an assessment of the deliverables, followed by a section that describes, on an item-by-item basis, the analytical results and any qualifications that were considered when using the data. The qualifications were made by assessing the results submitted by the laboratory in terms of the technical requirements of the analytical methods (including QA/QC criteria) and data validation requirements. The DUSRs/reports highlight the data results that did not meet QC limits and therefore may have required data qualification. The reports also indicate the data qualification actions taken as a result of these criteria.

2.8.2 Validation Results

Based upon the data evaluation process, the qualifications of data are made by the use of qualifier codes. These qualifiers serve as an indication of the qualitative and quantitative reliability of the data. The qualifier codes utilized for this project are as follows:

- *No qualifier* - The analyte was positively identified at the associated numerical value, which is the concentration of the analyte in the sample.

- *U* – Indicates analyte not detected at or above the CRDL, or the compound is not detected due to qualification through the method or field blank.

- *J* – The reported value is estimated due to variance from quality control limits.

- *UJ* – The element was analyzed for, but not detected. The sample quantitation limit is an estimate due to variance from quality control limits.

- E – Reported value is estimated because of the presence of interference.

- *R* – Reported value is unusable and rejected due to variance from quality control limits.

The analytical results for samples collected as part of the investigation are valid and usable with qualifications as noted in each DUSR. Data qualifiers were taken into account during the interpretation of the analytical results. Analytical results were simplified for preparation of the analytical results summary tables which are presented in Chapter 4. Qualifier flags were limited to "U" for non-detects, "J" for estimated values based upon results of the validation, "UJ" for non-detect values that were estimated based on the validation and "R" for values that were deemed as unusable during the validation process based on quality control deficiencies. No analytical results were rejected based on the data evaluation. Overall there was no significant impact regarding the usability of the data set. The validator has determined that after thorough review of the entire data set, each sample collected during the investigation are valid and should be considered usable.

2.9 QUALITATIVE EXPOSURE ASSESMENT

A Qualitative Human Health Exposure Assessment for the site was completed. The objectives of the Exposure Assessment were to:

- Identify potential exposure pathways for contaminants at the site
- Identify chemicals of concern for each exposure pathway
- Qualitatively evaluate potential human health exposures for each pathway.

The Exposure Assessment was conducted in accordance with the protocols specified in the RI/FS Work Plan (EA, 2009) and is presented in Chapter 6.

2.10 FISH AND WILDLIFE IMPACT ANALYSIS

A Fish and Wildlife Impact Analysis was performed to identify actual or potential impacts to fish and wildlife resources from site contaminants of ecological concern and to provide information necessary for the design of a remedial alternative. This analysis contained:

- Site descriptions and a characterization of plant and animal resources and their value to humans and the environment.
- Evaluation of potential exposure pathways to fish and wildlife from site-related chemicals of potential ecological concern (COPECs).
- Comparison of concentrations of COPECs to regulatory criteria or derived toxicological benchmarks for the protection of fish and wildlife.
- Conclusions regarding the potential of exposure and possible risks to fish and wildlife on and in the vicinity of the site.

The Fish and Wildlife Impact Analysis was conducted in accordance with the protocols specified in the RI/FS Work Plan (EA, 2009) and is presented in Chapter 7.

3. ENVIRONMENTAL AND PHYSICAL SETTING

3.1 GEOLOGY

As noted in Section 1.4.4 of this report, the site lies within the glacial deposits above the Lockport Group. The site is also located within the loams associated with the Pleistocene Epoch in the Quaternary Period.

3.1.1 Regional Geology

The following sections provide a detailed review of surficial and bedrock geology in areas surrounding the site. Additional information regarding regional surficial and bedrock geology can be obtained from the 2007 SI report issued by the NYSDEC (Appendix B).

3.1.1.1 Surficial Geology

In the area surrounding the site, evidence exists of two major glacial episodes. The final glacial event widened valleys and basins in the area and eroded earlier glacial deposits. A series of glacial advances produced various lakes in the region and was responsible for the deposition of stratified lacustrine clays, silts, sands, and gravel (La Salla, 1968). These deposits dominate the current surficial geology of western New York State.

In addition, a number of unconsolidated deposits, associated with glacial activity have been deposited in the Lockport area (Smith, 1990). Glacial till, including a non-sorted, non-stratified mixture of sands, silts, clays, and gravel/rock were deposited in the area directly from glacial movements. Many of the lakes that formed during the glacial advances were subject to glaciolacustrine deposits associated with ice melt. These deposits include sand, silt, and clay. Additionally, glaciofluvial deposits of sand and gravel were deposited along former glacial lake shores from streams and the reworking of till associated with glacial melt and retreat.

In the Lockport area, surficial deposits from the final glacial advance vary in depth from less than 2 ft near the Niagara escarpment to approximately 45 ft at the Frontier Pendleton Quarry Site, which is located approximately 5 mi southwest of the site. Bedrock outcrops are visible on the GMCH property to the west of the site.

The area surrounding the site is dominated with well drained soil with slow infiltration rates with fine grained sands, silt, and clay which impede downward movement of water in the formation.

3.1.1.2 Bedrock Geology

Bedrock within the area surrounding the site is comprised of a thick sequence of shales, sandstones, limestone, and dolostones (Buehler and Tesmer, 1963). According to the EDR report, these deposits are associated with the middle Silurian period. In the Lockport area, bedrock bedding strikes predominantly in an east-west direction. Bedding parallels the Niagara and Onondaga Escarpments and dips south at approximately 30-40 ft per mile (Johnson, 1964; La Salla, 1968; Yager and Kappel, 1987).

The uppermost bedrock formation underlying the Old Upper Mountain Road site is the Guelph Dolostone of the Lockport Group. The Lockport Group varies in thickness from approximately 20 to 175 ft (Johnson, 1964). In the areas surrounding the site, the thickness of the Lockport Group ranges from approximately 35 to 62 ft. Across Upper Mountain Road, at the GMCH Plant, the Lockport Group bedrock ranges from approximately 40-45-ft thick, but does not have a sharp contact with the underlying Rochester Shale.

3.1.2 On-Site Geology

Geological information of the subsurface at the Old Upper Mountain Road site was gathered from the installation of groundwater monitoring wells and the advancement of soil borings and test pits at numerous on-site locations. Using the geologic information from the historical soil boring logs and the newly installed monitoring wells, soil borings and test pits completed as part of this RI, a series of geologic cross-sections were developed for the site. Figures 3-1 through 3-6 illustrate cross-sections of the subsurface lithology based on the above mentioned investigation methods.

A review of the geologic map of New York, Niagara Sheet published by the University of the State of New York, the State Education Department, dated 1970, and indicates that the subject site lies within the glacial deposits above the Guelph Dolostone. A thin layer of glaciolacustrine deposits was encountered in several soil boring and test pit locations completed during this RI. This deposit consisted primarily of tan to brown silty clays and clayey silts containing rock fragments ranging in thickness from approximately 2 in. to 2 ft. This native soil unit directly overlies a layer of weathered bedrock.

The Guelph Dolostone is the upper most formation of the Lockport Group. Depth to bedrock ranges across the site from 2 ft bgs in test pit TP-01 to greater than 78 ft bgs in monitoring well MW-04. Monitoring well MW-04 was installed to 78 ft and competent bedrock was not encountered. Soil boring SB-24 and monitoring well MW-04 were advanced to the deepest depths in the central portion of the site, indicating that the base of the former natural ravine was located in this portion of the site. Due to the historic landfill dumping operations at the site this former ravine has been filled to existing grades. The subsurface soil/fill material encountered during the installation of monitoring well MW-04 consisted predominantly of fill material that contained fine sand and silt, red and black ash, glass, brick, and concrete fragments.

Two soil borings were advanced during the installation of monitoring well MW-06. The first boring was advanced to a depth of approximately 66 ft bgs where HSA refusal was encountered. The monitoring well construction log (Appendix I) reported fill material, consistent with the material encountered at monitoring well MW-04, to a depth of approximately 38 ft bgs. Below 38 ft bgs, the subsurface strata changed to light brown very fine sand with a trace of silt until a depth of approximately 58 ft bgs where a red/brown silty clay and then a stiff brownish red clay unit was observed. This original boring was backfilled and sealed with a bentonite grout mixture to grade and the second boring, which resulted in the installation of monitoring well MW-06, was advanced in an area adjacent to the original boring location. During advancement of the original boring, a water bearing zone was encountered at approximately 36-40 ft bgs at the interface of the fill material and native soil. In an effort to identify the top of bedrock the boring was then advanced to 66 ft bgs where refusal was encountered. Therefore, the original boring was backfilled and sealed with bentonite grout mixture, and the second boring that resulted in the installation of monitoring well MW-06 was installed to the water bearing zone initially identified.

Bedrock cores were collected during the monitoring well installation of MW-01, MW-02, MW-03, and MW-05. The Guelph Dolostone is described as a grey dolomitic limestone that is typically hard and fine grained, and contains numerous vertical and horizontal bedding plane fractures. Guelph Dolostone was observed within bedrock cores at each of the bedrock monitoring well locations. The on-site thickness of this formation was at least 15 to 23 ft based upon bedrock cores collected during groundwater monitoring well installation. Monitoring well construction and installation logs are provided in Appendix I.

The Rochester Shale was not encountered during on-site rock coring for the installation of bedrock monitoring wells.

3.1.2.1 Geologic Cross Sections

Five geological cross sections were constructed across the site to illustrate the subsurface conditions and the amount of fill material located at the site. Figure 3-1 shows the locations of the cross sections. A general description of each cross section is provided below:

- Cross section A-A’ (Figure 3-2) illustrates a cross section from the southwestern corner of the site to the southeastern corner of the site. This section displays the subsurface material located along the southern portion of the site. Beginning at test pit TP-31 (A) and moving east to monitoring well MW-05 the fill material depths are relatively shallow (6 ft bgs at TP-31) and overlay a 2 ft layer of native soil (silty clay unit); at monitoring well MW-05 the depth of the fill material begins to increase moving east to soil boring SB-13 (approximately 48 ft of fill material) reaching its deepest depths at soil boring SB-14 (60 ft bgs), assumed to be the base of the former ravine. Continuing east, fill thickness begins to decrease toward soil boring SB-15, monitoring well MW-06, and soil boring SB-09; the next section along this transect was not evaluated due to the existence of an active railroad line, however, it is assumed that the slope of the former ravine continues to rise towards test pit TP-10, where the depths of fill material were reported to be 3.5 ft bgs. Further east at monitoring well MW-01, a slight dip in the top of bedrock was observed where fill material was observed to depths of 8 ft bgs; fill material thins again to an approximate depth of 2.5 ft bgs at the cross section termination point in test pit TP-03 (A’).

- Cross section B-B’ (Figure 3-3) illustrates a cross section from the northwest corner of the site to the northeastern edge of the site. This section displays the subsurface material located along the northern portion of the site along the current edge of the ravine. Beginning at test pit TP-33 (B) and moving east to DEC-SB-14 the depth of fill material ranged to 10-12 ft bgs and overlaid a thin layer of native soil; moving east from DEC-SB-14 towards soil borings SB-06 and SB-17 the depth of fill material gradually increases to 20 ft bgs and 26 ft bgs, respectively. Continuing east, soil boring SB-20 and monitoring well MW-04 revealed a significant increase in fill material depths, which extend to 77.5 ft bgs at monitoring well MW-04; monitoring well MW-04 and soil boring SB-24 are assumed to be at the base of the former ravine. Following the section further east, fill thickness decreases at soil boring SB-22 (60 ft bgs) as the former ravine begins to increase in slope; however, the base of the ravine seems to level off slightly to monitoring well MW-03, but then rises sharply towards test pit TP-22, where fill material extends to a depth of 15 ft bgs;east of test pit TP-22 there is a small rise in bedrock at test pit TP-13 and then a dip moving towards test pit TP-14.

- Cross section C-C’ (Figure 3-4) cuts the site from the northwestern edge through the southern central edge in a diagonal direction. At test pit TP-34 (C) the depth of fill material is approximately 5 ft bgs; a dip in the bedrock and increase in fill material depth is observed moving east towards monitoring well MW-02 and DEC-SB-14, where fill material was identified at depth up to 12-14 ft bgs. A gradual slope of the bedrock is observed to soil boring locations SB-05 and DEC-SB-13. Soil boring SB-26 exhibits the deepest depths of fill material (58 ft bgs) along this cross section, which is maintained to soil boring SB-15; after which the former ravine slope begins to rise towards test pit TP-12. A distinct layer of native soil appears within soil boring SB-15 beneath the fill material and thickens eastward to monitoring well MW-06, where depths of native soil increase to 25 ft. The depths of fill material again become shallow (4-5 ft bgs) at test pit TP-12 and cross section termination point at test pit TP-11 (C’).

- Cross section D-D’ (Figure 3-5) shows a cross section of the site from the southern edge of the property moving north into the existing ravine. Starting at test pit TP-30 the cross section moves to the north to terminate at an arbitrary point along a contour elevation line surveyed in the ravine. Moving north from test pit TP-30, fill material extends to a shallow depth (approximately 12 ft bgs) to monitoring well MW-05, where fill material depths begin to increase and follow the slope of the former ravine through soil borings SB-26 and SB-21, eventually having its greatest depths at monitoring well MW-04 (77.5 ft bgs) and soil boring SB-24 (73 ft bgs), assumed to be the base of the former ravine.

- Cross section E-E’ (Figure 3-6) runs northwest to southeast across the eastern portion of the site. The cross section begins at another arbitrary point along a contour line within the existing ravine to illustrate the steepness of the ravine’s current slope. Monitoring well MW-03 is the first identifiable field investigation location tied into the cross section and has approximately 28 ft of fill material that thins out to the southeast towards test pit TP-20 and TP-21. Bedrock grade and thickness of fill material is maintained until the termination point within test pit TP-09 (E’), with the exception of monitoring well MW-

01, where a slight dip in the top of bedrock was observed. Fill material at this location was observed to depths of 8 ft bgs.

The cross sections demonstrate a similar pattern as to the distribution of fill material at the site, an identifiable former ravine feature within the central portion of the site, a fairly consistent layer of native soil (typically a silty clay to clay unit) overlying the bedrock formation, and the former ravine base sloping from south to north indicating that overburden groundwater flows would be towards Gulf Creek.

3.1.2.2 Fill material

Fill material was found at grade across the site ranging in depth from a few feet in the southeast corner of the site to approximately 78 ft bgs in the central portion of the of the site. Fill material consisted of ash containing metal, glass, rock, ceramic, coal, and brick/concrete fragments with layers of black foundry sand. At select subsurface locations, staining and obvious odors were observed. The fill material was typically loose and dry, which would indicate a potential for high infiltration rates and effective porosities. Movement of surface water and precipitation infiltration through the fill material would be essentially unimpeded by confining or retarding geologic units allowing for high potential of contaminant leaching, although contact residence time would be low with the exception of the interface between the native soil and bedrock unit.

The material found in test pits TP-26 and TP-27 was buried residential garbage consisting of plastic bags, cardboard boxes, and backfill material (silt, sand and gravel). These test pits, located along the northwestern edge of the Gulf are indicative of household dumping, and are likely not related to the historic landfill operations onsite in the areas to the south of the Gulf and bulkhead outfall.

Based upon the observations of fill material noted during the subsurface soil/fill material sampling conducted under the June 2007 SI and during field investigation activities performed as part of this RI, two interpreted contour elevation maps were developed. The first contour elevation map (Figure 3-7) illustrates the interpreted native soil surface based upon the known depths observed at test pit, soil boring, and monitoring well locations throughout the site. The second contour elevation map (Figure 3-8) illustrates the interpreted bedrock surface based on the subsurface investigation methods performed during this RI. In addition, an isopach map depicting the approximate depth of fill at the site is presented in Figure 3-9. Based upon the interpreted native soil contour elevation map, the recently completed topographic survey, and the presence of fill as determined through soil borings and test pits at the site, the estimated volume of fill material contained within OU 1 is approximately 145,000 yds^3. Additionally, using an estimate that 1 yd^3 of fill material is approximately equal to 1.5 tons; the estimated volume of fill material located within OU 1 is approximately 217,500 tons. These estimates do not account for the existing fill material that lies along the slope of the ravine to the base of Gulf Creek or any fill material that lies beneath the railroad line and ballast which bisects the site into two parcels.

3.2 HYDROGEOLOGY

Six monitoring wells were installed across the site, two in the overburden soil/fill material and four into the competent bedrock formation. Based upon the regional groundwater flow in the area, it is suspected that site groundwater flows to the north towards Gulf Creek.

3.2.1 Regional Hydrogeology

As discussed in Section 1.4.5, the June 2007 SI conducted by the NYSDEC did not encounter saturated zones in on-site overburden or soil/fill material. However, it was observed that the groundwater flows in different directions within the southwestern Lockport area based on natural features and man-made structures. These features include the Niagara Escarpment and Gulf, the former Frontier Stone Products quarry located southwest of the site, and the Erie Barge Canal located southeast of the site.

Prior to the initiation of quarrying operations, little information regarding regional groundwater flow in the upper Lockport Group bedrock was available. It is suspected, however, that historic regional groundwater flow in the southwestern portion of Lockport was largely toward the Gulf, with more localized flow toward the Erie Barge Canal. Quarrying operations have altered the groundwater flow patterns. According the 2007 SI, water levels that were measured in area wells indicated that upper bedrock groundwater flows from a roughly north-south trending groundwater divide centered over the Guterl Specialty Steel Corporation Landfill (located south and southeast of the site). From this divide, groundwater flows west toward the former Frontier Stone Products quarry, while groundwater under the Diamond Shamrock Site and Guterl Excised Area (located southeast of the site) flows east toward the Erie Barge Canal. To the north, groundwater under the GMCH facility flows east toward the Gulf, while groundwater under the Lockport City Landfill flows west toward the Gulf.

Further discussion of regional hydrogeology including figures depicting groundwater flow in the area surrounding the site are available in the 2007 SI report (Appendix B).

3.2.2 Local Hydrogeology

The groundwater flow direction based on the groundwater elevations is towards the former ravine and eventually Gulf Creek. Groundwater moving within the bedrock system from the west continues in a westerly direction until it reaches the former ravine where it then moves north toward Gulf Creek. According to the 2007 SI prepared by the NYSDEC, bedrock groundwater from areas south of the site flows in a northerly direction into the former ravine and then toward Gulf Creek, while flow from the eastern portion of the site moves west to the former ravine and then towards Gulf Creek. The former ravine identified during the subsurface investigation acts as a likely discharge point for bedrock groundwater within the vicinity of the site. Interpreted groundwater contour maps illustrating the direction of groundwater flow for the January 2010 and February 2010 gauging events are shown in Figures 3-10 and 3-11, respectively.

As part of the RI, six monitoring wells were installed to evaluate groundwater quality and provide groundwater elevation information for evaluating groundwater flow direction at the site. Groundwater level measurements were taken prior to monitoring well development on 13 January 2010 and prior to the groundwater sampling event on 10 February 2010. Groundwater level measurements collected are provided in Table 3-1.

Based upon the geologic and fill material characteristics of the site, including the relatively steep bedrock surface observed throughout the central portion of the site (Figure 3-8) and the porosity of fill material within the overburden, it is likely that groundwater levels observed within the two overburden fill material monitoring wells (MW-04 and MW-06) are a combination of infiltration/perched water and bedrock groundwater seepages located along the former ravine face. Locations onsite where no native soil was observed along the bedrock interface include soil boring SB-26, which is located along the western slope of the former ravine in the central portion of the site (Figure 3-4), at soil boring SB-22 located along the slope of the northern portion of the former ravine (Figure 3-3), and within the assumed base of the former ravine at monitoring well MW-04 and soil boring SB-24 (Figures 3-3 and 3-5).

Monitoring well gauging information (February 2010) at monitoring well MW-06 (555.71 ft above mean sea level [AMSL]) shows a consistency in groundwater table elevation with bedrock monitoring well MW-05 (558.06 ft AMSL) which is located hydraulically upgradient to the southwest. Along with soil boring observations that noted saturated zones within soil borings SB-14 and SB-15 (located between monitoring well MW-05 and MW-06) it appears that the bedrock groundwater is in communication with the saturated zones observed within the overburden fill material. The geologic cross sections show the gauged depths to groundwater within the monitoring wells in February 2010, as well as the approximate saturated zones as recorded during soil boring advancement. Once groundwater enters the overburden fill material within the former ravine, movement will be towards Gulf Creek along the former base of the ravine, eventually discharging to Gulf Creek (Figure 3-5). During the course of the field investigation, and specifically the sediment and surface water sampling events in Gulf Creek, a groundwater seep was identified at the base of the fill material southwest of sediment sampling location SED-03 (Figure 2-5). Due to the amount of debris and waste (tires, household waste, etc) mounded within the base of the ravine it was difficult to pinpoint the actual discharge point along the base of the fill material.

3.3 CLIMATE

The Old Upper Mountain Road site is located in Lockport, Niagara County, New York. Western New York has a humid climate that is heavily influenced by two of the Great Lakes, Lake Erie to the southwest and Lake Ontario to the north. Winters are typically long and cold, often lasting from late-October to mid-April, but are changeable and include frequent thaws and rain as well. Western New York receives a large amount of lake effect snow from the bordering Great Lakes. Lake effect snow occurs when cold air crosses the relatively warm lake waters and becomes saturated, creating clouds and precipitation downwind. Lake effect snows are bands of snow that are relatively narrow, but may have very intense bursts of snowfall. Snow within a band can fall at rates of a dusting to a couple of inches per hour. On average lake effect snow does not last very long due to prevailing winds. The Southern Tier region of Western New York receives almost double the amount of snow that the Buffalo Metro and points northward receives. On average Western New York receives approximately 90 inches of snow per year. Spring and fall in Western New York are usually short and changeable. Breezes blowing over Lake Erie and Lake Ontario are usually cooler than the air temperature in the summer. Western New York generally has cooler summers than other regions in the same climatic zone.

3.4 WATER SUPPLY

The Niagara County Water District (NCWD) water supply source is located in the west branch of the Niagara River. NCWD services approximately 150,000 people through 108 service connections to towns and villages located in Niagara, Erie, and Orleans Counties. The daily average volume of water treated and pumped into the distribution system averaged approximately 14,700,000 gal per day in 2009 according to the Annual Drinking Water Quality Report for 2009. Water is pumped to a pumping station at the water treatment plant located on Grand Island where water is treated and filtered. As required by state regulations, all drinking water is tested for contaminants. The presence of contaminants does not necessarily indicate that water poses a health risk. According to the NCWD 2009 annual report, no violations were reported for contaminant detections within the system (NCWD, 2009).

Water lines run north to south along Old Upper Mountain Road. As part of the NCWD, water in the area of the site is obtained from the water district source at the west branch of the Niagara River, located approximately 20 mi west of the site. There are no public water supply wells or other municipal water sources located downgradient of the site. Private properties in the area surrounding the site are connected to the NCWD.

3.5 SEWER SYSTEM

As described in Chapter 2, Section 2.4.1, tracer dye testing was performed in November 2009 and May 2010 to confirm the connection of various points of the sewer systems to the west and south of the site with the sanitary sewer line that intersects the western portion of the site, and the storm sewer line that discharges into Gulf Creek via the bulkhead outfall. Figure 2-3 illustrates the sewer system and flow direction within the various lines surrounding the site known to date.

Based upon a review of historic mapping and the results of the tracer dye testing completed during this RI, the following is known regarding the sanitary and storm sewer lines in the vicinity of the site:

- A storm sewer line with a manhole located along the north side of Old Saunders Settlement Road southwest of the site appears to connect with the observed storm sewer manholes located west of the site within Old Upper Mountain Road. Tracer dye testing was performed at the Old Saunders Road manhole; however, no dye was observed at the manhole just west of Old Upper Mountain Road. Based on the limited flow volumes observed during the dye testing and distance to the Old Saunders Road manhole, dye reaching the manhole west of Old Upper Mountain Road would have taken a substantial amount of time.

- The storm sewer line located within Upper Mountain Road (NYS Route 93) was confirmed to be connected to the manhole just west of Old Upper Mountain Road and the bulkhead outfall that discharges directly into Gulf Creek.

- An additional storm sewer was found to be on a separate sewer line fed from NYS Route 31. This sewer discharges into Gulf Creek on the northeast side of the Gulf, near South Niagara Street.

- The manhole located at the end of Old Upper Mountain Road receives flow from a sanitary sewer line along Otto Park Place that originates on Park Avenue between Heath Street and Michigan Street east of the site. The sewer line originating on Park Avenue also receives flow from a 10-in. line that originates on West Avenue/Route 31. The sanitary sewer manhole at the end of Old Upper Mountain Road also receives additional flow from a 24-in. Town of Lockport sanitary sewer line that reportedly receives flow from the GMCH facility located west of the site. The sanitary sewer manhole at the end of Old Upper Mountain Road is one of nine locations within the City of Lockport's sewer system where the city accepts flow from the Town of Lockport. After these lines converge, the combined flow intersects the western portion of the site and follows the "Gulf Interceptor" toward the City of Lockport Publicly Owned Treatment Works (POTW), which is located approximately 1.6 mi northeast of the site.

EA understands that further sewer system mapping will be undertaken by GMCH in cooperation with NYSDEC to further assess the connections and flow paths of the sanitary and storm sewer lines surrounding the site.

4. RESULTS OF THE REMEDIAL INVESTIGATION

This chapter presents the analytical results and findings of the field investigation activities conducted during the RI. Aqueous and non-aqueous environmental samples were analyzed for a number of analytes including VOCs, SVOCs, TAL metals, TCLP Lead, pesticides, PCBs, and major anions. A detailed breakdown of the environmental samples collected and analyzed during the course of this RI is provided in Table 2-1. Laboratory analytical methods were performed by HCV, an Environmental Laboratory Accreditation Program (ELAP)-certified laboratory. In addition, the laboratory followed the QA/QC, holding time, and reporting requirements as defined in the NYSDEC Analytical Services Protocol of June 2000. Laboratory analytical data were reported using Category B deliverables and the standard electronic data deliverable. Laboratory analytical data and Form I's are provided in Appendix N. Analytical data packages generated by HCV during the RI were validated by ChemWorld Environmental, Inc. of Rockville, Maryland, an independent third party. Analytical data packages were reviewed for completeness, field and laboratory QC sample results were evaluated, significant laboratory control problems were assessed, and data qualifiers were assigned. The DUSRs are presented in Appendix O.

Standards, criteria, and guidance (SCGs) are promulgated requirements and non-promulgated guidance which govern activities that may affect the environment and are widely used at different stages of an investigation and remediation of a site. The analytical data collected during this RI were evaluated using the following SCGs:

- NYSDEC Division of Water Technical and Operational Guidance Series (TOGS) 1.1.1 Ambient Water Quality Standards for Class GA (groundwater) and Class D waters (surface waters) Type H(FC)
- 6 New York Code of Rules and Regulations (NYCRR) Part 375 Environmental Remediation Programs - Unrestricted Use - Soil Cleanup Objectives (SCOs)
- 6 NYCRR Part 375 Environmental Remediation Programs – Restricted Use – SCOs – Commercial Use - SCOs
- 6 NYCRR Part 371 NYSDEC Identification and Listings of Hazardous Wastes (Part 371)
- NYSDEC Technical Guidance for Screening Contaminated Sediments (NYSDEC, 1999)
- Fish and Wildlife Impact Analysis for Inactive Hazardous Waste Site (NYSDEC, 1994).

Contaminants of Concern (COCs) were identified based upon the frequency of detections above SCGs; determination of COCs is detailed in Section 6.3 of this RI report.

4.1 SOIL/FILL CHARACTERIZATION

The focus of the soil/fill screening efforts conducted during this RI were to determine the nature and extent of contamination in fill material and to quantify the volume of fill material within OU 1 and OU1A at the site.

As mentioned in Chapter 1, the site historically received waste from a number of industrial sources from the 1920s to the 1950s. Waste was dumped at the site, burned and then pushed over the ravine, filling in a large portion of the Gulf just to the northeast of the intersection of NYS Routes 31 and Upper Mountain Road. Previous sampling at the site determined lead and other TAL metals to be primary COCs at the site, with other exceedences of NYSDEC SCGs detected for VOCs, SVOCs, pesticides, and PCBs within on-site surface and subsurface soil/fill material.

4.1.1 Surface Soil/Fill Results

In total, 11 surface soil/fill samples were submitted for analyses. Table 4-1A through Table 4-1E summarize the analytical results of surface soil/fill samples (SS-07 through SS-17) collected in May 2010. Surface soil/fill samples were collected at 9 locations at OU 1 and 2 locations at OU 1A. Figure 4-1 illustrates the on-site surface soil locations where concentrations of TAL metals, TCLP lead, SVOCs, pesticides, and PCBs exceeded their respective SCGs. Figure 4-1 also shows analytical results for the surface soil/fill sampling locations (DEC-SS-1 through DEC-SS-6) collected in June 2007 by the NYSDEC. This figure shows that surface soil/fill samples were collected from various locations located throughout the site.

4.1.1.1 Target Analyte List Metals

TAL metals were detected in each of the eleven surface soil/fill samples collected and submitted for analysis via USEPA Method 6010 B/7471A (Table 4-1A). Figure 4-1 shows the exceedences of metal concentrations above the Part 375 SCOs for Unrestricted Use and Restricted Use (commercial). Concentrations of at least one USEPA Priority Pollutant metal were detected in surface soil/fill samples at the site (arsenic, cadmium, copper, lead, mercury, or zinc) with concentrations above the Part 375 SCOs for restricted commercial use with the exception of sampling locations DEC-SS-4 and DEC-SS-3 located in the northeastern portion of the site. Lead exhibited the highest concentrations of the USEPA priority pollutant metals, and was reported at concentrations exceeding the unrestricted SCGs at each surface soil/fill sampling location from both this RI and the June 2007 SI. Concentrations of lead ranged from 170 mg/kg (SS-10) to 24,300 mg/kg (DEC-SS-2), with 11 of 17 sampling locations exceeding the Part 375 SCOs for restricted commercial use (1,000 mg/kg). Based on the results of the surface soil/fill analytical data, widespread surface contamination exists for TAL metals throughout the site.

After review of the initial surface soil/fill metals results and in consultation with the NYSDEC, EA directed the laboratory to analyze eight samples with the highest concentrations of lead (collected during the 2010 event) for TCLP lead analysis. Of the eight samples submitted for TCLP lead analysis, three surface soil/fill samples (SS-08, SS-12 and SS-16) were reported above the NYSDEC Identification and Listing of Hazardous Wastes 6 NYCRR Part 371 (Part 371) value (5 mg/L) and exhibited characteristics of hazardous waste (D008) (Table 4-1B). Both operable units OU1 and OU 1A identified surface soil/fill samples that exhibited hazardous waste characteristics. The remaining five samples that were analyzed for TCLP lead were below the Part 371 value for lead. The results of the TCLP lead analysis confirm that hazardous waste exists in surface soil/fill material at the site. Surface soil/fill material presents the most direct exposure route to both human and environmental receptors.

Although, lead will occur naturally in the environment, most high concentration levels found throughout the environment come from human activities, with the greatest increase occurring between the years of 1950 and 2000 reflecting increased worldwide use of leaded gasoline. Lead can enter the environment through releases from activities such as mining lead and other metals, and from factories that make or use lead, lead alloys, or lead compounds. Lead is released into the air during burning of coal, oil, or waste. Once lead gets into the atmosphere, it may travel long distances if the lead particles are very small. Lead is commonly precipitated from the air by rain and by particles falling to land or into surface water. However, due to the historical operation of the site as a landfill, lead concentrations observed in on-site surface soil is likely the results of the characteristics of the ash/fill material disposed of at the site.

Lead adheres strongly to soil particles and remains in the upper layer of soil. Lead may be transported when soil particles are moved by rainwater and surface runoff. Movement of lead from soil particles into groundwater is unlikely unless the rain falling on the soil is acidic or "soft". Movement of lead from soil will also depend on the type of lead compound, and on the physical and chemical characteristics of the soil (see Section 5).

4.1.1.2 Semivolatile Organic Compounds

Several SVOCs were detected in 8 of 11 surface soil/fill samples collected during the RI, and 11 of 17 surface soil/fill samples including the June 2007 SI (Table 4-1C, Figure 4-1). Three SVOCs, benzo[a]pyrene, benzo[b]flouranthene, and dibenzo[a,h]anthracene were detected above both the Part 375 SCOs for restricted and unrestricted uses in surface soil/fill sample SS-11. Surface soil/fill sample SS-11 reported the highest concentrations of SVOCs and was located in the northern central portion of OU 1 adjacent to a former access road. Benzo[a]pyrene was the most frequently detected polycyclic aromatic hydrocarbon (PAH) and was reported above the Part 375 SCOs for commercial use at 10 of 17 surface soil/fill sampling locations. SVOCs were detected above the SCGs in surface soil/fill samples collected at both OU 1 and OU 1A.

The PAHs are a group of over 100 different chemicals that are formed during the incomplete burning of coal, oil and gas, garbage, or other organic substances. PAHs are usually found as a mixture containing two or more compounds and are found in coal tar, crude oil, creosote, and roofing tar, and a few are used in medicines or to make dyes, plastics, and pesticides. Because the former operational history at the site included the burning of industrial waste the occurrences of PAHs in site surface soil/fill material would be expected. None of the total SVOC concentrations were above 100 mg/kg. The total SVOC concentrations ranged from 1.27 mg/kg (SS-10) to 71.67 mg/kg (SS-11) for the 11 surface soil/fill samples collected during the RI.

4.1.1.3 Pesticides

Five pesticides, specifically aldrin, alpha-BHC (cyclohexane), dichlorodiphenyldichloroethylene (DDE), dichlorodiphenyltrichloroethane (DDT), and dieldrin were detected above SCGs in surface soil/fill samples during both this RI (Table 4-1D, Figure 4-1) and the June 2007 SI. DDT was the most prevalent pesticide detected, with reported concentrations above the respective Part 375 SCO for unrestricted use in 9 of 17 samples. The detected concentration range above SCGs for DDT was reported between 0.0054 D mg/kg (SS-14) and 0.160 B mg/kg (DEC-SS-2). DDE a breakdown compound of DDT was the next most frequently detected pesticide above SCGs, being reported in 8 of 17 surface soil/fill samples. Dieldrin (a manufactured pesticide and a breakdown compound of aldrin) was above SCGs in three surface soil/fill samples, alpha-BHC was above SCGs in two surface soil/fill samples and aldrin was reported above SCGs in one surface soil/fill sample. The pesticide exceedances were located throughout the site (OU 1 and OU 1A) and show no pattern in concentration or distribution, with the exception of the northeast most quadrant of OU 1 where no pesticides were detected. No pesticides were detected at concentrations that exceeded the Part 375 SCOs for restricted commercial use.

DDT and DDE were also once widely used pesticides to control insects and do not occur naturally in the environment. DDT and DDE last in the soil for a very long time, potentially for hundreds of years. Most pesticides break down by the action of microorganisms. These chemicals may also evaporate into the air and be deposited in other places. They adsorb strongly to soil and, therefore, generally remain in the surface layers of soil. Some soil particles with adsorbed DDT, DDE, or dichlorodiphenyldichloroethane (DDD) may migrate via erosional runoff. DDT degrades faster when the soil is flooded or wet as opposed to when it is dry. DDT tends to breakdown faster when it initially enters the soil. In surface water, DDT will bind to particles in the water, settle, and be deposited in the sediment. DDT is taken up by small organisms and fish in the water. It has the potential to accumulate to higher concentrations in fish and marine mammals, reaching levels many thousands of times higher than in water.

Dieldrin is an insecticide that does not occur naturally in the environment. Aldrin, which is very similar chemically to dieldrin, quickly breaks down to dieldrin by sunlight, and by bacteria in the body, plants and in the environment. From the 1950s until 1970, dieldrin was a widely used pesticide for crops but was banned in 1974, except to control termites, due to concerns of contamination to the environment and human health. The USEPA banned all uses of dieldrin in1987. Dieldrin breaks down very slowly in water and soil, binding tightly to the soil and slowly evaporating.

4.1.1.4 Polychlorinated Biphenyls

Analytical results for PCBs identified total aroclor concentrations at two surface soil/fill sample locations, SS-08 and SS-12 (OU 1), above the Part 375 SCOs for unrestricted use (Table 4-1E, Figure 4-1). Specifically, the analytical results reported the PCB aroclor 1254. The detections of PCBs were located in the central portion of OU 1 and no PCBs were reported at OU 1A. Aroclor 1254 is one of several commercial PCB mixtures marketed between the 1930s and 1970s. Aroclor 1254 was historically used in hydraulic fluid, rubber plasticizers, synthetic resin plasticizers, adhesives, wax extenders, dust suppressant, cutting oils, pesticide extenders, sealants, and caulking compounds. The production and sale of aroclor 1254 was discontinued in late-1977, but PCBs can still be present in electrical capacitors, electrical transformers, vacuum pumps, and gas-transmission turbines in use today. PCBs are extremely persistent in soil.

4.1.2 Subsurface Soil/Fill Results

Subsurface soil/fill samples were collected from across the site from various depths during test pit excavations and soil boring advancements. These samples were collected to determine the nature and extent of contamination within the fill material located on-site. An excavator was used to excavate test pit locations and a track mounted Geoprobe® rig and HSA rig were used to advance soil borings to subsurface depths.

The majority of the subsurface soil/fill samples were collected as composite samples from the test pit excavation material and multiple depth intervals at outer soil boring locations. In general, composite test pit subsurface soil/fill samples were collected from depths ranging from approximately 1-7 ft bgs in the southeastern (primarily OU 1A) and northwestern portions (OU 1) of the site. Within these portions of the site, bedrock was encountered at shallower depths as recorded during the test pit excavation and soil boring activities. Three discrete samples were collected at test pits TP-01 (0-6 in. bgs), TP-09 (2-4 ft bgs), and soil boring SB-11 (4-6 ft bgs). The subsurface soil/fill samples collected from within the northeastern and southwestern portions of the site were primarily composite samples from depths ranging from 1 to 14 ft bgs. No discrete subsurface soil/fill samples were collected from these areas. Subsurface soil/fill samples collected in the central portion of the site from interior soil borings (direct-push or HSA) were mostly discrete samples ranging in depths from 16 to 75 ft bgs, with the exception of SB-09 (24-30 ft bgs) and SB-17 (16-24 ft bgs). The central portion of the site included the vertical profile soil borings, SB-13, SB-20, SB-21, and SB-22, where discrete samples were collected every four feet until the top of bedrock. In addition to the vertical profile borings, direct-push methods were able to advance soil boring SB-09 to a depth of 44 ft bgs. HSA borings also completed to deeper depths in the central portion of the site included SB-14, SB-15, SB-17, SB-18, SB-19, and SB-23 through SB-26. Figure 4-2 illustrates the locations of the subsurface soil/fill sampling program conducted during this RI.

Table 4-2A through Table 4-2E summarize the analytical results of the test pit (TP-01 through TP-37) subsurface soil/fill samples; Table 4-3A through Table 4-3E summarize the analytical results of the soil boring (SB-01 through SB-26) subsurface soil/fill samples; Table 4-4 summarizes the analytical results of the vertical profile boring (SB-13, SB-20, SB-21, and SB-22) subsurface soil/fill samples; and Table 4-5A and Table 4-5B summarize the analytical results of the subsurface soil/fill sample collected during the installation of monitoring well MW-04. Figure 4-3 through Figure 4-12 illustrates the on-site subsurface soil/fill locations where concentrations of the TAL metals, TCLP Lead, VOCs, SVOCs, pesticides, and PCBs exceeded the respective SCGs. These results, in conjunction with the surface soil/fill results, represent the characterization of on-site soil/fill material for OU 1 and OU 1A. No subsurface soil/fill samples were collected from soil borings SB-07 or SB-10 as they were advanced adjacent to test pit excavations to confirm depth to bedrock.

4.1.2.1 Target Analyte List Metals – Test Pits/Soil Borings

A total of 60 subsurface soil/fill samples were collected and submitted from on-site test pits and soil boring locations for TAL metals analysis. Analytical results are summarized in Table 4-2A and Table 4-3A, respectively. Figures 4-3, 4-4, and 4-5 show the locations and concentrations for metal parameters that exceed SCGs for two Part 375 SCOs (unrestricted use and restricted use – commercial).

The TAL metal concentrations detected in the test pit and soil boring subsurface soil/fill samples indicate metal contamination is prominent at multiple sampling depth intervals across the entire site. Concentrations of copper and lead exhibited the highest concentrations of the USEPA priority pollutant metals. Copper concentrations detected above the SCGs ranged from 84 mg/kg (TP-27, 1-2 ft bgs) to 45,000 mg/kg (TP-01, 0-6 in. bgs). Lead concentrations reported above SCGs ranged from 77 mg/kg (TP-27, 1-2 ft bgs) to 23,000 mg/kg (TP-01, 0-6 in. bgs and TP-16, 6-12 ft bgs). Concentrations of lead in each of the 60 test pit/soil boring subsurface soil/fill samples were above the Part 375 SCO for unrestricted use and above the Part 375 SCOs for restricted commercial use in 42 of 60, or 70 percent, of the samples collected and analyzed. Based on the consistency with which lead concentrations were detected and exceeded the site SCGs, lead may be used as a predictor in defining the probable extent of subsurface contamination for OU 1.

A horizontal evaluation of TAL metal contamination indicates that concentrations are highest and more prominent along the eastern portion of the site; with the highest concentrations of numerous metals detected within the shallow (to approximately 14 ft bgs) test pit and soil boring subsurface soil/fill samples. This area includes both the 1-7 ft bgs and the 1-14 ft bgs composite sampling intervals (Figure 4-2). The eastern portion of the site appears to have been most recently filled based upon a review of USGS topographic maps, as discussed in Chapter 1, Section 1.4.2. In addition, high concentrations of several TAL metals were detected within the subsurface soil/fill material at numerous locations and depths throughout the site. There does not appear to be a general pattern indicating a trend for increasing or decreasing lead concentrations with depth based on the analytical data from test pit and soil boring subsurface soil/fill samples. This would indicate that contamination and concentrations within soil/fill material is likely the result of the origin of the waste disposed and the dates/time when disposal occurred at the site, rather than a migration of metals through the soil/fill material or specific zones/lifts where high concentration material exist *in-situ*.

4.1.2.2 Target Analyte List Metals – Vertical Profile Borings

In addition to the test pit and soil boring subsurface soil/fill samples, four vertical profile borings were advanced within the deepest portions of the site located at OU 1; these locations were sampled from existing grade to top of bedrock or native soil, whichever occurred first. A total of 56 subsurface soil/fill samples were collected and submitted for laboratory analysis for select TAL metals including arsenic, barium, cadmium, chromium, lead, and mercury from approximate 4 ft intervals, based upon sample recovery from the split spoons. Analytical results of these subsurface soil/fill samples are summarized in Table 4-4. Figures 4-6 (SB-13), 4-6A

(SB-20), 4-6B (SB-21) and 4-6C (SB-22) depict the vertical profile concentrations of the selected metals graphically for each individual boring location.

An evaluation of the vertical profile borings was completed to assess the vertical distribution of USEPA priority pollutant metals where the subsurface soil/fill material was at the greatest depths.

- Vertical profile boring SB-13 was located roughly 125 ft from the southwestern corner of the site boundary (Figure 4-6) and was advanced to a depth of approximately 55 ft bgs where bedrock refusal was encountered. Based on the vertical profile boring log, approximately 48 ft of soil/fill material was observed overlying 7 ft of silty clay with dolostone fragments and weathered bedrock (assumed to be native soil) and competent bedrock at 55 ft bgs. No saturated zones were observed during the advancement of vertical profile boring SB-13; however, a moist layer was recorded between 36 and 38 ft bgs. Vertical profile boring SB-13 demonstrated the highest concentrations of barium, cadmium, lead, and mercury at depths up to 20 ft bgs. Barium concentrations increased again at a depth of 32 ft bgs with concentrations then decreasing at approximately 44 ft bgs. Arsenic concentrations spiked at approximately 30 ft bgs and then immediately decreased. Lead concentrations were consistently above the Part 375 SCOs for unrestricted use to a depth of 48 ft bgs and were at or above the Part 375 SCOs for restricted commercial use to a depth of approximately 20 ft bgs. Concentrations of the lead fell below the SCGs in samples collected from within the 48-55 ft depth intervals, further indicating that metals contamination is not migrating vertically downward. Overall, the average concentrations of arsenic, barium, cadmium, lead, and mercury were above their respective Part 375 unrestricted use SCOs and the average concentrations of arsenic, barium, and lead were also above their respective Part 375 restricted use commercial SCOs. Based on the interpreted bedrock/native soil contour maps (Figures 3-7 and 3-8) and geologic cross-section A-A’ (Figure 3-2), vertical profile boring SB-13 was advanced approximately three quarters of the way down the western side of the former ravine.

- Vertical profile boring SB-20 was located in the central portion of the site roughly 175 ft east of the western site boundary (Figure 4-6A) and was advanced to a depth of approximately 57 ft bgs where bedrock refusal was encountered. Field boring logs completed during vertical profile boring advancement documented approximately 44 ft of soil/fill material above 13 ft of grey silty clay with trace gravel and dolostone fragments (assumed to be native soil) and bedrock at 57 ft. It was also noted that the interface between the soil/fill material and the top of native soil (46 ft bgs) was wet, indicating a potential for groundwater/infiltration water to move along this interface towards Gulf Creek. Analytical results for vertical profile boring SB-20 revealed an overall increasing trend in metal concentrations beginning between 8 and 12 ft bgs and then showed variable concentration spikes and declines to the termination depth. Notable concentrations of lead (15,000 mg/kg) were reported in the 20-24 ft sample interval and concentrations of mercury (9.8 mg/kg) were detected in the 32-36 ft sample interval. Lead concentrations were above the Part 375 unrestricted use SCOs from 4 to 40 ft bgs with six sample depth intervals above the restricted commercial use SCOs as well. Similar to vertical profile boring SB-13, vertical profile boring SB-20 reported average concentrations of arsenic, barium, and lead above the respective Part 375 restricted commercial use SCOs. Analogous with vertical profile boring SB-13, subsurface soil/fill samples collected from the native soil (44-48 ft bgs) were below SCGs. Based upon cross section B-B', vertical profile boring SB-20 was advanced about half way down the western side of the former ravine.

- Vertical profile boring SB-21 was located in the central portion of the site (Figure 4-6B) and was advanced to a depth of 74 ft bgs where weather bedrock and refusal was encountered. Boring logs from this vertical profile point report roughly 67 ft of soil/fill material overlying 7 ft of silty clay and bedrock fragments. Boring material was observed to be wet between 64 and 66 ft bgs, again directly above the native silty clay soil. Black staining and a discernable odor were observed in the material recovered at the bedrock interface. Vertical profile boring SB-21 reported the highest occurrences of foundry sand recovered during split-spoon sampling. Subsurface soil/fill sample results reveal that vertical profile boring SB-21 has the most sporadic concentration changes for cadmium and mercury with depth. Lead concentrations throughout the vertical profile boring were again reported above both SCGs from the ground surface to 68 ft bgs, with 13 of 18 subsurface soil/fill samples being detected at concentrations above the Part 375 restricted commercial use SCOs. Arsenic was reported above the restricted and unrestricted commercial use SCOs in all but two samples. Concentrations of the select metals were below the SCGs in samples collected from native soil. Based on the interpreted bedrock/native soil contour maps (Figures 3-7 and 3-8), vertical soil boring SB-21 appears to be located along the eastern slope near the base of the former ravine.

- Vertical profile boring SB-22 was located in the central northeastern portion of the site approximately 40 ft from the northern edge of the slope to the existing ravine (Figure 4-6C). Vertical profile boring SB-22 was advanced to a depth of approximately 60 ft bgs where bedrock refusal was encountered. No native soil was observed during the advancement of vertical profile boring SB-22, which indicates that roughly 60 ft of fill material overlies the bedrock formation at this location. In addition, vertical profile boring SB-22 also reported a high frequency of recovered foundry sand and no saturated zones were observed within the fill material. Concentrations of lead were again reported above the Part 375 restricted commercial use SCO at each depth interval with the exception of 12-16 ft bgs. The highest concentration of lead (19,000 mg/kg) was reported in the sample collected from the 48-52 ft depth interval, while the subsurface soil/fill material from 40-56 ft bgs reported the highest concentrations of lead out of all of the vertical profile borings. The average concentration of lead (5,646 mg/kg) within vertical profile boring SB-22 was the highest average concentration of all the vertical profile borings. The average concentrations of arsenic and barium were also above their respective Part 375 restricted commercial use SCOs. Based upon cross section B-B', vertical profile boring SB-22 appears to be located on a bedrock ledge along the western slope of the former ravine.

The overall evaluation of the analytical results from vertical profile boring samples indicates a heterogeneous distribution of contaminants in subsurface soil/fill material. Each vertical profile boring had reported concentrations of lead at levels significantly above the Part 375 unrestricted use SCO and approximately 62 percent (35 of 56) of those detections were above the Part 375 restricted commercial use SCO. Arsenic, barium, and lead had the highest frequency of reported concentrations above Part 375 restricted use SCOs and had the highest average concentrations. The concentration of metals within the vertical profiling soil borings confirms the analytical results of the test pit/soil boring sampling in that it appears that the types and source(s) of waste dumped at the site, rather than migration of metals through the fill material, is the primary influence on metals concentration within the subsurface soil/fill material on-site. Generally, metals concentrations appear to decrease with depth, with the exception of reported metals in vertical profile boring SB-22, where no native soil was encountered and the boring was terminated at the fill/bedrock interface. Native soil beneath the fill material does not appear to be impacted by the overlying waste/fill material based upon the analytical data for subsurface samples collected from this zone.

4.1.2.3 Toxicity Characteristics Leaching Procedure Results

After review of the metal analytical results, and at the direction of NYSDEC, EA contacted the analytical laboratory to have 77 subsurface soil/fill samples additionally analyzed for TCLP lead. Samples submitted for TCLP lead analysis generally included those subsurface soil/fill samples that reported lead concentrations greater than 1,000 mg/kg. Of the subsurface soil/fill samples analyzed for TLCP lead, 29 were test pit samples, 13 were soil boring samples, and 35 were samples collected from the vertical profile borings. In total, 33 of 77 (approximately 43 percent) of the subsurface soil/fill samples analyzed for TCLP lead were identified as characteristic hazardous waste (D008) (Table 4-6).

Figure 4-7 identifies the test pit, soil boring, and vertical profile boring sample locations that were submitted and the corresponding analytical results indicating whether or not the subsurface soil/fill samples were identified as hazardous or non-hazardous waste. Consistent with the overall TAL metals analytical results, the test pit subsurface soil/fill TCLP lead samples analyzed from the eastern portion of the site contained the highest frequency of TCLP lead exceedances. These test pit subsurface soil/fill samples were typically composite samples collected at depths ranging from 0 – 12 ft bgs. One test pit, TP-29, located on the western portion of the site identified subsurface soil/fill material as hazardous waste and was collected from the 1-7 ft bgs depth interval. TCLP lead exceedances were also documented in two direct-push soil boring locations, SB-08 and SB-16. These subsurface soil/fill samples were also composite samples from depth intervals of 5-12 ft bgs (SB-16) and 6-14 ft bgs (SB-08). Soil boring SB-08 was located in the central eastern portion of the site and soil boring SB-16 was located in the western portion of the site (Figure 4-7). A discrete subsurface soil/fill sample collected at HSA soil boring SB-18, from a depth interval of 38-42 ft bgs, was also charaterized as hazardous waste. Soil boring SB-18 was located on the northwestern portion of the site in an area near the edge of the existing ravine (Figure 4-7).

In addition to test pit and soil boring subsurface soil/fill samples that were characteristic of hazardous waste, a number of discrete subsurface soil/fill samples collected at the vertical profile boring locations reported concentrations of lead above the Part 371 TCLP regulatory limit. Vertical profile boring SB-13 contained hazardous waste in subsurface soil/fill samples collected from three depth intervals: 4-8 ft bgs, 8-12 ft bgs, and 16-20 ft bgs (Figure 4-7). Vertical profile boring SB-20 contained hazardous waste at two continuous depth intervals starting at 20 ft bgs and ending at 32 ft bgs (Figure 4-7); due to poor recovery no subsurface soil/fill samples were collected from the 24-28 ft depth interval. Vertical profile boring SB-21 also contained subsurface soil/fill samples with hazardous waste in three distinct depth intervals: 30-32 ft bgs, 48-52 ft bgs, and 56-60 ft bgs (Figure 4-7). Vertical profile boring SB-22 had the highest frequency of subsurface soil/fill samples with concentrations of lead above the Part 371 TCLP regulatory limits. Hazardous waste depth intervals started at 4-8 ft bgs, included four continuous depths from 22-42 ft bgs, and two more continuous depths from 46-54 ft bgs (Figure 4-7). The geologic cross sections presented in Chapter 3 were updated to included the results of the TCLP lead analysis and identify the depth intervals where subsurface soil/fill material exhibited hazardous waste characteristics. These cross sections are presented as Figure 4-8 through Figure 4-8E.

Overall, the bulk of the subsurface soil/fill material identified as characteristic hazardous waste was found in the eastern portion of the site extending from several test pits (TP-09, TP-5A, and TP-1) located on the southeastern parcel (OU 1A) through to the northeastern portion of OU 1 where test pit TP-22 terminated near the edge of the existing ravine. A reduction in the frequency of hazardous subsurface soil/fill occurs in the central and western portions of the site; however, several vertical zones of hazardous waste exist in deeper portions of the subsurface soil/fill material located within the former ravine. Based on the percentage of subsurface soil/fill material samples that were identified as characteristic hazardous waste (43 percent), the known concentrations of lead in soil/fill material (up to 23,000 mg/kg), the identification of significant quantities of hazardous waste fill located on the eastern portion of the site and within the former ravine, a conservative estimate to approximate the quantity of *in-situ* hazardous waste within OU 1 and OU 1A would be 50 percent by volume.

4.1.2.4 Semivolatile Organic Compounds

Twenty-five subsurface soil/fill samples were collected and analyzed for SVOCs. Fifteen of those samples reported detections of a number of SVOCs above the Part 375 SCOs (Table 4-2B, Table 4-3B, and Table 4-5B). Figure 4-9 illustrates the SVOC detections above the two Part 375 SCOs. Benzo[b]fluoranthene was the most frequently detected (15 of 25) SVOC above the Part 375 unrestricted use SCO and was reported above the Part 375 restricted commercial use SCO at three subsurface sampling locations. Concentrations of benzo[b]flouranthene above the SCG ranged from 1.1 mg/kg (SB-08) to 160 mg/kg (TP-20). Benzo[a]pyrene reported the highest number of detections above the Part 375 restricted commercial use SCO, with concentrations that ranged between 1.2 mg/kg (SB-09) and 50 mg/kg (TP-20). The highest total SVOC concentrations were detected in subsurface soil/fill sample collected from locations located in the northeastern and central portion of OU 1 at subsurface sampling locations TP-20, TP-22, and MW-04. The subsurface log for monitoring well location MW-04 noted black staining, a sheen, and strong odors within the boring, while black staining was note on the excavation log for test pit location TP-20. Consistent with the TAL metals exceedances, the SVOC detections above SCGs were located in the eastern portion of the site within both OU 1 and throughout OU 1A. Additionally, a number of detections were also located along the southern portion of OU 1.

4.1.2.5 Pesticides

Of the 24 subsurface soil/fill samples collected and analyzed for pesticides, only eight samples reported detections above the Part 375 unrestricted use SCO (Table 4-2C and Table 4-3C). Figure 4-10 illustrates the pesticide detections above the unrestricted use SCO. Specifically, DDE and DDT were the two pesticides detected. The detections of DDE and DDT were found no deeper than 12 ft bgs (TP-30), with a majority of the detections above the SCG located along the western edge of OU 1 and the northern and western edges of OU 1A. None of the reported pesticide concentrations exceeded the Part 375 restricted commercial use SCOs.

4.1.2.6 Polychlorinated Biphenyls

Twenty-four subsurface soil/fill samples were collected and submitted for analysis of PCBs. Figure 4-11 illustrates the PCB detections above the two Part 375 SCOs. PCB Aroclor 1268 was reported in test pit TP-09 (2-4 ft) and Aroclor 1254 was reported in test pit TP-36, resulting in total aroclor concentrations that exceeded SCGs (Table 4-2D and Table 4-3D). Test pit TP-09 is located next to the railroad tracks on the southern portion of OU 1A, while test pit TP-36 is located at the western portion of OU 1, close to the edge of the ravine (Figure 4-11).

4.1.2.7 Volatile Organic Compounds

Nine subsurface soil/fill samples were collected and analyzed for VOCs via USEPA method 8260B (Table 4-2E and Table 4-3E). Only two parameters were detected above the unrestricted use SCO, as shown in Figure 4-12: acetone in the subsurface soil/fill sample collected during the installation of monitoring well MW-04 (74-78 ft) and trichloroethene (TCE) in the subsurface soil/fill sample collected at test pit TP-30. The subsurface soil/fill sample collected at monitoring well MW-04 (74-78 ft) was collected during well installation activities in November 2009 when elevated PID readings, sheen and an odor prompted a VOC soil analysis. Test pit TP-30 was the closest subsurface sampling location to the sewer system line that bisects the site (Figure 2-3), and it should be noted that TCE concentrations were also reported in the water samples collected from the manhole at the base of the ravine. As previously discussed, this manhole is connected to the sewer line that runs adjacent to test pit TP-30.

4.1.2.8 Contaminated Subsurface Soil/Fill Volume Estimates

As previously discussed in Section 3.1.2.2, approximately 145,000 yd^3 of contaminated fill is present at OU 1 and OU 1A. Based upon this volume estimate, the TCLP analytical results summarized in Section 4.1.3, and utilizing a conservative estimate that 50 percent of on-site fill material is hazardous, EA calculated the volume of hazardous fill at the site to be approximately 72,500 yds^3. Based on the assumption that 1 yd^3 of *in-situ* fill material is approximately equal to

1.5 tons, the estimated volume of contaminated fill at OU 1 and OU 1A is approximately 217,500 tons; approximately 108,750 tons of this fill can be considered hazardous.

4.2 GROUNDWATER CHARACTERIZATION AND ANALYTICAL RESULTS

Six groundwater monitoring wells were gauged and sampled in February 2010. Monitoring wells MW-04 and MW-06 are screened within saturated zones in the overburden fill material, while the remaining four wells (MW-01, MW-02, MW-03 and MW-05) are screened within the bedrock. Depth to water ranged from 23.44 ft bgs (MW-01) to 73.54 ft bgs (MW-04) in February 2010.

Groundwater samples collected from the monitoring wells in February 2010 were submitted for laboratory analysis of VOCs, SVOCs, TAL metals, pesticides, PCBs, and the major anions (sulfate, chloride, and alkalinity). Table 4-7A through Table 4-7D summarizes the analytical results for groundwater samples collected during this RI. Groundwater exceedances are illustrated on Figures 4-13 through 4-15.

4.2.1 Target Analyte List Metals

TAL metal concentrations were detected in groundwater samples collected from each of the six on-site groundwater monitoring wells (Table 4-7A, Figure 4-13). Bedrock groundwater samples consistently reported concentrations of aluminum, iron, and sodium at concentrations above applicable SCGs, with the exception of monitoring well MW-01, where aluminum was non-detect. Other notable TAL metal detections within the bedrock groundwater samples were chromium (76 µg/L), manganese (550 µg/L), and potassium (7,300 µg/L) at monitoring well MW-05, which is located in the southwestern portion of the site; and chromium (350 µg/L), cobalt (35 µg/L), lead (130 µg/L), magnesium (160,000 µg/L), manganese (2,600 µg/L), and nickel (180 µg/L) at monitoring well MW-03, which is located in the northeastern portion of the site within the shallow bedrock layers nearest the base of the former ravine. Groundwater within monitoring well MW-03 likely has direct contact and communication with the overburden fill saturated zone; as indicated on the monitoring well installation log this bedrock zone was highly fractured.

These same TAL metals, along with a number of additional metals at monitoring well MW-04, were detected in groundwater samples collected from the monitoring wells located within the overburden fill material. USEPA priority pollutant metals aluminum, lead, and manganese were reported in exceedance of applicable SCGs. Monitoring well MW-06, located in the southern central portion of the site and nearest the former ravine bedrock/native soil slope, is upgradient of monitoring well MW-04. It is likely that groundwater quality within this location of the site would most resemble bedrock conditions as residence time within the fill material would be low. As groundwater moves down gradient through the fill material towards monitoring well MW-04, groundwater quality conditions change significantly, as documented by the groundwater analytical results from monitoring well MW-04. Concentrations of TAL metals in the groundwater samples collected at monitoring well MW-04 are significantly higher than those of the bedrock monitoring wells. For example, the detected concentrations of iron (1,200,000 µg/L) is 3 to 4 orders of magnitude higher than bedrock groundwater conditions, while concentrations of chromium (2,900 µg/L), lead (49,000 µg/L), and zinc (120,000 µg/L) are 2 orders of magnitude higher. Concentrations of beryllium and mercury, which were non-detect in other monitoring wells, were reported at 32 µg/L and 3 µg/L, respectively, in monitoring well MW-04.

The location of monitoring well MW-04 within the overburden fill material is at an ideal location at the site to evaluate groundwater impacts associated with the overburden fill material. Based on the former natural ravine contour features, monitoring well MW-04 is located nearest the former base of the ravine, and is within the discharge pathway of the on-site groundwater system. Groundwater within the vicinity of monitoring well MW-04 would have spent the highest amount of residence time within the overburden fill material prior to discharging to the surface waters of Gulf Creek. In addition, because of the location of monitoring well MW-04, it is likely that the groundwater conditions within this area of the site would be representative of water quality of the seep that discharges into Gulf Creek. Unfortunately, a sample of the seep was not collected during the RI. The high concentrations of TAL metals within groundwater samples collected at monitoring well MW-04 correspond with the concentrations and analytes observed within the subsurface soil/fill material, which indicates that leaching processes are likely occurring at the site.

4.2.2 Anions and Alkalinity

To further assess metal impacts to groundwater and the influence of anion exchange capacity on desorption of metals from soil/fill material to groundwater, two major anions (chloride, sulfate) were also analyzed during the February 2010 groundwater sampling event (Table 4-7B). A high anion exchange capacity indicates a likelihood of high metal concentrations within groundwater, resulting from desorption of positively charged metals from soil/fill particles as they bond with negatively charged anions in groundwater to form soluble compounds. Chloride and sulfate are commonly used to measure the dissolution processes occurring at a site.

In general, concentrations of sulfate and chloride were detected in groundwater samples from each of the on-site monitoring wells. However, chloride concentrations were above the SCG at monitoring wells MW-03, MW-04, and MW-06, and sulfate concentrations were detected above the SCG at monitoring well MW-03.

Overall, the highest anion concentrations were detected within MW-03 and MW-04, located in the northern portion of the site within the former base of the ravine and closest to the Gulf. These two monitoring wells also reported the highest overall metal concentrations. These results suggest that the potential exists for metals to be desorbed from the fill material due to the high anion exchange capacity.

In addition to the anions, groundwater samples were also submitted for analysis of alkalinity. The total alkalinity of a groundwater system is indicative of the system’s capacity to neutralize acid. Concentrations of alkalinity within the groundwater samples collected at the site ranged from 130,000 µg/L (MW-02) to 2,700,000 µg/L (MW-04). The three monitoring wells (MW-03, MW-04, and MW-06) located within or directly below the fill material reported higher concentrations of alkalinity than did the bedrock monitoring wells. Alkalinity results from the presence of hydroxides, carbonates, and bicarbonates of elements such as calcium, magnesium, sodium, potassium, or ammonia. Based on the TAL metal groundwater results, it appears that there is a direct correlation of alkalinity concentrations and the concentrations of calcium, magnesium, and sodium reported in each of the monitoring wells at the site. These species are commonly the result of dissolution of bedrock (especially carbonate bedrocks). Alkalinity of groundwater is directly related to the underlying bedrock. Alkalinity is important in maintaining groundwater pH because it buffers a groundwater system against acids. As noted on the monitoring well purging and sampling forms in Appendix K, relatively stable pH (6.91 – 9.79) values were recorded. Monitoring well MW-03 reported the most basic pH groundwater quality, ranging from 8.39 to 9.79, while monitoring well MW-04 exhibited pH values that ranged from 7.53 to 7.91.

4.2.3 Semivolatile Organic Compounds

SVOCs were only detected in two on-site monitoring wells, MW-03 and MW-04 (Table 4-7C, Figure 4-14). The groundwater sample collected at monitoring well MW-04 reported significantly more SVOCs above the NYSDEC Ambient Water Quality Standard than did the groundwater samples collected at monitoring well MW-03. In addition, a number of the SVOCs detected within the subsurface soil/fill sample collected at MW-04 (70-73’) were also detected within the groundwater sample collected from MW-04. Of the SVOC detections at monitoring well MW-04, eleven were reported at concentrations above their respective SCGs. One SVOC, bis(2-Ethylhexyl) phthalate was detected at concentrations above its applicable SCG at both monitoring well locations. Figure 4-14 illustrates the concentrations of SVOCs detected within on-site groundwater.

Because SVOC concentrations were not reported at monitoring well locations upgradient of monitoring wells MW-03 and MW-04, it appears that SVOC contamination within the fill material is impacting groundwater quality.

4.2.4 Volatile Organic Compounds

Groundwater samples collected in February 2010 revealed concentrations of VOCs in five of the six on-site monitoring wells (Table 4-7D, Figure 4-15). A number of chlorinated VOCs (CVOCs), including chloroethane, 1,1-dichlorethane (1,1-DCA), 1,1-dichlorethene (1,1-DCE), *cis*-1,2-dichloroethene (*cis*-1,2-DCE), *trans*-1,2-dichloroethene (*trans*-1,2-DCE), tetrachloroethene (PCE), TCE, 1,1,1-trichloroethane (1,1,1-TCA), and vinyl chloride (VC) were reported in groundwater samples collected at the site. Groundwater samples that exhibited CVOC concentrations were collected from monitoring wells MW-01, MW-02, MW-04, and MW-05. Groundwater samples collected at monitoring well MW-03 reported concentrations of BTEX compounds, toluene and xylenes (total), with toluene exceeding the SCG.

In general, CVOCs detected in monitoring wells MW-02 and MW-04 were primarily compounds related to PCE and TCE and their related daughter products. Concentrations of *cis*-1,2-DCE (16 µg/L) and TCE (17 µg/L) were above the SCGs at monitoring well MW-02, while concentrations of cis-1,2-DCE (6.3 µg/L) and VC (6.6 µg/L) were above the SCGs at monitoring well MW-04 (Figure 4-15). Groundwater samples collected at monitoring well MW-05 included a combination of CVOC compounds, both primary compounds PCE and TCE as well as primary compound 1,1,1-TCA, and the associated daughter products of these primary compounds. Monitoring well MW-05 reported concentrations of 1,1-DCA (5.5 µg/L), *cis*-1,2-DCE (15 µg/L), TCE (11 µg/L), and VC (4.5 µg/L) above the applicable SCGs (Figure 4-15). Both bedrock monitoring wells MW-02 and MW-05 are located along the western portion of the site and are within the flow path associated with bedrock groundwater migrating from areas west of the site. It is documented that the GMCH facility, located upgradient and west of the site, has reported concentrations of CVOCs within bedrock groundwater beneath their property.

The CVOCs reported in groundwater samples collected from monitoring well MW-01 appeared to be predominantly from compounds associated with 1,1,1-TCA and its daughter products. Concentrations of chloroethane (8.7 µg/L) and 1,1-DCA (48 µg/L) were the CVOCs reported at the highest concentrations at monitoring well MW-01, and both exceeded the SCGs. Bedrock monitoring well MW-01 is located in the southeastern portion of the site, and based upon groundwater flow direction interpreted from the monitoring well gauging events, appears to receive groundwater from areas south of the site. The Guterl Steel Site (Registry No. 932032) is located to the south, and has documented concentrations of TCA and its daughter products. Migration of contaminated groundwater to the north, however, has not been documented.
In addition to the CVOC detections within on-site groundwater, chloroform was detected above its applicable SCG at monitoring well MW-02 (17 µg/L), while toluene, a petroleum related VOC, was detected above its applicable SCG at monitoring well MW-03 (5.6 µg/L). Only one, low-level detection of a CVOC (TCE) was reported within the subsurface soil/fill material at the site (Figure 4-12), and the concentrations of CVOCs in groundwater decrease as they progress hydraulically downgradient across the site. This suggests that groundwater impacts at the site may have contributions from upgradient, off-site sources.

4.2.5 Polychlorinated Biphenyls and Pesticides

No pesticides or PCBs were detected within on-site groundwater at concentrations above their respective laboratory method detection limits (MDLs).

4.3 SURFACE WATER/MANHOLE SEWER WATER QUALITY

Surface water samples were collected in November 2009 and May 2010 from Gulf Creek. In addition to the surface water samples, several water samples were collected from sewer system manholes that were determined to drain into Gulf Creek, or a sanitary sewer line (The Gulf Interceptor Sewer) that bisects the western portion of the site and eventually flows along the Gulf. Analytical results from these samples are summarized in Table 4-8A through Table 4-8F and are illustrated on Figure 4-16.

4.3.1 Gulf Creek Surface Water Results

One VOC and one TAL metal were detected in surface water samples (SW-02 and SW-04) at concentrations exceeding the respective SCGs. PCE concentrations were detected in sample SW-04 (3.9 µg/L), which exceed the NYSDEC AWQS for Class D waters (Table 4-8A). Other notable CVOC detections included TCE at surface water location SW-02 at 11 µg/L (November 2009) and 12 µg/L (May 2010), and at surface water location SW-04 (8 µg/L in November 2009). 1,2-DCE was detected at surface water location SW-02 (2.1 µg/L in November 2009 and 2.8 µg/L in May 2010), and at surface water location SW-04 (8.7 µg/L in November 2009). Both of these analytes were below the Class D surface water standards at each surface water sample location. The surface water sample collected at SW-04 was located at the breech point of a substantial beaver dam where a noticeable sheen was evident on the water; while surface water location SW-02 was located at the outfall of the bulkhead in the western portion of the site. Surface water location SW-02 is located upstream of surface water location SW-04. In addition, one TAL metal, iron, was also detected at concentrations exceeding the SCGs for metals in both surface water samples collected in November 2009 (Table 4-8B). One SVOC, bis(2-Ethylhexyl)phthalate, was detected at surface water sample locations SW-01 and SW-03. The reported concentrations, however, were below the Class D standards (Table 4-8C).

No pesticides or PCBs were detected in surface water samples at concentrations above their respective laboratory MDLs.

Historical surface water sampling conducted in 2007 by the NYSDEC at similar locations to the surface water sampling locations sampled in November 2009 as part of this RI, also reported PCE at concentrations above NYSDEC Class D surface water standards (Table 4-8D). The surface water samples collected during that investigation were from the bulkhead outfall and a location further downstream within Gulf Creek. The detected CVOC concentrations of 1,2-DCE (total), PCE, and TCE ranged from 5 µg/L to 20 µg/L in 2007. Additionally, analytical data from surface water samples collected from the southwestern headwaters of Gulf Creek dating as far back as 1997 (NYSDEC) and 1998 (NYSDOH) have reported concentrations of the same three CVOCs (1,2-DCE, PCE, and TCE) in the Gulf Creek surface water body. Downstream surface water total CVOC concentrations have remained relatively consistent with the exception of a spike in the surface water sample collected in 1997. The bulkhead outfall has only been sampled during the last two investigations at the site (2007 and 2009) with the total CVOC concentrations being similar on both occasions. A summary of the historical surface water sampling completed at the site is included in the 2007 NYSDEC SI report and the Field Investigation Report previously submitted by EA to NYSDEC (Appendix B).

4.3.2 Manhole Sewer Water Results

Similar to the surface water analytical results, the manhole water samples collected in November 2009 (SW-01 and SW-03) documented concentrations of PCE and iron exceeding NYSDEC Class D surface water standards (Figure 4-16). These two samples were collected from a sanitary (SW-03) and storm sewer (SW-01) system associated with the site. Manhole sewer water sample SW-01 was collected from the manhole located just west of Old Upper Mountain

Road, and since the storm sewer dye testing confirmed connection with the bulkhead that discharges to the ravine and ultimately Gulf Creek, the analytical results for water sample SW-01 were evaluated using surface water criteria. One CVOC, TCE (3.9 µg/L), was detected in water sample SW-01, although the concentration is below the NYSDEC Class D surface water standard. Consistent with the surface water samples (SW-02 and SW-04), water sample SW-01 reported a concentration of iron (980 µg/L) that exceeded the SCG. Water sample SW-01 also detected a concentration of bis(2-Ethylhexyl)phthalate, a SVOC, which was below the applicable SCG.

Water sample SW-03 reported the highest concentration of total CVOCs, which included 1,2-DCE (20 µg/L), PCE (7.8 µg/L), TCE (9.1 µg/L), and VC (5.9 µg/L). Vinyl chloride was only detected above the laboratory method detection limit in water sample SW-03. Water sample SW-03 was compared with the NYSDEC Class D surface water standards because the sewer manhole was receiving surface waters due to flooding in this portion of Gulf Creek. The PCE concentration exceeded its SCG. The GMCH facility contributes waste water to the Gulf Interceptor sewer system. In addition, because water sample SW-03 was collected from the sanitary sewer manhole located in the base of the ravine, the analytical results from water sample SW-03 were also compared with the City of Lockport's POTW State Pollutant Discharge Elimination System (SPDES) permit (NY 002 7057) discharge limits and GMCH's Standard Industrial User (SIU) permit (CL860103) issued by the POTW to GMCH (Table 4-8E and Table 4-8F). Based on the SIU permit there are no discharge limitations for VOCs and/or SVOCs; only pH, oil and grease (total), phosphorus (total), and 10 metals are listed on the permit. The GMCH facility also maintains a SPDES permit (NY 000 0558) that identifies monitoring as the only discharge requirement. EA and NYSDEC recognize that the POTW SPDES permit discharge limits are regulated effluent guidance and that the sewer water sample (SW-03) collected is considered influent flow to the POTW. In comparison with the POTW SPDES discharge limits, lead and iron exceeded permit concentration values; no metal concentrations were above GMCH's SIU permit limits.

Additional manhole sewer water sampling for VOCs was completed in May 2010 following dye testing to confirm sewer system connections in the area surrounding the site. No VOCs were detected within water samples collected from manholes MSW-04 or MSW-05, which were located along separate sewer lines that run along Otto Park Place, located south of the site. Manhole water sample MSW-04 was collected from a sanitary sewer manhole that is located along a line that reportedly flows along the eastern portion of the site and discharges at a bulkhead outfall at the top of the ravine just west of the railroad tracks. Manhole sewer water sample MSW-05 was collected from a manhole located within a sewer line that was determined to converge with the sewer line that intersects the western portion of the site (The Gulf Interceptor Sewer), and includes a manhole previously sampled (November 2009) as manhole sewer water sample SW-03. No detections of VOCs were reported in the water sample collected from MSW-05, which indicates that this sewer system line is not contributing (during low flow conditions) to the CVOCs observed in the November 2009 analytical results at manhole water sample SW-03.

PCE was detected within manhole water sample MSW-03 (3.4 µg/L) above the NYSDEC Ambient Water Quality Standards for Class D waters. Two other CVOCs, including 1,2-DCE and TCE, were detected in manhole water sample MSW-03 as well. Manhole water sample MSW-03 was collected from what appeared to be a storm sewer manhole located along Old Saunders Road southwest of the site. The connection of this storm sewer line was not determined during dye testing activities; however the flow within the manhole was observed traveling east towards the site and the sewer system lines located within Upper Mountain Road. This sewer system was verified via dye testing to connect with the discharge point at the bulkhead outfall on the western portion of the site.

No pesticides or PCBs were detected in surface water samples at concentrations above their respective laboratory MDLs.

4.4 GULF CREEK SEDIMENT RESULTS

Five shallow sediment samples (SD-01 through SD-05) were collected at each of two depths, 0-2 in. and 2-6 in., from Gulf Creek on 20 November 2009. Six additional sediment samples (SD-06 through SD-11) were collected on 4 May 2010 from a depth of 0-6 in. These samples were located further downstream within Gulf Creek. A total of 16 sediment samples were submitted for analysis of TAL metals and eleven were submitted for SVOCs, pesticides, and VOCs. A summary of the detected analytical results for sediment samples is provided in Table 4-9A through 4-9H and shown on Figures 4-17 through 4-20.

Sediment criteria used for evaluating the sediment sample analytical data set for non-polar organic contaminants were developed from the NYSDEC *Technical Guidance for Screening Contaminated Sediments* (NYSDEC, 1999). The guidance document presents concentration values for several levels of protection. This RI has primarily used benthic aquatic life chronic toxicity values where applicable, and human health bioaccumulation values when chronic toxicity values were not available, for evaluating detected analytes. The guidance values are calculated as a function of the total organic carbon (TOC) content of the sediment being evaluated. As part of this investigation, sediment samples were collected at sampling locations nearest the site and analyzed for TOC. The TOC concentration was then utilized to calculate an average organic carbon concentration, the standard deviation within the data set, the 95 percent confidence limit concentration, and a lower confidence limit concentration value. EA selected the lower confidence limit concentration value as the percent TOC (4.828 percent) for the derivation of the sediment criteria via equilibrium partitioning methodology. The TOC analytical data and sediment criteria guidance values are provided in Table 4-9A and Table 4-9B, respectively.

Sediment sample TAL metal analytical results were compared to the lowest effect levels (LEL) and severe effect levels (SEL) found in Table 2 of the NYSDEC *Technical Guidance for Screening Contaminated Sediments*.

4.4.1 Target Analyte List Metals

For the sediment samples collected during the RI, eleven TAL metals were reported at concentrations that were above LELs, and of those eleven, six were reported above the SELs (Table 4-9C, Figure 4-17). SEL exceedances were reported for arsenic, copper, iron, lead, nickel, and zinc, with the most prevalent metals above the SELs being lead and zinc. Each sediment sample reported at least one metal above the SELs. Sediment samples collected at SD-03 reported the most TAL metals above LELs and SELs, as well as the highest overall TAL metal concentration values. Sediment sample SD-03 was collected from a location at the base of the waste/fill material, adjacent to the sewer manhole in the ravine. The other four sediment sampling locations were located along the stream channel defined by the discharge from the bulkhead outfall. In addition, the identical 11 TAL metal compounds were also reported above the LELs in sediment samples collected during the site investigation conducted in 2007.

After review of initial TAL metals analytical data results of sediment samples SD-01 (0-2 in.), SD-01 (2-6 in.), SD-02 (0-2 in.), and SD-03 (0-2 in.), and at the instruction of the NYSDEC, EA contacted the analytical laboratory to have the selected sediment samples additionally analyzed for total lead and TCLP lead. The concentrations for total lead were comparable with the initial analysis, and none of the samples were characterized as hazardous waste (Table 4-9D).

Based upon the analytical results of the sediment samples collected in November 2009, sediment samples SD-06 through SD-11 were collected from the Gulf Creek in locations downstream from the initial RI sediment sample locations in May 2010. Each of these samples was collected from the 0-6 in. interval. Eleven TAL metals were detected above LELs in each of the sediment samples collected in May 2010. These were the same 11 metals previously identified at concentrations above LELs in 2007 and November 2009. Additionally, arsenic, cadmium, copper, iron, lead, manganese, nickel, and zinc were detected in sediment sample locations at concentrations that exceeded the SELs. Sediment sample SD-08 reported seven metals above the SELs. This sample, along with sediment samples SD-09 and SD-10, were collected furthest downstream from the site and the bulkhead outfall that discharges into Gulf Creek.

Lead was detected at concentrations that exceeded the SELs at each of the sediment sampling locations. The specific TAL metals reported in sediment samples correlates with the TAL metals observed within the on-site fill material (OU 1), and are likely migrating to the sediments of Gulf Creek via erosion, surface water runoff and groundwater transport from OU 1. Based on the concentrations of iron reported within the water samples collected from the sewer system and bulkhead outfall surface water sample, it appears that iron concentrations within the sediment of Gulf Creek could also be related to sewer system sources as well.

4.4.2 Semivolatile Organics

Of the sediment samples collected in November 2009, only five samples (0-2 in.) were submitted for analysis of SVOCs. A total of 16 SVOCs were reported in at least one sediment sample collected from Gulf Creek (Table 4-9E, Figure 4-18). Five of the 16 SVOCs were reported at concentrations that exceeded the human health bioaccumulation standards; none of the SVOCs detected exceeded the benthic aquatic life chronic toxicity values. Benzo[b]fluoranthene was detected above the sediment criteria in each sediment sample. Indeno[1,2,3-cd]pyrene was detected above sediment criteria in four of five samples, while benzo[a]pyrene was detected above standards in three of five. Both benzo[k]fluoranthene and dibenzo[a,h]anthracene were detected above the sediment criteria in two of the five samples. Sediment samples SD-01 and SD-05 reported the highest number of SVOC exceedances as well as the highest concentration values. Again, the sediment samples analyzed for SVOCs during this investigation exhibited both a similar detected compound list as well as concentration range as sediment samples collected in 1997 and 2007.

SVOC results within the additional six sediment samples collected in May 2010 reported concentrations similar to those detected in the previous sampling events. Benzo[a]pyrene, benzo[b]fluoranthene, and indeno[1,2,3-cd]pyrene were detected above the sediment criteria in each of the May 2010 sediment samples. Benzo[a]anthracene and benzo[k]fluoranthene were detected above the sediment criteria in five of the six sediment samples, while benzo[a]pyrene was detected above standards in three of five. Dibenzo[a,h]anthracene was detected above the sediment criteria in three of the six samples. Each of the sediment sample exceedences were above calculated sediment criteria for human health bioaccumulation standards; none of the SVOCs detected exceeded the benthic aquatic life chronic toxicity values. Sediment samples SD-07 and SD-09 reported the highest number of SVOC exceedences (six), while samples SD-09 and SD-10 reported the highest concentration values. Again, the sediment samples analyzed for SVOCs during this investigation exhibited both a similar detected compound list as well as concentration range as sediment samples collected in 1997, 2007, and in November 2009.

4.4.3 Volatile Organic Compounds

Sediment samples collected from the 0-2 in. interval from the five November 2009 locations were submitted for VOC analysis. The 2-6 in. interval samples from locations SD-04 and SD-05, as well as each of the May 2010 sediment samples were also submitted for VOC analysis. The analytical results of seven of eight sediment samples collected from the five locations within Gulf Creek in November 2009 revealed that concentrations of nine VOCs were detected at levels above the laboratory MDLs (Table 4-9F). Similar to the surface water analytical results, CVOCs (1,2-DCE, PCE, and TCE) were reported in the sediment samples. Of the nine VOCs detected, only 1,2-DCE was reported at concentrations that exceeded the sediment criteria for human health bioaccumulation (sediment samples SD-01 (0-2 in.) and SD-02 (0-2 in.; Figure 4-19). There are no benthic aquatic life chronic toxicity sediment criteria for these contaminants. It should be noted that the calculated sediment criteria for 1,2-DCE is actually lower than the laboratory MDLs. The VOC analytical results are consistent with the results of the sediment sampling conducted in 1997 and 2007, where CVOCs were detected, but only 1,2-DCE was at a concentration above the respective sediment criteria. A general review of the sediment sample analytical results for VOCs reveals that the shallow samples (0-2 in.) reported a greater frequency of CVOC detections, while the deeper interval sample (2-6 in.) reported primarily petroleum related VOC detections. VOCs were reported in sediment samples collected from SD-09 and SD-10. However, no VOCs were reported above the sediment criteria in sediment samples collected further downstream during the May 2010 sampling event.

4.4.4 Pesticides and Polychlorinated Biphenyls

Three pesticides (DDD, DDE, and DDT) were reported at concentrations above the laboratory MDLs in the November 2009 sediment samples (Table 4-9G, Figure 4-20). While the MDLs were higher than the calculated sediment criteria, two of the sediment sampling locations (SD-02 and SD-03) were above human health bioaccumulation criteria for DDD and two locations (SD-04 and SD-05) were above human health bioaccumulation criteria for DDE (Table 4-9G). There are no benthic aquatic life chronic toxicity sediment criteria for these contaminants. No PCBs were detected at concentrations above the calculated sediment criteria (Table 4-9H).

One pesticide, DDD, was detected in the duplicate sample collected at SD-07 (0-6 in.), but below detection levels within the original sediment sample. No PCBs were detected in the six samples collected further downstream during the May 2010 sampling event.

4.5 SURFACE WATER AND SEDIMENT OF GULF CREEK (OU 2) SUMMARY

Concentrations in each of the investigations conducted at the site have reported TAL Metals, SVOC, VOCs, and pesticide concentrations that exceed the corresponding SCGs. TAL metals appear to be the most prevalent and widespread contaminates observed within the sediments of Gulf Creek and relate directly to the TAL metals observed within the on-site fill material. These exceedences have been reasonably persistent with regard to analyte and concentration with detections dating back to 1997. The sediment impacts observed during the historic sampling conducted at the site is consistent with the concentrations and exceedences noted within the sediment sampling completed as part of this RI. The longevity of these analytes are attributable to a continuing source(s) of contamination (OU 1), stagnation within the creek due to a number of beaver dams, limited flow volume within Gulf Creek in the sampling areas, and/or historical waste dumping into Gulf Creek.

Based upon the sediment sampling completed through May 2010, it appears that TAL metal and SVOC impacts to sediment extend further downstream of the site where Gulf Creek meets Niagara Street. EA and NYSDEC have made provisions under this work assignment to further evaluate surface water quality and sediment within Gulf Creek at locations downstream of the site under a Supplemental RI (SRI) effort. The results of the surface water and sediment work conducted under this RI will be combined with SRI data to fully characterize the nature and extent of impacts within Gulf Creek (OU 2) that are associated with OU 1. A FS will be completed to evaluate potential remedial alternatives for Gulf Creek upon finalization and approval of the SRI.

5. FATE AND TRANSPORT

This chapter presents the environmental fate and transport mechanisms for the COCs identified at the Old Upper Mountain Road site during the RI. The COCs are evaluated to determine the potential for continued on-site presence and potential off-site migration. The evaluation process assists in determining the current and future potential exposure pathways to human populations and the environment and in identifying potential technologies that may be appropriate for remediation of the site.

Three main factors are being evaluated when assessing a COCs fate and transport in the environment:

- Physiochemical characteristics of individual COCs.
- Site environmental characteristics.
- Biological interactions.

5.1 CONTAMINANTS OF CONCERN PHYSIOCHEMICAL CHARACTERISTICS

Historical site data and the findings of this RI have identified TAL metals, specifically lead, as the primary COC at the Old Upper Mountain Road site (OU 1). The TAL metals contamination found on-site was the result of many years of dumping burned industrial waste into a portion of the former ravine; therefore, pinpointing the exact contributing sources of the contamination is difficult. Lead released to groundwater, surface water and land is usually in the form of elemental lead, lead oxides and hydroxides, and lead metal oxyanion complexes (Smith et al., 1995; Remediation of Metals-Contaminated Soils and Groundwater, October 2007).

Lead occurs most commonly with an oxidation state of 0 or +II. Lead (II) is the more common and reactive form of lead. This form produces mononuclear and polynuclear oxides and hydroxides (Evanko and Dzombak, 1997). Under most conditions, lead (II) and lead-hydroxy complexes are the most stable forms of lead (Smith et al., 1995). Low solubility compounds are formed by complexation with inorganic (Cl^-, CO_3^{2-}, SO_4^{2-}, PO_4^{3-}) and organic ligands (humic and fulvic acids, EDTA, amino acids) (Bodek et al., 1988). Complexation is the formation of a coordination entity, a compound which consists of a central metallic atom attached in a surrounding array to other atoms. Lead carbonate solids generally form within basic solutions with a pH above six. Lead sulfide (PbS) is the most stable solid when high sulfide concentrations are present under reducing conditions (Remediation of Metals-Contaminated Soils and Groundwater, October 2007).

Most lead that is released to the environment is retained in the soil (Evans, 1989). The primary processes influencing the fate of lead in soil include adsorption, ion exchange, precipitation, and complexation with sorbed organic matter. The mobility of metals in groundwater is affected by various chemical reactions, including dissolution-precipitation, oxidation-reduction, adsorption-desorption and complexation. These processes limit the amount of lead that can be transported into the surface water or groundwater. The relatively volatile organolead compound tetramethyl lead may form in anaerobic sediments as a result of alkyllation by microorganisms (Smith et al., 1995) (Remediation of Metals-Contaminated Soils and Groundwater, October 2007).

The amount of dissolved lead in surface water and groundwater depends on pH and the concentration of dissolved salts and the types of mineral surfaces present. In surface water and groundwater systems, a significant fraction of lead is undissolved and occurs as precipitates ($PbCO_3$, Pb_2O, $Pb(OH)_2$, $PbSO_4$), sorbed ions or surface coatings on minerals, or as suspended organic matter (Remediation of Metals-Contaminated Soils and Groundwater, October 2007).

Table 5-1 summarizes the physiochemical characteristics of each of the COCs identified above applicable SCGs at the Old Upper Mountain Road site; these characteristics influence the COC's respective fate and transport in the environment. Because lead has been identified as the primary COC for OU 1 the specific chemical characteristics of lead are discussed in greater detail within the following sections.

5.1.1 Water Solubility

Water solubility is the measure of a compound's ability to dissolve in water and is typically expressed in a unit of mass/volume (e.g., mg/L or µg/L). Aqueous solubility is one factor that can affect a compound's concentration and residence time in water. Compounds that exhibit high water solubility remain in solution while compounds with low solubility tend to go out of solution or tend to affix to more hydrophobic surfaces. When reviewing Table 5-1, it should be noted that lead is insoluble in water (0.00+E00 mg/L).

Under normal conditions lead does not react with water. The solubility of lead will decrease in relationship with an increase in pH. However, when lead comes in contact with moist air, reactivity with water increases. A small lead oxide (PbO) layer forms at the surface of the metal. When both oxygen and water are present, metallic lead is converted to lead hydroxide ($Pb(OH)_2$).

Elemental lead is insoluble in water under normal conditions (20^oC, and pressure = 1 bar). It may however occur dissolved in water as lead carbonate ($PbCO_3$ or $Pb(CO_3)_2^{2-}$). A well-known example of a water soluble lead compound is lead sugar (lead(II)acetate), which derived its name from its sweet nature. Lead frequently binds to sulphur in sulphide form (S^{2-}), or to phosphor in phosphate form (PO_4^{3-}). In these forms, lead is extremely insoluble, and is present as immobile compounds in the environment (Lenntech, 1998-2009). Lead compounds are generally soluble in soft, slightly acidic water. Lead also has a tendency to form compounds of low solubility with the major anions found in natural water, including hydroxide, carbonate, sulfide, and, more rarely, sulfate acting as solubility controls in precipitating soluble lead from water (US Department of Health and Human Services, 1998). As a result, lead is generally much more prevalent in groundwater and surface water as a suspended solid in the form of a colloidal particle or an undissolved particle of a lead compound rather than in a dissolved form.

5.1.2 Volatilization

The process of volatilization involves the movement of a compound from the surface of a liquid or solid medium to the vapor phase. Typically, only the neutral or uncharged form of a compound can volatilize. Volatilization is calculated from the equilibrium vapor pressure which is essentially the solubility of the compound in air (measured as a partial pressure). When measuring a compound's fate in the environment, a more convenient index is the Henry's Law Constant, which defines the ratio of the compound's vapor pressure and water solubility, reported in units of atm-m^3/moles or atm-m^3/L. Generally, compounds with a Henry's Law Constant greater than 10^{-3} are readily volatized, compounds with constants of 10^{-3} to 10^{-5} are somewhat volatized, and compounds with constants less than 10^{-5} have limited volatility.

When evaluating Table 5-1, it would be assumed that lead with a Henry's Law Constant of 0.00E+00 will not volatilize when in contact with air, although, as discussed previously, organolead compounds such as tetramethyl lead will volatilize from water.

5.1.3 Adsorption/Desorption

Adsorption/desorption defines the degree to which compounds are bound to be released from a solid matrix. Adsorption is defined as the accumulation of ions at the interface between a solid phase and an aqueous phase. A soil matrix will often include organic matter, clay minerals, iron and manganese oxides and hydroxides, and carbonates. Soil organic matter can consist of microbial communities, soluble biochemicals (i.e., amino acids, proteins, organic acids, ligins), and insoluable humic substances. These humic substances and biochemicals can provide sites for metal sorption. As metals interact with natural biochemicals they form water soluble complexes that increase the mobility of the metals. Metals binding to organic matter tend to affix to potentially reactive sites, ranging from weak forces of attraction to formation of strong chemical bonds. Soil organic matter is typically the main source of soil cation exchange capacity in surface mineral soils. Major metal cations include cadmium, copper, lead, mercury and zinc. However, organic matter content in soil tends to decrease with depth, making subsurface mineral content of soil a more important surface for sorption. The cation exchange capacity (CEC) is a measure of the negatively charged sites for cation adsorption and anion exchange capacity (AEC) is a measure of the positively charged sites for anion adsorption. Anion capacity is relatively small in comparison with the cation adsorption capacity of soil. Anion exchange capacity was described in detail in Chapter 4, and appears to be an important mechanism at this site.

Soil surfaces maintain either a net negative or positive charge depending on the nature of the surface and the soil pH. For pH dependent charged surfaces, whether organic or inorganic, as the pH decreases, typically the number of negatively charged sites diminishes. In a more acidic condition, the majority of pH dependent surfaces will be positively charged and under more alkaline conditions, the majority of sites will maintain a negative charge. Several types of surface complexes can form between a metal and soil surface and are defined by the extent of bonding between the metal ion and the surface. Metals with a weak association or in an outer sphere complex are surrounded by water and are not directly bonded to the soil surface. These ions accumulate at the interface of charged surfaces in response to electrostatic forces. These reactions are rapid and reversible with only a weak dependence on the electron configuration of the surface group and the adsorbed ion. These two metal-surface interactions have also been termed exchange reactions because the introduction of other cations into the system, in sufficient concentration, causes the replacement or exchange of the original cations. Metals associated with exchange sites may, depending on the environment, be relatively mobile. With inner sphere complexation, the metal is bound directly to the soil surface; no waters of hydration are involved. It is distinguished from the exchangeable state by having ionic and/or covalent character to the binding between the metal and the surface. A much higher bonding energy is involved than in exchange reactions, and the bonding depends on the electron configuration of both the surface group and the metal. This adsorption mechanism is often termed specific adsorption. The term specific implies that there are differences in the energy of adsorption among cations, such that other ions, including major cations, Na, Ca, Mg, do not effectively compete for specific surface sites. Specifically adsorbed metal cations are relatively immobile and unaffected by high concentrations of the major cations due to large differences in their energies of adsorption.

Partition coefficients are concentration ratios of the compound between two phases and include K_{ow}, $K_{d,}$ and K_{oc}; all have units of L/kg. The K_{ow} is the octanol-water partition coefficient, which quantifies the concentration ratio of the compound in the octanol (organic) phase and aqueous phase. Octanol is used as a substitute for lipids; therefore, the K_{ow} is typically used to relate the compound partitioning from water to biota. The K_d is the concentration ratio of the compound between a solid and aqueous phase at steady-state. The K_d is constant for inorganic analytes (metals), but varies for organic analytes. The latter led to the usage of the K_{oc}, which is the organic carbon-water partition coefficient. The product of the compounds K_{oc} and the organic carbon content of the site soil or sediment is the site specific K_d for the compound. Higher values for K_{ow}, $K_{d,}$ and K_{oc} indicate a preference of the compound for the non-aqueous phase (low solubility in water). Metals, and specifically lead, maintain both low K_{ow} and K_{oc} values, as shown in Table 5-1.

5.1.4 Precipitation

Precipitation differs from adsorption in that the metal will form a new three dimensional solid state and not be associated with the surface of existing soil particles. Lead is retained in the soil or fill material, and transported during precipitation from the unsaturated zone into the groundwater table, with further potential migration to surface water and sediments.

As pH increases, aqueous metals species will tend to precipitate as hydroxide, oxyhydroxide, or hydroxysulfate minerals. In addition, as pH increases, dissolved metals may adsorb onto surfaces of these newly formed minerals and/or other surfaces present in the environment, such as organic matter due to decreasing competition with protons, decreased surface potential, and increased hydrolysis of metal ions at circum-neutral pH (USEPA, 2007). Because the removal of metals and metalloids present in the aqueous phase via mineral precipitation or surface adsorption processes are dependent upon pH, and metals tend to precipitate with increases in pH, the TAL metal groundwater concentrations at monitoring well MW-03 would be expected to be lower than concentrations at monitoring well MW-04 due to groundwater conditions at monitoring well MW-03 that are more conducive to mineral precipitation (higher pH values at monitoring well MW-03). This relationship (lower metal concentrations in well MW-03) was documented during the RI.

5.2 SITE ENVIRONMENTAL CHARACTERISTICS

The environmental characteristics of a site can have a significant influence on the fate and transport of the COCs present, and include geology, hydrology, and surface drainage.

5.2.1 Geology

The local geology of the site was detailed in Section 3.1. The site is covered by a layer of organic material ranging in depths up to a foot thick consisting of decomposing leaves and trees, roots, grass and weeds. The depth and composition of the unconsolidated fill material in the vadose zone varied across the site. The thickness of the vadose zone across the site was approximately from 0 to 78-ft thick in most areas, the deepest areas being the center of the site, where the former ravine was once located. The fill material in the vadose zone was typically dry and loose and consisted of fine foundry sand, ash, glass bottles, brick, brick fragments, concrete slabs, and bedrock fragments. Typically, dense silty clay was found above a layer of weathered bedrock, which was underlain by competent bedrock. At some soil boring locations, fill material were found to exist to the top of the bedrock formation. Groundwater was found in the shallow bedrock in areas on-site where bedrock was encountered at shallow depth intervals and was observed to be flowing into the fill material at locations with a significantly deeper bedrock interface. Water within the fill material was found in the zones of aeration and is likely the result of precipitation/infiltration water confined in layers of the fill material.

5.2.2 Hydrogeology

The local hydrogeology was detailed in Section 3.2. The analysis of data collected during this RI focused on the local on-site groundwater. Lateral migration of water through the subsurface is through interstitial spaces between the on-site fill material. Water migration is controlled by hydraulic gradients across the site and is influenced by surface topography, precipitation recharge, and water drainage patterns.

Regionally, groundwater flow is divided at NYS Route 31 to the south of the site. North of this divide, water moves in a north-northeasterly direction toward Gulf Creek, while south of the divide water moves toward the Erie Canal. The on-site groundwater moves through the bedrock toward the former ravine, into the ravine, then down the ravine to discharge in the Gulf. Specifically, groundwater moving within the bedrock system from the west continues in a westerly direction until it reaches the former ravine where it then moves north toward Gulf Creek. The bedrock groundwater system flowing from areas south of the site flows in a northerly direction into the former ravine and then toward Gulf Creek, while the flow from the eastern portion of the site moves west to the former ravine and then towards Gulf Creek. The former ravine identified during the subsurface investigation acts as a discharge point for bedrock groundwater within the vicinity of the site.

5.2.3 Surface Drainage

The topography of the site is relatively level on the western border and gradually rises toward the southern and eastern portion of the site. There is a sharp downward slope to the north, towards Gulf Creek. Regionally, surface water drains through various sub basins of the Gulf Creek watershed into the Eighteen Mile Creek Watershed and eventually to Ontario Lake.

5.3 BIOLOGICAL INTERACTIONS

The interactions between a COC and biota present at the Old Upper Mountain Road site may also affect the COCs fate and transport within the environment. These interactions are described in the following sections.

5.3.1 Bioconcentration

Bioconcentration is the accumulation of compounds by biota to greater concentrations than present in the aqueous phase. This is quantified using the bioconcentration factor which is the ratio of the compound concentration in the biota and in the water. As stated in Section 5.1.3, bioconcentration factors are typically expressed in units of L/kg and higher values of Kow, Kd, and Koc indicate a preference of the compound for the non-aqueous phase (low solubility in water). With the exception of lead and other metals, the majority of the COCs reported in the on-site soil/fill typically had lower values for K_{ow}, $K_{d,}$ and $K_{oc,}$ which means they would be less persistent in the on-site soil and biota, and tend to readily mobilize within groundwater.

5.3.2 Bioaccumulation

Bioaccumulation is the accumulation of compounds by biota from both aqueous phase and dietary phase exposure. The bioaccumulation factor, when related to aqueous phase concentrations, is larger than the actual bioconcentration factor. Lead and other metals have been known to bioaccumulate in fish, birds, mammals and plants. No biota samples were taken during this RI to confirm whether the site was serving as a source to compounds accumulating in biota.

5.4 TRANSPORT AND MECHANISMS OF MIGRATION

Based upon the physicochemical characteristics of lead, the geology and hydrogeology at the site, and the nature and extent of impacted media at the site, lead migration may have occurred via several pathways at each operable unit: OU 1, the site itself, and OU 2, Gulf Creek. These pathways include atmospheric migration via volatilization and particulate distribution (i.e., wind) from disturbed soils, aquatic migration via groundwater and migration via surface water runoff, leaching from soil into groundwater and soil erosion.

5.4.1 Migration of Emissions from Soil or Groundwater to Air

The primary COC within the on-site soil/fill (OU 1), lead, requires high temperatures to volatilize. As such, the migration of lead and other metals in air would likely be from wind erosion of on-site surface soil/fill resulting in suspended particulates within air, rather than through volatilization. USEPA studies have shown that lead is currently present in the atmosphere, likely due to wind erosion.

5.4.2 Migration with Surface Runoff and Erosion

A likely migration pathway associated with runoff and erosion from the site includes surface water and surface soil/fill that is transported from on-site (OU 1) to Gulf Creek (OU 2). This form of transport may have resulted from surface drainage including rain events, surface water runoff, snow melt, or from general site dumping activities. Lead's migration in this transport mechanism would likely be slow due to the low solubility, K_{ow} and K_{oc} properties of the metal. Surface runoff and erosion at the site would have likely brought lead down the ravine slopes towards Gulf Creek.

5.4.3 Migration through Leaching from Soil

The downward movement of lead from soil by leaching is very slow under most natural conditions. The conditions that induce leaching are the presence of lead in soil at concentrations that either approach or exceed the sorption capacity of a soil, the presence in the soil of materials that are capable of forming soluble chelates with lead, and a decrease in the pH of the leaching solution (e.g., acid rain) (NSF, 1977). Partial favorable conditions for leaching may be present in some soils near lead- smelting and sites that contain elevated levels of lead in soil (US Department of Health, 1998). Information obtained during the RI suggests that this migration mechanism is not significant at the site.

5.4.4 Migration within Groundwater

Lead and other metals have very low water solubility. In particular, lead has a tendency to form compounds of low solubility with the major anions found in natural water, including hydroxide, carbonate, sulfide, and, more rarely, sulfate acting as solubility controls in precipitating lead from water (US Department of Health, 1998). As a result, lead is generally much more prevalent in groundwater as a suspended solid rather than in a dissolved form.

The groundwater flow patterns based on groundwater elevations, is towards the former ravine and eventually Gulf Creek. Groundwater moving within the bedrock system from the west continues in a westerly direction until it reaches the former ravine where it then moves north toward Gulf Creek. The bedrock groundwater system flowing from areas south of the site flows in a northerly direction into the former ravine and then toward Gulf Creek, while the flow from the eastern portion of the site moves west to the former ravine and then towards Gulf Creek. The former ravine identified during the subsurface investigation acts as a discharge point for bedrock groundwater within the vicinity of the site. The flow direction represents a potential COC migration pathway at the site. The groundwater analytical data suggests that the COCs appear to be migrating from the site into Gulf Creek as documented by the surface water and sediment samples collected adjacent to, and downstream of, the site.

5.4.5 Migration through Construction Activities

Lead can migrate at the site through construction activities such as disturbing soils. Lead can be introduced into your body by inhalation (breathing) and ingestion (eating). Lead is not absorbed through your skin, unless it is present as an organolead compound, such as tetramethyl lead. When lead is scattered in the air as a dust, fume or mist it can be inhaled and absorbed through your lungs and upper respiratory tract. Inhalation is by far the most important exposure route in construction. Lead may be in the air if dust is created during excavation or other soil disturbance. You can also absorb lead through your digestive system through inadvertent ingestion, leading to bioaccumulation in the blood, fatty tissues, bones, and teeth. Ingestion exposures can happen on the job, mostly by handling food, cigarettes, chewing tobacco, or make-up which can have lead dust on them; or handle food items with unwashed hands or dusty clothing contaminated with lead dust. Additionally, unabated lead dust created during construction activities may be deposited in other areas of the site or on vegetation where it can be easily transported by stormwater surface run off to Gulf Creek.

6. QUALITATIVE HUMAN HEALTH EXPOSURE ASSESSMENT

This chapter identifies potential current and future human receptors and the associated exposure pathways to site related COCs, and provides a qualitative assessment of the potential significance of the exposure pathways as determined by the RI at the Old Upper Mountain Road site.

The qualitative human health exposure assessment is divided into four sections. In the first section, potential exposure pathways at the site are identified based on media type (Section 6.1). In the next section, COCs for each of the identified pathways/media are selected (Section 6.2). The third section provides a qualitative evaluation of potential human health exposures for each exposure pathway based on the identified COCs (Section 6.3). The conclusions of the exposure assessment are presented (Section 6.4).

6.1 SITE SETTING

The site is located along Old Upper Mountain Road, in both the Town and City of Lockport, Niagara County, New York (Figure 1-1). The property is an irregular-shaped parcel that is seven acres in size. The main access to the site is located on Old Upper Mountain Road. The site sits northeast of the intersection between NYS Route 93 and NYS Route 31. An access road exists on Otto Park Place to the southeastern portion of the site. The site consists of seven parcels and is located within mixed residential, industrial and commercial property. Somerset Railroad bounds the property to the south and the east. To the north, the property is bound by private property, a ravine and a creek that is called Gulf Creek.

6.2 NATURE AND EXTENT OF CHEMICAL CONSTITUENTS

The Old Upper Mountain Road site was initially discovered in 1993 during a routine inspection of the Lockport City Landfill located north of the Old Upper Mountain Road site (Figure 1-3). Evidence of ash and glass debris was noted throughout the top portion of the landfill, while recent dumping of trash/rubbish/tires was noted at the southern portion of the site. It was also noted during the inspection that a significant quantity of waste had been pushed over the embankment into the ravine at the base of which Gulf Creek runs.

The Old Upper Mountain Road site was reportedly operated as a municipal dump by the city of Lockport from 1921 to the 1950s. Access to the landfill during that time was from a viaduct under the railroad track just north of Otto Park Place. Garbage and other wastes were apparently dumped at the landfill, burned, and then pushed into the ravine. The City of Lockport moved its dumping operations in the 1950s to the area known today as the Lockport City Landfill. The site is currently vacant, and a fence was installed to prevent on-site dumping and trespassing. The site is not regularly frequented by potential human receptors.

During the RI, EA evaluated four media which included: soil/fill material (surface soil/fill and subsurface soil/fill), groundwater, surface water and sewer system water, and sediment. Potential exposure pathways for each of these media are described in the sections below.

6.2.1 Surface and Subsurface Soil/Fill

The western portion of the site is primarily covered with grasses, shrubs, small trees and debris piles while the remainder of the site is covered with grass and larger tress that were not cut down during the brush clearing activities. The southeastern portion of the property that is separated by the railroad tracks is covered with trees and brush. As noted above, the site is partially fenced and locked to restrict access along Old Upper Mountain Road. However, direct contact with surface soil by trespassers is a potentially complete exposure pathway via incidental ingestion and dermal absorption. It is important to note that during a site reconnaissance as part of the 2007 NYSDEC investigation, pits were observed to have been dug into the ash, apparently by individuals scavenging for antique bottles and other items. In addition, if future redevelopment of the site were to occur, direct contact with surface and subsurface soil by construction workers could potentially take place (incidental ingestion and dermal absorption). There is also a potential for inhalation of contaminant-laden particulates by construction works, and possibly, off-site receptors.

The presence of VOCs, SVOCs, metals, PCBs, and pesticides in on-site soil could result in incidental ingestion and dermal contact exposures to site workers and site visitors during any redevelopment activities. Additional exposure to contaminants would be possible via inhalation of particulates during site redevelopment. Pesticides, metals, VOCs, SVOCs and PCBs in on-site surface and subsurface soil could also act as a source of groundwater contamination. Groundwater exposure pathways are discussed below.

6.2.2 Groundwater

Currently, there is no groundwater usage at or in the immediate vicinity of the site (e.g., potable or industrial wells), and no expected future use of groundwater, as connection to public water supply is available. However, there is evidence that groundwater discharges to surface water in Gulf Creek via seeps at the base of the former ravine.

The primary source of water for the City of Lockport is the east branch of the Niagara River, and thus is not expected to be impacted by site conditions. Site groundwater flows to the north and northeast and appears to discharge to Gulf Creek which flows into Eighteen Mile Creek and eventually into Lake Ontario. Potential exposure pathways for surface water are discussed below.

6.2.3 Surface Water

Gulf Creek is designated by the NYSDEC as Class D water. The best usage for Class D waters is fishing. These waters shall be suitable for fish, shellfish, and wildlife propagation and survival (6 NYCRR 701.7). Due to such natural conditions as intermittency of flow, water conditions not conducive to propagation of game fishery, and/or stream bed conditions, the waters of Gulf Creek not appear to support fish propagation. Therefore, ingestion of fish from Gulf Creek (OU2) is likely an incomplete exposure pathway. No surface water exists at operable units OU1 and OU1A; however, on-site groundwater discharges to the surface water in Gulf Creek via seeps at the base of the former ravine.

Based on a review of the land usage in the vicinity of the site and the nature of the creek, direct contact (incidental ingestion and dermal absorption [i.e., secondary contact]) with surface water could occur as a result of fishing and recreational boating on Gulf Creek. Gulf Creek is heavily vegetated, and access to the water body is limited. As such, recreation and fishing in this creek would be unlikely; suggesting that ingestion of fish from Gulf Creek and direct contact during recreation is not a complete exposure pathway. A densely vegetated access trail exists on the northern side of Gulf Creek on Old Upper Mountain Road behind the two vacant residential homes.

6.2.4 Sediment

Significant direct human contact with Gulf Creek sediment in the vicinity of the site is not expected based on the limited access, lack of residential homes in the vicinity of the site, and vegetated conditions surrounding public access ways. However, the two rental properties located north of the site could become rented and create a potentially complete pathway to sediment for residents were they to go down to Gulf Creek via the access road. Additionally, the class designation of the creek (Class D) and intermittent flow of waters within the stream, fish population and propagation able to withstand fishing would be unlikely. A potential direct exposure pathway for Gulf Creek sediment is via ingestion of fish, this exposure is therefore unlikely due to lack of a stable fish population. Gulf Creek waters flow north and carry sediment to an eventual discharge point into Eighteen Mile Creek and therefore act as a contributing source to sediment contamination in Eighteen Mile Creek. Eighteen Mile Creek supports a substantial fish population which is directly exposed to the impacted sediments; so while the exposure to contaminated fish within Gulf Creek is unlikely, the potential for exposure exists further downstream within Eighteen Mile Creek.

Site-specific sediment criteria (SSC) were calculated for VOCs, SVOCs, heavy metals, pesticides and PCBs using the procedures outlined in the NYSDEC document entitled, Technical Guidance for Screening Contaminated Sediments dated March 1998 with January 1999 revisions. SSC were derived for Human Health Bioaccumulation, Benthic Aquatic Life Acute and Chronic Toxicity, and Wildlife Bioaccumulation using the organic compound normalized sediment criteria contained in Table 1 of the Contaminated Sediments Guidance Document. The sediment TOC concentrations were then utilized to calculate an average organic carbon concentration, the standard deviation within the data set, the 95 percent confidence limit concentration, and a lower confidence limit concentration value. As a conservative exposure, EA selected lower confidence limit organic carbon concentrations for the eleven sediment samples collected from the creek to develop the SSC.

Sediment criteria for each compound were compared to detected concentrations of analytes in each of the sediment samples and exceedences were determined. As shown on Table 4-8, impacts from lead were identified at each sediment sample location.

6.3 SELECTION OF CONTAMINANTS OF CONCERN

COCs for the site were selected following the practice established by the USEPA in the Risk Assessment Guidance for Superfund Volume I, Part A (USEPA, 1989). The selection criteria were as follows:

- The frequency of detection for chemicals in soil and groundwater was utilized to determine COCs. Chemicals with a frequency of detection of less than 5 percent in a data set of 20 or more samples were excluded from this assessment. Also, consideration was given as to whether the detected chemical is related to historic and current uses of the site.

- Chemicals not detected at least once above the limit of detection were automatically excluded from this assessment, regardless of the size of the data set.

- Chemicals selected as COCs were identified in at least one sample location at a concentration above its respective SCG.

A summary list of COCs by medium is provided in Table 6-1. Relevant and appropriate requirements (i.e., SCGs) for these COCs are discussed in Chapter 4.

This human exposure assessment provides qualitative descriptions of potential exposure to site related COCs for human populations who may reasonably be expected to contact site media under present or future conditions. This qualitative assessment is comprised of two components:

- Description of exposure setting and identification of potentially exposed populations
- Identification of exposure pathways.

These components are discussed in greater detail in the following sections.

6.4 EXPOSURE SETTING AND IDENTIFICATION OF POTENTIALLY EXPOSED POPULATIONS

This section identifies potential receptors and exposure pathways. A complete exposure pathway is one that meets the following criteria (NYSDEC, 2002; USEPA, 1989):

- A COC must be present.

- Release and transport mechanisms and media must be available to move the chemicals from the source medium to an exposure medium.

- A potential opportunity must exist for receptors to contact the affected media.

- A receptor population and a means for chemical uptake (e.g., ingestion, inhalation) must exist.

Under current and future site use conditions, the potentially exposed populations (i.e., potential receptors) are those that might come into contact with the COCs. Table 6-2 presents the exposure pathway matrix and depicts the various exposure routes for potential current and future on-site and off-site human populations. VOCs, SVOCs, PCBs, Pesticides, and TAL metals were evaluated as the primary COCs as their environmental persistence and detections in on-site fill material, surface water, sediment and groundwater provide the most likely exposure scenarios and potentially complete pathways.

6.4.1 Current Exposure Scenarios

Because the site is currently vacant, the only on-site human population considered in this qualitative exposure assessment is on-site trespassers. A complete exposure pathway to subsurface soil (fill material) and on-site groundwater at the site is unlikely for on-site trespassers. The more possible exposure pathways under current exposure scenarios exist for on-site surface soil, surface water and sediment. It is possible for on-site trespassers to come in direct contact with site surface soil, surface water and sediment. The potential for surface soil, surface water and sediment ingestion is expected to be low, but moderate potential exists for dermal contacts and particulate inhalation to on-site trespassers.

A secondary on-site human population considered in this qualitative exposure assessment is for adult workers. A complete exposure pathway to surface soil/fill, subsurface soil (fill material), on-site groundwater, sediment and surface water at the site is likely for on-site adult workers. It is possible for adult workers to come in direct contact with surface soil/fill, subsurface soil (fill material), on-site groundwater, sediment and surface water. The potential for surface soil, subsurface soil (fill material), on-site groundwater, sediment and surface water ingestion is expected to be low, but moderate potential exists for dermal contacts and particulate inhalation to on-site adult workers.

Current off-site human populations considered in this qualitative exposure assessment include adult commercial and industrial workers, adult construction workers, adult and child visitors and residents, and recreationists. A complete exposure pathway to site surface soil/fill, subsurface soil (fill material), groundwater, sediment and surface water are unlikely for all current off-site human populations.

Recreational exposure (i.e., dermal contact and ingestion while wading or swimming or boating) to surface water and sediment in Gulf Creek is possible. The potential for exposure to site-related COCs is considered minimal because of limited access to the creek, and the frequency with which Gulf Creek is used for recreational purposes (i.e., does not occur daily or year round).

6.4.2 Future Exposure Scenarios

Future human populations considered in this exposure assessment include on-site trespassers, on-site and off-site construction workers, nearby off-site utility workers, on-site commercial workers, on-site adult and child visitors to commercial/industrial establishments, and on-site and off-site adult and child residents.

As noted earlier, evidence of pitting activities by unknown trespassers were observed at the site and therefore would be considered as a future exposure scenario to surface and subsurface soil as well. On-site construction workers are considered since virtually any site redevelopment would involve construction activity in some form. Potentially complete on-site exposure media for construction workers would include surface and subsurface soil/fill. In addition, subsurface construction activities that contact the groundwater table would present another potentially complete exposure pathway. In addition, should repairs or replacement of the Gulf Interceptor sewer line be required in the future, potential exposure to surface water and sediment would exist for on-site utility workers. Soil particulate and volatilization of chemicals from soil to ambient air during construction excavation activities may be complete exposure pathways for this population.

Off-site construction and subsurface utility work exposure to areas surrounding the site is considered in the event of future off-site redevelopment. Chemical exposure for off-site construction and nearby off-site utility workers could be expected because of the presence of subsurface utility lines in areas adjacent to the site. Potential off-site exposure media for construction workers and nearby off-site utility workers would include soil/fill, as analyzed during this RI, in addition to soil particulate and volatilization of chemicals from soil to ambient air during construction activities.

The possibility exists that the site may be used in the future for commercial or residential purposes. Thus, exposure of adult on-site commercial workers and adult and child visitors to future on-site commercial establishment or residential homes is possible. These individuals may be exposed to soil/fill (both surface and subsurface) and groundwater contamination. Potential on-site exposure media for future on-site residents would include surface and subsurface soil.

6.5 IDENTIFICATION OF EXPOSURE PATHWAYS

Table 6-2 provides qualitative descriptions of the potentially complete exposure pathways for current and future on-site and off-site human populations, and anticipates level of exposure potential. Long-term exposure to heavy metals (lead) and pesticides can affect the nervous system in humans and animals. Some of the long term symptoms are common to a variety of health problems and can be overlooked by exposed populations.

6.5.1 Exposure Assessment

Under current site use conditions, the on-site trespasser has a moderate to high potential for exposure to surface soil/fill via ingestion (oral), inhalation, or dermal contact. There is only minimal potential for exposure of current off-site populations to the soil/fill at the Old Upper Mountain Road site. Current off-site adult industrial workers and recreationalists have a moderate potential for exposure to contaminated surface water and sediment.

Under future site use conditions, on-site construction workers have moderate potential for exposure to soil/fill and groundwater through ingestion and dermal contact, and soil particulate and volatized contaminants in ambient air through inhalation. On-site commercial workers and site visitors would face moderate potential for exposure to soil and groundwater via ingestion and dermal contact. Additionally, on-site utility workers would have moderate potential for exposure to surface water and sediment. There are no additional relevant exposure pathways for future off-site populations, with the exception of nearby off-site utility and construction workers, which would have minimal potential for exposure to subsurface soil and groundwater through ingestion and dermal contact, and soil particulate and volatized contaminants in ambient air through inhalation.

6.6 CONCLUSIONS

There are several distinct human populations both on-site and in the vicinity of the site that could potentially be exposed to site-related COCs. Current potential on-site populations which may be exposed include trespassers. Current off-site populations which may be exposed include commercial/industrial workers, adult and child visitors to commercial/industrial establishments, recreationists, and adult and child residents north of the site. Under future off-site use conditions, potential receptors at risk of exposure include construction and utility workers, and commercial/industrial workers. On-site, additional future receptors potentially at risk of exposure include construction workers, commercial/industrial workers, adult and child visitors to future on-site commercial establishments, and adult and child residents. A summary of the potential exposure pathways, by receptor, medium, and potential for exposure are presented in Table 6-2.

The RI and qualitative human exposure assessment have indicated that there are actual and potential pathways through which populations on-site and off-site could be exposed to potentially hazardous chemicals related to the former operations at the Old Upper Mountain Road site. The potentially complete exposure pathways should be further evaluated to determine the best course of action to address them. These actions may consist of a quantitative risk assessment to more definitively assess those populations at risk and those COCs driving risk. In addition, engineering and/or administrative controls should be evaluated in the development of a FS for the site.

7. FISH AND WILDLIFE IMPACT ANALYSIS

Following the Appendix 1C Decision Key in the NYSDEC's Fish and Wildlife Resources Impact Analysis guidance document, a Fish and Wildlife Resources Impact Analysis was deemed required (Table 7-1). Therefore, the following analysis identifies actual or potential risks to fish and wildlife residing on and in the vicinity of the Old Upper Mountain Road site from contaminants potentially migrating from the site. The analysis focuses on risks associated with site-related chemicals detected in soil, surface water, sediment and groundwater. This analysis contains:

- Site descriptions and a characterization of plant and animal resources and their value to humans and the environment.

- Evaluation of potential exposure pathways to fish and wildlife from site-related chemicals of potential ecological concern (COPECs).

- Comparison of concentrations of COPECs to regulatory criteria or derived toxicological benchmarks for the protection of fish and wildlife.

- Conclusions regarding the potential of exposure and possible risks to fish and wildlife on and in the vicinity of the site.

7.1 OBJECTIVES

The objectives of the Fish and Wildlife Impact Analysis (FWRIA) are to identify actual or potential impacts to fish and wildlife resources from site contaminants of ecological concern and to provide information necessary for the design of a remedial alternative. The FWRIA consists of the following steps:

- Identify all fish and wildlife resources based upon knowledge of the site and a search of NYSDEC records and/or other sources.

- Describe the resources on the site and within 0.25 mi of the site.

- Identify contaminant migration pathways and any fish and wildlife exposure pathways.

- Identify contaminants of potential ecological concern.

- Based upon resources and pathways identified and the toxicity of the contaminants of ecological concern, draw conclusions regarding the actual or potential adverse impacts to fish and wildlife resources.

7.2 SITE DESCRIPTION

A detailed site description is provided in Chapter 1, Section 1.4. The site is located on Old Upper Mountain Road, in both the town and city of Lockport, Niagara County, New York. The property is an irregular-shaped parcel that has main access to the site on Old Upper Mountain Road. The site sits northeast of the intersection between Upper Mountain Road (NYS Route 93) and NYS Route 31. An access road exists on Otto Park Place to the smaller parcel of land that is separated by the railroad tracks. Residential, commercial and industrial properties are located to the north, south, east, and west of the property.

7.3 FISH AND WILDLIFE RESOURCES

A topographic map of the site is provided as Figure 7-2 and as Sheet 1 in Appendix E. Documented fish and wildlife resources exist within a 0.5-mile radius of the site, including Gulf Creek north of the site.

Figure 7-1 presents the National Wetland Inventory (NWI) map for the site and a 0.5-mile radius. The NWI identified freshwater wetlands within Gulf Creek, identified in Chapter 1, Section 1.8 as Operable Unit OU 2 for this site. Both Freshwater Pond and Freshwater Forested/Shrub Wetlands were identified within Gulf Creek on the NWI map. Because the NYSDEC does not regulate wetlands smaller than 12.4 acres in size, the NWI map is also being presented for the New York State Freshwater Wetland map. Rare Plant or Rare Animal species are not mapped within the 0.5-mile radius of the site. Using the NYSDEC Environmental Resources Mapper (ERM), EA generated Figure 7-2, which depicts the classified water bodies, state-regulated freshwater wetlands and check-zones. The Gulf Creek was identified in the ERM as a Class D stream, which may be suitable for fishing, fish survival, and primary and secondary recreation, but are often limited by flow or stream substrate.

The topography across the site is relatively level on the western border, with a slight rise towards the southern and eastern property lines and a sharp drop off at the northern border where the ravine begins. The direction of on-site surface flow is depicted on Figure 7-3. Depth to groundwater in the two fill/overburden wells ranged from 38.63 in MW-06 (January 2010) to 73.54 (February 2010) in MW-04, and in the four bedrock monitoring wells ranged from 23.44 in MW-01 (February 2010) to 72.59 in MW-03 (January 2010). The interpreted groundwater contour maps (Figures 3-9 and 3-10) indicate that groundwater flow is towards the former ravine and eventually Gulf Creek. Groundwater moving within the bedrock system from the west continues in a westerly direction until it reaches the former ravine where it then moves north toward Gulf Creek. The bedrock groundwater system flowing from areas south of the site flows in a northerly direction into the former ravine and then toward Gulf Creek, while the flow from the eastern portion of the site moves west to the former ravine and then towards Gulf Creek. The former ravine identified during the subsurface investigation acts as a discharge point for bedrock groundwater within the vicinity of the site.

The ecological communities found within a 0.5-mile radius of the site are defined below.

7.3.1 Ecological Resources

Based upon activities completed on-site and information obtained from the New York Natural Heritage Program Draft Ecological Communities within New York State (NYSDEC, 2002b), the following distinct ecological habitat types were identified within a 0.5-mile radius of the site:

- **Urban structure exterior:** The exterior surfaces of metal, wood, or concrete structures (such as commercial buildings, apartment buildings, houses, bridges) or any structural surface composed of inorganic materials (glass, plastics, etc.) in an urban or densely populated suburban area. These sites may be sparsely vegetated with lichens, mosses, and terrestrial algae; occasionally vascular plants may grow in cracks. Nooks and crannies may provide nesting habitats for birds and insects, and roosting sites for bats. Characteristic birds include common nighthawk (*Chordeiles minor*) on rooftops, American robin (*Turdus migratorius*) on porches or under shelter, and exotic birds such as a house sparrow (*Passer domesticus*).

- **Mowed lawn with trees:** Residential, recreational, or commercial land in which the ground cover is dominated by clipped grasses and forbs, and it is shaded by at least 30 percent cover of trees. Ornamental and/or native shrubs may be present, usually with less than 50 percent cover. The groundcover is maintained by mowing. Characteristic animals include gray squirrel (*Sciurus carolinensis*), American robin (*Turdus migratorius*), mourning dove (*Zenaida macroura*), and mockingbird (*Mimus polyglottos*).

- **Mowed lawn:** Residential, recreational, or commercial land, or unpaved airport runways in which the groundcover is dominated by clipped grasses and there is less than 30% cover of trees. Ornamental and/or native shrubs may be present, usually with less than 50% cover. The groundcover is maintained by mowing. Characteristic birds include American robin (*Turdus migratorius*), and red winged blackbird (*Agelaius phoeniceus*).

- **Paved road/path:** A road or pathway that is paved with asphalt, concrete, brick, stone, etc. There may be sparse vegetation rooted in cracks in the paved surface.

- **Unpaved road/path:** A sparsely vegetated road or pathway of gravel, bare soil, or bedrock outcrop. These roads or pathways are maintained by regular trampling or scraping of the land surface. The substrate consists of the soil or parent material at the site, which may be modified by the addition of local organic material (woodchips, logs, etc.) or sand and gravel. One characteristic plant is the common dandelion (*Taraxacum officinale*). A characteristic bird is American robin (*Turdus migratorius*).

- **Mowed roadside/pathway:** A narrow strip of mowed vegetation along the side of a road, or a mowed pathway through taller vegetation (e.g., meadows, old fields, woodlands, forests), or along utility right-of-way corridors (e.g., power lines, telephone lines, gas pipelines). The vegetation in these mowed strips and paths may be dominated by grasses, sedges, and rushes; or it may be dominated by forbs, vines, and low shrubs that can tolerate infrequent mowing.

- **Brushy Cleared Land:** Land that has been clearcut or cleared by brush-hog. There may be a lot of woody debris such as branches and slashings from trees that were logged. Vegetation is patchy, with scattered herbs, shrubs, and tree saplings. The amount of vegetative cover depends on soil fertility and the length of time since the land was cleared.

- **Landfill/dump:** A site that has been cleared or excavated, where garbage is disposed. The bulk of the material in the landfill or dump is organic and biodegradable; although some inorganic material (plastic, glass, metal, etc.) is usually present.

- **Successional old field:** A meadow dominated by forbs and grasses that occurs on sites that have been cleared and plowed (for farming or development), and then abandoned. Characteristic herbs include goldenrods (*Solidago altissima, S. nemoralis, S. rugosa, S. juncea, S. canadensis,* and *Euthamia graminifolia*), bluegrasses (*Poa pratensis, P. compressa*), timothy (*Phleum pratense*), quackgrass (*Agropyron repens*), smooth brome (*Bromus inermis*), sweet vernal grass (*Anthoxanthum odoratum*), orchard grass (*Dactylis glomerata*), common chickweed (*Cerastium arvense*), common evening primrose (*Oenothera biennis*), oldfield cinquefoil (*Potentilla simplex*), calico aster (*Aster lateriflorus*), New England aster (*Aster novae-angliae*), wild strawberry (*Fragaria virginiana*), Queen-Anne's lace (*Daucus corota*), ragweed (*Ambrosia artemisiifolia*), hawkweeds (*Hieracium* spp.), dandelion (*Taraxacum officinale*), and ox-tongue (*Picris hieracioides*). Shrubs may be present, but collectively they have less than 50% cover in the community. Characteristic shrubs include gray dogwood (*Cornus foemina* ssp. *racemosa*), silky dogwood (*Cornus amomum*), arrowwood (*Viburnum recognitum*), raspberries (*Rubus* spp.), sumac (*Rhus typhina, R. glabra*), and eastern red cedar (*Juniperus virginiana*). A characteristic bird is the field sparrow (*Spizella pusilla*). This is a relatively short-lived community that succeeds to a shrubland, woodland, or forest community

- **Flower/herb garden:** residential, commercial, or horticultural land cultivated for the production of ornamental herbs and shrubs. This community includes gardens cultivated for the production of culinary herbs. Characteristic birds include American robin (*Turdus migratorius*) and mourning dove (*Zenaida macroura*).

7.3.2 Observation of Stress

Limited signs of stress to vegetation and wildlife at or around the site were noted during the field activities undertaken during the RI at the site. There was slight stress to on-site vegetation, Japanese Knotweed (*Fallopia japonica*), observed during field investigation activities. However, the stress to vegetation observed was on the plant as the result of an overnight frost and was limited to grasses and shrubs located near excavated areas on the east and southeastern property. No signs of stress to vegetation or wildlife resulting from impacts of site-related COCs were observed during field activities.

The site is predominately covered with tall grass and shrubs. Trees observed during RI activities included the Quaking Aspen (*populous tremuloides).* The Quaking Aspen, and other members of its genus, are clonal species, reproducing via root sprouts underground. In addition, members of the *populous* genus grow at a fast rate, and are able to generate within acidic and metal contaminated soils (Winterhalder, Keith 1990).

7.3.3 Value of Habitat to Associated Fauna

The residential, commercial, and industrial properties surrounding the site are of little value to wildlife. However, several wooded areas, creeks, fields and other isolated areas with vegetation exist within 0.5-miles of the site. These areas are of significant value to wildlife. The wildlife expected to occur in the vicinity of the site include urbanized bird and mammalian species such as the American robin (*Turdus migratorius*) and gray squirrel *(Sciurus carolinensis)*. White tailed deer (*Odocoileus virginianus*) were observed during RI activities on-site and are presumed to be a transient species within the area surrounding the site. Due to the limited size of other habitat types in the vicinity of the site, larger mammalian and bird of prey species are not likely to occur at the site other than periodic transient movement across the site. The creek habitat and freshwater wetlands located north of the site are of great value to fish and other aquatic fauna that exist within Gulf Creek. Additionally, numerous North American beaver (*Castor canadensis)* dams were observed within Gulf Creek.

7.3.4 Value of Resources to Humans

The site and surrounding area are of some value to humans for recreational use. Bird feeders may be in residential yards to the south and the north of the site. Recreational use, including kayaking, boating, and fishing, in Gulf Creek are not likely due to the intermittent flow and the presence of numerous beaver dams within the creek. The developed nature immediately surrounding the site precludes hunting of small game and deer in the vicinity of the site. However, hunting and fishing is likely within wooded areas further downstream within the Gulf.

7.4 CONTAMINANT EXPOSURE PATHWAYS

The Old Upper Mountain Road site was reportedly operated as a municipal dump by the City of Lockport from 1921 to the 1950s. Access to the landfill during that time was from the viaduct under the railroad track just north of Otto Park Place. Garbage and other wastes were apparently dumped at the landfill, burned, and then pushed into the ravine. Contaminants from the waste disposal include TAL metals, VOCs, SVOCs, pesticides and PCBs.

There is documented surface and subsurface soil/fill, groundwater, surface water, and sediment contamination at the site, but habitat for endangered, threatened, or special concern species was not identified on the site or in the area immediately surrounding the site. Based upon the NYSDEC Environmental Resources Mapper, the site and Gulf Creek are not listed as having an area suitable for rare animals and rare plants. Areas adjacent to the site and within Gulf Creek (OU2) are designated as freshwater wetlands. Additionally, areas north, south and east of the site are designated as state regulated freshwater wetlands such as Eighteen Mile Creek, in which surface water from Gulf Creek eventually flows. The land area immediately surrounding the site would be characterized as medium developed, deciduous forest, and scrub/shrub community types. Figure 7-4 illustrates the land cover types at the site and within the vicinity of the site.

The soil/fill beneath the site is characterized by an unsaturated fill material zone underlain by bedrock. As the groundwater table at the site occurs at approximately 23.44 to 73.54 ft below grade, any sizable amount of material released on the property could potentially reach the groundwater table due to the porous nature of the fill material. Once these contaminants reach the water table, they can be transported via the groundwater flow mechanism. Groundwater flowing along the bottom of the former ravine discharges into Gulf Creek as a seep at the base of the ravine. It is likely, therefore, that contaminants are migrating from the site into Gulf Creek, further contaminating sediment and/or surface water. Because of this situation, groundwater is one of the principal pathways for contaminant migration at the site. Erosion of contaminated fill into Gulf Creek is another contaminant migration pathway.

Although the potential for the migration of contaminants exists, environmental conditions and the physiochemical properties of the contaminants may limit the movement within the environment. Movement of contaminants through the unsaturated and saturated zones depends on several factors, including the sorptive capacity, retardation effects, and available organic material. These processes can serve to limit the migration of contaminants off-site. However, the high concentrations of metals reported in groundwater at monitoring well MW-04, the high concentrations of metals in the sediment of Gulf Creek, and the similarity of metals in the fill/soil and sediment suggests that migration from the site (OU1 and OU1A) to Gulf Creek (OU2) is prevalent.

7.5 DESCRIPTION OF RESOURCES POTENTIALLY IMPACTED BY THE SITE

Because groundwater flows toward Gulf Creek (OU2), biological communities in the creek will be the focus of this FWIA. Gulf Creek is located north of the site. It is classified as a Class D surface water body; fresh surface waters.

The New York State Natural Heritage Program (NYSNHP) and the U.S. Fish and Wildlife Services have been contacted to request information concerning the specific occurrence of plants, wildlife and any endangered, threatened, proposed, or candidate species or their critical habitats on or in the vicinity of the site. The NYSNHP reviewed their databases and found no records of rare or state-listed animals or plants, significant natural communities, or other significant natural habitats, on or in the immediate vicinity of the site (Appendix P). USFWS formally responded to the request, directing the use of the USFWS Critical Habitat Portal for a review of critical habitats within the area surrounding the site. No such areas were observed based upon a review of the Critical Habitat Portal (http://criticalhabitat.fws.gov/).

7.6 IDENTIFICATION OF FISH AND WILDLIFE REGULATORY CRITERIA AND CONTAMINANTS OF ECOLOGICAL CONCERN

A criteria-specific analysis uses numerical criteria to assess potential ecological impacts associated with the contaminants. The numerical criteria are obtained from the New York State Department of Environmental Conservation Water Quality Regulations: Surface Water and Groundwater Classifications and Standards (New York State Codes, Rules and Regulations; Title 6, Chapter X Parts 700-706, Amendments through August 4, 1999) and the NYSDEC Technical Guidance for Screening Contaminated Sediments. If constituent concentrations are less than the numerical criteria, it is assumed that the constituent does not pose an unacceptable risk, and additional analysis is unnecessary. Where site-related constituent concentrations exceed the numerical criteria, an analysis of toxic effects may be required.

7.6.1 Screening of Analytical Results

As explained in Chapter 4, the surface water results were compared to applicable SCGs found in the Division of Water Technical and Operational Guidance Series (1.1.1) (TOGS 1.1.1); Class D for protection of Fish and Wildlife Propagation and Survival.

The detected concentrations of constituents in groundwater were also used to evaluate the potential for site-related impacts to surface water. Groundwater concentrations were compared to TOGS 1.1.1 Class GA SCGs. Sediment data results were compared to the SCGs calculated from the guidance provided in the NYSDEC Technical Guidance for Screening Contaminated Sediments. These SCGs were presented in Chapter 4 as well.

7.6.1.1 Groundwater Screening Results

Six monitoring wells were sampled during this RI. The screening of detected VOCs, SVOCs, metals and pesticides/PCBs against the Class GA SCGs are presented on Table 4-7.

7.6.1.2 Gulf Creek Sediment Screening Results

Five sediment samples from each of the 0-2 in. and 2-6 in. depth intervals were collected from Gulf Creek in November 2009 and six sediment samples from 0 to 6 in. were collected further downgradient in Gulf Creek in May 2010. The screening of reported analytes is provided in Table 4-9. Site-specific sediment criteria (SSC) were derived using the sediment criteria provided on Table 1 in the Technical Guidance for Screening Contaminated Sediments and a calculated average organic carbon concentration from the Creek sediment samples.

All 16 sediment samples exhibited concentrations of lead above the sediment criteria for human health bioaccumulation. Sediment samples SD-02 (0-2 in.), SD-03 (0-2 in.), SD-04 (0-2 in.) and SD-05 (0-2 in.) were collected from the streambed of Gulf Creek. Pesticides (p,p’-DDD and p,p’-DDE) and PAHs collected from these locations exceeded the sediment criteria for benthic aquatic life chronic toxicity or human health bioaccumulation. Based on these results, it appears that benthic aquatic life and plant life residing within Gulf Creek would potentially be exposed to site-related contaminants of ecological concern. An evaluation of deeper sediment depth intervals would be needed to further characterize this potentially absorbing layer.

7.6.1.3 Surface Water Screening Results

Four off-site surface water samples were collected from areas downgradient of the site on the shoreline of Gulf Creek (SW-01, SW-02, SW-03, and SW-04) during the 19 November 2009 sampling event. Two surface water samples (SW-01 and SW-02) in conjunction with four manhole water samples (MSW-02, MSW-03, MSW-04, and MSW-05) were collected during the 4 May, 2010 sampling event.

PCE was detected in off-site surface water sample SW-04 during the November 2009 sampling event and in manhole water samples MW-03 and MSW-03 during the November 2009 and May 2010 sampling events above their respective laboratory MDLs. No pesticides were detected in off-site surface water samples at concentrations above their respective laboratory MDLs. Lead was detected in SW-01, SW-02, SW-03 and SW-04 above SCGs. The analytical results from the surface water sampling locations selected during this RI indicate that site related contaminants of ecological concern appear to be migrating from groundwater to the surface water bodies (iron), or be the result of a point source discharge to the Gulf (PCE).

7.7 FWIA SUMMARY AND CONCLUSIONS

In general, based on the screening results reviewed under this FWIA, groundwater concentrations of COPECs present a potential exposure pathway to fish and wildlife within the area of the site (OU 1 and OU1A). The groundwater pathway appears to be a potential source to sediment and surface waters within Gulf Creek (OU 2). Additional impacts to sediment and surface water within Gulf Creek could be the result of a point source discharge at the outfall located along the western portion of the Gulf. A more robust sampling evaluation of sediment within Gulf Creek and a detailed evaluation of the groundwater discharge mechanisms along the base of the fill material would be needed to fully assess the groundwater to surface water/sediment pathway. As such, remedial activities specifically directed at wildlife exposure would not be proposed at this time for OU 1 and OU1A.

8. CONCLUSIONS AND RECOMMENDATIONS

This chapter discusses the conclusions and recommendations of the RI. The chapter provides a summary of the existing environmental conditions for the Old Upper Mountain Road site, as determined by the completion of the RI work conducted from October 2009 through May 2010. This section also presents recommendations for management of the Old Upper Mountain Road site in the immediate future.

8.1 SUMMARY OF IMPACTS AT OLD UPPER MOUNTAIN ROAD SITE

The following sections briefly summarize the environmental impacts at the Old Upper Mountain Road site. This section is organized by operable units (OU 1 and OU 1A, and OU 2) and media or areas of potential concern within those operable units. The areas of concern and impacts associated with the environmental media are based on laboratory analytical results and their comparison to the SCGs. The focus of the following summaries and conclusions are aimed at defining the nature and extent of COC impacts within each OU and assessing the available data for use in defining remedial action objectives (RAOs), and screening remedial action alternatives for each OU during the FS process. Table 8-1 summarizes the COCs, ranges of concentrations, compares the data with the applicable SCGs for the site, and presents the frequency of exceedance of the SCGs. This table presents a summary of the RI laboratory analytical data set.

8.2 OPERABLE UNIT 1 AND OPERABLE UNIT 1A

OU 1 is defined as the approximate 6 acres of landfill wastes that make up the portion of the Old Upper Mountain Road site north of the Somerset rail line. OU 1A is defined as the approximate 1 acre of landfill wastes that make up the portion of the Old Upper Mountain Road site southeast of the Somerset rail line. Impacts associated with OU 1 and OU 1A evaluated in this RI include on-site surface and subsurface soil/fill material, and on-site groundwater. The following sub-sections summarize the results of this RI with respect to OU 1 and OU 1A.

8.2.1 On-Site Surface Soil/Fill

- Several TAL metals were reported in on-site surface soil/fill above their applicable SCGs. Lead, a COC reported in concentrations exceeding the SCGs in each of the surface soil/fill samples collected, was reported at concentrations ranging from 900 mg/kg to 19,000 mg/kg in surface soil/fill material within OU 1/OU 1A. Copper and zinc also exceeded the SCG in each surface soil/fill sample collected. TAL metal analytical results for surface soil samples collected during this RI are consistent with samples collected by the NYSDEC in 2007.

- Surface soil/fill material within OU 1/OU 1A exhibited hazardous waste characteristics for lead (D008). Three out of eight (approximately 38 percent) surface soil/fill samples submitted for TCLP lead analysis were identified as hazardous waste. Surface soil/fill material was identified as hazardous waste on both the main portion of the site and on the southeastern parcel located south of the railroad tracks.

- A number of SVOCs, pesticides, and PCBs were also detected within surface soil/fill samples within OU 1/OU 1A at concentrations above their applicable SCGs.

8.2.2 On-Site Subsurface Soil/Fill

- Laboratory analytical results from the on-site subsurface soil/fill sampling program identified elevated concentrations of several TAL Metals. Concentrations of lead in exceedence of its SCG were detected in 107 of 116 (approximately 92 percent) subsurface soil samples collected under this evaluation. The deepest impacts to subsurface soil/fill were found within SB-24 at a depth of 70-73 ft bgs. This sample was collected from the deepest portion of fill material observed during soil boring installations. The metal contamination appears to be greatest within shallow subsurface soil/fill collected from the eastern portion of the site. No metal impacts above SCGs were observed within the native soils encountered beneath the on-site fill material.

- Vertical profile borings completed at 4 locations on-site indicated that there is no direct correlation between metals impacts and depth of fill material on-site. There does not appear to be a general pattern indicating a trend for increasing or decreasing lead concentrations with depth based on the analytical data from both the test pit and soil boring subsurface soil/fill samples and the vertical profile boring samples. It appears that the types and source(s) of waste dumped at the site, rather than migration of metals through the fill material, is the primary influence on metals concentration within the subsurface soil/fill material within OU 1/OU 1A.

- Subsurface soil/fill material within OU 1/OU 1A exhibited hazardous waste characteristics for lead (D008). Thirty-three out of 77 (approximately 43 percent) subsurface soil/fill samples submitted for TCLP lead analysis were identified as hazardous waste. Subsurface soil/fill material was identified as hazardous waste on both the main portion of the site and on the southeastern parcel located south of the railroad tracks. The distribution of hazardous fill material was intermittent within the vertical profile borings, while a majority of the shallow hazardous fill material was located within the eastern portion of the site.

- Based upon the interpreted native soil contour elevation map (Figure 3-7) the estimated volume of fill material contained within OU 1/OU 1A is approximately 145,000 yds^3 or 217,500 ton using as an estimate that one cubic yard of fill material is approximately equal to 1.5 ton. This volume estimate does not account for the existing fill material that lies along the slope of the ravine to the base of Gulf Creek or any fill material that lies beneath the railroad line and ballast which bisects the site into two parcels.

- Using a conservative estimate that 50 percent of the fill material would be identified as hazardous waste within OU 1/OU 1A, approximately 72,500 yds^3 or 108,750 ton of on-site fill material (both surface and subsurface) would require hazardous waste handling and disposal.

8.2.3 Groundwater

- Based upon the geologic and fill material characteristics of the site, including the relatively steep bedrock contour observed throughout the central portion of the site and the porosity of fill material within the overburden, it is likely that groundwater levels observed within the overburden fill material are a combination of infiltration/perched water and bedrock groundwater seepages located along the former ravine face. The hydrogeologic data evaluated during this RI indicates that bedrock groundwater is in communication with the saturated zones observed within the overburden fill material.

- The groundwater flow direction, based on groundwater elevations, is towards the former ravine and eventually Gulf Creek. Groundwater moving within the bedrock system from the west continues in a westerly direction until it reaches the former ravine where it then moves north toward Gulf Creek. The bedrock groundwater system flowing from areas south of the site flows in a northerly direction into the former ravine and then toward Gulf Creek, while the flow from the eastern portion of the site moves west to the former ravine and then towards Gulf Creek. The former ravine identified during the subsurface investigation acts as a discharge point for bedrock groundwater within the vicinity of the site.

- Laboratory analytical results from the groundwater sampling event reported the concentrations of TAL metals at each of the monitoring well locations. The highest overall concentrations of TAL metals were reported at monitoring wells MW-04 and MW-03, which are screened within the deepest portion of the on-site fill material (MW-04) and shallow bedrock just below the fill material (MW-03), and are located along the northern portion of the site. In addition, the major anions, chloride and sulfate, were reported at their highest concentrations within monitoring wells MW-03, MW-04, and MW-06. Monitoring well MW-06 was also screened within the on-site fill material. On-site subsurface fill material appears to be acting as a direct source of elevated metal concentrations to groundwater quality within OU 1/OU 1A.

- SVOCs that exceeded site SCGs were detected at monitoring wells MW-04 and MW-03 as well. Because SVOC concentrations were not reported at monitoring well locations upgradient of monitoring wells MW-03 and MW-04, it appears that SVOC contamination observed within the fill material are also impacting groundwater quality.

- Groundwater samples that exhibited CVOC concentrations above the SCGs were collected from monitoring wells MW-01, MW-02, MW-04, and MW-05. Groundwater samples collected at monitoring well MW-03 reported concentrations of toluene exceeding the SCG. VOC detections in groundwater at the site may be due to off-site sources.

8.3 OPERABLE UNIT 2

OU 2 is defined as surface water and sediment within Gulf Creek, from the area located at the western origin of the ravine at the bulkhead outfall located north of the site to an area downstream where Gulf Creek meets Niagara Street. Because surface water within Gulf Creek receives discharge water from a storm sewer system and groundwater flow from areas surrounding the site and the site itself, on-site groundwater at OU 1 and the sewer system evaluation have been utilized to characterize the known impacts to surface water and sediment within OU 2.

8.3.1 Surface Water

- Low level CVOCs have been identified in surface water within Gulf Creek, the storm sewer system discharge water that flows into Gulf Creek, the sanitary sewer system that intersects the western portion of the site, and on-site groundwater. PCE was detected above its respective SCG for Class D waters within surface water samples collected from Gulf Creek.

- Iron was detected in surface water within Gulf Creek, the storm sewer system that discharge water that flows into Gulf Creek, the sanitary sewer system that intersects the western portion of the site, and on-site groundwater. Iron was detected at concentrations above the SCG within the surface water samples collected from Gulf Creek during this RI.

- As noted above, multiple sources of PCE and iron appear to be contributing to contaminated surface water quality conditions observed in Gulf Creek.

8.3.2 Sewer System

- The sanitary sewer system that bisects the Old Upper Mountain Road site has been partially defined via liquid tracer dye testing. This sewer system receives discharge flow from a number of sewer lines including sewer lines that originate along Route 31 and Otto Park Place, and a Town of Lockport line that accepts discharge flow from the GMCH facility. These sewer lines combine flow at the sewer manhole located at the end of Old Upper Mountain Road and then travel to the City of Lockport’s POTW via the “Gulf Interceptor”, a sewer line that runs beneath portions of Gulf Creek and at the base of the ravine adjacent to the site. The sanitary sewer line cuts through the western portion of the site and is buried beneath the fill material.

- The storm sewer system that exists to the west of Old Upper Mountain Road is still undefined as to the whereabouts of its upgradient origin and what additional flow/discharge/runoff if any contribute to this sewer system. It has been determined that the storm sewer ultimately discharges to the surface waters of Gulf Creek via the bulkhead outfall located in the western portion of the site. Based on the inspection of the storm sewer manhole, flow was entering the manhole from the west.

- Analytical results of the water samples (SW-01 and SW-03, and MSW-03) collected from the sewer systems identified the compounds 1,2-DCE, PCE, TCE, and iron. These compounds were also reported in surface water samples collected at the bulkhead outfall and downstream sampling locations in Gulf Creek.

8.3.3 Sediment

- Concentrations of six TAL metals were identified above the SELs in the sediment of Gulf Creek with the most prevalent metals being lead and zinc. Sediment with metal concentrations above the SELs are considered contaminated and significant harm to benthic aquatic life is possible.

- The specific TAL metals reported in sediment samples correlate with the TAL metals observed within the on-site fill material (OU 1 and OU 1A) and are likely migrating to the sediments of Gulf Creek via erosion runoff and groundwater transport pathways.

- None of the sediment samples submitted for TCLP lead analysis were identified as hazardous waste.

- Sediment samples collected from Gulf Creek in each of the investigations conducted at the site have reported VOC, SVOC, and pesticide concentrations that exceed the corresponding calculated sediment criteria. These exceedences have been reasonably persistent with regard to compounds and concentration with detections dating back to 1997.

- Concentrations of TAL metals and SVOCs have been detected above applicable SELs or calculated sediment criteria at sediment sampling locations located furthest downgradient of the site.

8.4 CURRENT CONCEPTUAL SITE MODEL

A conceptual site model (CSM) is a depiction of a site’s condition that conveys what is known of suspected sources of COCs, releases and release mechanisms, the potential COC’s fate and transport in the environment, exposure pathways to potential receptors, and their associated risks. A CSM is based on information available at any given point during an investigation and evolves as more information is available. Based on the data collected during previous investigations and the data gather during the implementation of this RI, the CSM is presented in figure format on Figure 8-1.

8.5 REMEDIAL INVESTIGATION DATA GAP EVALUATION

Based on the completion of this RI, EA completed a data gap evaluation utilizing the analytical, physical, and observational data collected to date for the site. Sufficient data and delineation exist for the proper characterization of on-site soil/fill material, and as such, EA has concluded that no further data is needed to move forward identifying applicable RAOs targeting the remediation of metal contamination in on-site soil/fill. As discussed in Section 6.4.1, under current use scenarios, pathways exist for potential exposure of on-site trespassers to COCs in on-site surface soil/fill. In addition, based on the concentrations of lead and other metals and SVOCs that persist in on-site soil/fill, on-site soil/fill is acting as a continuing source of contamination to groundwater and surface water and sediment within Gulf Creek (OU 2). Remedial actions implemented for OU 1 and OU 1A would be expected to mitigate a continuing source of contamination at OU 2.

Groundwater was assessed during this RI through a one-time sampling event. Elevated levels of VOCs, SVOCs, TAL metals, and major anions were detected within on-site groundwater. Confirmation of groundwater analytical data would provide additional information to further assess the potential migration pathways and interactions of COCs identified in groundwater to OU 2.

Full characterization and delineation of surface water and sediment impacts have not been accomplished for Gulf Creek (OU 2). Additional sampling and evaluation of sediment and surface water within Gulf Creek, extending northeast toward the City of Lockport's landfill and the eventual confluence with 18 Mile Creek would provide further clarity to the processes and interactions of groundwater contamination discharge to Gulf Creek, the depositional areas impacted with COC identified at OU 1 and OU 1A, a complete delineation of the nature and extent of those impacts, and a better defined estimate on the amount of contaminated sediment within OU 2.

8.6 RECOMMENDATIONS

In review of historical documentation, previous environmental investigations, and the work conducted under this RI, the following recommendations are made for the management of the Old Upper Mountain Road site:

- Based on the site data collected during this RI, EA recommends that it is now appropriate to proceed with a FS for OU 1 and OU 1A at the Old Upper Mountain Road site to evaluate potential remedial technologies and alternatives that would be effective at achieving the RAOs that NYSDEC agrees to pursue.

- EA also recommends proceeding with the SRI for OU 2 to further evaluate the off-site interactions of the known groundwater contamination within OU 1 and further delineate surface water and sediment contamination within Gulf Creek. EA understands that GMCH has agreed to further evaluate sewer systems within the area surrounding the site that may also be contributing to contamination within the Gulf Creek as a point source discharge. EA plans on summarizing the results of the SRI in a similar format to this RI and moving forward with the FS for OU 2.

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All figures, except Figure 2-1, were deleted due to size constraints. This figure was retained for reference to the analytical data tables. The complete report can be found at the document repositories.

OLD UPPER MOUNTAIN ROAD (932112)
REMEDIAL INVESTIGATION REPORT
LOCKPORT, NEW YORK

FIGURE 2-1
Surface and Subsurface Soil
Sample Locations

Feet
0 25 50 100
1 inch = 60 feet

Legend

Source: NYS GIS Clearing House

- ● Vertical Profile Soil Boring Location - May 2010 (Augered)
- ● Soil Boring Locations - May 2010 (Direct-Push and Auger)
- ▲ Surface Soil Locations
- ▭ Limits of Test Pit Excavations - May 2010

PROJECT MGR:	DESIGNED BY:	CREATED BY:	CHECKED BY:	PROJECT NO:	DATE:	SCALE:	FILE NO:
RSC	RSC	JCP	RSC	14368.41	APRIL 2011	AS SHOWN	GIS/PROJECTS/ FIGURE2-1.MXD

TABLE 2-1 REMEDIAL INVESTIGATION SAMPLING AND ANALYTICAL PROGRAM

	Sample Matrix	TCLP Lead(a)	TCLP	VOC	SVOC	Pesticides	PCBs	TAL Metals	6 Metals(b)	Anions(c)
SURFACE SOIL SAMPLING										
No. of Samples	Soil/Fill	8	---	---	11	11	11	11	---	---
Field Duplicate		---	---	---	1	1	1	1	---	---
Trip Blank/Rinsate Blank		---	---	---	1	1	1	1	---	---
Matrix Spike/Matrix Spike (MS/MSD) Duplicate		---	---	---	2	2	2	2	---	---
Total No. of Analyses		8	---	---	15	15	15	15	---	---
SUBSURFACE SOIL/FILL MATERIAL SAMPLING–TEST PITS										
No. of Samples	Soil/Fill	29	---	7	18	18	18	42	---	---
Field Duplicate		---	---	---	2	2	2	2	---	---
Trip Blank/ Rinsate Blank		---	---	4	6	6	6	6	---	---
MS/MSD		---	---	2	6	6	6	6	---	---
Total No. of Analyses		29	---	13	32	32	32	56	---	---
SUBSURFACE SOIL/FILL MATERIAL SAMPLING–SOIL BORINGS										
No. of Samples	Soil/Fill	13	---	5	7	7	7	20	---	---
Field Duplicate		---	---	1	1	1	1	1	---	---
Trip Blank/ Rinsate Blank		---	---	4	4	4	4	9	---	---
MS/MSD		---	---	---	2	2	2	4	---	---
Total No. of Analyses		13	---	10	14	14	14	34	---	---

(a) TCLP Lead analysis performed on soil/fill. Selection of sample locations contingent upon TAL metals results.
(b) Arsenic, barium, cadmium, chromium, and lead by USEPA Method 601 and mercury by USEPA Method 7470.
(c) Chloride and Sulfate by USEPA Method 300.0 and Alkalinity by USEPA Method 2320B.

NOTE: TCLP = Toxicity Characteristics and Leaching Procedures by USEPA Method 1311, corrosivity by USEPA Method 9045 ignitability by SW-846 CH 7.1, and reactive cyanide by USEPA Method 7.3.3.2 REV3, reactive sulfide by USEPA Method 7.3.4.2 REV3
VOC = Volatile organic compound by U.S. Environmental Protection Agency (USEPA) Method 8260B.
SVOC = Semivolatile organic compound by USEPA Method 8270 C.
PCB = Polychlorinated Biphenyls by USEPA Method 8082.
TAL = Target Analyte List metals by USEPA Method 6010 and mercury by USEPA Method 7470.
Pesticides by USEPA Method 8081A (soil)/USEPA Method 608 (aqueous).
Dashes (---) indicate no sample taken.
Laboratory quality control samples collected at a minimum of frequency of 1 per 20 samples, per matrix.

	Sample Matrix	TCLP Lead(a)	TCLP	VOC	SVOC	Pesticides	PCBs	TAL Metals	6 Metals(b)	Anions(c)
SUBSURFACE SOIL/FILL MATERIAL SAMPLING–VERTICAL PROFILING LOCATIONS										
No. of Samples	Soil/Fill	42	---	---	---	---	---	---	57	
Field Duplicate		---	---	---	---	---	---	---	3	
Trip Blank/ Rinsate Blank		---	---	---	---	---	---	---	3	
MS/MSD		---	---	---	---	---	---	---	6	
Total No. of Analyses		42	---	---	---	---	---	---	69	
GROUNDWATER SAMPLING–MONITORING WELLS										
No. of Samples	Groundwater	---	1	6	6	6	6	6	---	6
Field Duplicate		---	---	1	1	1	1	1	---	---
Trip Blank/Rinsate Blank		---	---	1	---	---	---	---	---	---
MS/MSD		---	---	2	2	2	2	2	---	---
Total No. of Analyses		---	---	9	9	9	9	9	---	6
SEWER AND SURFACE WATER SAMPLING										
No. of Samples	Sewer and Surface Water	---	---	8	4	---	---	4	---	---
Field Duplicate		---	---	2	1	---	---	1	---	---
Trip Blank/Rinsate Blank		---	---	2	--	---	---	---	---	---
MS/MSD Duplicate		---	---	4	2	---	---	2	---	---
Total No. of Analyses		---	---	16	7	---	---	7	---	---
SEDIMENT SAMPLING										
No. of Samples	Sediment(d)	4	---	12	11	11	11	16	---	4
Field Duplicate		---	---	2	2	2	2	2	---	---
Trip Blank/ Rinsate Blank		---	---	2	2	2	2	2	---	---
MS/MSD		---	---	2	2	2	2	2	---	---
Total No. of Analyses		4	---	19	17	17	17	22	---	4

(d) Sediment samples were also collected for Total Organic Carbon and analyzed by USEPA Method 9060 for sediment criterion normalization.

TABLE 2-2 SUMMARY OF SUBSURFACE SOIL/FILL SAMPLE COLLECTION

TEST PITS

Test Pit Location ID	Sample Depth Interval (ft bgs)	VOCs by USEPA Method 8260	SVOCs by USEPA Method 8270	TAL Metals by USEPA Method 6010/7470	Pesticides by USEPA Method 8081	PCBs by USEPA Method 8082	TCLP Lead by USEPA Method 1311	QA/QC Samples Collected
932112-TP-01	2-12			TAL Metals			TCLP	
932112-TP-02	2-3		SVOC	TAL Metals	Pesticides	PCBs		
932112-TP-02A	3			TAL Metals			TCLP	
932112-TP-03	2-2.5			TAL Metals			TCLP	
931112-TP-04	1			TAL Metals			TCLP	
932112-TP-05	1-6		SVOC	TAL Metals	Pesticides	PCBs		MS/MSD
932112-TP-05A	2-5			TAL Metals			TCLP	
932112-TP-06	1-5			TAL Metals			TCLP	
932112-TP-07	1-5		SVOC	TAL Metals	Pesticides	PCBs	TCLP	
932112-TP-08	3-5			TAL Metals			TCLP	
932112-TP-09	2-4	VOC	SVOC	TAL Metals	Pesticides	PCBs	TCLP	
932112-TP-10	1-3.5	VOC	SVOC	TAL Metals	Pesticides	PCBs	TCLP	
932112-TP-11	1-3			TAL Metals				
932112-TP-12	1-4			TAL Metals				
932112-TP-13	4-10	VOC	SVOC	TAL Metals	Pesticides	PCBs	TCLP	TP-DUP-02
932112-TP-14	8-13	VOC	SVOC	TAL Metals	Pesticides	PCBs	TCLP	
932112-TP-15	8-12			TAL Metals			TCLP	
932112-TP-16	6-12			TAL Metals			TCLP	MS/MSD
932112-TP-17	3-4			TAL Metals			TCLP	
932112-TP-18	1-12		SVOC	TAL Metals	Pesticides	PCBs	TCLP	
932112-TP-19	1-12			TAL Metals			TCLP	
932112-TP-20	1-12			TAL Metals	Pesticides	PCBs	TCLP	
	5-7	VOC	SVOC					
931112-TP-21	3-6			TAL Metals			TCLP	
932112-TP-22	5-10		SVOC	TAL Metals	Pesticides	PCBs	TCLP	
932112-TP-23	5-10			TAL Metals			TCLP	
932112-TP-24	5-10			TAL Metals			TCLP	
932112-TP-25	2-6			TAL Metals			TCLP	
932112-TP-26	3-7			TAL Metals				
932112-TP-27	1-2			TAL Metals				
932112-TP-28	1-2		SVOC	TAL Metals	Pesticides	PCBs		
932112-TP-29	1-7			TAL Metals			TCLP	
932112-TP-30	2-5	VOC						MS/MSD
	8-12		SVOC	TAL Metals	Pesticides	PCBs		
932112-TP-31	2-6			TAL Metals			TCLP	
932112-TP-32	4-10			TAL Metals				
932112-TP-33	4-10		SVOC	TAL Metals	Pesticides	PCBs	TCLP	TP-DUP-01
932112-TP-34	2-5	VOC	SVOC	TAL Metals	Pesticides	PCBs	TCLP	
932112-TP-35	1-5			TAL Metals			TCLP	
932112-TP-36	2-10		SVOC	TAL Metals	Pesticides	PCBs		MS/MSD
932112-TP-37	2-9			TAL Metals			TCLP	

NOTE: bgs = below ground surface
VOC = Volatile Organic Compounds
USEPA = United States Environmental Protection Agency
SVOC = Semivolatile Organic Compounds
TAL = Target Analyte List Metals
PCB = Polychlorinated Biphenyls
TCLP = Toxicity Leaching Characteristics Procedure
QA/QC = Quality Assurance/Quality Control
MS/MSD = Matrix Spike/Matrix Spike Duplicate
DUP = Duplicate

TABLE 2-2 SUMMARY OF SUBSURFACE SOIL/FILL SAMPLE COLLECTION

SOIL BORING (DIRECT PUSH, HOLLOW STEM AUGER)								
Soil Boring Location ID	Sample Depth Interval (ft bgs)	VOCs by USEPA Method 8260	SVOCs by USEPA Method 8270	TAL Metals by USEPA Method 6010/7470	Pesticides by USEPA Method 8081	PCBs by USEPA Method 8082	TCLP Lead by USEPA Method 1311	QA/QC Samples Collected
932112-SB-01	2-12			TAL Metals				
	30-32	VOC						
932112-SB-02	2-12			TAL Metals				
932112-SB-03	4-14		SVOC	TAL Metals	Pesticides	PCBs		
932112-SB-04	2-14			TAL Metals			TCLP	
932112-SB-05	2-14			TAL Metals				
932112-SB-06	4-16		SVOC	TAL Metals	Pesticides	PCBs		
932112-SB-08	6-12	VOC						
	6-14		SVOC	TAL Metals	Pestícdes	PCBs	TCLP	
932112-SB-09	24-30		SVOC	TAL Metals	Pesticides	PCBs	TCLP	
932112-SB-11	4-6	VOC	SVOC	TAL Metals	Pesticdes	PCBs	TCLP	
932112-SB-12	4-8			TAL Metals			TCLP	
932112-SB-13	0-4; 4-8; 8-12; 12-16; 16-20; 20-24; 24-28; 28-32; 32-36; 36-40; 40-44; 44-48; 48-52; 52-55			TAL Metals[a]			TCLP (4-8; 8-12; 12-16; 16-20 ft bgs)	MS/MSD (44-48 ft bgs) DUP (0-4 ft bgs)
932112-SB-14	25-27			TAL Metals			TCLP	
	60-64	VOC	SVOC	TAL Metals	Pesticides	PCBs		
932112-SB-15	46-50			TAL Metals			TCLP	
932112-SB-16	5-12			TAL Metals			TCLP	
932112-SB-17	16-24			TAL Metals			TCP	
932112-SB-18	38-42			TAL Metals			TCLP	
932112-SB-19	37-41			TAL Metals				
932112-SB-20	0-4; 4-8; 8-12; 12-16; 16-20; 20-24; 24-28; 28-32; 32-36; 36-42; 46-48			TAL Metals[a]			TCLP (8-12; 12-16; 16-20; 20-24; 28-32; 36-36 ft bgs)	
932112-SB-21	0-4; 4-8; 8-12; 12-16; 16-20; 20-24; 24-28; 32-36; 36-40; 40-44; 44-46; 48-52; 52-56; 60-64; 64-68; 68-72			TAL Metals[a]			TCLP (0-4; 4-8; 8-12; 24-28; 30-32; 32-36; 36-40; 44-46; 48-52; 52-56; 56-60; 60-64; 64-68 ft bgs)	MS/MSD (40-44 ft bgs)
932112-SB-22	0-4; 4-8; 8-12; 12-16; 16-20; 22-28; 28-32; 38-42; 42-46; 46-50; 50-54; 54-58			TAL Metals[a]			TCLP (0-4; 4-8; 8-12; 16-20; 22-28; 28-32; 32-36; 38-42; 42-46; 46-50; 50-54; 54-58 ft bgs)	MS/MSD (28-32 ft bgs)
932112-SB-23	50-52			TAL Metals			TCLP	
932112-SB-24	70-73		SVOCS	TAL Metals	Pesticides	PCBs	TCLP	MS/MSD (SVOC, Pesticdes, PCBS)
932112-SB-25	44-48			TAL Metals			TCLP	
932112-SB-26	52-56			TAL Metals				

(a) SB-13, SB-20, SB-21, and SB-22 completed as vertical profiling borings for 6 TAL Metals including Arsenic, Barium, Cadmium, Chromium, Lead, and Mercury.

TABLE 2-3 MONITORING WELL ELEVATION DATA

Monitoring Well Identification	Casing Construction	Northing	Easting	Elevation at Ground Surface (ft AMSL)	Elevation at Casing (ft AMSL)	Elevation at Top of Riser Pipe (ft AMSL)	Monitoring Well Depth Below Ground Surface (ft AMSL)	Top of Screen Interval Below Ground Surface (ft AMSL)	Bottom of Screen Interval Below Ground Surface (ft AMSL)
932112-MW-01	Stick-Up	1153434.3	1110969.3	596.05	598.05	597.77	562.05	577.05	562.05
932112-MW-02	Stick-Up	1153518.8	1110366.8	589.26	592.86	592.68	555.86	570.86	555.86
932112-MW-03	Stick-Up	1153662.9	1110753.4	595.80	597.78	597.69	520.78	530.78	520.78
932112-MW-04	Stick-Up	1153543.9	1110610.4	588.87	590.77	590.97	513.27	523.27	513.27
932112-MW-05	Stick-Up	1153321.5	1110568.7	590.24	593.34	593.16	554.34	564.34	554.34
932112-MW-06	Stick-Up	1153407.4	1110726.2	592.26	594.36	594.45	554.36	559.36	554.36

NOTE:
AMSL = Above mean sea level
Horizontal Datum NAD 83(CORS) - New York State Plane Coordinate System, East Zone
Vertical Datum NAVD 1988

TABLE 3-1 GROUNDWATER ELEVATION DATA

Monitoring Well Identification	Top of Riser Elevation (ft AMSL)	Depth to Groundwater (ft btoc) January 2010	Depth to Well Bottom (ft btoc) January 2010	Groundwater Table Elevation (ft AMSL) January 2010	Depth to Groundwater (ft btoc) February 2010	Depth to Well Bottom (ft btoc) February 2010	Groundwater Table Elevation (ft AMSL) February 2010	Comments
932112-MW-01	598.05	23.45	38.13	574.60	23.44	38.10	574.61	
932112-MW-02	592.86	24.52	39.67	568.34	26.43	39.67	566.43	
932112-MW-03	597.78	72.59	77.40	525.19	72.48	77.40	525.30	
932112-MW-04	590.77	73.40	78.90	517.37	73.54	78.90	517.23	Well Head Space Total Organic Vapor Concentration = 1.4 ppm
932112-MW-05	593.34	34.99	42.27	558.35	35.28	42.26	558.06	
932112-MW-06	594.36	38.63	45.11	555.73	38.65	45.10	555.71	

NOTE:
AMSL = Above mean sea level
btoc = Below top of casing
ppm = parts per million
Horizontal Datum NAD 83(CORS) - New York State Plane Coordinate System, East Zone
Vertical Datum NAVD 1988

TABLE 4-1A DETECTED TARGET ANALYTE LIST METALS SURFACE SOIL/FILL ANALYTICAL DATA

Parameter List USEPA Method 6010B/7471A	Sample ID	932112-SS-07 (0-2")		932112-SS-08 (0-2")		932112-SS-09 (0-2")		932112-SS-10 (0-2")		932112-SS-11 (0-2")		932112-SS-12 (0-2")		6 NYCRR Part 375 Soil Cleanup Objectives - Unrestricted Use (mg/kg)	6 NYCRR Part 375 Soil Cleanup Objectives - Restricted Use - Commercial (mg/kg)
	Lab ID	AC51679-011		AC51679-014		AC51679-013		AC51679-020		AC51679-019		AC51679-015			
	Sample Type	Fill/Ash		Fill/Ash		Fill/Ash		Fill/Ash		Fill/Ash		Fill/Ash			
	Sample Date	5/12/2010		5/12/2010		5/12/2010		5/12/2010		5/12/2010		5/12/2010			
Aluminum	(mg/kg)	5,800		6,300		5,700		4,800		5,800		9,400		---	---
Antimony	(mg/kg)	4.2		11		4		(<2.8)	U	5.3		35		---	---
Arsenic	(mg/kg)	**15**		13		**19**		**20**		6.7		**35**		13	16
Barium	(mg/kg)	96		**440**		**620**		180		220		**420**		350	400
Beryllium	(mg/kg)	0.88		(<0.78)	U	1.1		(<0.83)	U	(<0.77)	U	1.2		7.2	590
Cadmium	(mg/kg)	1.7		**11**		2.3		(<0.83)	U	**9**		**8.3**		2.5	9.3
Calcium	(mg/kg)	6,700		63,000		40,000		4,800		71,000		17,000		---	---
Chromium	(mg/kg)	14		**60**		**32**		9.5		28		**170**		30	1,500
Cobalt	(mg/kg)	5.1		8.3		7.6		6.2		5.3		9.6		---	---
Copper	(mg/kg)	**3,700**		**1,400**		**230**		**65**		**810**		**1,900**		50	270
Iron	(mg/kg)	25,000	J	21,000	J	24,000	J	8,500	J	17,000	J	23,000	J	---	---
Lead	(mg/kg)	**4,400**		**2,600**		**1,400**		**170**		**1,600**		**19,000**		63	1,000
Magnesium	(mg/kg)	2,500		12,000		19,000		830		32,000		5,300		---	---
Manganese	(mg/kg)	230		910		400		110		520		470		1,600	10,000
Mercury	(mg/kg)	0.16		**0.45**		**0.73**		0.16		**0.91**		**0.75**		0.18	2.8
Nickel	(mg/kg)	**49**		**76**		**46**		16		**33**		**58**		30	310
Potassium	(mg/kg)	640		1,000		1,100		(<690)	U	1,200		1,200		---	---
Selenium	(mg/kg)	(<2)	U	(<2.3)	U	(<2.3)	U	2.9		(<2.3)	U	(<2.4)	U	3.9	1,500
Silver	(mg/kg)	(<1.7)	U	**14**		(<1.9)	U	(<2.1)	U	**5**		**9.2**		2	1,500
Sodium	(mg/kg)	(<280)	U	(<320)	U	(<320)	U	(<350)	U	(<320)	U	(<340)	U	---	---
Thallium	(mg/kg)	(<1.3)	U	(<1.6)	U	(<1.5)	U	(<1.7)	U	(<1.5)	U	(<1.6)	U	---	---
Vanadium	(mg/kg)	14		20		23		24		20		26		---	---
Zinc	(mg/kg)	**660**		**1,800**		**850**		**170**		**2,800**		**1,900**		109	10,000

NOTE:
USEPA = United States Enivronmental Protection Agency
NYCRR = New York Code of Rules and Regulation
mg/kg = milligrams per kilogram.
--- = No Standard
U = Non-detect, detection below the method detection limit
J = The associated numerical value is an estimated quantity.
Data provided by Hampton-Clarke Veritech. Only analytes that were detected in at least one sample are shown. Data validation completed by Chemworld Environmental, Inc.
Concentration values in **bold** indicate the concentration was above the 6 NYCRR Part 375 Soil Cleanup Objectives - Unrestricted Use.
Concentration values in **bold and highlighted** indicate the concentration was above the 6 NYCRR Part 375 Soil Cleanup Objectives - Restricted Use (Commercial).

TABLE 4-1A DETECTED TARGET ANALYTE LIST METALS SURFACE SOIL/FILL ANALYTICAL DATA

Parameter List USEPA Method 6010B/7471A	Sample ID	932112-SS-13 (0-2")		932112-SS-14 (0-2")		932112-SS-15 (0-2")		932112-SS-16 (0-2")		932112-SS-17 (0-2")		932112-SS-Dup-01[(a)]		6 NYCRR Part 375 Soil Cleanup Objectives - Unrestricted Use (mg/kg)	6 NYCRR Part 375 Soil Cleanup Objectives - Restricted Use - Commercial (mg/kg)
	Lab ID	AC51679-016		AC51679-017		AC51679-018		AC51679-007		AC51679-008		AC51679-022			
	Sample Type	Fill/Ash		Fill/Ash		Fill/Ash		Fill/Ash		Fill/Ash		QA/QC			
	Sample Date	5/13/2010		5/13/2010		5/13/2010		5/13/2010		5/13/2010		5/13/2010			
Aluminum	(mg/kg)	12,000		5,800		7,500		10,000		8,500		10,000		---	---
Antimony	(mg/kg)	6.8		(<3)	U	13		3.8		7.3		5.6		---	---
Arsenic	(mg/kg)	6.2		8.3		**21**		**40**		**28**		**41**		13	16
Barium	(mg/kg)	170		170		**1,000**		**980**		**450**		**1000**		350	400
Beryllium	(mg/kg)	(<0.97)	U	(<0.91)	U	(<0.85)	U	1.2		(<0.88)	U	1.9		7.2	590
Cadmium	(mg/kg)	**4.6**		**4.4**		**20**		**3.8**		**3.7**		**3.8**		2.5	9.3
Calcium	(mg/kg)	24,000		41,000		46,000		25,000		16,000		16,000		---	---
Chromium	(mg/kg)	**45**		**31**		**190**		**45**		**45**		**36**		30	1,500
Cobalt	(mg/kg)	34		7.5		11		15		14		12		---	---
Copper	(mg/kg)	**250**		**530**		**3,700**		**460**		**360**		NA		50	270
Iron	(mg/kg)	65,000	J	41,000	J	33,000	J	56,000	J	110,000	J	24,000	J	---	---
Lead	(mg/kg)	**260**		**1,000**		**5,800**		**2,800**		**900**		**2,700**		63	1,000
Magnesium	(mg/kg)	9,500		17,000		11,000		3,800		6,700		2,200		---	---
Manganese	(mg/kg)	610	V	510		620		430		1000		350		1,600	10,000
Mercury	(mg/kg)	(<0.13)	U	**0.31**		**3**		**1**		**0.46**		**0.86**		0.18	2.8
Nickel	(mg/kg)	**37**		**43**		**250**		**48**		**48**		**38**		30	310
Potassium	(mg/kg)	1,400		1,400		820		1,500		1,300		1,400		---	---
Selenium	(mg/kg)	(<2.9)	U	(<2.7)	U	2.6		**8.4**		(<2.6)		**12**		3.9	1,500
Silver	(mg/kg)	(<2.4)	U	**5.9**		**33**		(<2.1)	U	**2.3**		**3.1**		2	1,500
Sodium	(mg/kg)	(<400)	U	(<380)	U	(<350)	U	590	V	(<370)	U	520		---	---
Thallium	(mg/kg)	(<1.9)	U	(<1.8)	U	(<1.7)	U	(<1.7)	U	(<1.8)	U	(<1.7)	U	---	---
Vanadium	(mg/kg)	18		20		25		46		32		44		---	---
Zinc	(mg/kg)	**33,000**		**730**		**4,500**		**1,900**		**1,000**		**2,100**		109	10,000

(a) 932112-SS-Dup-01 collected at 932112-SS-16 (0-2")

TABLE 4-1A DETECTED TARGET ANALYTE LIST METALS SURFACE SOIL/FILL ANALYTICAL DATA

Parameter List USEPA Method 6010B/7471A	Sample ID	932112-SS-Rinsate-01(b)		6 NYCRR Part 375 Soil Cleanup Objectives - Unrestricted Use (mg/kg)	6 NYCRR Part 375 Soil Cleanup Objectives - Restricted Use - Commercial (mg/kg)
	Lab ID	AC51679-021			
	Sample Type	QA/QC			
	Sample Date	5/12/2010			
Aluminum	(µg/L)	(<2,000)	U	---	---
Antimony	(µg/L)	(<20)	U	---	---
Arsenic	(µg/L)	(<20)	U	13	16
Barium	(µg/L)	(<100)	U	350	400
Beryllium	(µg/L)	(<6)	U	7.2	590
Cadmium	(µg/L)	(<6)	U	2.5	9.3
Calcium	(µg/L)	(<10,000)	U	---	---
Chromium	(µg/L)	(<50)	U	30	1,500
Cobalt	(µg/L)	(<25)	U	---	---
Copper	(µg/L)	(<50)	U	50	270
Iron	(µg/L)	(<2,000)	U	---	---
Lead	(µg/L)	(<50)	U	63	1,000
Magnesium	(µg/L)	(<5,000)	U	---	---
Manganese	(µg/L)	(<100)	U	1,600	10,000
Mercury	(µg/L)	(<0.5)	U	0.18	2.8
Nickel	(µg/L)	(<50)	U	30	310
Potassium	(µg/L)	(<5,000)	U	---	---
Selenium	(µg/L)	(<18)	U	3.9	1,500
Silver	(µg/L)	(<15)	U	2	1,500
Sodium	(µg/L)	(<2,500)	U	---	---
Thallium	(µg/L)	(<12)	U	---	---
Vanadium	(µg/L)	(<100)	U	---	---
Zinc	(µg/L)	(<100)	U	109	10,000

(b) Rinsate blanks are aqueous samples, units are in µg/L.

TABLE 4-1B TCLP LEAD SURFACE SOIL/FILL ANALYTICAL DATA

Parameter List USEPA Method 6010B	Sample ID	932112-SS-07(0-2")		932112-SS-08(0-2")		932112-SS-09(0-2")		932112-SS-11(0-2")		NYSDEC Identification and Listings of Hazardous Wastes 6 NYCRR Part 371 (mg/L)
	Lab ID	AC52666-006		AC52666-008		AC52666-007		AC52666-012		
	Sample Type	Fill/Ash		Fill/Ash		Fill/Ash		Fill/Ash		
	Sample Date	5/12/2010		5/12/2010		5/12/2010		5/12/2010		
TCLP Lead	(mg/L)	1.7		**6.5**		0.5		3		5.0

Parameter List USEPA Method 6010B	Sample ID	932112-SS-12(0-2")		932112-SS-14(0-2")		932112-SS-15(0-2")		932112-SS-16(0-2")		NYSDEC Identification and Listings of Hazardous Wastes 6 NYCRR Part 371 (mg/L)
	Lab ID	AC52666-009		AC52666-010		AC52666-011		AC52666-005		
	Sample Type	Fill/Ash		Fill/Ash		Fill/Ash		Fill/Ash		
	Sample Date	5/12/2010		5/12/2010		5/12/2010		5/12/2010		
TCLP Lead	(mg/L)	**51**		0.96		3.6		**11**		5.0

NOTE:
USEPA = United States Enivronmental Protection Agency
NYSDEC = New York State Department of Environmental Conservation
NYCRR = New York Code of Rules and Regulations
mg/L = milligrams per liter
TCLP = Toxicity Characteristic Leaching Procedure
Data provided by Hampton-Clarke Veritech.
Concentration values in **bold** indicate that analyte was identified as hazardous waste.

TABLE 4-1C DETECTED SEMIVOLATILE ORGANIC COMPOUNDS SURFACE SOIL/FILL ANALYTICAL DATA

Parameter List USEPA Method 8270C	Sample ID	932112-SS-07 (0-2")		932112-SS-08 (0-2")		932112-SS-09 (0-2")		932112-SS-10 (0-2")		932112-SS-11 (0-2")		932112-SS-12 (0-2")		6 NYCRR Part 375 Soil Cleanup Objectives - Unrestricted Use (mg/kg)	6 NYCRR Part 375 Soil Cleanup Objectives - Restricted Use - Commercial (mg/kg)
	Lab ID	AC51679-011		AC51679-014		AC51679-013		AC51679-020		AC51679-019		AC51679-015			
	Sample Type	Fill/Ash		Fill/Ash		Fill/Ash		Fill/Ash		Fill/Ash		Fill/Ash			
	Sample Date	5/12/2010		5/12/2010		5/12/2010		5/12/2010		5/12/2010		5/12/2010			
1,1'-Biphenyl	(mg/kg)	(<0.07)	U	(<0.26)	U	(<0.26)	U	(<0.09)	U	(<0.26)	U	(<0.09)	U	---	---
2-Methylnaphthalene	(mg/kg)	(<0.07)	U	(<0.26)	U	(<0.26)	U	(<0.09)	U	(<0.26)	U	(<0.09)	U	---	---
Acenaphthene	(mg/kg)	(<0.07)	U	(<0.26)	U	(<0.26)	U	(<0.09)	U	0.73		(<0.09)	U	20	500
Acenaphthylene	(mg/kg)	(<0.07)	U	(<0.26)	U	0.78		(<0.09)	U	(<0.26)	U	0.14		100	500
Acetophenone	(mg/kg)	(<0.07)	U	(<0.26)	U	(<0.26)	U	(<0.09)	U	(<0.26)	U	(<0.09)	U	---	---
Anthracene	(mg/kg)	0.093		0.39		0.54		(<0.09)	U	1.6		0.21		100	500
Benzo[a]anthracene	(mg/kg)	0.53		**1.8**		**3.1**		0.17		**5.1**		**1.4**		1	5.6
Benzo[a]pyrene	(mg/kg)	0.52		**1.7**		**3.3**		0.12		**5**		**1.4**		1	1
Benzo[b]fluoranthene	(mg/kg)	**1.1**		**3.4**		**5.5**		0.26		**7.8**		**2.7**		1	5.6
Benzo[g,h,i]perylene	(mg/kg)	0.36		1.2		2.1		0.096		3.2		0.7		100	500
Benzo[k]fluoranthene	(mg/kg)	0.29		**0.89**		**1.5**		(<0.09)	U	**2.5**		0.71		0.8	56
bis(2-Ethylhexyl)phthalate	(mg/kg)	(<0.07)	U	0.57		(<0.26)	U	(<0.09)	U	(<0.26)	U	0.12		---	---
Carbazole	(mg/kg)	(<0.07)	U	0.41		(<0.26)	U	(<0.09)	U	0.78		(<0.09)	U	---	---
Chrysene	(mg/kg)	0.56		**2.1**		**3.3**		0.14		**5.5**		**1.3**		1	56
Dibenzo[a,h]anthracene	(mg/kg)	0.16		**0.5**		**0.81**		(<0.09)	U	**1.1**		**0.34**		0.33	0.56
Dibenzofuran	(mg/kg)	(<0.07)	U	(<0.26)	U	(<0.26)	U	(<0.09)	U	0.5		(<0.09)	U	7	350
Di-n-butylphthalate	(mg/kg)	(<0.07)	U	(<0.26)	U	(<0.26)	U	(<0.09)	U	(<0.26)	U	(<0.09)	U	---	---
Fluoranthene	(mg/kg)	0.62		3.1		3.4		0.19		12		1.6		100	500
Fluorene	(mg/kg)	(<0.07)	U	(<0.26)	U	(<0.26)	U	(<0.09)	U	0.96		(<0.09)	U	30	500
Indeno[1,2,3-cd]pyrene	(mg/kg)	0.33		**1.1**		**1.9**		0.093		**2.9**		**0.68**		0.5	5.6
Naphthalene	(mg/kg)	(<0.07)	U	(<0.26)	U	(<0.26)	U	(<0.09)	U	(<0.26)	U	(<0.09)	U	12	500
Phenanthrene	(mg/kg)	0.4		3.4		1.5		(<0.09)	U	10		0.66		100	500
Pyrene	(mg/kg)	0.76		4		4.7		0.2		12		1.8		100	500

NOTE:

USEPA = United States Enivronmental Protection Agency
NYCRR = New York Code of Rules and Regulation
mg/kg = milligrams per kilogram.
U = Non-detect, detection below the method detection limit
--- = No Standard

Data provided by Hampton-Clarke Veritech. Only analytes that were detected in at least one sample are shown. Data validation completed by Chemworld Environmental, Inc.

Concentration values in **bold** indicate the concentration was above the 6 NYCRR Part 375 Soil Cleanup Objectives - Unrestricted Use.

Concentration values in **bold and highlighted** indicate the concentration was above the 6 NYCRR Part 375 Soil Cleanup Objectives - Restricted Use (Commercial).

TABLE 4-1C DETECTED SEMIVOLATILE ORGANIC COMPOUNDS SURFACE SOIL/FILL ANALYTICAL DATA

Parameter List USEPA Method 8270C	Sample ID	932112-SS-13 (0-2")		932112-SS-14 (0-2")		932112-SS-15 (0-2")		932112-SS-16 (0-2")		932112-SS-17 (0-2")		932112-SS-Dup-01[(a)]		6 NYCRR Part 375 Soil Cleanup Objectives - Unrestricted Use (mg/kg)	6 NYCRR Part 375 Soil Cleanup Objectives - Restricted Use - Commercial (mg/kg)
	Lab ID	AC51679-016		AC51679-017		AC51679-018		AC51679-007		AC51679-008		AC51679-022			
	Sample Type	Fill/Ash		Fill/Ash		Fill/Ash		Fill/Ash		Fill/Ash		QA/QC			
	Sample Date	5/13/2010		5/13/2010		5/13/2010		5/13/2010		5/13/2010		5/13/2010			
1,1'-Biphenyl	(mg/kg)	0.66		(<0.3)	U	(<0.28)	U	(<0.09)	U	(<0.09)	U	(<0.09)	U	---	---
2-Methylnaphthalene	(mg/kg)	0.22		(<0.3)	U	(<0.28)	U	(<0.09)	U	(<0.09)	U	(<0.09)	U	---	---
Acenaphthene	(mg/kg)	(<0.11)	U	(<0.3)	U	(<0.28)	U	(<0.09)	U	(<0.09)	U	(<0.09)	U	20	500
Acenaphthylene	(mg/kg)	0.12		0.35		(<0.28)	U	0.11		0.28		0.19		100	500
Acetophenone	(mg/kg)	0.49		(<0.3)	U	(<0.28)	U	(<0.09)	U	(<0.09)	U	(<0.09)	U	---	---
Anthracene	(mg/kg)	(<0.11)	U	1		(<0.28)	U	0.11		0.19		(<0.09)	U	100	500
Benzo[a]anthracene	(mg/kg)	0.19		**3.4**		**1.1**		0.51		**1.3**		0.44		1	5.6
Benzo[a]pyrene	(mg/kg)	0.21		**2.7**		**1.1**		0.49		**1.3**		0.44		1	1
Benzo[b]fluoranthene	(mg/kg)	(<0.11)	U	**4.9**		**2.1**		1		**2.3**		0.91		1	5.6
Benzo[g,h,i]perylene	(mg/kg)	(<0.11)	U	2		0.89		0.29		0.95		0.38		100	500
Benzo[k]fluoranthene	(mg/kg)	(<0.11)	U	**1**		0.59		0.22		0.68		0.28		0.8	56
bis(2-Ethylhexyl)phthalate	(mg/kg)	(<0.11)	U	(<0.3)	U	(<0.28)	U	(<0.09)	U	0.12		(<0.09)	U	---	---
Carbazole	(mg/kg)	(<0.11)	U	0.53		(<0.28)	U	(<0.09)	U	0.19		(<0.09)	U	---	---
Chrysene	(mg/kg)	0.6		**3.3**		**1.3**		0.63		**1.5**		0.58		1	56
Dibenzo[a,h]anthracene	(mg/kg)	(<0.11)	U	**0.77**		**0.36**		0.15		**0.41**		0.16		0.33	0.56
Dibenzofuran	(mg/kg)	(<0.11)	U	(<0.3)	U	(<0.28)	U	(<0.09)	U	(<0.09)	U	(<0.09)	U	7	350
Di-n-butylphthalate	(mg/kg)	(<0.11)	U	(<0.3)	U	(<0.28)	U	0.13		(<0.09)	U	(<0.09)	U	---	---
Fluoranthene	(mg/kg)	0.36		5.4		1.3		0.71		2		0.65		100	500
Fluorene	(mg/kg)	(<0.11)	U	0.66		(<0.28)	U	(<0.09)	U	(<0.09)	U	(<0.09)	U	30	500
Indeno[1,2,3-cd]pyrene	(mg/kg)	(<0.11)	U	**1.7**		**0.74**		0.3		**0.85**		0.37		0.5	5.6
Naphthalene	(mg/kg)	0.42		(<0.3)	U	(<0.28)	U	(<0.09)	U	(<0.09)	U	(<0.09)	U	12	500
Phenanthrene	(mg/kg)	0.36		5.6		0.88		0.55		1.1		0.41		100	500
Pyrene	(mg/kg)	0.39		7.1		1.9		0.93		2.4		0.73		100	500

(a) 932112-SS-Dup-01 collected at 932112-SS-16 (0-2")

TABLE 4-1C DETECTED SEMIVOLATILE ORGANIC COMPOUNDS SURFACE SOIL/FILL ANALYTICAL DATA

Parameter List USEPA Method 8270C	Sample ID	932112-SS-Rinsate-01[(b)]		6 NYCRR Part 375 Soil Cleanup Objectives - Unrestricted Use (mg/kg)	6 NYCRR Part 375 Soil Cleanup Objectives - Restricted Use - Commercial (mg/kg)
	Lab ID	AC51679-021			
	Sample Type	QA/QC			
	Sample Date	5/12/2010			
1,1'-Biphenyl	(µg/L)	(<2)	U	---	---
2-Methylnaphthalene	(µg/L)	(<2)	U	---	---
Acenaphthene	(µg/L)	(<2)	U	20	500
Acenaphthylene	(µg/L)	(<2)	U	100	500
Acetophenone	(µg/L)	(<2)	U	---	---
Anthracene	(µg/L)	(<2)	U	100	500
Benzo[a]anthracene	(µg/L)	(<2)	U	1	5.6
Benzo[a]pyrene	(µg/L)	(<2)	U	1	1
Benzo[b]fluoranthene	(µg/L)	(<2)	U	1	5.6
Benzo[g,h,i]perylene	(µg/L)	(<2)	U	100	500
Benzo[k]fluoranthene	(µg/L)	(<2)	U	0.8	56
bis(2-Ethylhexyl)phthalate	(µg/L)	(<2)	U	---	---
Carbazole	(µg/L)	(<2)	U	---	---
Chrysene	(µg/L)	(<2)	U	1	56
Dibenzo[a,h]anthracene	(µg/L)	(<2)	U	0.33	0.56
Dibenzofuran	(µg/L)	(<2)	U	7	350
Di-n-butylphthalate	(µg/L)	(<2)	U	---	---
Fluoranthene	(µg/L)	(<2)	U	100	500
Fluorene	(µg/L)	(<2)	U	30	500
Indeno[1,2,3-cd]pyrene	(µg/L)	(<2)	U	0.5	5.6
Naphthalene	(µg/L)	(<2)	U	12	500
Phenanthrene	(µg/L)	(<2)	U	100	500
Pyrene	(µg/L)	(<2)	U	100	500

(b) Rinsate blanks are aqueous samples, units are in µg/L.

TABLE 4-1D DETECTED PESTICIDES SURFACE SOIL/FILL ANALYTICAL DATA

Parameter List USEPA Method 8081A	Sample ID	932112-SS-07 (0-2")		932112-SS-08 (0-2")		932112-SS-09 (0-2")		932112-SS-10 (0-2")		932112-SS-11 (0-2")		932112-SS-12 (0-2")		6 NYCRR Part 375 Soil Cleanup Objectives - Unrestricted Use (mg/kg)	6 NYCRR Part 375 Soil Cleanup Objectives - Restricted Use - Commercial (mg/kg)
	Lab ID	AC51679-011		AC51679-014		AC51679-013		AC51679-020		AC51679-019		AC51679-015			
	Sample Type	Fill/Ash		Fill/Ash		Fill/Ash		Fill/Ash		Fill/Ash		Fill/Ash			
	Sample Date	5/12/2010		5/12/2010		5/12/2010		5/12/2010		5/12/2010		5/12/2010			
Chlordane	(mg/kg)	(<0.01)	UJ	0.059	J	(<0.01)	UJ	(<0.01)	UJ	(<0.02)	UJ	(<0.01)	UJ	---	---
Dieldrin	(mg/kg)	(<0.0011)	U	(<0.0013)	U	(<0.0013)	U	(<0.0014)	U	**0.0062**	**J**	(<0.0014)	U	0.005	1.4
p,p'-DDE	(mg/kg)	(<0.0028)	U	**0.005**	**J**	**0.0093**	**J**	(<0.0035)	U	**0.028**		**0.015**		0.0033	62
p,p'-DDT	(mg/kg)	(<0.0028)	UJ	**0.0064**	**J**	**0.009**	**J**	(<0.0035)	UJ	(<0.0064)	UJ	**0.0099**	**J**	0.0033	47

Parameter List USEPA Method 8081A	Sample ID	932112-SS-13 (0-2")		932112-SS-14 (0-2")		932112-SS-15 (0-2")		932112-SS-16 (0-2")		932112-SS-17 (0-2")		932112-SS-Dup-01(a)		6 NYCRR Part 375 Soil Cleanup Objectives - Unrestricted Use (mg/kg)	6 NYCRR Part 375 Soil Cleanup Objectives - Restricted Use - Commercial (mg/kg)
	Lab ID	AC51679-016		AC51679-017		AC51679-018		AC51679-007		AC51679-008		AC51679-022			
	Sample Type	Fill/Ash		Fill/Ash		Fill/Ash		Fill/Ash		Fill/Ash		QA/QC			
	Sample Date	5/13/2010		5/13/2010		5/13/2010		5/13/2010		5/13/2010		5/13/2010			
Chlordane	(mg/kg)	(<0.01)	UJ	(<0.01)	UJ	(<0.01)	UJ	(<0.01)	UJ	(<0.01)	UJ	(<0.01)	UJ	---	---
Dieldrin	(mg/kg)	(<0.0016)	U	(<0.0015)	U	(<0.0014)	U	(<0.0014)	U	(<0.0015)	U	(<0.0014)	U	0.005	1.4
p,p'-DDE	(mg/kg)	(<0.004)	U	**0.0043**		**0.0088**		(<0.0036)	U	(<0.0037)	U	(<0.0035)	U	0.0033	62
p,p'-DDT	(mg/kg)	(<0.004)	UJ	**0.0054**	**J**	**0.017**	**J**	(<0.0036)	UJ	(<0.0037)	UJ	(<0.0035)	UJ	0.0033	47

Parameter List USEPA Method 8081A	Sample ID	932112-SS-Rinsate-01(b)		6 NYCRR Part 375 Soil Cleanup Objectives - Unrestricted Use (mg/kg)	6 NYCRR Part 375 Soil Cleanup Objectives - Restricted Use - Commercial (mg/kg)
	Lab ID	AC51679-021			
	Sample Type	QA/QC			
	Sample Date	5/12/2010			
Chlordane	(mg/kg)	(<0.1)	UJ	---	---
Dieldrin	(mg/kg)	(<0.01)	U	0.005	1.4
p,p'-DDE	(mg/kg)	(<0.01)	U	0.0033	62
p,p'-DDT	(mg/kg)	(<0.01)	UJ	0.0033	47

(a) 932112-SS-Dup-01 collected at 932112-SS-16 (0-2")

(b) Rinsate blanks are aqueous samples, units are in µg/L.

NOTE:

USEPA = United States Enivronmental Protection Agency
NYCRR = New York Code of Rules and Regulation
mg/kg = milligrams per kilogram.
UJ = The compound analyzed for, but not detected. The sample quantitation limit is an estimated quantity due to variance from quality control limits.
J = The associated numerical value is an estimated quantity.
--- = No Standard.
U = Non-detect, detection below the method detection limit
DDE = Dichlorodiphenyldichloroethylene
DDT = Dichlorodiphenyltrichloroethane

Data provided by Hampton-Clarke Veritech. Only analytes that were detected in at least one sample are shown. Data validation completed by Chemworld Environmental, Inc.

Concentration values in **bold** indicate the concentration was above the 6 NYCRR Part 375 Soil Cleanup Objectives - Unrestricted Use.

Concentration values in **bold and highlighted** indicate the concentration was above the 6 NYCRR Part 375 Soil Cleanup Objectives - Restricted Use (Commercial).

TABLE 4-1E DETECTED POLYCHLORINATED BIPHENYLS SURFACE SOIL/FILL ANALYTICAL DATA

Parameter List USEPA Method 8082	Sample ID	932112-SS-07 (0-2")		932112-SS-08 (0-2")		932112-SS-09 (0-2")		932112-SS-10 (0-2")		932112-SS-11 (0-2")		932112-SS-12 (0-2")		6 NYCRR Part 375 Soil Cleanup Objectives - Unrestricted Use (mg/kg)	6 NYCRR Part 375 Soil Cleanup Objectives - Restricted Use - Commercial (mg/kg)
	Lab ID	AC51679-011		AC51679-014		AC51679-013		AC51679-020		AC51679-019		AC51679-015			
	Sample Type	Fill/Ash		Fill/Ash		Fill/Ash		Fill/Ash		Fill/Ash		Fill/Ash			
	Sample Date	5/12/2010		5/12/2010		5/12/2010		5/12/2010		5/12/2010		5/12/2010			
Aroclor-1254	(mg/kg)	(<0.02)	U	0.27		(<0.03)	U	(<0.03)	U	(<0.03)	U	0.33		---	---
Aroclor (Total)	(mg/kg)	(<0.02)	U	**0.27**		(<0.03)	U	(<0.03)	U	(<0.03)	U	**0.33**		0.1	1

Parameter List USEPA Method 8082	Sample ID	932112-SS-13 (0-2")		932112-SS-14 (0-2")		932112-SS-15 (0-2")		932112-SS-16 (0-2")		932112-SS-17 (0-2")		932112-SS-Dup-01(a)		6 NYCRR Part 375 Soil Cleanup Objectives - Unrestricted Use (mg/kg)	6 NYCRR Part 375 Soil Cleanup Objectives - Restricted Use - Commercial (mg/kg)
	Lab ID	AC51679-016		AC51679-017		AC51679-018		AC51679-007		AC51679-008		AC51679-022			
	Sample Type	Fill/Ash		Fill/Ash		Fill/Ash		Fill/Ash		Fill/Ash		Fill/Ash			
	Sample Date	5/13/2010		5/13/2010		5/13/2010		5/13/2010		5/13/2010		5/13/2010			
Aroclor-1254	(mg/kg)	(<0.04)	U	(<0.03)	U	(<0.03)	U	(<0.03)	U	(<0.03)	U	(<0.03)	U	---	---
Aroclor (Total)	(mg/kg)	(<0.04)	U	(<0.03)	U	(<0.03)	U	(<0.03)	U	(<0.03)	U	(<0.03)	U	0.1	1

Parameter List USEPA Method 8082	Sample ID	932112-SS-Rinsate-01(b)		6 NYCRR Part 375 Soil Cleanup Objectives - Unrestricted Use (mg/kg)	6 NYCRR Part 375 Soil Cleanup Objectives - Restricted Use - Commercial (mg/kg)
	Lab ID	AC51679-021			
	Sample Type	QA/QC			
	Sample Date	5/12/2010			
Aroclor-1254	(mg/kg)	(<0.25)	U	---	---
Aroclor (Total)	(mg/kg)	(<0.25)	U	0.1	1

(a) 932112-SS-Dup-01 collected at 932112-SS-16 (0-2")

(b) Rinsate blanks are aqueous samples, units are in µg/L.

NOTE:
USEPA = United States Enivronmental Protection Agency
NYCRR = New York Code of Rules and Regulation
mg/kg = milligrams per kilogram.
U = Non-detect, detection below the method detection limit
--- = No Standard.
QA/QC = Quality Assurance/Quality Control
Data provided by Hampton-Clarke Veritech. Only analytes that were detected in at least one sample are shown. Data validation completed by Chemworld Environmental, Inc.
Concentration values in **bold** indicate the concentration was above the 6 NYCRR Part 375 Soil Cleanup Objectives - Unrestricted Use.
Concentration values in **bold and highlighted** indicate the concentration was above the 6 NYCRR Part 375 Soil Cleanup Objectives - Restricted Use (Commercial).

TABLE 4-2A DETECTED TARGET ANALYTE LIST METALS TEST PIT ANALYTICAL DATA

Parameter List USEPA Method 6010B/7471A	Sample ID	932112-TP01-K13(0-6")D		932112-TP02-M12(2-3')C		932112-TP02A-M12(3')C		932112-TP03-L12(2-2.5')C		932112-TP04-K12(1')C		932112-TP05-K11(1-6')C		6 NYCRR Part 375 Soil Cleanup Objectives - Unrestricted Use (mg/kg)	6 NYCRR Part 375 Soil Cleanup Objectives - Restricted Use - Commercial (mg/kg)
	Lab ID	AC51455-001		AC51455-002		AC51455-003		AC51455-004		AC51562-008		AC51455-006			
	Sample Type	Subsurface Soil (Fill)		Subsurface Soil (Fill)		Subsurface Soil (Fill)		Subsurface Soil (Fill)		Subsurface Soil (Fill)		Subsurface Soil (Fill)			
	Sample Date	5/3/2010		5/3/2010		5/3/2010		5/3/2010		5/3/2010		5/3/2010			
Aluminum	(mg/kg)	99,000		8,900		8,100		12,000		8,700		6,600		---	---
Antimony	(mg/kg)	240	J	(<2.7)	U	(<2.8)	U	(<2.6)	U	6.4		(<3.1)	U	---	---
Arsenic	(mg/kg)	**22**		9.8		**52**		**14**		**18**		**14**		13	16
Barium	(mg/kg)	**1,300**		150		**530**		220		**400**		**520**		350	400
Beryllium	(mg/kg)	(<0.88)	U	(<0.8)	U	(<0.83)	U	(<0.77)	U	1.7	J	1.3		7.2	590
Cadmium	(mg/kg)	**18**	**J**	1.6	J	**4.7**	**J**	**31**	**J**	**24**		2.4	J	2.5	9.3
Calcium	(mg/kg)	9,900		23,000		11,000		34,000		28,000	J	16,000		---	---
Chromium	(mg/kg)	**580**	**J**	19	J	**38**	**J**	21	J	**36**		25	J	30	1,500
Cobalt	(mg/kg)	23		6.8		11		9.1		11	J	22		---	---
Copper	(mg/kg)	**45,000**		**59**		**450**		**270**		**1,700**		**16,000**		50	270
Iron	(mg/kg)	130,000	J	24,000	J	41,000	J	32,000	J	37,000		17,000	J	---	---
Lead	(mg/kg)	**23,000**	**J**	**220**	**J**	**1,500**	**J**	**1,400**	**J**	**6,900**		**780**	**J**	63	1,000
Magnesium	(mg/kg)	3,900		12,000		2,500		14,000		10,000		3,000		---	---
Manganese	(mg/kg)	1,200		1,200		480		1,100		1,200		350		1,600	10,000
Mercury	(mg/kg)	**6.9**	**J**	**0.23**	**J**	**3.3**	**J**	**0.61**	**J**	**1.4**	**J**	**1.7**	**J**	0.18	2.8
Nickel	(mg/kg)	**400**		23		**44**		25		**49**		**160**		30	310
Potassium	(mg/kg)	(<740)	U	1,600		1,300		1,700		1,900		(<770)	U	---	---
Selenium	(mg/kg)	**6.9**		(<2.4)	U	(<2.5)	U	(<2.3)	U	**4.5**		(<2.8)	U	3.9	1,500
Silver	(mg/kg)	**130**	**J**	(<2)	U	**2.4**	**J**	(<1.9)	U	(<2)	U	**2.8**	**J**	2	1,500
Sodium	(mg/kg)	(<370)	U	(<330)	U	360		(<320)	U	(<330)	U	(<380)	U	---	---
Thallium	(mg/kg)	(<1.8)	U	(<1.6)	U	(<1.7)	U	(<1.5)	U	(<1.6)	U	(<1.8)	U	---	---
Vanadium	(mg/kg)	28		27		33		32		25		24		---	---
Zinc	(mg/kg)	**8,800**		**670**		**1,600**		**940**		**2,800**		**1,200**		109	10,000

NOTE:
USEPA = United States Enivronmental Protection Agency
NYCRR = New York Code of Rules and Regulation
mg/kg = milligrams per kilogram
--- = No Standard.
J = The assocaited numerical value is an estimated quantity
U = Non-detect, detection below the method detection limit
A sample ID identified with a "C" denotes that the sample was collected as a composite sample.
A sample ID identified with a "D" denotes that the sample was collected at a discrete sample interval.
Data provided by Hampton-Clarke Veritech. Only analytes that were detected in at least one sample are shown. Data validation completed by Chemworld Environmental, Inc.
Concentration values in **bold** indicate the concentration was above the 6 NYCRR Part 375 Soil Cleanup Objectives - Unrestricted Use.
Concentration values in **bold and highlighted** indicate the concentration was above the 6 NYCRR Part 375 Soil Cleanup Objectives - Restricted Use (Commercial)

TABLE 4-2A DETECTED TARGET ANALYTE LIST METALS TEST PIT ANALYTICAL DATA

Parameter List USEPA Method 6010B/7471A	Sample ID	932112-TP05A-K11(2-5')C		932112-TP06-L11(1-5')C		932112-TP07-L10(1-5')C		932112-TP08-K10(3-5')C		932112-TP09(2-4)D		932112-TP10-K9(1-3.5')C		6 NYCRR Part 375 Soil Cleanup Objectives - Unrestricted Use (mg/kg)	6 NYCRR Part 375 Soil Cleanup Objectives - Restricted Use - Commercial (mg/kg)
	Lab ID	AC51455-009		AC51455-010		AC51455-011		AC51455-013		AC51455-014		AC51562-009			
	Sample Type	Subsurface Soil (Fill)		Subsurface Soil (Fill)		Subsurface Soil (Fill)		Subsurface Soil (Fill)		Subsurface Soil (Fill)		Subsurface Soil (Fill)			
	Sample Date	5/3/2010		5/3/2010		5/3/2010		5/3/2010		5/3/2010		5/3/2010			
Aluminum	(mg/kg)	6,800		8,200		5,400		7,200		7,200		5,400		---	---
Antimony	(mg/kg)	(<2.6)	U	(<2.7)	U	(<2.4)	U	(<2.4)	U	(<2.7)	U	8.6		---	---
Arsenic	(mg/kg)	**39**		**22**		12		**16**		**22**		12		13	16
Barium	(mg/kg)	**1,100**		**520**		**450**		**580**		**1,100**		320		350	400
Beryllium	(mg/kg)	(<0.77)	U	(<0.8)	U	(<0.71)	U	(<0.72)	U	(<0.82)	U	(<0.71)	U	7.2	590
Cadmium	(mg/kg)	**6.5**	**J**	**3.2**	**J**	2.2	J	**5.1**	**J**	**6.7**	**J**	**3.6**		2.5	9.3
Calcium	(mg/kg)	16,000		17,000		88,000		45,000		17,000		71,000	J	---	---
Chromium	(mg/kg)	**66**	**J**	**39**	**J**	19	J	**45**	**J**	**84**	**J**	**37**		30	1,500
Cobalt	(mg/kg)	12		7.2		4.1		7.7		15		6.4	J	---	---
Copper	(mg/kg)	**870**		**8,500**		**450**		**760**		**1,100**		**930**		50	270
Iron	(mg/kg)	83,000	J	73,000	J	22,000	J	31,000	J	49,000	J	22,000		---	---
Lead	(mg/kg)	**2,200**	**J**	**2,500**	**J**	**1,800**	**J**	**1,600**	**J**	**4,200**	**J**	**3,700**		63	1,000
Magnesium	(mg/kg)	3,200		1,400		41,000		13,000		3,600		17,000		---	---
Manganese	(mg/kg)	630		1,100		570		720		660		550		1,600	10,000
Mercury	(mg/kg)	**2**	**J**	**0.4**	**J**	**0.31**	**J**	**0.52**	**J**	**1.0**	**J**	**0.39**	**J**	0.18	2.8
Nickel	(mg/kg)	**55**		**36**		**38**		**44**		**53**		**47**		30	310
Potassium	(mg/kg)	770		1,300		690		1,300		1,500		1,200		---	---
Selenium	(mg/kg)	**7.2**		3.2		(<2.1)	U	(<2.2)	U	**5.8**		(<2.1)	U	3.9	1,500
Silver	(mg/kg)	(<1.9)	U	**2.3**	**J**	(<1.8)	UJ	**2.8**	**J**	**3.3**	**J**	**4.5**	**J**	2	1,500
Sodium	(mg/kg)	(<320)	U	(<330)	U	(<300)	U	(<300)	U	510		(<300)	U	---	---
Thallium	(mg/kg)	(<1.5)	U	(<1.6)	U	(<1.4)	U	(<1.4)	U	(<1.6)	U	(<1.4)	U	---	---
Vanadium	(mg/kg)	28		36		19		27		31		18		---	---
Zinc	(mg/kg)	**2,900**		**2,000**		**4,600**		**1,500**		**6,900**		**1,000**		109	10,000

TABLE 4-2A DETECTED TARGET ANALYTE LIST METALS TEST PIT ANALYTICAL DATA

Parameter List USEPA Method 6010B/7471A	Sample ID	932112-TP11-L9(1-3')C		932112-TP12-L8(1-4')C		932112-TP13-D12(4-10')C		932112-TP14-E13(8-13')C		932112-TP15-F13(8-12')C		932112-TP16-G13(6-12')C		6 NYCRR Part 375 Soil Cleanup Objectives - Unrestricted Use (mg/kg)	6 NYCRR Part 375 Soil Cleanup Objectives - Restricted Use - Commercial (mg/kg)
	Lab ID	AC51562-013		AC51455-018		AC51455-019		AC51455-020		AC51455-021		AC51455-023			
	Sample Type	Subsurface Soil (Fill)		Subsurface Soil (Fill)		Subsurface Soil (Fill)		Subsurface Soil (Fill)		Subsurface Soil (Fill)		Subsurface Soil (Fill)			
	Sample Date	5/4/2010		5/4/2010		5/4/2010		5/4/2010		5/4/2010		5/4/2010			
Aluminum	(mg/kg)	5,900		4,500		5,400		11,000		3,200		14,000		---	---
Antimony	(mg/kg)	(<2.6)	U	(<2.3)	U	4.5		140	J	45	J	13	J	---	---
Arsenic	(mg/kg)	7.4		9.5		**15**		**46**		**32**		**33**		13	16
Barium	(mg/kg)	100		130		**910**		**6,500**		**1,800**		**3,000**		350	400
Beryllium	(mg/kg)	(<0.77)	U	(<0.7)	U	(<0.85)	U	(<0.91)	U	(<0.73)	U	(<0.79)	U	7.2	590
Cadmium	(mg/kg)	1.2		1.9	J	**4.3**	**J**	**27**	**J**	**6.3**	**J**	**130**	**J**	2.5	9.3
Calcium	(mg/kg)	83,000	J	90,000		55,000		30,000		20,000		31,000		---	---
Chromium	(mg/kg)	20		15	J	**35**	**J**	**130**	**J**	**110**	**J**	**330**	**J**	30	1,500
Cobalt	(mg/kg)	5.2	J	4.7		7.4		14		16		20		---	---
Copper	(mg/kg)	**180**		**370**		**540**		**5,400**		**650**		**8,100**		50	270
Iron	(mg/kg)	17,000		16,000	J	200,000	J	210,000	J	210,000	J	250,000	J	---	---
Lead	(mg/kg)	**300**		**710**	**J**	**1,000**	**J**	**15,000**	**J**	**1,600**	**J**	**23,000**	**J**	63	1,000
Magnesium	(mg/kg)	21,000		28,000		13,000		3,400		6,400		6,000		---	---
Manganese	(mg/kg)	470		710		1,300		1,400		**2,400**		1,400		1,600	10,000
Mercury	(mg/kg)	**0.26**	**J**	**0.31**	**J**	**0.77**	**J**	**20**	**J**	**0.38**	**J**	**0.52**	**J**	0.18	2.8
Nickel	(mg/kg)	18		22		**32**		**98**		**100**		**520**		30	310
Potassium	(mg/kg)	1,100		1,100		790		860		750		1,000		---	---
Selenium	(mg/kg)	(<2.3)	U	(<2.1)	U	(<2.5)	U	**5.5**		3.1		**6.9**		3.9	1,500
Silver	(mg/kg)	(<1.9)	U	(<1.7)	U	(<2.1)	U	**13**	**J**	**4.4**	**J**	**110**	**J**	2	1,500
Sodium	(mg/kg)	(<320)	U	(<290)	U	(<350)	U	440		410		990		---	---
Thallium	(mg/kg)	(<1.5)	U	(<1.4)	U	(<1.7)	U	(<1.8)	U	(<1.5)	U	(<1.6)	U	---	---
Vanadium	(mg/kg)	19		18		22		18		18		33		---	---
Zinc	(mg/kg)	**540**		**540**		**2,000**		**22,000**		**2,900**		**18,000**		109	10,000

TABLE 4-2A DETECTED TARGET ANALYTE LIST METALS TEST PIT ANALYTICAL DATA

Parameter List USEPA Method 6010B/7471A	Sample ID	932112-TP17-H12(3-4')C		932112-TP18-G12(1-12')C		932112-TP19-E12(1-12')C		932112-TP20-F11(1-12')C		932112-TP21-H11(3-6')C		932112-TP22-E11(5-10')C		6 NYCRR Part 375 Soil Cleanup Objectives - Unrestricted Use (mg/kg)	6 NYCRR Part 375 Soil Cleanup Objectives - Restricted Use - Commercial (mg/kg)
	Lab ID	AC51491-001		AC51491-002		AC51491-003		AC51491-004		AC51491-006		AC51491-007			
	Sample Type	Subsurface Soil (Fill)		Subsurface Soil (Fill)		Subsurface Soil (Fill)		Subsurface Soil (Fill)		Subsurface Soil (Fill)		Subsurface Soil (Fill)			
	Sample Date	5/5/2010		5/5/2010		5/5/2010		5/5/2010		5/5/2010		5/5/2010			
Aluminum	(mg/kg)	5,000		4,800		9,800		5,400		4,700		4,400		---	---
Antimony	(mg/kg)	23		28		46		34		5.6		11		---	---
Arsenic	(mg/kg)	**28**		**44**		**29**		**41**		**20**		**110**		13	16
Barium	(mg/kg)	**1,300**		**1,400**		**1,300**		**550**		**1,000**		**1,000**		350	400
Beryllium	(mg/kg)	(<0.71)	U	(<0.79)	U	1.5		(<0.79)	U	1.3		1		7.2	590
Cadmium	(mg/kg)	**8.9**		**22**		**42**		**6.1**		**4.1**		**6.1**		2.5	9.3
Calcium	(mg/kg)	36,000		47,000		28,000		22,000		38,000		17,000		---	---
Chromium	(mg/kg)	**65**		**52**		**67**		**1,100**		26		**41**		30	1,500
Cobalt	(mg/kg)	12		13		13		13		5.3		7.3		---	---
Copper	(mg/kg)	**1,700**		**7,300**		**3,500**		**4,300**		**940**		**890**		50	270
Iron	(mg/kg)	49,000		100,000		57,000		140,000		26,000		65,000		---	---
Lead	(mg/kg)	**12,000**		**18,000**		**7,200**		**4,900**		**3,700**		**3,000**		63	1,000
Magnesium	(mg/kg)	8,100		9,100		3,700		1,700		8,400		2,800		---	---
Manganese	(mg/kg)	610		1,000		620		1,100		470		460		1,600	10,000
Mercury	(mg/kg)	**1.3**		**0.39**		**1.6**		**6.7**		**1.5**		**1.9**		0.18	2.8
Nickel	(mg/kg)	**130**		**390**		**180**		**140**		**75**		**51**		30	310
Potassium	(mg/kg)	820		880		1,800		890		630		1,700		---	---
Selenium	(mg/kg)	**4.5**		(<2.4)	U	(<2.5)	U	(<2.4)	U	(<2.2)	U	(<2.4)	U	3.9	1,500
Silver	(mg/kg)	**10**		**2.5**		**20**		(<2)	U	2		(<2)	U	2	1,500
Sodium	(mg/kg)	(<300)	U	460		1,400		(<330)	U	(<300)	U	1,000		---	---
Thallium	(mg/kg)	(<1.4)	U	(<1.6)	U	(<1.7)	U	(<1.6)	U	(<1.4)	U	(<1.6)	U	---	---
Vanadium	(mg/kg)	26		27		34		27		20		25		---	---
Zinc	(mg/kg)	**4,600**		**13,000**		**5,800**		**2,200**		**3,300**		**1,700**		109	10,000

TABLE 4-2A DETECTED TARGET ANALYTE LIST METALS TEST PIT ANALYTICAL DATA

Parameter List USEPA Method 6010B/7471A	Sample ID	932112-TP23-G10(5-10')C		932112-TP24-I10(5-10')C		932112-TP25-I9 (2-6')C		932112-TP26 (3-7')C		932112-TP27 (1-2')C		932112-TP28-E2(1-2')C		6 NYCRR Part 375 Soil Cleanup Objectives - Unrestricted Use (mg/kg)	6 NYCRR Part 375 Soil Cleanup Objectives - Restricted Use - Commercial (mg/kg)
	Lab ID	AC51491-008		AC51491-009		AC51491-011		AC51491-012		AC51491-013		AC51491-014			
	Sample Type	Subsurface Soil (Fill)		Subsurface Soil (Fill)		Subsurface Soil (Fill)		Subsurface Soil (Fill)		Subsurface Soil (Fill)		Subsurface Soil (Fill)			
	Sample Date	5/5/2010		5/5/2010		5/5/2010		5/6/2010		5/6/2010		5/6/2010			
Aluminum	(mg/kg)	8,300		3,400		11,000		5,800		6,800		5,900		---	---
Antimony	(mg/kg)	15		(<2.6)	U	93		(<2.6)	U	(<2.4)	U	(<2.8)	U	---	---
Arsenic	(mg/kg)	**23**		**48**		**37**		**14**		11		**25**		13	16
Barium	(mg/kg)	310		**540**		**2,400**		220		85		200		350	400
Beryllium	(mg/kg)	1.1		(<0.78)	U	(<0.81)	U	1.2		0.8		1.5		7.2	590
Cadmium	(mg/kg)	**6.6**		**12**		**19**		**3.1**		1.2		(<0.85)	U	2.5	9.3
Calcium	(mg/kg)	61,000		22,000		36,000		160,000		88,000		7,700		---	---
Chromium	(mg/kg)	28		27		**59**		**37**		9.7		15		30	1,500
Cobalt	(mg/kg)	11		14		14		8.3		6.2		7.4		---	---
Copper	(mg/kg)	**1,300**		**450**		**390**		**84**		30		**81**		50	270
Iron	(mg/kg)	44,000		230,000		190,000		67,000		17,000		19,000		---	---
Lead	(mg/kg)	**1,700**		**1,400**		**5,900**		**370**		**77**		**280**		63	1,000
Magnesium	(mg/kg)	14,000		3,200		7,800		24,000		19,000		820		---	---
Manganese	(mg/kg)	890		1,500		**1,800**		**2,100**		**2,400**		190		1,600	10,000
Mercury	(mg/kg)	**6.1**		**1.6**		**2.5**		**0.56**		**0.29**		**0.24**		0.18	2.8
Nickel	(mg/kg)	**48**		**54**		**51**		28		15		24		30	310
Potassium	(mg/kg)	1,700		(<650)	U	1,200		1,000		1,000		1,100		---	---
Selenium	(mg/kg)	(<2.3)	U	(<2.3)	U	(<2.4)	U	(<2.3)	U	(<2.1)	U	**7.2**		3.9	1,500
Silver	(mg/kg)	**8.7**		**8.8**		(<2)	U	(<1.9)	U	(<1.8)	U	(<2.1)	U	2	1,500
Sodium	(mg/kg)	(<320)	U	690		570		(<320)	U	(<300)	U	360		---	---
Thallium	(mg/kg)	(<1.5)	U	(<1.6)	U	(<1.6)	U	(<1.5)	U	(<1.4)	U	(<1.7)	U	---	---
Vanadium	(mg/kg)	29		28		43		20		19		30		---	---
Zinc	(mg/kg)	**1,700**		**2,500**		**8,300**		**1,100**		**290**		**270**		109	10,000

TABLE 4-2A DETECTED TARGET ANALYTE LIST METALS TEST PIT ANALYTICAL DATA

Parameter List USEPA Method 6010B/7471A	Sample ID	932112-TP29-G2(1-7')C		932112-TP30-I2(8-12')C		932112-TP31-H1(2-6')C		932112-TP32-F1(4-10')C		932112-TP33-D1(4-10')C		932112-TP34-B1(2-5')C		6 NYCRR Part 375 Soil Cleanup Objectives - Unrestricted Use (mg/kg)	6 NYCRR Part 375 Soil Cleanup Objectives - Restricted Use - Commercial (mg/kg)
	Lab ID	AC51491-015		AC51491-019		AC51491-020		AC51491-021		AC51562-001		AC51562-002			
	Sample Type	Subsurface Soil (Fill)		Subsurface Soil (Fill)		Subsurface Soil (Fill)		Subsurface Soil (Fill)		Subsurface Soil (Fill)		Subsurface Soil (Fill)			
	Sample Date	5/6/2010		5/6/2010		5/6/2010		5/6/2010		5/7/2010		5/7/2010			
Aluminum	(mg/kg)	8,300		6,200		4,300		9,100		8,600		18,000		---	---
Antimony	(mg/kg)	17		2.7		130		6.1		7.2		14		---	---
Arsenic	(mg/kg)	**25**		9.6		12		**15**		**14**		**20**		13	16
Barium	(mg/kg)	**580**		170		200		**1,000**		**630**	**J**	**1,100**		350	400
Beryllium	(mg/kg)	1.3		1.2		0.76		1.8		1		(<0.79)	U	7.2	590
Cadmium	(mg/kg)	**5.1**		0.86		**3.4**		2.1		**3.6**		**3.5**		2.5	9.3
Calcium	(mg/kg)	22,000		34,000		78,000		22,000		33,000	J	88,000	J	---	---
Chromium	(mg/kg)	**57**		14		13		26		**35**		**50**		30	1,500
Cobalt	(mg/kg)	12		5.9		4.6		8.3		11		11	J	---	---
Copper	(mg/kg)	**590**		**220**		**190**		**240**		**450**		**550**		50	270
Iron	(mg/kg)	51,000		20,000		21,000		29,000		47,000		37,000		---	---
Lead	(mg/kg)	**3,100**		**220**		**3,200**		**990**		**2,500**		**1,200**		63	1,000
Magnesium	(mg/kg)	6,700		8,000		34,000		3,500		5,100		13,000		---	---
Manganese	(mg/kg)	590		480		610		450		670		960		1,600	10,000
Mercury	(mg/kg)	**0.61**		**6.5**		**0.62**		**0.97**		**1.3**	**J**	**1.1**	**J**	0.18	2.8
Nickel	(mg/kg)	**73**		25		22		**38**		**38**		**55**		30	310
Potassium	(mg/kg)	1,200		830		850		1,300		1,300		4,400		---	---
Selenium	(mg/kg)	(<2.4)	U	(<2.1)	U	(<2.1)	U	2.6		**4.7**		(<2.4)	U	3.9	1,500
Silver	(mg/kg)	**4.7**		(<1.7)	U	**5.2**		**2.2**		(<1.9)	U	**5.3**		2	1,500
Sodium	(mg/kg)	490	V	(<290)	U	310		890		460		4,000		---	---
Thallium	(mg/kg)	(<1.6)	U	(<1.4)	U	(<1.4)	U	(<1.6)	U	(<1.5)	U	(<1.6)	U	---	---
Vanadium	(mg/kg)	27		18		16		30		35		31		---	---
Zinc	(mg/kg)	**2,000**		**330**		**510**		**1,600**		**1,100**		**1,900**		109	10,000

TABLE 4-2A DETECTED TARGET ANALYTE LIST METALS TEST PIT ANALYTICAL DATA

Parameter List USEPA Method 6010B/7471A	Sample ID	932112-TP35-A1(1-5')C		932112-TP36-C3(2-10')C		932112-TP37-C1(2-9')C		932112-TP-Dup-01[(a)]		932112-TP-Dup-02[(a)]		932112-TP-Rinsate-01[(b)]		6 NYCRR Part 375 Soil Cleanup Objectives - Unrestricted Use (mg/kg)	6 NYCRR Part 375 Soil Cleanup Objectives - Restricted Use - Commercial (mg/kg)
	Lab ID	AC51562-003		AC51562-004		AC51562-007		AC51562-012		AC51455-022		AC51455-015			
	Sample Type	Subsurface Soil (Fill)		Subsurface Soil (Fill)		Subsurface Soil (Fill)		QA/QC		QA/QC		QA/QC			
	Sample Date	5/7/2010		5/7/2010		5/7/2010		5/7/2010		5/4/2010		5/3/2010			
Aluminum	(mg/kg)	9,900		6,600		19,000		8,500		6,500		(<2,000)	U	---	---
Antimony	(mg/kg)	(<2.4)	U	8.6		9.1		65		7.0	J	(<20)	U	---	---
Arsenic	(mg/kg)	12		**16**		13		13		12		(<20)	U	13	16
Barium	(mg/kg)	340		**430**		**1,200**		**500**		**1,200**		(<100)	U	350	400
Beryllium	(mg/kg)	0.94	J	0.96	J	0.85	J	1.8	J	(<0.73)	U	(<6)	U	7.2	590
Cadmium	(mg/kg)	1.9		**2.8**		**2.7**		2.5		**3.4**	**J**	(<6)	U	2.5	9.3
Calcium	(mg/kg)	71,000	J	36,000	J	39,000	J	35,000	J	64,000		(<10,000)	U	---	---
Chromium	(mg/kg)	29		22		**46**		**47**		**33**	**J**	(<50)	U	30	1,500
Cobalt	(mg/kg)	6.5	J	7.8	J	20	J	8.9	J	6.8		(<25)	U	---	---
Copper	(mg/kg)	**310**		**320**		**510**		**970**		**450**		(<50)	U	50	270
Iron	(mg/kg)	19,000		31,000		30,000		40,000		36,000	J	(<2,000)	U	---	---
Lead	(mg/kg)	**1,100**		**900**		**1,100**		**3,700**		**1,100**	**J**	(<50)	U	63	1,000
Magnesium	(mg/kg)	9,300		8,300		8,300		7,100		9,000		(<5,000)	U	---	---
Manganese	(mg/kg)	590		580		660		820		770		(<100)	U	1,600	10,000
Mercury	(mg/kg)	**0.53**	**J**	**1.7**	**J**	**2.5**	**J**	**2.1**	**J**	**0.72**	**J**	(<0.5)	U	0.18	2.8
Nickel	(mg/kg)	24		**35**		**60**		**33**		**55**		(<50)	U	30	310
Potassium	(mg/kg)	1,200		1,700		5,300		1,400		880		(<5,000)	U	---	---
Selenium	(mg/kg)	(<2.1)	U	4.5		3.4		**4.9**		(<2.2)	U	(<18)	U	3.9	1,500
Silver	(mg/kg)	**3.1**	**J**	**16**	**J**	**3.2**	**J**	**2.4**	**J**	(<1.8)	U	(<15)	U	2	1,500
Sodium	(mg/kg)	(<300)	U	500		3,100		460		(<300)	U	(<2,500)	U	---	---
Thallium	(mg/kg)	(<1.4)	U	(<1.5)	U	(<1.5)	U	(<1.6)	U	(<1.5)	U	(<12)	U	---	---
Vanadium	(mg/kg)	26		25		32		28		21		(<100)	U	---	---
Zinc	(mg/kg)	**780**		**850**		**1,700**		**1,200**		**2,500**		(<100)	U	109	10,000

(a) 932112-TP-Dup-01 collected at 932112-TP33-D1 (4-10')C; 932112-TP-Dup-02 collected at 932112-TP13-D12 (4-10')C.
(b) Rinsate blank was an aqueous sample, units are in µg/L.
NOTE: QA/QC = Quality Assurance/Quality Control

TABLE 4-2A DETECTED TARGET ANALYTE LIST METALS TEST PIT ANALYTICAL DATA

Parameter List USEPA Method 6010B/7471A	Sample ID	932112-TP-Rinsate-02(a)		932112-TP-Rinsate-03(a)		932112-TP-Rinsate-04(c)		932112-TP-Rinsate-05(c)		932112-TP-Rinsate-06(c)		6 NYCRR Part 375 Soil Cleanup Objectives - Unrestricted Use (mg/kg)	6 NYCRR Part 375 Soil Cleanup Objectives - Restricted Use - Commercial (mg/kg)
	Lab ID	AC51455-026		AC51491-010		AC51491-022		AC51562-010		AC51562-011			
	Sample Type	QA/QC		QA/QC		QA/QC		QA/QC		QA/QC			
	Sample Date	5/4/2010		5/5/2010		5/6/2010		5/7/2010		5/7/2010			
Aluminum	(µg/L)	(<2,000)	U	(<2,000)	U	(<2,000)	U	(<2,000)	U	(<2,000)	U	---	---
Antimony	(µg/L)	(<20)	U	(<20)	U	(<20)	U	(<20)	U	(<20)	U	---	---
Arsenic	(µg/L)	(<20)	U	(<20)	U	(<20)	U	(<20)	U	(<20)	U	13	16
Barium	(µg/L)	(<100)	U	(<100)	U	(<100)	U	(<100)	U	(<100)	U	350	400
Beryllium	(µg/L)	(<6)	U	(<6)	U	(<6)	U	(<6)	U	(<6)	U	7.2	590
Cadmium	(µg/L)	(<6)	U	(<6)	U	(<6)	U	(<6)	U	(<6)	U	2.5	9.3
Calcium	(µg/L)	(<10,000)	U	(<10,000)	U	(<10,000)	U	(<10,000)	U	(<10,000)	U	---	---
Chromium	(µg/L)	(<50)	U	(<50)	U	(<50)	U	(<50)	U	(<50)	U	30	1,500
Cobalt	(µg/L)	(<25)	U	(<25)	U	(<25)	U	(<25)	U	(<25)	U	---	---
Copper	(µg/L)	53		(<50)	U	(<50)	U	(<50)	U	(<50)	U	50	270
Iron	(µg/L)	(<2,000)	U	(<2,000)	U	(<2,000)	U	(<2,000)	U	(<2,000)	U	---	---
Lead	(µg/L)	(<50)	U	(<50)	U	(<50)	U	(<50)	U	(<50)	U	63	1,000
Magnesium	(µg/L)	(<5,000)	U	(<5,000)	U	(<5,000)	U	(<5,000)	U	(<5,000)	U	---	---
Manganese	(µg/L)	(<100)	U	(<100)	U	(<100)	U	(<100)	U	(<100)	U	1,600	10,000
Mercury	(µg/L)	(<0.5)	U	(<0.5)	U	(<0.5)	U	(<0.5)	U	(<0.5)	U	0.18	2.8
Nickel	(µg/L)	(<50)	U	(<50)	U	(<50)	U	(<50)	U	(<50)	U	30	310
Potassium	(µg/L)	(<5,000)	U	(<5,000)	U	(<5,000)	U	(<5,000)	U	(<5,000)	U	---	---
Selenium	(µg/L)	(<18)	U	(<18)	U	(<18)	U	(<18)	U	(<18)	U	3.9	1,500
Silver	(µg/L)	(<15)	U	(<15)	U	(<15)	U	(<15)	U	(<15)	U	2	1,500
Sodium	(µg/L)	(<2,500)	U	(<2,500)	U	(<2,500)	U	(<2,500)	U	(<2,500)	U	---	---
Thallium	(µg/L)	(<12)	U	(<12)	U	(<12)	U	(<12)	U	(<12)	U	---	---
Vanadium	(µg/L)	(<100)	U	(<100)	U	(<100)	U	(<100)	U	(<100)	U	---	---
Zinc	(µg/L)	(<100)	U	(<100)	U	(<100)	U	(<100)	U	(<100)	U	109	10,000

(c) Rinsate blank was an aqueous sample, units are in µg/L.

TABLE 4-2B DETECTED SEMIVOLATILE ORGANIC COMPOUNDS TEST PIT ANALYTICAL DATA

Parameter List USEPA Method 8270C	Sample ID	932112-TP02-M12(2-3')C		932112-TP04-K12(1')C		932112-TP05-K11(1-6')C		932112-TP07-L10(1-5')C		932112-TP09(2-4)D		6 NYCRR Part 375 Soil Cleanup Objectives - Unrestricted Use (mg/kg)	6 NYCRR Part 375 Soil Cleanup Objectives - Restricted Use - Commercial (mg/kg)
	Lab ID	AC51455-002		AC51562-008		AC51455-006		AC51455-011		AC51455-014			
	Sample Type	Subsurface Soil (Fill)		Subsurface Soil (Fill)		Subsurface Soil (Fill)		Subsurface Soil (Fill)		Subsurface Soil (Fill)			
	Sample Date	5/3/2010		5/3/2010		5/3/2010		5/3/2010		5/3/2010			
2,4-Dimethylphenol	(mg/kg)	(<0.08)	U	(<0.08)	U	(<0.1)	U	(<1.6)	U	(<0.27)	U	---	---
2-Methylnaphthalene	(mg/kg)	(<0.08)	U	0.15		(<0.1)	U	(<1.6)	U	(<0.27)	U	---	---
2-Methylphenol	(mg/kg)	(<0.08)	U	(<0.08)	U	(<0.1)	U	(<1.6)	U	(<0.27)	U	0.33	500
3&4-Methylphenol	(mg/kg)	(<0.08)	U	(<0.08)	U	(<0.1)	U	(<1.6)	U	(<0.27)	U	0.33	500
Acenaphthene	(mg/kg)	(<0.08)	U	0.1		(<0.1)	U	(<1.6)	U	(<0.27)	U	20	500
Acenaphthylene	(mg/kg)	(<0.08)	U	0.2		(<0.1)	U	(<1.6)	U	(<0.27)	U	100	500
Anthracene	(mg/kg)	(<0.08)	U	0.5		(<0.1)	UJ	5		0.36		100	500
Benzo[a]anthracene	(mg/kg)	0.39	J	**1.7**		0.33	J	**20**		**1.7**		1	5.6
Benzo[a]pyrene	(mg/kg)	0.3	J	**1.4**		0.29	J	**15**		**1.5**		1	1
Benzo[b]fluoranthene	(mg/kg)	0.45	J	**2.3**		0.63	J	**21**		**2.3**		1	5.6
Benzo[g,h,i]perylene	(mg/kg)	0.23	J	1		0.42	J	8.5		1.3		100	500
Benzo[k]fluoranthene	(mg/kg)	0.15	J	0.75		0.2	J	**7.5**		**0.84**		0.8	56
bis(2-Ethylhexyl)phthalate	(mg/kg)	(<0.08)	UJ	(<0.08)	U	(<0.1)	UJ	(<1.6)	U	(<0.27)	U	---	---
Carbazole	(mg/kg)	(<0.08)	U	0.28		(<0.1)	UJ	2.7	V	(<0.27)	U	---	---
Chrysene	(mg/kg)	0.37	J	**1.6**		0.42	J	**18**		**2.1**		1	56
Dibenzo[a,h]anthracene	(mg/kg)	(<0.08)	UJ	**0.38**		0.17	J	**4**		**0.54**		0.33	0.56
Dibenzofuran	(mg/kg)	(<0.08)	U	0.15		(<0.1)	U	(<1.6)	U	(<0.27)	U	7	350
Fluoranthene	(mg/kg)	0.59		3.2		0.34		36		2.3		100	500
Fluorene	(mg/kg)	(<0.08)	U	0.24		(<0.1)	U	3.7		(<0.27)	U	30	500
Hexachlorobenzene	(mg/kg)	(<0.08)	U	(<0.08)	U	(<0.1)	UJ	(<1.6)	U	(<0.27)	U	0.33	6
Indeno[1,2,3-cd]pyrene	(mg/kg)	0.26	J	**1.1**		0.38	J	**10**		**1.3**		0.5	5.6
Naphthalene	(mg/kg)	(<0.08)	U	0.22		(<0.1)	U	(<1.6)	U	(<0.27)	U	12	500
Phenanthrene	(mg/kg)	0.18		2.5		0.2	J	35		1.9		100	500
Pyrene	(mg/kg)	0.65	J	3		0.39	J	37		2.8		100	500

NOTE:

USEPA = United States Enivronmental Protection Agency
NYCRR = New York Code of Rules and Regulation
mg/kg = milligrams per kilogram
U = Non-detect, detection below the method detection limit
--- = No Standard.
UJ = The compound analyzed for, but not detected. The sample quantitation limit is an estimated quantity due to variance from quality control limits.
J = The assocaited numerical value is an estimated quantity

A sample ID identified with a "C" denotes that the sample was collected as a composite sample.

A sample ID identified with a "D" denotes that the sample was collected at a discrete sample interval.

Data provided by Hampton-Clarke Veritech. Only analytes that were detected in at least one sample are shown. Data validation completed by Chemworld Environmental, Inc.

Concentration values in **bold** indicate the concentration was above the 6 NYCRR Part 375 Soil Cleanup Objectives - Unrestricted Use.

Concentration values in **bold and highlighted** indicate the concentration was above the 6 NYCRR Part 375 Soil Cleanup Objectives - Restircted Use (Commerical)

TABLE 4-2B DETECTED SEMIVOLATILE ORGANIC COMPOUNDS TEST PIT ANALYTICAL DATA

Parameter List USEPA Method 8270C	Sample ID	932112-TP10-K9(1-3.5')C		932112-TP11-L9(1-3')C		932112-TP13-D12(4-10')C		932112-TP14-E13(8-13')C		932112-TP18-G12(1-12')C		6 NYCRR Part 375 Soil Cleanup Objectives - Unrestricted Use (mg/kg)	6 NYCRR Part 375 Soil Cleanup Objectives - Restricted Use - Commercial (mg/kg)
	Lab ID	AC51562-009		AC51562-013		AC51455-019		AC51455-020		AC51491-002			
	Sample Type	Subsurface Soil (Fill)		Subsurface Soil (Fill)		Subsurface Soil (Fill)		Subsurface Soil (Fill)		Subsurface Soil (Fill)			
	Sample Date	5/4/2010		5/4/2010		5/4/2010		5/4/2010		5/4/2010			
2,4-Dimethylphenol	(mg/kg)	0.12		(<0.08)	U	(<0.1)	U	(<0.3)	U	(<0.08)	U	---	---
2-Methylnaphthalene	(mg/kg)	0.18		(<0.08)	U	(<0.1)	U	(<0.3)	U	(<0.08)	U	---	---
2-Methylphenol	(mg/kg)	0.098		(<0.08)	U	(<0.1)	U	(<0.3)	U	(<0.08)	U	0.33	500
3&4-Methylphenol	(mg/kg)	0.26		(<0.08)	U	(<0.1)	U	(<0.3)	U	(<0.08)	U	0.33	500
Acenaphthene	(mg/kg)	0.16		(<0.08)	U	(<0.1)	U	(<0.3)	U	(<0.08)	U	20	500
Acenaphthylene	(mg/kg)	0.49		0.1		(<0.1)	U	(<0.3)	U	(<0.08)	U	100	500
Anthracene	(mg/kg)	0.78		0.2		0.11		(<0.3)	U	(<0.08)	U	100	500
Benzo[a]anthracene	(mg/kg)	**2.6**		0.81		0.95	J	**1.8**		0.14		1	5.6
Benzo[a]pyrene	(mg/kg)	**2.4**		0.67		0.83	J	**1.9**		0.13		1	1
Benzo[b]fluoranthene	(mg/kg)	**3.4**		1		**1.2**	**J**	**2.3**		0.23		1	5.6
Benzo[g,h,i]perylene	(mg/kg)	1.4		0.46		0.68	J	1.6		0.17		100	500
Benzo[k]fluoranthene	(mg/kg)	**0.9**		0.39		0.41	J	**0.86**		0.088		0.8	56
bis(2-Ethylhexyl)phthalate	(mg/kg)	(<0.07)	U	0.15		(<0.1)	UJ	(<0.3)	U	(<0.08)	U	---	---
Carbazole	(mg/kg)	0.46		0.1		(<0.1)	U	(<0.3)	U	(<0.08)	U	---	---
Chrysene	(mg/kg)	**2.4**		0.78		0.89	J	**1.7**		0.19		1	56
Dibenzo[a,h]anthracene	(mg/kg)	**0.5**		0.16		0.22	J	**0.41**		(<0.08)	U	0.33	0.56
Dibenzofuran	(mg/kg)	0.21		(<0.08)	U	(<0.1)	U	(<0.3)	U	(<0.08)	U	7	350
Fluoranthene	(mg/kg)	5.6		1.5		1.3		2.1		0.19		100	500
Fluorene	(mg/kg)	0.32		(<0.08)	U	(<0.1)	U	(<0.3)	U	(<0.08)	U	30	500
Hexachlorobenzene	(mg/kg)	(<0.07)	U	(<0.08)	U	(<0.1)	U	(<0.3)	U	0.13		0.33	6
Indeno[1,2,3-cd]pyrene	(mg/kg)	**1.5**		0.49		**0.72**	**J**	**1.5**		0.16		0.5	5.6
Naphthalene	(mg/kg)	0.48		(<0.08)	U	(<0.1)	U	(<0.3)	U	(<0.08)	U	12	500
Phenanthrene	(mg/kg)	3.8		0.84		0.14		0.7		0.18		100	500
Pyrene	(mg/kg)	4.6		1.4		1.7	J	2.1		0.18		100	500

TABLE 4-2B DETECTED SEMIVOLATILE ORGANIC COMPOUNDS TEST PIT ANALYTICAL DATA

	Sample ID	932112-TP20-F11(5-7')D		932112-TP22-E11(5-10')C		932112-TP28-E2(1-2')C		932112-TP30-I2(8-12')C		932112-TP33-D1(4-10')C		6 NYCRR Part 375 Soil Cleanup Objectives - Unrestricted Use (mg/kg)	6 NYCRR Part 375 Soil Cleanup Objectives - Restricted Use - Commercial (mg/kg)
	Lab ID	AC51491-005		AC51491-007		AC51491-014		AC51491-019		AC51562-001			
	Sample Type	Subsurface Soil (Fill)		Subsurface Soil (Fill)		Subsurface Soil (Fill)		Subsurface Soil (Fill)		Subsurface Soil (Fill)			
Parameter List USEPA Method 8270C	Sample Date	5/5/2010		5/5/2010		5/6/2010		5/6/2010		5/7/2010			
2,4-Dimethylphenol	(mg/kg)	(<2.3)	U	(<0.26)	U	(<0.09)	U	(<0.23)	U	(<0.08)	U	---	---
2-Methylnaphthalene	(mg/kg)	(<2.3)	U	(<0.26)	U	(<0.09)	U	(<0.23)	U	0.15		---	---
2-Methylphenol	(mg/kg)	(<2.3)	U	(<0.26)	U	(<0.09)	U	(<0.23)	U	(<0.08)	U	0.33	500
3&4-Methylphenol	(mg/kg)	(<2.3)	U	(<0.26)	U	(<0.09)	U	(<0.23)	U	(<0.08)	U	0.33	500
Acenaphthene	(mg/kg)	(<2.3)	U	(<0.26)	U	(<0.09)	U	(<0.23)	U	0.68		20	500
Acenaphthylene	(mg/kg)	12		(<0.26)	U	(<0.09)	U	(<0.23)	U	(<0.08)	U	100	500
Anthracene	(mg/kg)	8.1		0.64		(<0.09)	U	0.31		1.3		100	500
Benzo[a]anthracene	(mg/kg)	**70**		**8.9**		(<0.09)	U	**1.2**		**2.5**		1	5.6
Benzo[a]pyrene	(mg/kg)	**50**		**2.7**		(<0.09)	U	1		**1.9**		1	1
Benzo[b]fluoranthene	(mg/kg)	**160**		**15**		0.12		**1.5**		**2.6**		1	5.6
Benzo[g,h,i]perylene	(mg/kg)	72		4.9		(<0.09)	U	0.88		1.1		100	500
Benzo[k]fluoranthene	(mg/kg)	**37**		**3.4**		(<0.09)	U	0.51		0.78		0.8	56
bis(2-Ethylhexyl)phthalate	(mg/kg)	(<2.3)	U	(<0.26)	U	(<0.09)	U	(<0.23)	U	(<0.08)	U	---	---
Carbazole	(mg/kg)	2.6		(<0.26)	U	(<0.09)	U	(<0.23)	U	0.48		---	---
Chrysene	(mg/kg)	**78**		**12**		(<0.09)	U	**1.3**		**2.1**		1	56
Dibenzo[a,h]anthracene	(mg/kg)	**22**		**1.9**		(<0.09)	U	**0.36**		**0.47**		0.33	0.56
Dibenzofuran	(mg/kg)	(<2.3)	U	(<0.26)	U	(<0.09)	U	(<0.23)	U	0.44		7	350
Fluoranthene	(mg/kg)	78		7.9		0.12		2.2		5.7		100	500
Fluorene	(mg/kg)	(<2.3)	U	(<0.26)	U	(<0.09)	U	(<0.23)	U	0.62		30	500
Hexachlorobenzene	(mg/kg)	(<2.3)	U	(<0.26)	U	(<0.09)	U	(<0.23)	U	(<0.08)	U	0.33	6
Indeno[1,2,3-cd]pyrene	(mg/kg)	**70**		**5.5**		(<0.09)	U	**0.84**		**1.1**		0.5	5.6
Naphthalene	(mg/kg)	3.7		(<0.26)	U	(<0.09)	U	(<0.23)	U	0.2		12	500
Phenanthrene	(mg/kg)	20		2		0.12		1.7		6.4		100	500
Pyrene	(mg/kg)	83		8.3		0.14		2.1		4.5		100	500

TABLE 4-2B DETECTED SEMIVOLATILE ORGANIC COMPOUNDS TEST PIT ANALYTICAL DATA

Parameter List USEPA Method 8270C	Sample ID	932112-TP34-B1(2-5')C		932112-TP36-C3(2-10')C		932112-TP-Dup-01(a)		932112-TP-Dup-02(a)		932112-TP-Rinsate-01(b)		6 NYCRR Part 375 Soil Cleanup Objectives - Unrestricted Use (mg/kg)	6 NYCRR Part 375 Soil Cleanup Objectives - Restricted Use - Commercial (mg/kg)
	Lab ID	AC51562-002		AC51562-004		AC51562-012		AC51455-022		AC51455-015			
	Sample Type	Subsurface Soil (Fill)		Subsurface Soil (Fill)		QA/QC		QA/QC		QA/QC			
	Sample Date	5/7/2010		5/7/2010		5/7/2010		5/4/2010		5/3/2010			
2,4-Dimethylphenol	(mg/kg)	(<0.08)	U	(<0.08)	U	(<0.08)	U	(<0.08)	U	(<2)	U	---	---
2-Methylnaphthalene	(mg/kg)	(<0.08)	U	(<0.08)	U	0.14		(<0.08)	U	(<2)	U	---	---
2-Methylphenol	(mg/kg)	(<0.08)	U	(<0.08)	U	(<0.08)	U	(<0.08)	U	(<2)	U	0.33	500
3&4-Methylphenol	(mg/kg)	(<0.08)	U	(<0.08)	U	(<0.08)	U	(<0.08)	U	(<2)	U	0.33	500
Acenaphthene	(mg/kg)	(<0.08)	U	(<0.08)	U	0.26		(<0.08)	U	(<2)	U	20	500
Acenaphthylene	(mg/kg)	(<0.08)	U	(<0.08)	U	0.092		(<0.08)	U	(<2)	U	100	500
Anthracene	(mg/kg)	0.12		(<0.08)	U	0.6		(<0.08)	U	(<2)	U	100	500
Benzo[a]anthracene	(mg/kg)	0.39		0.33		**1.1**		0.43		(<2)	U	1	5.6
Benzo[a]pyrene	(mg/kg)	0.33		0.32		0.8		0.4		(<2)	U	1	1
Benzo[b]fluoranthene	(mg/kg)	0.44		0.53		**1.1**		0.61		(<2)	U	1	5.6
Benzo[g,h,i]perylene	(mg/kg)	0.24		0.3		0.41		0.34		(<2)	U	100	500
Benzo[k]fluoranthene	(mg/kg)	0.18		0.19		0.42		0.18		(<2)	U	0.8	56
bis(2-Ethylhexyl)phthalate	(mg/kg)	(<0.08)	U	(<0.08)	U	(<0.08)	U	(<0.08)	U	(<2)	U	---	---
Carbazole	(mg/kg)	0.099		(<0.08)	U	0.29		(<0.08)	U	(<2)	U	---	---
Chrysene	(mg/kg)	0.38		0.38		0.96		0.45		(<2)	U	1	56
Dibenzo[a,h]anthracene	(mg/kg)	0.088		0.13		0.17		0.11		(<2)	U	0.33	0.56
Dibenzofuran	(mg/kg)	(<0.08)	U	(<0.08)	U	0.2		(<0.08)	U	(<2)	U	7	350
Fluoranthene	(mg/kg)	0.75		0.48		2.2		0.64		(<2)	U	100	500
Fluorene	(mg/kg)	0.089		(<0.08)	U	0.29		(<0.08)	U	(<2)	U	30	500
Hexachlorobenzene	(mg/kg)	(<0.08)	U	(<0.08)	U	(<0.08)	U	(<0.08)	U	(<2)	U	0.33	6
Indeno[1,2,3-cd]pyrene	(mg/kg)	0.26		0.31		0.48		0.36		(<2)	U	0.5	5.6
Naphthalene	(mg/kg)	(<0.08)	U	(<0.08)	U	0.26		(<0.08)	U	(<2)	U	12	500
Phenanthrene	(mg/kg)	0.72		0.36		2.5		0.13		(<2)	U	100	500
Pyrene	(mg/kg)	0.73		0.61		1.8		0.8		(<2)	U	100	500

(a) 932112-TP-Dup-01 collected at 932112-TP33-DA(4-10')C. 932112-TP-Dup-02 collected at 932112-TP13-D12(4-10')C

(b) Rinsate blank was an aqueous sample, units are in µg/L.

TABLE 4-2B DETECTED SEMIVOLATILE ORGANIC COMPOUNDS TEST PIT ANALYTICAL DATA

Parameter List USEPA Method 8270C	Sample ID	932112-TP-Rinsate-02(a)		932112-TP-Rinsate-03(a)		932112-TP-Rinsate-04(c)		932112-TP-Rinsate-05(c)		932112-TP-Rinsate-06(c)		6 NYCRR Part 375 Soil Cleanup Objectives - Unrestricted Use (mg/kg)	6 NYCRR Part 375 Soil Cleanup Objectives - Restricted Use - Commercial (mg/kg)
	Lab ID	AC51455-026		AC51491-010		AC51491-022		AC51562-010		AC51562-011			
	Sample Type	QA/QC		QA/QC		QA/QC		QA/QC		QA/QC			
	Sample Date	5/4/2010		5/5/2010		5/6/2010		5/7/2010		5/7/2010			
2,4-Dimethylphenol	(µg/L)	(<2)	U	(<2.2)	U	(<2)	U	(<2.1)	U	(<2.1)	U	---	---
2-Methylnaphthalene	(µg/L)	(<2)	U	(<2.2)	U	(<2)	U	(<2.1)	U	(<2.1)	U	---	---
2-Methylphenol	(µg/L)	(<2)	U	(<2.2)	U	(<2)	U	(<2.1)	U	(<2.1)	U	0.33	500
3&4-Methylphenol	(µg/L)	(<2)	U	(<2.2)	U	(<2)	U	(<2.1)	U	(<2.1)	U	0.33	500
Acenaphthene	(µg/L)	(<2)	U	(<2.2)	U	(<2)	U	(<2.1)	U	(<2.1)	U	20	500
Acenaphthylene	(µg/L)	(<2)	U	(<2.2)	U	(<2)	U	(<2.1)	U	(<2.1)	U	100	500
Anthracene	(µg/L)	(<2)	U	(<2.2)	U	(<2)	U	(<2.1)	U	(<2.1)	U	100	500
Benzo[a]anthracene	(µg/L)	(<2)	U	(<2.2)	U	(<2)	U	(<2.1)	U	(<2.1)	U	1	5.6
Benzo[a]pyrene	(µg/L)	(<2)	U	(<2.2)	U	(<2)	U	(<2.1)	U	(<2.1)	U	1	1
Benzo[b]fluoranthene	(µg/L)	(<2)	U	(<2.2)	U	(<2)	U	(<2.1)	U	(<2.1)	U	1	5.6
Benzo[g,h,i]perylene	(µg/L)	(<2)	U	(<2.2)	U	(<2)	U	(<2.1)	U	(<2.1)	U	100	500
Benzo[k]fluoranthene	(µg/L)	(<2)	U	(<2.2)	U	(<2)	U	(<2.1)	U	(<2.1)	U	0.8	56
bis(2-Ethylhexyl)phthalate	(µg/L)	(<2)	U	(<2.2)	U	(<2)	U	(<2.1)	U	(<2.1)	U	---	---
Carbazole	(µg/L)	(<2)	U	(<2.2)	U	(<2)	U	(<2.1)	U	(<2.1)	U	---	---
Chrysene	(µg/L)	(<2)	U	(<2.2)	U	(<2)	U	(<2.1)	U	(<2.1)	U	1	56
Dibenzo[a,h]anthracene	(µg/L)	(<2)	U	(<2.2)	U	(<2)	U	(<2.1)	U	(<2.1)	U	0.33	0.56
Dibenzofuran	(µg/L)	(<2)	U	(<2.2)	U	(<2)	U	(<2.1)	U	(<2.1)	U	7	350
Fluoranthene	(µg/L)	(<2)	U	(<2.2)	U	(<2)	U	(<2.1)	U	(<2.1)	U	100	500
Fluorene	(µg/L)	(<2)	U	(<2.2)	U	(<2)	U	(<2.1)	U	(<2.1)	U	30	500
Hexachlorobenzene	(µg/L)	(<2)	U	(<2.2)	U	(<2)	U	(<2.1)	U	(<2.1)	U	0.33	6
Indeno[1,2,3-cd]pyrene	(µg/L)	(<2)	U	(<2.2)	U	(<2)	U	(<2.1)	U	(<2.1)	U	0.5	5.6
Naphthalene	(µg/L)	(<2)	U	(<2.2)	U	(<2)	U	(<2.1)	U	(<2.1)	U	12	500
Phenanthrene	(µg/L)	(<2)	U	(<2.2)	U	(<2)	U	(<2.1)	U	(<2.1)	U	100	500
Pyrene	(µg/L)	(<2)	U	(<2.2)	U	(<2)	U	(<2.1)	U	(<2.1)	U	100	500

(c) Rinsate blank was an aqueous sample, units are in µg/L.

NOTE: QA/QC = Quality Assurance/Quality Control

TABLE 4-2C DETECTED PESTICIDES TEST PIT ANALYTICAL DATA

Parameter List USEPA Method 8081A	Sample ID	932112-TP02-M12(2-3')C		932112-TP04-K12(1')C		932112-TP05-K11(1-6')C		932112-TP07-L10(1-5')C		932112-TP09(2-4)D		6 NYCRR Part 375 Soil Cleanup Objectives - Unrestricted Use (mg/kg)	6 NYCRR Part 375 Soil Cleanup Objectives - Commercial Use (mg/kg)
	Lab ID	AC51455-002		AC51562-008		AC51455-006		AC51455-011		AC51455-014			
	Sample Type	Subsurface Soil (Fill)		Subsurface Soil (Fill)		Subsurface Soil (Fill)		Subsurface Soil (Fill)		Subsurface Soil (Fill)			
	Sample Date	5/3/2010		5/3/2010		5/3/2010		5/3/2010		5/3/2010			
p,p'-DDE	(mg/kg)	(<0.0033)	U	(<0.0033)	U	(<0.0038)	U	(<0.0030)	U	(<0.0034)	UJ	0.0033	62
p,p'-DDT	(mg/kg)	(<0.0033)	UJ	**0.0063**	**J**	(<0.0038)	UJ	(<0.0030)	UJ	(<0.0034)	UJ	0.0033	47

Parameter List USEPA Method 8081A	Sample ID	932112-TP10-K9(1-3.5')C		932112-TP11-L9(1-3')C		932112-TP13-D12(4-10')C		932112-TP14-E13(8-13')C		932112-TP18-G12(1-12')C		6 NYCRR Part 375 Soil Cleanup Objectives - Unrestricted Use (mg/kg)	6 NYCRR Part 375 Soil Cleanup Objectives - Commercial Use (mg/kg)
	Lab ID	AC51562-009		AC51562-013		AC51455-019		AC51455-020		AC51491-002			
	Sample Type	Subsurface Soil (Fill)		Subsurface Soil (Fill)		Subsurface Soil (Fill)		Subsurface Soil (Fill)		Subsurface Soil (Fill)			
	Sample Date	5/4/2010		5/4/2010		5/4/2010		5/4/2010		5/4/2010			
p,p'-DDE	(mg/kg)	(<0.0030)	U	(<0.0032)	U	(<0.0035)	U	(<0.0038)	UJ	(<0.0033)	U	0.0033	62
p,p'-DDT	(mg/kg)	**0.021**	**J**	(<0.0032)	UJ	(<0.0035)	UJ	(<0.0038)	UJ	(<0.0033)	U	0.0033	47

Parameter List USEPA Method 8081A	Sample ID	932112-TP20-F11(5-7')D		932112-TP22-E11(5-10')C		932112-TP28-E2(1-2')C		932112-TP30-I2(8-12')C		932112-TP33-D1(4-10')C		6 NYCRR Part 375 Soil Cleanup Objectives - Unrestricted Use (mg/kg)	6 NYCRR Part 375 Soil Cleanup Objectives - Commercial Use (mg/kg)
	Lab ID	AC51491-005		AC51491-007		AC51491-014		AC51491-019		AC51562-001			
	Sample Type	Subsurface Soil (Fill)		Subsurface Soil (Fill)		Subsurface Soil (Fill)		Subsurface Soil (Fill)		Subsurface Soil (Fill)			
	Sample Date	5/5/2010		5/5/2010		5/6/2010		5/6/2010		5/7/2010			
p,p'-DDE	(mg/kg)	(<0.0033)	U	**0.013**		**0.0046**		**0.0045**		(<0.0032)	U	0.0033	62
p,p'-DDT	(mg/kg)	(<0.0033)	U	**0.013**		**0.0039**		(<0.0029)	U	**0.0071**	**J**	0.0033	47

NOTE:

USEPA = United States Enivronmental Protection Agency
NYCRR = New York Code of Rules and Regulation
mg/kg = milligrams per kilogram
DDE = Dichlorodiphenyldichloroethylene
DDT = Dichlorodiphenyltrichloroethane
U = Non-detect, detection below the method detection limit
UJ = The compound analyzed for, but not detected. The sample quantitation limit is an estimated quantity due to variance from quality control limits.
J = The assocaited numerical value is an estimated quantity

A sample ID identified with a "C" denotes that the sample was collected as a composite sample.

A sample ID identified with a "D" denotes that the sample was collected at a discrete sample interval.

Data provided by Hampton-Clarke Veritech. Only analytes that were detected in at least one sample are shown. Data validation completed by Chemworld Environmental, Inc.

Concentration values in **bold** indicate the concentration was above the 6 NYCRR Part 375 Soil Cleanup Objectives - Unrestricted Use.

Concentration values in **bold and highlighted** indicate the concentration was above the 6 NYCRR Part 375 Soil Cleanup Objectives - Restricted Use (Commercial)

TABLE 4-2C DETECTED PESTICIDES TEST PIT ANALYTICAL DATA

Parameter List USEPA Method 8081A	Sample ID	932112-TP34-B1(2-5')C		932112-TP36-C3(2-10')C		932112-TP-Dup-01(a)		932112-TP-Dup-02(a)		932112-TP-Rinsate-01(b)		6 NYCRR Part 375 Soil Cleanup Objectives - Unrestricted Use (mg/kg)	6 NYCRR Part 375 Soil Cleanup Objectives - Commercial Use (mg/kg)
	Lab ID	AC51562-002		AC51562-004		AC51562-012		AC51455-022		AC51455-015			
	Sample Type	Subsurface Soil (Fill)		Subsurface Soil (Fill)		QA/QC - Duplicate		QA/QC - Duplicate		QA/QC - Rinsate			
	Sample Date	5/7/2010		5/7/2010		5/7/2010		5/4/2010		5/3/2010			
p,p'-DDE	(mg/kg)	**0.0072**		(<0.0032)	U	**0.0042**		(<0.0030)	U	(<0.01)	U	0.0033	62
p,p'-DDT	(mg/kg)	**0.0082**	**J**	(<0.0032)	UJ	**0.005**	**J**	(<0.0030)	UJ	(<0.01)	UJ	0.0033	47

Parameter List USEPA Method 8081A	Sample ID	932112-TP-Rinsate-02(b)		932112-TP-Rinsate-03(b)		932112-TP-Rinsate-04(b)		932112-TP-Rinsate-05(b)		932112-TP-Rinsate-06(b)		6 NYCRR Part 375 Soil Cleanup Objectives - Unrestricted Use (mg/kg)	6 NYCRR Part 375 Soil Cleanup Objectives - Commercial Use (mg/kg)
	Lab ID	AC51455-026		AC51491-010		AC51491-022		AC51562-010		AC51562-011			
	Sample Type	QA/QC - Rinsate		QA/QC - Rinsate		QA/QC - Rinsate		QA/QC - Rinsate		QA/QC - Rinsate			
	Sample Date	5/4/2010		5/5/2010		5/6/2010		5/7/2010		5/7/2010			
p,p'-DDE	(mg/kg)	(<0.01)	U	(<0.01)	U	(<0.01)	U	(<0.01)	U	(<0.01)	U	0.0033	62
p,p'-DDT	(mg/kg)	(<0.01)	UJ	(<0.01)	U	(<0.01)	U	(<0.01)	UJ	(<0.01)	UJ	0.0033	47

(a) 932112-TP-Dup-01 collected at 932112-TP-33-D1(4-10')C; 932112-TP-Dup-02 collected at 932112-TP13-D12(4-10')C

(b) Rinsate blanks were aqueous samples, units are in μg/L.

TABLE 4-2D DETECTED POLYCHLORINATED BIPHENYL TEST PIT ANALYTICAL DATA

Parameter List USEPA Method 8082	Sample ID	932112-TP02-M12(2-3')C		932112-TP04-K12(1')C		932112-TP05-K11(1-6')C		932112-TP07-L10(1-5')C		932112-TP09(2-4)D		6 NYCRR Part 375 Soil Cleanup Objectives - Unrestricted Use (mg/kg)	6 NYCRR Part 375 Soil Cleanup Objectives - Commercial Use (mg/kg)
	Lab ID	AC51455-002		AC51562-008		AC51455-006		AC51455-011		AC51455-014			
	Sample Type	Subsurface Soil (Fill)		Subsurface Soil (Fill)		Subsurface Soil (Fill)		Subsurface Soil (Fill)		Subsurface Soil (Fill)			
	Sample Date	5/3/2010		5/3/2010		5/3/2010		5/3/2010		5/3/2010			
Aroclor-1254	(mg/kg)	(<0.03)	U	(<0.03)	U	(<0.03)	U	(<0.03)	U	(<0.03)	U	---	---
Aroclor-1260	(mg/kg)	(<0.03)	U	(<0.03)	U	(<0.03)	UJ	(<0.03)	U	(<0.03)	U	---	---
Aroclor-1268	(mg/kg)	(<0.03)	U	(<0.03)	U	(<0.03)	U	(<0.03)	U	1.4		---	---
Aroclor (Total)	(mg/kg)	(<0.03)	U	(<0.03)	U	(<0.03)	U	(<0.03)	U	**1.4**		0.1	1

Parameter List USEPA Method 8082	Sample ID	932112-TP10-K9(1-3.5')C		932112-TP11-L9(1-3')C		932112-TP13-D12(4-10')C		932112-TP14-E13(8-13')C		932112-TP18-G12(1-12')C		6 NYCRR Part 375 Soil Cleanup Objectives - Unrestricted Use (mg/kg)	6 NYCRR Part 375 Soil Cleanup Objectives - Commercial Use (mg/kg)
	Lab ID	AC51562-009		AC51562-013		AC51455-019		AC51455-020		AC51491-002			
	Sample Type	Subsurface Soil (Fill)		Subsurface Soil (Fill)		Subsurface Soil (Fill)		Subsurface Soil (Fill)		Subsurface Soil (Fill)			
	Sample Date	5/4/2010		5/4/2010		5/4/2010		5/4/2010		5/4/2010			
Aroclor-1254	(mg/kg)	(<0.03)	U	(<0.03)	U	(<0.03)	U	(<0.03)	U	(<0.03)	U	---	---
Aroclor-1260	(mg/kg)	(<0.03)	U	(<0.03)	U	(<0.03)	U	(<0.03)	U	(<0.03)	U	---	---
Aroclor-1268	(mg/kg)	(<0.03)	U	(<0.03)	U	(<0.03)	U	(<0.03)	U	(<0.03)	U	---	---
Aroclor (Total)	(mg/kg)	(<0.03)	U	(<0.03)	U	(<0.03)	U	(<0.03)	U	(<0.03)	U	0.1	1

Parameter List USEPA Method 8082	Sample ID	932112-TP20-F11(5-7')D		932112-TP22-E11(5-10')C		932112-TP28-E2(1-2')C		932112-TP30-I2(8-12')C		932112-TP33-D1(4-10')C		6 NYCRR Part 375 Soil Cleanup Objectives - Unrestricted Use (mg/kg)	6 NYCRR Part 375 Soil Cleanup Objectives - Commercial Use (mg/kg)
	Lab ID	AC51491-005		AC51491-007		AC51491-014		AC51491-019		AC51562-001			
	Sample Type	Subsurface Soil (Fill)		Subsurface Soil (Fill)		Subsurface Soil (Fill)		Subsurface Soil (Fill)		Subsurface Soil (Fill)			
	Sample Date	5/5/2010		5/5/2010		5/6/2010		5/6/2010		5/7/2010			
Aroclor-1254	(mg/kg)	(<0.03)	U	(<0.03)	U	(<0.03)	U	(<0.02)	U	(<0.03)	U	---	---
Aroclor-1260	(mg/kg)	(<0.03)	U	(<0.03)	U	(<0.03)	U	0.058		(<0.03)	U	---	---
Aroclor-1268	(mg/kg)	(<0.03)	U	(<0.03)	U	(<0.03)	U	(<0.02)	U	(<0.03)	U	---	---
Aroclor (Total)	(mg/kg)	(<0.03)	U	(<0.03)	U	(<0.03)	U	0.058		(<0.03)	U	0.1	1

NOTE:

USEPA = United States Enivronmental Protection Agency
NYCRR = New York Code of Rules and Regulation
mg/kg = milligrams per kilogram
U = Non-detect, detection below the method detection limit
--- = No Standard.

A sample ID identified with a "C" denotes that the sample was collected as a composite sample.

A sample ID identified with a "D" denotes that the sample was collected at a discrete sample interval.

Data provided by Hampton-Clarke Veritech. Only analytes that were detected in at least one sample are shown. Data validation completed by Chemworld Environmental, Inc.

Concentration values in **bold** indicate the concentration was above the 6 NYCRR Part 375 Soil Cleanup Objectives - Unrestricted Use.

Concentration values in **bold and highlighted** indicate the concentration was above the 6 NYCRR Part 375 Soil Cleanup Objectives - Restricted Use (Commercial)

TABLE 4-2D DETECTED POLYCHLORINATED BIPHENYL TEST PIT ANALYTICAL DATA

Parameter List USEPA Method 8081A	Sample ID	932112-TP34-B1(2-5')C		932112-TP36-C3(2-10')C		932112-TP-Dup-01[(a)]		932112-TP-Dup-02[(a)]		932112-TP-Rinsate-01[(b)]		6 NYCRR Part 375 Soil Cleanup Objectives - Unrestricted Use (mg/kg)	6 NYCRR Part 375 Soil Cleanup Objectives - Commercial Use (mg/kg)
	Lab ID	AC51562-002		AC51562-004		AC51562-012		AC51455-022		AC51455-015			
	Sample Type	Subsurface Soil (Fill)		Subsurface Soil (Fill)		QA/QC		QA/QC		QA/QC			
	Sample Date	5/7/2010		5/7/2010		5/7/2010		5/4/2010		5/3/2010			
Aroclor-1254	(mg/kg)	(<0.03)	U	0.76		(<0.03)	U	(<0.03)	U	(<0.25)	U	---	---
Aroclor-1260	(mg/kg)	(<0.03)	U	(<0.03)	U	(<0.03)	U	(<0.03)	U	(<0.25)	U	---	---
Aroclor-1268	(mg/kg)	(<0.03)	U	(<0.03)	U	(<0.03)	U	(<0.03)	U	(<0.25)	U	---	---
Aroclor (Total)	(mg/kg)	(<0.03)	U	**0.76**		(<0.03)	U	(<0.03)	U	(<0.25)	U	0.1	1

Parameter List USEPA Method 8081A	Sample ID	932112-TP-Rinsate-02[(b)]		932112-TP-Rinsate-03[(b)]		932112-TP-Rinsate-04[(b)]		932112-TP-Rinsate-05[(b)]		932112-TP-Rinsate-06[(b)]		6 NYCRR Part 375 Soil Cleanup Objectives - Unrestricted Use (mg/kg)	6 NYCRR Part 375 Soil Cleanup Objectives - Commercial Use (mg/kg)
	Lab ID	AC51455-026		AC51491-010		AC51491-022		AC51562-010		AC51562-011			
	Sample Type	QA/QC		QA/QC		QA/QC		QA/QC		QA/QC			
	Sample Date	5/4/2010		5/5/2010		5/6/2010		5/7/2010		5/7/2010			
Aroclor-1254	(mg/kg)	(<0.25)	U	(<0.25)	U	(<0.25)	U	(<0.25)	U	(<0.25)	U	---	---
Aroclor-1260	(mg/kg)	(<0.25)	U	(<0.25)	U	(<0.25)	U	(<0.25)	U	(<0.25)	U	---	---
Aroclor-1268	(mg/kg)	(<0.25)	U	(<0.25)	U	(<0.25)	U	(<0.25)	U	(<0.25)	U	---	---
Aroclor (Total)	(mg/kg)	(<0.25)	U	(<0.25)	U	(<0.25)	U	(<0.25)	U	(<0.25)	U	0.1	1

(a) 932112-TP-Dup-01 collected at 932112-TP-33-D1(4-10')C.   932112-TP-Dup-02 collected at 932112-TP13-D12(4-10')C

(b) Rinsate blanks were aqueous samples, units are in µg/L.

TABLE 4-2E DETECTED VOLATILE ORGANIC COMPOUNDS TEST PIT ANALYTICAL DATA

Parameter List USEPA Method 8260B	Sample ID	932112-TP09(2-4)D		932112-TP20-F11(5-7')D		932112-TP30-I2(2-5')D		932112-TP34-B1(2-5')C		932112-TP-Rinsate-01(a)		6 NYCRR Part 375 Soil Cleanup Objectives - Unrestricted Use (mg/kg)	6 NYCRR Part 375 Soil Cleanup Objectives - Restricted Use - Commercial (mg/kg)
	Lab ID	AC51455-014		AC51491-005		AC51491-016		AC51562-002		AC51455-015			
	Sample Type	Subsurface Soil (Fill)		Subsurface Soil (Fill)		Subsurface Soil (Fill)		Subsurface Soil (Fill)		QA/QC			
	Sample Date	5/3/2010		5/5/2010		5/6/2010		5/7/2010		5/3/2010			
m&p-Xylenes	(mg/kg)	(<0.0014)	U	0.0023		(<0.0061)	U	(<0.0013)	U	(<1)	U	---	---
Methylene chloride	(mg/kg)	(<0.0068)	U	0.014		(<0.03)	U	(<0.0065)	U	(<1)	U	0.05	500
Tetrachloroethene	(mg/kg)	(<0.0068)	U	0.049		0.31		(<0.0065)	U	(<0.5)	U	1.3	150
Toluene	(mg/kg)	(<0.0014)	U	0.0028		(<0.0061)	U	(<0.0013)	U	(<0.5)	U	0.7	500
Trichloroethene	(mg/kg)	(<0.0068)	U	(<0.0084)	U	**0.81**		(<0.0065)	U	(<0.5)	U	0.47	200
Xylenes (Total)	(mg/kg)	(<0.0014)	U	0.0023		(<0.0061)	U	(<0.0013)	U	(<0.5)	U	0.26	500

Parameter List USEPA Method 8260B	Sample ID	932112-TP-Rinsate-03(a)		932112-TP-Rinsate-04)(a)		932112-TP-Rinsate-05(a)		6 NYCRR Part 375 Soil Cleanup Objectives - Unrestricted Use (mg/kg)	6 NYCRR Part 375 Soil Cleanup Objectives - Restricted Use - Commercial (mg/kg)
	Lab ID	AC51491-010		AC51491-022		AC51562-010			
	Sample Type	QA/QC		QA/QC		QA/QC			
	Sample Date	5/5/2010		5/6/2010		5/7/2010			
m&p-Xylenes	(mg/kg)	(<1)	U	(<1)	U	(<1)	U	---	---
Methylene chloride	(mg/kg)	(<1)	U	(<1)	U	(<1)	U	0.05	500
Tetrachloroethene	(mg/kg)	(<0.5)	U	(<0.5)	U	(<0.5)	U	1.3	150
Toluene	(mg/kg)	(<0.5)	U	(<0.5)	U	(<0.5)	U	0.7	500
Trichloroethene	(mg/kg)	(<0.5)	U	(<0.5)	U	(<0.5)	U	0.47	200
Xylenes (Total)	(mg/kg)	(<0.5)	U	(<0.5)	U	(<0.5)	U	0.26	500

(a) Rinsate blanks are aqueous samples, units are in µg/L.

NOTE:
USEPA = United States Enivronmental Protection Agency
NYCRR = New York Code of Rules and Regulation
mg/kg = milligrams per kilogram
U = Non-detect, detection below the method detection limit
--- = No Standard.
QA/QC = Quality Assurance/Quality Control
A sample ID identified with a "C" denotes that the sample was collected as a composite sample.
A sample ID identified with a "D" denotes that the sample was collected at a discrete sample interval.
Data provided by Hampton-Clarke Veritech. Only analytes that were detected in at least one sample are shown. Data validation completed by Chemworld Environmental, Inc.
Concentration values in **bold** indicate the concentration was above the 6 NYCRR Part 375 Soil Cleanup Objectives - Unrestricted Use.
Concentration values in **bold and highlighted** indicate the concentration was above the 6 NYCRR Part 375 Soil Cleanup Objectives - Restricted Use (Commercial)

TABLE 4-3A DETECTED TARGET ANALYTE LIST METALS SOIL BORING ANALYTICAL DATA

Parameter List USEPA Method 6010B/7471A	Sample ID	932112-SB01-I3(2-12')C		932112-SB02-H3(2-12')C		932112-SB03-G3(4-14')C		932112-SB04-F3(2-14')C		932112-SB05-E3(2-14')C		932112-SB06-D3(4-6')		6 NYCRR Part 375 Soil Cleanup Objectives - Unrestricted Use (mg/kg)	6 NYCRR Part 375 Soil Cleanup Objectives - Restricted Use - Commercial (mg/kg)
	Lab ID	AC51562-015		AC51562-016		AC51562-017		AC51562-018		AC51562-021		AC51562-022			
	Sample Type	Subsurface Soil (Fill)		Subsurface Soil (Fill)		Subsurface Soil (Fill)		Subsurface Soil (Fill)		Subsurface Soil (Fill)		Subsurface Soil (Fill)			
	Sample Date	5/10/2010		5/10/2010		5/10/2010		5/10/2010		5/10/2010		5/10/2010			
Aluminum	(mg/kg)	7,300	J	4,800	J	5,800	J	7,200	J	4,700	J	5,200	J	---	---
Antimony	(mg/kg)	6.6	J	13	J	6.2	J	11	J	(<2.5)	UJ	2.9	J	---	---
Arsenic	(mg/kg)	**15**		**21**		**23**		**40**		11		12		13	16
Barium	(mg/kg)	270		**610**		**370**		**600**		210		300		350	400
Beryllium	(mg/kg)	1.3		1.3		(<0.75)	U	0.93		1.3		1.2		7.2	590
Cadmium	(mg/kg)	**2.7**		2.4		**2.5**		**3.8**		1.7		2		2.5	9.3
Calcium	(mg/kg)	12,000	J	6,700	J	12,000	J	20,000	J	5,400	J	11,000	J	---	---
Chromium	(mg/kg)	24	J	**36**	**J**	29	J	**61**	**J**	13	J	14	J	30	1,500
Cobalt	(mg/kg)	6.4		9.1		12		9.1		7.3		6.9		---	---
Copper	(mg/kg)	**370**		**25,000**		**1,300**		**1,500**		**64**		**130**		50	270
Iron	(mg/kg)	18,000	J	50,000	J	61,000	J	78,000	J	20,000	J	17,000	J	---	---
Lead	(mg/kg)	**760**		**970**		**630**		**1,600**		**170**		**510**		63	1,000
Magnesium	(mg/kg)	1,200	J	1,700	J	2,100	J	4,700	J	(<630)	U	1,500	J	---	---
Manganese	(mg/kg)	190		300		350		370		160		170		1,600	10,000
Mercury	(mg/kg)	0.13		0.17		(<0.1)	U	**0.4**		(<0.11)	U	**0.44**		0.18	2.8
Nickel	(mg/kg)	**39**		**190**		**37**		**49**		25		21		30	310
Potassium	(mg/kg)	850		860		740		1,300		670		860		---	---
Selenium	(mg/kg)	**4.5**		**7.2**		**5.1**		**10**		**5**		3.8		3.9	1,500
Silver	(mg/kg)	**3.7**		**8.5**		(<1.9)	U	1.9		(<1.9)	U	(<1.9)	U	2	1,500
Sodium	(mg/kg)	470		(<310)	U	790		1,100		(<320)	U	360		---	---
Thallium	(mg/kg)	(<13)		(<1.5)	U	(<1.5)	U	(<1.5)	U	(<1.5)	U	(<1.5)	U	---	---
Vanadium	(mg/kg)	22		29		24		27		28		26		---	---
Zinc	(mg/kg)	**610**		**1,900**		**960**		**1,400**		**880**		**500**		109	10,000

NOTE:

USEPA = United States Enivronmental Protection Agency
NYCRR = New York Code of Rules and Regulation
mg/kg = milligrams per kilogram
J = The associated numerical value is and estimated quantity.
--- = No Standard.
UJ = The compound analyzed for, but not detected. The sample quantitation limit is an estimated quantity due to variance from quality control limits.
U = Non-detect, detection below the method detection limit

A sample ID identified with a "C" denotes that the sample was collected as a composite sample.

A sample ID identified with a "D" denotes that the sample was collected at a discrete sample.

Data provided by Hampton-Clarke Veritech. Only analytes that were detected in at least one sample are shown. Data validation completed by Chemworld Environmental, Inc.

Concentration values in **bold** indicate the concentration was above the 6 NYCRR Part 375 Soil Cleanup Objectives - Unrestricted Use.

Concentration values in **bold and highlighted** indicate the concentration was above the 6 NYCRR Part 375 Soil Cleanup Objectives - Restricted Use (Commercial).

TABLE 4-3A DETECTED TARGET ANALYTE LIST METALS SOIL BORING ANALYTICAL DATA

Parameter List USEPA Method 6010B/7471A	Sample ID	932112-SB08-I8(6-14')C		932112-SB09-I7(24-30')C		932112-SB11-H9(4-6')D		932112-SB12-F10(4-12')C		932112-SB13-I4(25-27')D		932112-SB14-I5(60-64')		6 NYCRR Part 375 Soil Cleanup Objectives - Unrestricted Use (mg/kg)	6 NYCRR Part 375 Soil Cleanup Objectives - Restricted Use - Commercial (mg/kg)
	Lab ID	AC51679-002		AC51679-005		AC51679-003		AC51679-004		AC51679-040		AC51740-001			
	Sample Type	Subsurface Soil (Fill)		Subsurface Soil (Fill)		Subsurface Soil (Fill)		Subsurface Soil (Fill)		Subsurface Soil (Fill)		Subsurface Soil (Fill)			
	Sample Date	5/3/2010		5/11/2010		5/11/2010		5/11/2010		5/13/2010		5/14/2010			
Aluminum	(mg/kg)	6,300		6,000		4,300		8,900		1,600		2,300	J	---	---
Antimony	(mg/kg)	13	J	5.8	J	8.9	J	30	J	3.1	J	6		---	---
Arsenic	(mg/kg)	**35**		**23**		**21**		**13**		**25**		**14**	**J**	13	16
Barium	(mg/kg)	**1,000**		**760**		**830**		**550**		53		47		350	400
Beryllium	(mg/kg)	(<0.71)	U	(<0.71)	U	1.2	J	1.2	J	(<0.7)	U	(<0.72)	U	7.2	590
Cadmium	(mg/kg)	**5.3**		**5.8**		**3.6**		**2.6**		(<0.7)	U	**15**		2.5	9.3
Calcium	(mg/kg)	26,000		52,000		13,000		42,000		3,500		100,000	J	---	---
Chromium	(mg/kg)	**39**	**J**	**37**	**J**	22	J	**31**	J	**36**	**J**	**130**	**J**	30	1,500
Cobalt	(mg/kg)	13		10		11		8.3		7.1		11	J	---	---
Copper	(mg/kg)	**450**		**430**		**200**		**1,700**		**140**		**1,200**	**J**	50	270
Iron	(mg/kg)	69,000		85,000		30,000		31,000		64,000		92,000		---	---
Lead	(mg/kg)	**3,600**		**2,400**		**1,400**		**2,800**		**1,200**		**640**	**J**	63	1,000
Magnesium	(mg/kg)	4,900		13,000		1,800		10,000		720		11,000	J	---	---
Manganese	(mg/kg)	570		610		320		700		300		690	J	1,600	10,000
Mercury	(mg/kg)	**5**		**2.1**		**2.9**		**0.7**		**1.4**		0.13		0.18	2.8
Nickel	(mg/kg)	**31**		**42**		**31**		**120**		28		**44**	**J**	30	310
Potassium	(mg/kg)	1,600		1,400		720		1,100		(<580)	U	(<600)	U	---	---
Selenium	(mg/kg)	(<2.1)	U	(<2.1)	U	2.3		(<2.2)	U	**9.1**		(<2.2)	U	3.9	1,500
Silver	(mg/kg)	(<1.8)	U	(<1.8)	U	(<1.9)	U	(<1.8)	U	(<1.7)	U	(<1.8)	U	2	1,500
Sodium	(mg/kg)	820		370		(<310)	U	320		(<290)	U	(<300)	U	---	---
Thallium	(mg/kg)	(<1.4)	U	(<1.4)	U	(<1.5)	U	(<1.5)	U	(<1.4)	U	(<1.4)	U	---	---
Vanadium	(mg/kg)	28		26		15		21		(<12)	U	15		---	---
Zinc	(mg/kg)	**2,100**	**J**	**3,100**	**J**	**860**	**J**	**2,300**	**J**	**1,200**	**J**	**7,000**	**J**	109	10,000

TABLE 4-3A DETECTED TARGET ANALYTE LIST METALS SOIL BORING ANALYTICAL DATA

Parameter List USEPA Method 6010B/7471A	Sample ID	932112-SB15-I6(46-50')		932112-SB16-G4(5-12')C		932112-SB17-E4(16-24)C		932112-SB18-C4(38-42)C		932112-SB19-D5(37-41')C		932112-SB23-F9(50-52')D		6 NYCRR Part 375 Soil Cleanup Objectives - Unrestricted Use (mg/kg)	6 NYCRR Part 375 Soil Cleanup Objectives - Restricted Use - Commercial (mg/kg)
	Lab ID	AC51740-003		AC51740-004		AC51740-005		AC51740-006		AC51761-001		AC51740-001			
	Sample Type	Subsurface Soil (Fill)		Subsurface Soil (Fill)		Subsurface Soil (Fill)		Subsurface Soil (Fill)		Subsurface Soil (Fill)		Subsurface Soil (Fill)			
	Sample Date	5/14/2010		5/17/2010		5/17/2010		5/17/2010		5/18/2010		5/20/2010			
Aluminum	(mg/kg)	7,200	J	6,500	J	4,500	J	6,700	J	5,400		8,300		---	---
Antimony	(mg/kg)	35		260		72		3.9		8.6		260		---	---
Arsenic	(mg/kg)	**39**	**J**	**36**	**J**	**47**	**J**	**18**	**J**	**33**		**70**		13	16
Barium	(mg/kg)	**740**		**950**		**500**		310		**560**	**J**	**1,600**		350	400
Beryllium	(mg/kg)	(<0.82)	U	(<0.67)	U	(<0.82)	U	(<0.77)	U	(<0.79)	U	1.8		7.2	590
Cadmium	(mg/kg)	**4.8**		**30**		**21**	**J**	1.3		1.1		**15**		2.5	9.3
Calcium	(mg/kg)	19,000	J	39,000	J	16,000	J	39,000	J	14,000		36,000		---	---
Chromium	(mg/kg)	**32**	**J**	**190**	**J**	**46**	**J**	14	J	**41**		**44**		30	1,500
Cobalt	(mg/kg)	11	J	17	J	15	J	8.2	J	12		14		---	---
Copper	(mg/kg)	**460**	**J**	**5,200**	**J**	**340**		**150**	**J**	**120**		**1,300**		50	270
Iron	(mg/kg)	51,000		74,000		99,000	J	19,000		54,000		49,000		---	---
Lead	(mg/kg)	**1,700**	**J**	**7,000**	**J**	**1,800**	**J**	**1,200**	**J**	**450**	**J**	**8,600**		63	1,000
Magnesium	(mg/kg)	4,600	J	14,000	J	4,000	J	3,800	J	2,800		4,300		---	---
Manganese	(mg/kg)	1,100	J	990	J	660		240	J	360		**2,300**		1,600	10,000
Mercury	(mg/kg)	**0.52**		(<0.09)	U	**0.21**	J	(<0.11)	U	**4.5**		(<0.1)	U	0.18	2.8
Nickel	(mg/kg)	**40**	J	**590**	J	**67**	J	23	J	**89**		**42**		30	310
Potassium	(mg/kg)	1,200	J	1,200	J	1,600		1,200	J	770		2,100		---	---
Selenium	(mg/kg)	**5.2**	**J**	**9.8**	**J**	(<2.5)	U	(<2.3)	U	3		2.8		3.9	1,500
Silver	(mg/kg)	(<2.1)	U	**85**		(<2.1)	U	(<1.9)	U	(<2)	U	**3.5**		2	1,500
Sodium	(mg/kg)	750		800		1,200		510		(<330)	U	3,100		---	---
Thallium	(mg/kg)	(<1.6)	U	(<1.3)	U	(<1.6)	U	(<1.5)	U	(<1.6)	U	(<1.5)	U	---	---
Vanadium	(mg/kg)	29		22		17		26		23		29		---	---
Zinc	(mg/kg)	**2,100**	**J**	**5,100**	**J**	**3,000**	**J**	**390**	**J**	**450**		**4,400**		109	10,000

TABLE 4-3A DETECTED TARGET ANALYTE LIST METALS SOIL BORING ANALYTICAL DATA

Parameter List USEPA Method 6010B/7471A	Sample ID	932112-SB24-E7(70-73')C		932112-SB25-H7(44-48')		932112-SB26-H5(52-56')		932112-SB-Dup-01[(a)]		932112-SB-Rinsate-01[(b)]		932112-SB-Rinsate-02[(b)]		6 NYCRR Part 375 Soil Cleanup Objectives - Unrestricted Use (mg/kg)	6 NYCRR Part 375 Soil Cleanup Objectives - Restricted Use - Commercial (mg/kg)
	Lab ID	AC51820-022		AC51882-001		AC51882-003		AC51562-024		AC51562-023		AC51679-006			
	Sample Type	Subsurface Soil (Fill)		Subsurface Soil (Fill)		Subsurface Soil (Fill)		QA/QC		QA/QC		QA/QC			
	Sample Date	5/20/2010		5/21/2010		5/21/2010		5/10/2010		5/10/2010		5/11/2010			
Aluminum	(mg/kg)	3,600		6,000		7,300		5,700	J	(<2000)	U	(<2000)	U	---	---
Antimony	(mg/kg)	19		7.6		6.7		3	J	(<20)	U	(<20)	U	---	---
Arsenic	(mg/kg)	**54**		**40**		**23**		**14**		(<20)	U	(<20)	U	13	16
Barium	(mg/kg)	**1,300**		**510**		230		**410**		(<100)	U	(<100)	U	350	400
Beryllium	(mg/kg)	(<0.74)	U	(<0.87)	U	(<0.76)	U	1.4		(<6)	U	(<6)	U	7.2	590
Cadmium	(mg/kg)	**3.7**		**15**		**8.9**		**2.7**		(<6)	U	(<6)	U	2.5	9.3
Calcium	(mg/kg)	23,000		25,000		28,000		17,000	J	(<10,000)	U	(<10,000)	U	---	---
Chromium	(mg/kg)	**34**		**51**		25		20	J	(<50)	U	(<50)	U	30	1,500
Cobalt	(mg/kg)	8.4		18		11		8.4		(<25)	U	(<25)	U	---	---
Copper	(mg/kg)	**2,200**		**510**		**110**		**220**		(<50)	U	(<50)	U	50	270
Iron	(mg/kg)	93,000		130,000		60,000		28,000	J	(<2,000)	U	(<2,000)	U	---	---
Lead	(mg/kg)	**2,300**		**2,800**		**980**		**560**		(<50)	U	(<50)	U	63	1,000
Magnesium	(mg/kg)	3,200		2,700		9,700		2,200	J	(<5,000)	U	(<5,000)	U	---	---
Manganese	(mg/kg)	510		1,100		670		270		(<100)	U	(<100)	U	1,600	10,000
Mercury	(mg/kg)	**0.99**		**1.5**		(<0.11)	U	**1.2**		(<0.5)	U	(<0.5)	U	0.18	2.8
Nickel	(mg/kg)	**43**		**57**		**42**		**30**		(<50)	U	(<50)	U	30	310
Potassium	(mg/kg)	(<620)	U	(<720)	U	1,600		880		(<5,000)	U	(<5,000)	U	---	---
Selenium	(mg/kg)	(<2.2)	U	(<2.6)	U	**4.9**		**4.1**		(<18)	U	(<18)	U	3.9	1,500
Silver	(mg/kg)	(<1.9)	U	(<2.2)	U	(<1.9)	U	(<1.9)	U	(<15)	U	(<15)	U	2	1,500
Sodium	(mg/kg)	(<310)	U	440		380		420		(<2,500)	U	(<2,500)	U	---	---
Thallium	(mg/kg)	(<1.5	U	(<1.7)	U	(<1.5)	U	(<1.5)	U	(<12)	U	(<12)	U	---	---
Vanadium	(mg/kg)	17		19		26		23		(<100)	U	(<100)	U	---	---
Zinc	(mg/kg)	**3,900**		**5,200**		**800**		**780**		(<100)	U	(<100)	U	109	10,000

(a) 932112-SB-Dup-01 collected at 932112-SB06-D3(4-16')C

(b) Rinsate blanks are aqueous samples, units are in µg/L.

TABLE 4-3A DETECTED TARGET ANALYTE LIST METALS SOIL BORING ANALYTICAL DATA

Parameter List USEPA Method 6010B/7471A	Sample ID	932112-SB-Rinsate-03(c)		932112-SB-Rinsate-04(c)		932112-SB-Rinsate05(c)		932112-SB-Rinsate-06(c)		2112-SB-Rinsate-08(c)		932112-SB-Rinsate-09(c)		6 NYCRR Part 375 Soil Cleanup Objectives - Unrestricted Use (mg/kg)	6 NYCRR Part 375 Soil Cleanup Objectives - Restricted Use - Commercial (mg/kg)
	Lab ID	AC51679-041		AC51740-002		AC51740-007		AC51562-024		AC51820-021		AC51679-041			
	Sample Type	QA/QC		QA/QC		QA/QC		QA/QC		QA/QC		QA/QC			
	Sample Date	5/13/2010		5/14/2010		5/17/2010		5/18/2010		5/20/2010		5/21/2010			
Aluminum	(µg/L)	(<2000)	U	(<2000)	U	(<2000)	U	(<2000)	U	(<2000)	U	(<2000)	U	---	---
Antimony	(µg/L)	(<20)	U	(<20)	U	(<20)	U	(<20)	U	(<20)	U	(<20)	U	---	---
Arsenic	(µg/L)	(<20)	U	(<20)	U	(<20)	U	(<20)	U	(<20)	U	(<20)	U	13	16
Barium	(µg/L)	(<100)	U	(<100)	U	(<100)	U	(<100)	U	(<100)	U	(<100)	U	350	400
Beryllium	(µg/L)	(<6)	U	(<6)	U	(<6)	U	(<6)	U	(<6)	U	(<6)	U	7.2	590
Cadmium	(µg/L)	(<6)	U	(<6)	U	(<6)	U	(<6)	U	(<6)	U	(<6)	U	2.5	9.3
Calcium	(µg/L)	(<10,000)	U	(<10,000)	U	(<10,000)	U	(<10,000)	U	(<10,000)	U	(<10,000)	U	---	---
Chromium	(µg/L)	(<50)	U	(<50)	U	(<50)	U	(<50)	U	(<50)	U	(<50)	U	30	1,500
Cobalt	(µg/L)	(<25)	U	(<25)	U	(<25)	U	(<25)	U	(<25)	U	(<25)	U	---	---
Copper	(µg/L)	(<50)	U	(<50)	U	120		(<50)	U	(<50)	U	(<50)	U	50	270
Iron	(µg/L)	(<2,000)	U	(<2,000)	U	3,700		(<2,000)	U	(<2,000)	U	(<2,000)	U	---	---
Lead	(µg/L)	(<50)	U	(<50)	U	120		(<50)	U	(<50)	U	(<50)	U	63	1,000
Magnesium	(µg/L)	(<5,000)	U	(<5,000)	U	(<5,000)	U	(<5,000)	U	(<5,000)	U	(<5,000)	U	---	---
Manganese	(µg/L)	(<100)	U	(<100)	U	(<100)	U	(<100)	U	(<100)	U	(<100)	U	1,600	10,000
Mercury	(µg/L)	(<0.5)	U	(<0.5)	U	(<0.5)	U	(<0.5)	U	(<0.5)	U	(<0.5)	U	0.18	2.8
Nickel	(µg/L)	(<50)	U	(<50)	U	(<50)	U	(<50)	U	(<50)	U	(<50)	U	30	310
Potassium	(µg/L)	(<5,000)	U	(<5,000)	U	(<5,000)	U	(<5,000)	U	(<5,000)	U	(<5,000)	U	---	---
Selenium	(µg/L)	(<18)	U	(<18)	U	(<18)	U	(<18)	U	(<18)	U	(<18)	U	3.9	1,500
Silver	(µg/L)	(<15)	U	(<15)	U	(<15)	U	(<15)	U	(<15)	U	(<15)	U	2	1,500
Sodium	(µg/L)	(<2,500)	U	(<2,500)	U	(<2,500)	U	(<2,500)	U	(<2,500)	U	(<2,500)	U	---	---
Thallium	(µg/L)	(<12)	U	(<12)	U	(<12)	U	(<12)	U	(<12)	U	(<12)	U	---	---
Vanadium	(µg/L)	(<100)	U	(<100)	U	(<100)	U	(<100)	U	(<100)	U	(<100)	U	---	---
Zinc	(µg/L)	(<100)	U	(<100)	U	190		(<100)	U	100	U	(<100)	U	109	10,000

(c) Rinsate blanks are aqueous samples, units are in µg/L.

TABLE 4-3B DETECTED SEMIVOLATILE ORGANIC COMPOUNDS SOIL BORING ANALYTICAL DATA

Parameter List USEPA Method 8270C	Sample ID	932112-SB03-G3(4-14')C		932112-SB06-D3(4-6')		932112-SB08-I8(6-14')C		932112-SB09-I7(24-30')C		932112-SB11-H9(4-6')D		6 NYCRR Part 375 Soil Cleanup Objectives - Unrestricted Use (mg/kg)	6 NYCRR Part 375 Soil Cleanup Objectives - Restricted Use - Commercial (mg/kg)
	Lab ID	AC51562-017		AC51562-022		AC51679-002		AC51679-005		AC51679-003			
	Sample Type	Subsurface Soil (Fill)		Subsurface Soil (Fill)		Subsurface Soil (Fill)		Subsurface Soil (Fill)		Subsurface Soil (Fill)			
	Sample Date	5/10/2010		5/10/2010		5/11/2010		5/11/2010		5/11/2010			
2-Methylnaphthalene	(mg/kg)	(<0.08)	U	(<0.08)	U	0.2		(<0.24)	U	(<0.08)	U	---	---
Acenaphthene	(mg/kg)	(<0.08)	U	(<0.08)	U	0.12		(<0.24)	U	(<0.08)	U	20	500
Acenaphthylene	(mg/kg)	(<0.08)	U	(<0.08)	U	0.095		(<0.24)	U	(<0.08)	U	100	500
Anthracene	(mg/kg)	(<0.08)	U	(<0.08)	U	0.31		(<0.24)	U	0.095		100	500
Benzo[a]anthracene	(mg/kg)	0.13		(<0.08)	U	0.72		**1.4**		0.62		1	5.6
Benzo[a]pyrene	(mg/kg)	0.13		(<0.08)	U	0.58		**1.2**		0.6		1	1
Benzo[b]fluoranthene	(mg/kg)	0.17		0.14		**1.1**		**3.2**		1		1	5.6
Benzo[g,h,i]perylene	(mg/kg)	0.12		0.095		0.58		1.5		0.44		100	500
Benzo[k]fluoranthene	(mg/kg)	(<0.08)	U	(<0.08)	U	0.24		0.74		0.33		0.8	56
bis(2-Ethylhexyl)phthalate	(mg/kg)	(<0.08)	U	(<0.08)	U	(<0.07)	U	(<0.24)	U	0.54		---	---
Carbazole	(mg/kg)	(<0.08)	U	(<0.08)	U	0.11		(<0.24)	U	(<0.08)	U	---	---
Chrysene	(mg/kg)	0.12		(<0.08)	U	0.77		**1.7**		0.66		1	56
Dibenzo[a,h]anthracene	(mg/kg)	(<0.08)	U	(<0.08)	U	0.23		**0.63**		0.16		0.33	0.56
Dibenzofuran	(mg/kg)	(<0.08)	U	(<0.08)	U	0.17		(<0.24)	U	(<0.08)	U	7	350
Fluoranthene	(mg/kg)	0.12		(<0.08)	U	0.87		1.1		0.78		100	100
Fluorene	(mg/kg)	(<0.08)	U	(<0.08)	U	0.2		(<0.24)	U	(<0.08)	U	30	500
Indeno[1,2,3-cd]pyrene	(mg/kg)	0.098		(<0.08)	U	0.42		**1.3**		0.41		0.5	5.6
Naphthalene	(mg/kg)	(<0.08)	U	(<0.08)	U	0.37		(<0.24)	U	(<0.08)	U	12	500
Phenanthrene	(mg/kg)	(<0.08)	U	(<0.08)	U	1.3		0.44		0.54		100	500
Pyrene	(mg/kg)	0.14		(<0.08)	U	1.1		1.9		0.95		100	500

NOTE:

USEPA = United States Enivronmental Protection Agency
NYCRR = New York Code of Rules and Regulation
mg/kg = milligrams per kilogram
U = Non-detect, detection below the method detection limit
--- = No Standard.

A sample ID identified with a "C" denotes that the sample was collected as a composite sample.

A sample ID identified with a "D" denotes that the sample was collected at a discrete sample.

Data provided by Hampton-Clarke Veritech. Only analytes that were detected in at least one sample are shown. Data validation completed by Chemworld Environmental, Inc.

Concentration values in **bold** indicate the concentration was above the 6 NYCRR Part 375 Soil Cleanup Objectives - Unrestricted Use.

Concentration values in **bold and highlighted** indicate the concentration was above the 6 NYCRR Part 375 Soil Cleanup Objectives - Restricted Use (Commercial).

TABLE 4-3B DETECTED SEMIVOLATILE ORGANIC COMPOUNDS SOIL BORING ANALYTICAL DATA

Parameter List USEPA Method 8270C	Sample ID	932112-SB14-I5(60-64')		932112-SB24-E7 (70-73')		932112-SB-Dup-01(a)		932112-SB-Rinsate-01(b)		932112-SB-Rinsate-02(b)		6 NYCRR Part 375 Soil Cleanup Objectives - Unrestricted Use (mg/kg)	6 NYCRR Part 375 Soil Cleanup Objectives - Restricted Use - Commercial (mg/kg)
	Lab ID	AC51740-001		AC51820-022		AC51562-024		AC51562-023		AC51679-006			
	Sample Type	Subsurface Soil (Fill)		Subsurface Soil (Fill)		QA/QC		QA/QC		QA/QC			
	Sample Date	5/14/2010		5/20/2010		5/10/2010		5/10/2010		5/11/2010			
2-Methylnaphthalene	(mg/kg)	(<0.24)	U	(<0.25)	U	(<0.08)	U	(<2.2)	U	(<2)	U	---	---
Acenaphthene	(mg/kg)	(<0.24)	U	(<0.25)	U	(<0.08)	U	(<2.2)	U	(<2)	U	20	500
Acenaphthylene	(mg/kg)	(<0.24)	U	0.3		(<0.08)	U	(<2.2)	U	(<2)	U	100	500
Anthracene	(mg/kg)	(<0.24)	U	0.53		0.088		(<2.2)	U	(<2)	U	100	500
Benzo[a]anthracene	(mg/kg)	0.73		**2.4**		0.43		(<2.2)	U	(<2)	U	1	5.6
Benzo[a]pyrene	(mg/kg)	0.63	J	**1.7**		0.31		(<2.2)	U	(<2)	U	1	1
Benzo[b]fluoranthene	(mg/kg)	**1.2**	**J**	**3**		0.5		(<2.2)	U	(<2)	U	1	5.6
Benzo[g,h,i]perylene	(mg/kg)	(<0.24)	U	0.82		0.28		(<2.2)	U	(<2)	U	100	500
Benzo[k]fluoranthene	(mg/kg)	0.32	J	**1**		0.11		(<2.2)	U	(<2)	U	0.8	56
bis(2-Ethylhexyl)phthalate	(mg/kg)	(<0.24)	U	(<0.25)	U	(<0.08)	U	(<2.2)	U	(<2)	U	---	---
Carbazole	(mg/kg)	(<0.24)	U	(<0.25)	U	(<0.08)	U	(<2.2)	U	(<2)	U	---	---
Chrysene	(mg/kg)	**1.7**		**1.8**		0.44		(<2.2)	U	(<2)	U	1	56
Dibenzo[a,h]anthracene	(mg/kg)	(<0.24)	U	**0.36**		0.1		(<2.2)	U	(<2)	U	0.33	0.56
Dibenzofuran	(mg/kg)	(<0.24)	U	(<0.25)	U	(<0.08)	U	(<2.2)	U	(<2)	U	7	350
Fluoranthene	(mg/kg)	1.1		3		0.41		(<2.2)	U	(<2)	U	100	100
Fluorene	(mg/kg)	(<0.24)	U	0.27		(<0.08)	U	(<2.2)	U	(<2)	U	30	500
Indeno[1,2,3-cd]pyrene	(mg/kg)	(<0.24)	U	**0.93**		0.18		(<2.2)	U	(<2)	U	0.5	5.6
Naphthalene	(mg/kg)	(<0.24)	U	(<0.25)	U	(<0.08)	U	(<2.2)	U	(<2)	U	12	500
Phenanthrene	(mg/kg)	0.38		1.2		0.44		(<2.2)	U	(<2)	U	100	500
Pyrene	(mg/kg)	0.71		3		0.83		(<2.2)	U	(<2)	U	100	500

(a) 932112-SB-Dup-01 collected at 932112-SB06-D3(4-16')C

(b) Rinsate blanks are aqueous samples, units are in µg/L.

TABLE 4-3B DETECTED SEMIVOLATILE ORGANIC COMPOUNDS SOIL BORING ANALYTICAL DATA

Parameter List USEPA Method 8270C	Sample ID	932112-SB-Rinsate-04(c)		932112-SB-Rinsate-08(c)		6 NYCRR Part 375 Soil Cleanup Objectives - Unrestricted Use (mg/kg)	6 NYCRR Part 375 Soil Cleanup Objectives - Restricted Use - Commercial (mg/kg)
	Lab ID	AC51740-002		AC51820-021			
	Sample Type	QA/QC		QA/QC			
	Sample Date	5/14/2010		5/20/2010			
2-Methylnaphthalene	(µg/L)	(<2)	U	(<2.2)	U	---	---
Acenaphthene	(µg/L)	(<2)	U	(<2.2)	U	20	500
Acenaphthylene	(µg/L)	(<2)	U	(<2.2)	U	100	500
Anthracene	(µg/L)	(<2)	U	(<2.2)	U	100	500
Benzo[a]anthracene	(µg/L)	(<2)	U	(<2.2)	U	1	5.6
Benzo[a]pyrene	(µg/L)	(<2)	U	(<2.2)	U	1	1
Benzo[b]fluoranthene	(µg/L)	(<2)	U	(<2.2)	U	1	5.6
Benzo[g,h,i]perylene	(µg/L)	(<2)	U	(<2.2)	U	100	500
Benzo[k]fluoranthene	(µg/L)	(<2)	U	(<2.2)	U	0.8	56
bis(2-Ethylhexyl)phthalate	(µg/L)	(<2)	U	(<2.2)	U	---	---
Carbazole	(µg/L)	(<2)	U	(<2.2)	U	---	---
Chrysene	(µg/L)	(<2)	U	(<2.2)	U	1	56
Dibenzo[a,h]anthracene	(µg/L)	(<2)	U	(<2.2)	U	0.33	0.56
Dibenzofuran	(µg/L)	(<2)	U	(<2.2)	U	7	350
Fluoranthene	(µg/L)	(<2)	U	(<2.2)	U	100	100
Fluorene	(µg/L)	(<2)	U	(<2.2)	U	30	500
Indeno[1,2,3-cd]pyrene	(µg/L)	(<2)	U	(<2.2)	U	0.5	5.6
Naphthalene	(µg/L)	(<2)	U	(<2.2)	U	12	500
Phenanthrene	(µg/L)	(<2)	U	(<2.2)	U	100	500
Pyrene	(µg/L)	(<2)	U	(<2.2)	U	100	500

(c) Rinsate blanks are aqueous samples, units are in µg/L.

NOTE: QA/QC = Quality Assurance/Quality Control

TABLE 4-3C DETECTED PESTICIDES SOIL BORING ANALYTICAL DATA

Parameter List USEPA Method 8081A	Sample ID	932112-SB03-G3(4-14')C		932112-SB06-D3(4-6')		932112-SB08-I8(6-14')C		932112-SB09-I7(24-30')C		932112-SB11-H9(4-6')D		6 NYCRR Part 375 Soil Cleanup Objectives - Unrestricted Use (mg/kg)	6 NYCRR Part 375 Soil Cleanup Objectives - Restricted Use - Commercial (mg/kg)
	Lab ID	AC51562-017		AC51562-022		AC51679-002		AC51679-005		AC51679-003			
	Sample Type	Subsurface Soil (Fill)		Subsurface Soil (Fill)		Subsurface Soil (Fill)		Subsurface Soil (Fill)		Subsurface Soil (Fill)			
	Sample Date	5/10/2010		5/10/2010		5/11/2010		5/11/2010		5/11/2010			
p,p'-DDE	(mg/kg)	(<0.0031)	U	**0.0053**		(<0.0029)	U	(<0.0029)	U	(<0.0031)	U	0.0033	62
p,p'-DDT	(mg/kg)	(<0.0031)	UJ	**0.0049**	**J**	(<0.0029)	UJ	(<0.0029)	UJ	(<0.0031)	UJ	0.0033	47

Parameter List USEPA Method 8081A	Sample ID	932112-SB14-I5(60-64')		932112-SB24-E7(70-73')		932112-SB-Dup-01(a)		932112-SB-Rinsate-01(b)		932112-SB-Rinsate-02(b)		6 NYCRR Part 375 Soil Cleanup Objectives - Unrestricted Use (mg/kg)	6 NYCRR Part 375 Soil Cleanup Objectives - Restricted Use - Commercial (mg/kg)
	Lab ID	AC51740-001		AC51820-022		AC51562-024		AC51562-023		AC51679-006			
	Sample Type	Subsurface Soil (Fill)		Subsurface Soil (Fill)		QA/QC		QA/QC		QA/QC			
	Sample Date	5/13/2010		5/20/2010		5/10/2010		5/10/2010		5/11/2010			
p,p'-DDE	(mg/kg)	(<0.003)	U	(<0.0031)	U	**0.007**		(<0.01)	U	(<0.01)	U	0.0033	62
p,p'-DDT	(mg/kg)	(<0.003)	UJ	(<0.0031)	U	**0.0095**	**J**	(<0.01)	UJ	(<0.01)	UJ	0.0033	47

Parameter List USEPA Method 8081A	Sample ID	932112-SB-Rinsate-04(b)		932112-SB-Rinsate-08(b)		6 NYCRR Part 375 Soil Cleanup Objectives - Unrestricted Use (mg/kg)	6 NYCRR Part 375 Soil Cleanup Objectives - Restricted Use - Commercial (mg/kg)
	Lab ID	AC51740-002		AC51820-021			
	Sample Type	QA/QC		QA/QC			
	Sample Date	5/13/2010		5/20/2010			
p,p'-DDE	(mg/kg)	(<0.01)	U	(<0.01)	U	0.0033	62
p,p'-DDT	(mg/kg)	(<0.01)	UJ	(<0.01)	U	0.0033	47

(a) 932112-SB-Dup-01 collected at 932112-SB06-D3(4-6')C

(b) Rinsate blanks are aqueous samples, units are in µg/L.

NOTE:

USEPA = United States Enivronmental Protection Agency
NYCRR = New York Code of Rules and Regulation
mg/kg = milligrams per kilogram
U = Non-detect, detection below the method detection limit
UJ = The compound analyzed for, but not detected. The sample quantitation limit is an estimated quantity due to variance from quality control limits.
J = The associated numerical value is and estimated quantity.
DDE = Dichlorodiphenyldichloroethylene
DDT = Dichlorodiphenyltrichloroethane

A sample ID identified with a "C" denotes that the sample was collected as a composite sample.

A sample ID identified with a "D" denotes that the sample was collected at a discrete sample.

Data provided by Hampton-Clarke Veritech. Only analytes that were detected in at least one sample are shown. Data validation completed by Chemworld Environmental, Inc.

Concentration values in**bold** indicate the concentration was above the 6 NYCRR Part 375 Soil Cleanup Objectives - Unrestricted Use.

Concentration values in**bold and highlighted** indicate the concentration was above the 6 NYCRR Part 375 Soil Cleanup Objectives - Restricted Use (Commercial).

TABLE 4-3D DETECTED POLYCHLORINATED BIPHENYLS SOIL BORING ANALYTICAL DATA

Parameter List USEPA Method 8082	Sample ID	932112-SB03-G3(4-14')C		932112-SB06-D3(4-6')		932112-SB08-I8(6-14')C		932112-SB09-I7(24-30')C		932112-SB11-H9(4-6')D		6 NYCRR Part 375 Soil Cleanup Objectives - Unrestricted Use (mg/kg)	6 NYCRR Part 375 Soil Cleanup Objectives - Restricted Use - Commercial (mg/kg)
	Lab ID	AC51562-017		AC51562-022		AC51679-002		AC51679-005		AC51679-003			
	Sample Type	Subsurface Soil (Fill)		Subsurface Soil (Fill)		Subsurface Soil (Fill)		Subsurface Soil (Fill)		Subsurface Soil (Fill)			
	Sample Date	5/10/2010		5/10/2010		5/11/2010		5/11/2010		5/11/2010			
Aroclor-1268	(mg/kg)	0.08		(<0.03)	U	(<0.02)	U	(<0.02)	U	(<0.03)	U	---	---
Aroclor (Total)	(mg/kg)	0.08		(<0.03)	U	(<0.02)	U	(<0.02)	U	(<0.03)	U	0.1	1

Parameter List USEPA Method 8082	Sample ID	932112-SB14-I5(60-64')		932112-SB24-E7(70-73')		932112-SB-Dup-01[a]		932112-SB-Rinsate-01[b]		932112-SB-Rinsate-02[b]		6 NYCRR Part 375 Soil Cleanup Objectives - Unrestricted Use (mg/kg)	6 NYCRR Part 375 Soil Cleanup Objectives - Restricted Use - Commercial (mg/kg)
	Lab ID	AC51740-001		AC51820-022		AC51562-024		AC51562-023		AC51679-006			
	Sample Type	Subsurface Soil (Fill)		Subsurface Soil (Fill)		QA/QC		QA/QC		QA/QC			
	Sample Date	5/13/2010		5/20/2010		5/10/2010		5/10/2010		5/11/2010			
Aroclor-1268	(mg/kg)	(<0.03)	U	(<0.03)	U	(<0.03)	U	(<0.25)	U	(<0.25)	U	---	---
Aroclor (Total)	(mg/kg)	(<0.03)	U	(<0.03)	U	(<0.03)	U	(<0.25)	U	(<0.25)	U	0.1	1

Parameter List USEPA Method 8082	Sample ID	932112-SB-Rinsate-04[b]		932112-SB-Rinsate-08[b]		6 NYCRR Part 375 Soil Cleanup Objectives - Unrestricted Use (mg/kg)	6 NYCRR Part 375 Soil Cleanup Objectives - Restricted Use - Commercial (mg/kg)
	Lab ID	AC51740-002		AC51820-021			
	Sample Type	QA/QC		QA/QC			
	Sample Date	5/13/2010		5/20/2010			
Aroclor-1268	(mg/kg)	(<0.25)	U	(<0.25)	U	---	---
Aroclor (Total)	(mg/kg)	(<0.25)	U	(<0.25)	U	0.1	1

(a) 932112-SB-Dup-01 collected at 932112-SB06-D3(4-6')C

(b) Rinsate blanks are aqueous samples, units are in µg/L.

NOTE:

USEPA = United States Enivronmental Protection Agency
NYCRR = New York Code of Rules and Regulation
mg/kg = milligrams per kilogram
U = Non-detect, detection below the method detection limit
--- = No Standard

A sample ID identified with a "C" denotes that the sample was collected as a composite sample.

A sample ID identified with a "D" denotes that the sample was collected at a discrete sample.

Data provided by Hampton-Clarke Veritech. Only analytes that were detected in at least one sample are shown. Data validation completed by Chemworld Environmental, Inc.

Concentration values in **bold** indicate the concentration was above the 6 NYCRR Part 375 Soil Cleanup Objectives - Unrestricted Use.

Concentration values in **bold and highlighted** indicate the concentration was above the 6 NYCRR Part 375 Soil Cleanup Objectives - Restricted Use (Commercial).

TABLE 4-3E DETECTED VOLATILE ORGANIC COMPOUNDS SOIL BORING ANALYTICAL DATA

Parameter List USEPA Method 8260B	Sample ID	932112-SB01-I3(30-32')D		932112-SB08-I8(6-12')D		932112-SB11-H9(4-6')D		932112-SB13-I4 (25-27')D		932112-SB14-I5(60-64')		6 NYCRR Part 375 Soil Cleanup Objectives - Unrestricted Use (mg/kg)	6 NYCRR Part 375 Soil Cleanup Objectives - Restircted Use - Commercial (mg/kg)
	Lab ID	AC51562-014		AC51679-001		AC51679-003		AC51679-040		AC51740-001			
	Sample Type	Subsurface Soil (Fill)		Subsurface Soil (Fill)		Subsurface Soil (Fill)		Subsurface Soil (Fill)		Subsurface Soil (Fill)			
	Sample Date	5/10/2010		5/11/2010		5/11/2010		5/13/2010		5/14/2010			
Benzene	(mg/kg)	(<0.0011)	U	0.0012		(<0.0013)	U	(<0.0012)	U	(<0.006)	UJ	0.06	44
1,4-Dichlorobenzene	(mg/kg)	(<0.0056)	U	(<0.0059)	U	(<0.0063)	UJ	(<0.0058)	UJ	0.14	J	1.8	130
Ethylbenzene	(mg/kg)	(<0.0011)	U	0.0018		(<0.0013)	UJ	(<0.0012)	UJ	(<0.006)	UJ	1	390
Methylene chloride	(mg/kg)	(<0.0056)	U	0.023		0.013		(<0.0058)	U	(<0.03)	UJ	0.05	500
Tetrachloroethene	(mg/kg)	(<0.0056)	U	0.041		0.025		0.37		(<0.03)	U	1.3	150
Toluene	(mg/kg)	(<0.0011)	U	0.014		0.0034		0.0013		(<0.006)	UJ	0.7	500
Trichloroethene	(mg/kg)	(<0.0056)	U	0.031		(<0.0063)	U	0.21		(<0.03)	UJ	0.47	200
m&p-Xylenes	(mg/kg)	(<0.0011)	U	0.0087		(<0.0013)	UJ	(<0.0012)	UJ	(<0.006)	UJ	---	---
o-Xylene	(mg/kg)	(<0.0011)	U	0.0042		(<0.0013)	UJ	(<0.0012)	UJ	(<0.006)	UJ	---	---
Xylenes (Total)	(mg/kg)	(<0.0011)	U	0.0129		(<0.0013)	UJ	(<0.0012)	UJ	(<0.006)	UJ	0.26	500

Parameter List USEPA Method 8260B	Sample ID	932112-SB-Dup-02(a)		932112-SB-Rinsate-01(b)		932112-SB-Rinsate-02(b)		932112-SB-Rinsate-03(b)		932112-SB-Rinsate-04(b)		6 NYCRR Part 375 Soil Cleanup Objectives - Unrestricted Use (mg/kg)	6 NYCRR Part 375 Soil Cleanup Objectives - Restircted Use - Commercial (mg/kg)
	Lab ID	AC51679-012		AC51562-023		AC51679-006		AC51679-041		AC51740-002			
	Sample Type	QA/QC		QA/QC		QA/QC		QA/QC		QA/QC			
	Sample Date	5/10/2010		5/10/2010		5/11/2010		5/13/2010		5/14/2010			
Benzene	(mg/kg)	(<0.0012)	U	(<0.05)	U	(<0.05)	U	(<0.05)	U	(<0.05)	U	0.06	44
1,4-Dichlorobenzene	(mg/kg)	(<0.006)	U	(<0.05)	U	(<0.05)	U	(<0.05)	U	(<1)	U	1.8	130
Ethylbenzene	(mg/kg)	(<0.0012)	U	(<0.05)	U	(<0.05)	U	(<0.05)	U	(<1)	U	1	390
Methylene chloride	(mg/kg)	0.022		(<1)	U	(<1)	U	(<1)	U	(<1)	U	0.05	500
Tetrachloroethene	(mg/kg)	0.0096		(<0.05)	U	(<0.05)	U	(<0.05)	U	(<1)	U	1.3	150
Toluene	(mg/kg)	0.0058		(<0.05)	U	(<0.05)	U	(<0.05)	U	(<1)	U	0.7	500
Trichloroethene	(mg/kg)	0.01		(<0.05)	U	(<0.05)	U	(<0.05)	U	(<1)	U	0.47	200
m&p-Xylenes	(mg/kg)	0.0019		(<1)	U	(<1)	U	(<1)	U	(<1)	U	---	---
o-Xylene	(mg/kg)	(<0.0012)	U	(<0.05)	U	(<0.05)	U	(<0.05)	U	(<1)	U	---	---
Xylenes (Total)	(mg/kg)	0.0019		(<0.05)	U	(<0.05)	U	(<0.05)	U	(<1)	U	0.26	500

(a) 932112-SB-Dup-02 collected at 932112-SB08-I8(6-12')D

(b) Rinsate blanks are aqueous samples, units are in µg/L.

NOTE:

USEPA = United States Enivronmental Protection Agency
NYCRR = New York Code of Rules and Regulation
mg/kg = milligrams per kilogram
U = Non-detect, detection below the method detection limit
UJ = The compound was analyzed for, but not detected. The sample quantitation limit is an estimated quantity due to variance from quality control limits.
--- = No Standard.
QA/QC = Quality Assurance/Quality Control

A sample ID identified with a "C" denotes that the sample was collected as a composite sample.

A sample ID identified with a "D" denotes that the sample was collected at a discrete sample.

Data provided by Hampton-Clarke Veritech. Only analytes that were detected in at least one sample are shown. Data validation completed by Chemworld Environmental, Inc.

Concentration values in **bold** indicate the concentration was above the 6 NYCRR Part 375 Soil Cleanup Objectives - Unrestricted Use.

Concentration values in **bold and highlighted** indicate the concentration was above the 6 NYCRR Part 375 Soil Cleanup Objectives - Restricted Use (Commercial).

TABLE 4-4 DETECTED TARGET ANALYTE LIST METALS VERTICAL PROFILE SOIL BORING ANALYTICAL DATA

Parameter List USEPA Method 6010B/7471A	Sample ID	932112-SB-13-I4 (0-4')		932112-SB-13-I4 (4-8')		932112-SB-13-I4 (8-12')		932112-SB-13-I4 (12-16')		932112-SB-13-I4 (16-20')		932112-SB-13-I4 (20-24')		6 NYCRR Part 375 Soil Cleanup Objectives - Unrestricted Use (mg/kg)	6 NYCRR Part 375 Soil Cleanup Objectives - Restricted Use - Commercial (mg/kg)
	Lab ID	AC51679-023		AC51679-024		AC51679-025		AC51679-026		AC51679-027		AC51679-028			
	Sample Type	Subsurface Soil (Fill)		Subsurface Soil (Fill)		Subsurface Soil (Fill)		Subsurface Soil (Fill)		Subsurface Soil (Fill)		Subsurface Soil (Fill)			
	Sample Date	5/13/2010		5/13/2010		5/13/2010		5/13/2010		5/13/2010		5/13/2010			
Arsenic	(mg/kg)	6.2		**18**		**36**		**17**		13		9.1		13	16
Barium	(mg/kg)	110		**960**		**1,300**		**720**		190		130		350	400
Cadmium	(mg/kg)	0.9		**77**		**7.4**		1.7		1.9		**3.6**		2.5	9.3
Chromium	(mg/kg)	11	J	**72**	**J**	**57**	**J**	24	J	14	J	14	J	30	1,500
Lead	(mg/kg)	**350**		**8,800**		**10,000**		**1,000**		**1,000**		**270**		63	1,000
Mercury	(mg/kg)	0.15		**0.5**		**0.76**		**0.22**		**1.5**		(<0.1)	U	0.18	2.8

Parameter List USEPA Method 6010B/7471A	Sample ID	932112-SB-13-I4 (24-28')		932112-SB-13-I4 (28-32')		932112-SB-13-I4 (32-36')		932112-SB-13-I4 (36-40')		932112-SB-13-I4 (40-44')		932112-SB-13-I4 (44-48')		6 NYCRR Part 375 Soil Cleanup Objectives - Unrestricted Use (mg/kg)	6 NYCRR Part 375 Soil Cleanup Objectives - Restricted Use - Commercial (mg/kg)
	Lab ID	AC51679-029		AC51679-030		AC51679-031		AC51679-033		AC51679-034		AC51679-035			
	Sample Type	Subsurface Soil (Fill)		Subsurface Soil (Fill)		Subsurface Soil (Fill)		Subsurface Soil (Fill)		Subsurface Soil (Fill)		Subsurface Soil (Fill)			
	Sample Date	5/13/2010		5/13/2010		5/13/2010		5/13/2010		5/13/2010		5/13/2010			
Arsenic	(mg/kg)	9.1		**1,000**		**26**		**38**		**24**		11		13	16
Barium	(mg/kg)	300		**420**		**530**		**860**		**430**		120		350	400
Cadmium	(mg/kg)	(<0.83)	U	**4.3**		1.7		0.95		(<0.83)	U	(<0.81)	U	2.5	9.3
Chromium	(mg/kg)	10	J	**31**	J	23	J	20	J	16	J	**86**	J	30	1,500
Lead	(mg/kg)	**310**		**260**		**530**		**440**		**580**		**380**		63	1,000
Mercury	(mg/kg)	(<0.12)	U	**0.35**		(<0.12)	U	(<0.12)	U	(<0.12)	U	(<0.11)	U	0.18	2.8

Parameter List USEPA Method 6010B/7471A	Sample ID	932112-SB-13-I4 (48-52')		932112-SB-13-I4 (52-55')		932112-SB-Dup-03[a]		932112-SB-Rinsate-03[b]		6 NYCRR Part 375 Soil Cleanup Objectives - Unrestricted Use (mg/kg)	6 NYCRR Part 375 Soil Cleanup Objectives - Restricted Use - Commercial (mg/kg)
	Lab ID	AC51679-038		AC51679-039		AC51679-032		AC51679-041			
	Sample Type	Subsurface Soil (Fill)		Subsurface Soil (Native)		QA/QC		QA/QC			
	Sample Date	5/13/2010		5/13/2010		5/13/2010		5/13/2010			
Arsenic	(mg/kg)	(<2.2)	U	(<2.2)	U	6.1		(<20)	U	13	16
Barium	(mg/kg)	11		(<2.2)	U	140		(<100)	U	350	400
Cadmium	(mg/kg)	(<0.65)	U	(<0.65)	U	1.6		(<6)	U	2.5	9.3
Chromium	(mg/kg)	7.3	J	6.5	J	14	J	(<50)	U	30	1,500
Lead	(mg/kg)	28		34		**310**		(<50)	U	63	1,000
Mercury	(mg/kg)	(<0.09)	U	(<0.09)	U	**0.26**		(<0.5)	U	0.18	2.8

(a) 932112-SB-Dup-03 collected at 932112-SB-13-I4 (0-4')

(b) Rinsate blanks are aqueous samples, units are in µg/L.

NOTE:
USEPA = United States Enivronmental Protection Agency
NYCRR = New York Code of Rules and Regulation
mg/kg = milligrams per kilogram.
J = The associated numerical value is an estimated quantity.
U = Non-detect, detection below the method detection limit.
QA/QC = Quality Assurance/Quality Control
A sample ID identified with a "C" denotes that the sample was collected as a composite sample.
Data provided by Hampton-Clarke Veritech. Only analytes that were detected in at least one sample are shown. Data validation completed by Chemworld Environmental, Inc.
Concentration values in **bold** indicate the concentration was above the 6 NYRCC Part 375 Soil Cleanup Objective - Unrestricted Use.
Concentration values in **bold and highlighted** indicate the concentration was above the 6 NYCRR Part 375 Soil Cleanup Objectives - Restricted Use (Commercial).

TABLE 4-4 DETECTED TARGET ANALYTE LIST METALS VERTICAL PROFILE SOIL BORING ANALYTICAL DATA

Parameter List USEPA Method 6010B/7471A	Sample ID	932112-SB20-E5 (0-4')C		932112-SB20-E5 (4-8')C		932112-SB20-E5 (8-12')C		932112-SB20-E5 (12-16')C		932112-SB20-E5 (16-20')C		932112-SB20-E5 (20-24')C		6 NYCRR Part 375 Soil Cleanup Objectives - Unrestricted Use (mg/kg)	6 NYCRR Part 375 Soil Cleanup Objectives - Restricted Use - Commercial (mg/kg)
	Lab ID	AC51761-003		AC51761-004		AC51761-005		AC51761-006		AC51761-007		AC51761-008			
	Sample Type	Subsurface Soil (Fill)		Subsurface Soil (Fill)		Subsurface Soil (Fill)		Subsurface Soil (Fill)		Subsurface Soil (Fill)		Subsurface Soil (Fill)			
	Sample Date	5/18/2010		5/18/2010		5/18/2010		5/18/2010		5/18/2010		5/18/2010			
Arsenic	(mg/kg)	12		**15**		11		**42**		**22**		**23**		13	16
Barium	(mg/kg)	64	J	**390**	**J**	**590**	**J**	**1,100**	**J**	**500**	**J**	**630**	**J**	350	400
Cadmium	(mg/kg)	1.6		(<0.8)	U	2		**8.3**		**12**		**33**		2.5	9.3
Chromium	(mg/kg)	8.9		20		24		**66**		**170**		**63**		30	1,500
Lead	(mg/kg)	**92**	**J**	**480**	**J**	**1,700**	**J**	**3,300**	**J**	**1,200**	**J**	**15,000**	**J**	63	1,000
Mercury	(mg/kg)	0.15		**0.2**		**1.5**		**0.42**		**2.8**		**6.5**		0.18	2.8

Parameter List USEPA Method 6010B/7471A	Sample ID	932112-SB20-E5 (24-28')C		932112-SB20-E5 (28-32')C		932112-SB20-E5 (32-36')C		932112-SB20-E5 (36-42')C		932112-SB20-E5 (46-48')D		932112-SB-DUP-04(c)		6 NYCRR Part 375 Soil Cleanup Objectives - Unrestricted Use (mg/kg)	6 NYCRR Part 375 Soil Cleanup Objectives - Restricted Use - Commercial (mg/kg)
	Lab ID	AC51761-009		AC51761-011		AC51761-012		AC51761-013		AC51679-034		AC51761-010			
	Sample Type	Subsurface Soil (Fill)		Subsurface Soil (Fill)		Subsurface Soil (Fill)		Subsurface Soil (Fill)		Subsurface Soil (Native)		QA/QC			
	Sample Date	5/18/2010		5/18/2010		5/18/2010		5/18/2010		5/18/2010		5/18/2010			
Arsenic	(mg/kg)	**20**		13		13		13		4.6		13		13	16
Barium	(mg/kg)	**410**	**J**	**570**	**J**	310	J	**640**	J	15	J	**370**		350	400
Cadmium	(mg/kg)	1.6		1.8		1.1		1.3		(<0.71)	U	0.94		2.5	9.3
Chromium	(mg/kg)	**31**		**39**		**61**		18		6		20		30	1,500
Lead	(mg/kg)	**320**	**J**	**6,200**	**J**	**1,300**	**J**	**190**	**J**	16	J	**540**		63	1,000
Mercury	(mg/kg)	**0.61**		**4**		**9.8**		(<0.11)	U	(<0.09)	U	**0.64**		0.18	2.8

(c) 932112-SB-Dup-04 collected at 932112-SB20-E5 (8-12')C

TABLE 4-4 DETECTED TARGET ANALYTE LIST METALS VERTICAL PROFILE SOIL BORING ANALYTICAL DATA

Parameter List USEPA Method 6010B/7471A	Sample ID	932112-SB21-G6 (0-4')C		932112-SB21-G6 (4-8')C		932112-SB21-G6 (8-12')C		932112-SB21-G6 (12-16')C		932112-SB21-G6 (16-20')C		932112-SB21-G6 (20-24')C		6 NYCRR Part 375 Soil Cleanup Objectives - Unrestricted Use (mg/kg)	6 NYCRR Part 375 Soil Cleanup Objectives - Restricted Use - Commercial (mg/kg)
	Lab ID	AC51761-015		AC51761-016		AC51761-017		AC51761-018		AC51761-019		AC51761-020			
	Sample Type	Subsurface Soil (Fill)		Subsurface Soil (Fill)		Subsurface Soil (Fill)		Subsurface Soil (Fill)		Subsurface Soil (Fill)		Subsurface Soil (Fill)			
	Sample Date	5/18/2010		5/18/2010		5/18/2010		5/18/2010		5/18/2010		5/18/2010			
Arsenic	(mg/kg)	**24**		7		**23**		**25**		**93**		**51**		13	16
Barium	(mg/kg)	**530**	**J**	140	J	140	J	340	J	**470**	**J**	**380**	**J**	350	400
Cadmium	(mg/kg)	**6.5**		1.1		1		**3.2**		**2.6**		(<0.8)	U	2.5	9.3
Chromium	(mg/kg)	**42**		12		30		**39**		18		13		30	1,500
Lead	(mg/kg)	**3,700**	**J**	**2,500**	**J**	**2,000**	**J**	**780**	**J**	**550**	**J**	**320**	J	63	1,000
Mercury	(mg/kg)	**0.37**		**1.5**		**6.9**		**1.9**		**5.4**		**0.59**		0.18	2.8

Parameter List USEPA Method 6010B/7471A	Sample ID	932112-SB21-G6 (24-28')C		932112-SB21-G6 (30-32')C		932112-SB21-G6 (32-36')C		932112-SB21-G6 (36-40')C		932112-SB21-G6 (40-44')C		932112-SB21-G6 (44-46')C		6 NYCRR Part 375 Soil Cleanup Objectives - Unrestricted Use (mg/kg)	6 NYCRR Part 375 Soil Cleanup Objectives - Restricted Use - Commercial (mg/kg)
	Lab ID	AC51761-021		AC51761-022		AC51761-023		AC51761-024		AC51761-025		AC51761-028			
	Sample Type	Subsurface Soil (Fill)		Subsurface Soil (Fill)		Subsurface Soil (Fill)		Subsurface Soil (Fill)		Subsurface Soil (Fill)		Subsurface Soil (Fill)			
	Sample Date	5/18/2010		5/18/2010		5/18/2010		5/18/2010		5/18/2010		5/18/2010			
Arsenic	(mg/kg)	**63**		**53**		**71**		**20**		**50**		**25**		13	16
Barium	(mg/kg)	**970**	**J**	**1,100**	**J**	**1,100**	**J**	**1,000**	**J**	150	J	340	J	350	400
Cadmium	(mg/kg)	**25**		1.8		**24**		2		(<0.71)	U	1.7		2.5	9.3
Chromium	(mg/kg)	**84**		**41**		**78**		**32**		12		25		30	1,500
Lead	(mg/kg)	**4,000**	**J**	**1,100**	**J**	**7,300**	**J**	**13,000**	**J**	**440**	**J**	**1,200**	**J**	63	1,000
Mercury	(mg/kg)	**0.98**		**5.4**		**1.6**		**1.6**		**0.6**		**0.97**		0.18	2.8

Parameter List USEPA Method 6010B/7471A	Sample ID	932112-SB21-G6 (48-52')C		932112-SB21-G6 (52-56')C		932112-SB21-G6 (56-60')C		932112-SB21-G6 (60-64')C		932112-SB21-G6 (64-68')C		932112-SB21-G6 (68-72')C		6 NYCRR Part 375 Soil Cleanup Objectives - Unrestricted Use (mg/kg)	6 NYCRR Part 375 Soil Cleanup Objectives - Restricted Use - Commercial (mg/kg)
	Lab ID	AC51761-029		AC51761-030		AC51761-031		AC51761-032		AC51820-001		AC51820-002			
	Sample Type	Subsurface Soil (Fill)		Subsurface Soil (Fill)		Subsurface Soil (Fill)		Subsurface Soil (Fill)		Subsurface Soil (Fill)		Subsurface Soil (Native)			
	Sample Date	5/18/2010		5/18/2010		5/18/2010		5/18/2010		5/19/2010		5/19/2010			
Arsenic	(mg/kg)	**33**		**21**		**60**		**46**		**20**		7.6		13	16
Barium	(mg/kg)	**870**	**J**	**650**	**J**	**2,000**	**J**	**1,400**	**J**	**1,600**		64		350	400
Cadmium	(mg/kg)	**8.8**		**4.4**		**17**		**18**		**7.9**		(<0.77)	U	2.5	9.3
Chromium	(mg/kg)	**50**		23		**63**		**77**		**140**		8.4		30	1,500
Lead	(mg/kg)	**3,000**	**J**	**1,400**	**J**	**1,500**	**J**	**4,400**	**J**	**2,300**		42		63	1,000
Mercury	(mg/kg)	**0.96**		0.17		**1.4**		**3.7**		**0.6**		(<0.11)	U	0.18	2.8

Parameter List USEPA Method 6010B/7471A	Sample ID	932112-SB-DUP-05(d)		932112-SB-Rinsate-06(e)		6 NYCRR Part 375 Soil Cleanup Objectives - Unrestricted Use (mg/kg)	6 NYCRR Part 375 Soil Cleanup Objectives - Restricted Use - Commercial (mg/kg)
	Lab ID	AC51820-010		AC51761-002			
	Sample Type	QA/QC		QA/QC			
	Sample Date	5/19/2010		5/18/2010			
Arsenic	(mg/kg)	**20**		(<20)	U	13	16
Barium	(mg/kg)	**1,300**		(<100)	U	350	400
Cadmium	(mg/kg)	**11**		(<6)	U	2.5	9.3
Chromium	(mg/kg)	**98**		(<50)	U	30	1,500
Lead	(mg/kg)	**3,100**		(<50)	U	63	1,000
Mercury	(mg/kg)	**1.4**		(<0.5)	U	0.18	2.8

(d) 932112-SB-Dup-05 collected at 932112-SB21-G6 (60-64')C

(e) Rinsate blanks are aqueous samples, units are in µg/L.

TABLE 4-4 DETECTED TARGET ANALYTE LIST METALS VERTICAL PROFILE SOIL BORING ANALYTICAL DATA

Parameter List USEPA Method 6010B/7471A	Sample ID	932112-SB22-F9 (0-4')C		932112-SB22-F9 (4-8')C		932112-SB22-F9 (8-12')C		932112-SB22-F9 (12-16')C		932112-SB22-F9 (16-20')C		932112-SB22-F9 (22-28')C		6 NYCRR Part 375 Soil Cleanup Objectives - Unrestricted Use (mg/kg)	6 NYCRR Part 375 Soil Cleanup Objectives - Restricted Use - Commercial (mg/kg)
	Lab ID	AC51820-004		AC51820-005		AC51820-006		AC51820-007		AC51820-008		AC51820-009			
	Sample Type	Subsurface Soil (Fill)		Subsurface Soil (Fill)		Subsurface Soil (Fill)		Subsurface Soil (Fill)		Subsurface Soil (Fill)		Subsurface Soil (Fill)			
	Sample Date	5/19/2010		5/19/2010		5/19/2010		5/19/2010		5/19/2010		5/19/2010			
Arsenic	(mg/kg)	8.9		**21**		13		**17**		**25**		**69**		13	16
Barium	(mg/kg)	210		280		**720**		220		80		290		350	400
Cadmium	(mg/kg)	**10**		1.7		**2.8**		(<0.71)	U	**3.3**		**4**		2.5	9.3
Chromium	(mg/kg)	**34**		25		**39**		19		**44**		25		30	1,500
Lead	(mg/kg)	**2,300**		**1,300**		**1,300**		**700**		**1,800**		**2,400**		63	1,000
Mercury	(mg/kg)	**0.83**		**1.4**		**1**		**0.2**		**0.28**		(<0.09)	U	0.18	2.8

Parameter List USEPA Method 6010B/7471A	Sample ID	932112-SB22-F9 (28-32')C		932112-SB22-F9 (32-36')C		932112-SB22-F9 (38-42')C		932112-SB22-F9 (42-46')C		932112-SB22-F9 (46-50')C		932112-SB22-F9 (50-54')C		6 NYCRR Part 375 Soil Cleanup Objectives - Unrestricted Use (mg/kg)	6 NYCRR Part 375 Soil Cleanup Objectives - Restricted Use - Commercial (mg/kg)
	Lab ID	AC51820-011		AC51820-014		AC51820-015		AC51820-016		AC51820-017		AC51820-018			
	Sample Type	Subsurface Soil (Fill)		Subsurface Soil (Fill)		Subsurface Soil (Fill)		Subsurface Soil (Fill)		Subsurface Soil (Fill)		Subsurface Soil (Fill)			
	Sample Date	5/19/2010		5/19/2010		5/19/2010		5/19/2010		5/19/2010		5/19/2010			
Arsenic	(mg/kg)	**50**		**71**		9.2		**49**		**22**		**34**		13	16
Barium	(mg/kg)	**800**		**930**		190		**660**		**550**		**710**		350	400
Cadmium	(mg/kg)	**5.5**		**14**		2.2		**7**		**2.7**		(<0.71)	U	2.5	9.3
Chromium	(mg/kg)	**38**		**41**		27		**50**		**39**		**42**		30	1,500
Lead	(mg/kg)	**3,400**		**2,600**		**14,000**		**13,000**		**5,600**		**19,000**		63	1,000
Mercury	(mg/kg)	(<0.1)	U	0.17		**0.73**		**0.74**		**0.27**		**0.22**		0.18	2.8

Parameter List USEPA Method 6010B/7471A	Sample ID	932112-SB22-F9 (54-58')C		932112-SB-Rinsate-07[f]		6 NYCRR Part 375 Soil Cleanup Objectives - Unrestricted Use (mg/kg)	6 NYCRR Part 375 Soil Cleanup Objectives - Restricted Use - Commercial (mg/kg)
	Lab ID	AC51820-019		AC51820-003			
	Sample Type	Subsurface Soil (Fill)		QA/QC			
	Sample Date	5/19/2010		5/19/2010			
Arsenic	(mg/kg)	**49**		(<20)	U	13	16
Barium	(mg/kg)	**1,900**		(<100)	U	350	400
Cadmium	(mg/kg)	**17**		(<6)	U	2.5	9.3
Chromium	(mg/kg)	**52**		(<50)	U	30	1,500
Lead	(mg/kg)	**6,000**		(<50)	U	63	1,000
Mercury	(mg/kg)	**1**		(<0.5)	U	0.18	2.8

(f) Rinsate blanks are aqueous samples, units are in µg/L.

TABLE 4-5A DETECTED VOLATILE ORGANIC COMPOUNDS SUBSURFACE SOIL AT MW-04 ANALYTICAL DATA

Parameter List USEPA Method 8260B	Sample ID	932112-MW-04 (74-78')		6 NYCRR Part 375 Soil Cleanup Objectives - Unrestricted Use (mg/kg)
	Lab ID	AC49117-001		
	Sample Type	Subsurface Soil/Fill		
	Sample Date	12/22/2009		
Acetone	(mg/kg)	**0.12**		0.05
Benzene	(mg/kg)	0.0018		0.06
Ethylbenezene	(mg/kg)	0.0083		1
Isoproplybenzene	(mg/kg)	0.004		---
Tetrachloroethene	(mg/kg)	0.022		1.3
Toulene	(mg/kg)	0.0053		0.7
Trichloroethene	(mg/kg)	0.012		0.47
m&p-Xylenes	(mg/kg)	0.013		---
o-Xylenes	(mg/kg)	0.0092		---
Xylenes (total)	(mg/kg)	0.0222		0.26

NOTE:

USEPA = United States Enivronmental Protection Agency
NYCRR = New York Code of Rules and Regulations
mg/kg = milligrams per kilogram = parts per million (ppm)
--- = No Standard

Data provided by Hampton-Clarke Veritech. Only analytes that were detected in at least one sample are shown. Data validation completed by Chemworld Environmental, Inc.

Concentration values in **bold** indicate that analyte was detecetd above the 6 NYCRR Part 375 SCO.

TABLE 4-5B DETECTED SEMIVOLATILE ORGANIC COMPOUNDS SUBSURFACE SOIL AT MW-04 ANALYTICAL DATA

	Sample ID	932112-MW-04 (74-78')		6 NYCRR Part 375 Soil Cleanup Objectives - Unrestricted Use (mg/kg)
	Lab ID	AC49117-001		
	Sample Type	Subsurface Soil/Fill		
Parameter List USEPA Method 8270C	Sample Date	12/22/2009		
Acenaphthene	(mg/kg)	1.90		20
Anthracene	(mg/kg)	5.70		100
Benzo[a]anthracene	(mg/kg)	**10**		1
Benzo[a]pyrene	(mg/kg)	**7.2**		1
Benzo[b]fluoranthene	(mg/kg)	**9**		1
Benzo[g,h,i]perylene	(mg/kg)	5		100
Benzo[k]fluoranthene	(mg/kg)	**2.9**		0.8
1-1'-Biphenyl	(mg/kg)	0.26		---
Carbazole	(mg/kg)	1.9		---
Chrysene	(mg/kg)	**8.6**		1
Dibenzo[a,h]anthracene	(mg/kg)	1.6		0.33
Dibenzofuran	(mg/kg)	2		7
Fluoranthene	(mg/kg)	18		100
Fluorene	(mg/kg)	3.1		30
Indeno[1,2,3-cd]pyrene	(mg/kg)	**4.7**		0.5
2-Methylnaphthalene	(mg/kg)	0.96		---
Naphthalene	(mg/kg)	2.7		12
Phenanthrene	(mg/kg)	21		100
Pyrene	(mg/kg)	18		100

NOTE:

USEPA = United States Enivronmental Protection Agency

NYCRR = New York Code of Rules and Regulations

mg/kg = milligrams per kilogram = parts per million (ppm)

--- = No Standard

Data provided by Hampton-Clarke Veritech. Only analytes that were detected in at least one sample are shown. Data validation completed by Chemworld Environmental, Inc.

Concentration values in **bold** indicate that analyte was detecetd above the 6 NYCRR Part 375 SCO.

TABLE 4-6 DETECTED TCLP LEAD SUBSURFACE SOIL/FILL ANALYTICAL DATA

Parameter List USEPA Method 6010B	Sample ID	932112-SB04-F3(2-14')C		932112-SB08-I8(6-14')C		932112-SB09-I7(24-30')C		932112-SB11-H9(4-6')D		932112-SB12-F10(4-12')C		NYSDEC Identification and Listings of Hazardous Wastes 6 NYCRR Part 371 (mg/L)
	Lab ID	AC52662-007		AC52666-001		AC52666-004		AC52666-002		AC52666-003		
	Sample Type	Fill		Fill		Fill		Fill		Fill		
	Sample Date	5/10/2010		5/11/2010		5/11/2010		5/11/2010		5/11/2010		
TCLP Lead	(mg/L)	2.2		**7.2**		2.1		3.6		1.3		*5.0*

Parameter List USEPA Method 6010B	Sample ID	932112-SB-13-I4(4-8')		932112-SB-13-I4(8-12')		932112-SB-13-I4(12-16')		932112-SB-13-I4(16-20')		932112-SB-13-I4(25-27')D		NYSDEC Identification and Listings of Hazardous Wastes 6 NYCRR Part 371 (mg/L)
	Lab ID	AC52666-013		AC52666-014		AC52666-015		AC52666-016		AC52666-017		
	Sample Type	Fill		Fill		Fill		Fill		Fill		
	Sample Date	5/13/2010		5/13/2010		5/13/2010		5/13/2010		5/13/2010		
TCLP Lead	(mg/L)	**17**		**5.5**		1.6		**9.6**		0.84		5.0

Parameter List USEPA Method 6010B	Sample ID	932112-SB15-I6(46-50')		932112-SB16-G4(5-12')C		932112-SB17-E4(16-24)C		932112-SB18-C4(38-42)C		932112-SB20-E5(8-12')C		NYSDEC Identification and Listings of Hazardous Wastes 6 NYCRR Part 371 (mg/L)
	Lab ID	AC52664-001		AC52664-002		AC52664-003		AC52664-004		AC52665-001		
	Sample Type	Fill		Fill		Fill		Fill		Fill		
	Sample Date	5/14/2010		5/17/2010		5/17/2010		5/17/2010		5/18/2010		
TCLP Lead	(mg/L)	1.7		**25**		0.72		**12**		0.44		5.0

Parameter List USEPA Method 6010B	Sample ID	932112-SB20-E5(12-16')C		932112-SB20-E5(16-20')C		932112-SB20-E5(20-24')C		932112-SB20-E5(28-32')C		932112-SB20-E5(32-36')C		NYSDEC Identification and Listings of Hazardous Wastes 6 NYCRR Part 371 (mg/L)
	Lab ID	AC52665-002		AC52665-003		AC52665-004		AC52665-005		AC52665-006		
	Sample Type	Fill		Fill		Fill		Fill		Fill		
	Sample Date	5/18/2010		5/18/2010		5/18/2010		5/18/2010		5/18/2010		
TCLP Lead	(mg/L)	4		0.94		**35**		**55**		3.5		5.0

NOTE:
USEPA = United States Enivronmental Protection Agency
NYSDEC = New York State Department of Environmental Conservation
NYCRR = New York Code of Rules and Regulations
mg/L = milligrams per liter
TCLP = Toxicity Characteristics Leaching Procedure
Data provided by Hampton-Clarke Veritech.
Concentration values in **bold** indicate that analyte was identified as hazarouds waste.

TABLE 4-6 DETECTED TCLP LEAD SUBSURFACE SOIL/FILL ANALYTICAL DATA

Parameter List USEPA Method 6010B	Sample ID	932112-SB21-G6(0-4')C		932112-SB21-G6(4-8')C		932112-SB21-G6(8-12')C		932112-SB21-G6(24-28')C		932112-SB21-G6(30-32')C		NYSDEC Identification and Listings of Hazardous Wastes 6 NYCRR Part 371 (mg/L)
	Lab ID	AC52665-007		AC52665-008		AC52665-009		AC52665-010		AC52665-011		
	Sample Type	Fill		Fill		Fill		Fill		Fill		
	Sample Date	5/18/2010		5/18/2010		5/18/2010		5/18/2010		5/18/2010		
TCLP Lead	(mg/L)	**7.9**		0.99		0.55		2.2		**21**		5.0

Parameter List USEPA Method 6010B	Sample ID	932112-SB21-G6(32-36')C		932112-SB21-G6(36-40')C		932112-SB21-G6(44-46')C		932112-SB21-G6(48-52')C		932112-SB21-G6(52-56')C		NYSDEC Identification and Listings of Hazardous Wastes 6 NYCRR Part 371 (mg/L)
	Lab ID	AC52665-012		AC52665-013		AC52665-014		AC52665-015		AC52665-016		
	Sample Type	Fill		Fill		Fill		Fill		Fill		
	Sample Date	5/18/2010		5/18/2010		5/18/2010		5/18/2010		5/18/2010		
TCLP Lead	(mg/L)	(<0.3)	U	1.4		4.2		**6.1**		3.7		5.0

Parameter List USEPA Method 6010B	Sample ID	932112-SB21-G6(56-60')C		932112-SB21-G6(60-64')C		932112-SB21-G6(64-68')C		932112-SB22-F9(0-4')C		932112-SB22-F9(4-8')C		NYSDEC Identification and Listings of Hazardous Wastes 6 NYCRR Part 371 (mg/L)
	Lab ID	AC52665-017		AC52665-018		AC52661-001		AC52661-002		AC52661-003		
	Sample Type	Fill		Fill		Fill		Fill		Fill		
	Sample Date	5/18/2010		5/18/2010		5/19/2010		5/19/2010		5/19/2010		
TCLP Lead	(mg/L)	**10**		0.37		0.39		**5**		**5.5**		5.0

Parameter List USEPA Method 6010B	Sample ID	932112-SB22-F9(8-12')C		932112-SB22-F9(16-20')C		932112-SB22-F9(22-28')C		932112-SB22-F9(28-32')C		932112-SB22-F9(32-36')C		NYSDEC Identification and Listings of Hazardous Wastes 6 NYCRR Part 371 (mg/L)
	Lab ID	AC52661-004		AC52661-005		AC52661-006		AC52661-007		AC52661-008		
	Sample Type	Fill		Fill		Fill		Fill		Fill		
	Sample Date	5/19/2010		5/19/2010		5/19/2010		5/19/2010		5/19/2010		
TCLP Lead	(mg/L)	2.3		1.9		**7.2**		**160**		**8.4**		5.0

NOTE: U = Non-Detect, detection below the method detection limit.

TABLE 4-6 DETECTED TCLP LEAD SUBSURFACE SOIL/FILL ANALYTICAL DATA

Parameter List USEPA Method 6010B	Sample ID	932112-SB22-F9(38-42')C		932112-SB22-F9(42-46')C		932112-SB22-F9(46-50')C		932112-SB22-F9(50-54')C		932112-SB22-F9(54-58')C		NYSDEC Identification and Listings of Hazardous Wastes 6 NYCRR Part 371 (mg/L)
	Lab ID	AC52661-009		AC52661-010		AC52661-011		AC52661-012		AC52661-013		
	Sample Type	Fill		Fill		Fill		Fill		Fill		
	Sample Date	5/19/2010		5/19/2010		5/19/2010		5/19/2010		5/19/2010		
TCLP Lead	(mg/L)	**8.6**		1.3		**31**		**7.7**		0.34		5.0

Parameter List USEPA Method 6010B	Sample ID	932112-SB23-G8(50-52')D		932112-SB24-E7(70-73')C		932112-SB25-H7(44-48')C		932112-TP01-K13(0-6")D		932112-TP02A-M12(3')C		NYSDEC Identification and Listings of Hazardous Wastes 6 NYCRR Part 371 (mg/L)
	Lab ID	AC52661-014		AC52661-015		AC52663-001		AC52660-001		AC52660-002		
	Sample Type	Fill		Fill		Fill		Fill		Fill		
	Sample Date	5/20/2010		5/20/2010		5/21/2010		5/3/2010		5/3/2010		
TCLP Lead	(mg/L)	2.2		2.7		4		**20**		4.3		5.0

Parameter List USEPA Method 6010B	Sample ID	932112-TP03-L12(2-2.5')C		932112-TP04-K12(1')C		932112-TP05A-K11(2-5')C		932112-TP06-L11(1-5')C		932112-TP07-L10(1-5')C		NYSDEC Identification and Listings of Hazardous Wastes 6 NYCRR Part 371 (mg/L)
	Lab ID	AC52660-003		AC52662-005		AC52660-004		AC52660-005		AC52660-006		
	Sample Type	Fill		Fill		Fill		Fill		Fill		
	Sample Date	5/3/2010		5/7/2010		5/3/2010		5/3/2010		5/3/2010		
TCLP Lead	(mg/L)	0.39		1.4		**23**		1.5		3.5		5.0

Parameter List USEPA Method 6010B	Sample ID	932112-TP08-K10(3-5')C		932112-TP09(2-4)D		932112-TP10-K9(1-3.5')C		932112-TP13-D12(4-10)C		932112-TP14-E13(8-13')C		NYSDEC Identification and Listings of Hazardous Wastes 6 NYCRR Part 371 (mg/L)
	Lab ID	AC52660-007		AC52660-008		AC52662-006		AC52660-009		AC52660-010		
	Sample Type	Fill		Fill		Fill		Fill		Fill		
	Sample Date	5/3/2010		5/3/2010		5/7/2010		5/4/2010		5/4/2010		
TCLP Lead	(mg/L)	2.2		**8.7**		0.35		0.2		2.8		5.0

TABLE 4-6 DETECTED TCLP LEAD SUBSURFACE SOIL/FILL ANALYTICAL DATA

Parameter List USEPA Method 6010B	Sample ID	932112-TP15-F13(8-12')C		932112-TP16-G13(6-12')C		932112-TP17-H12(3-4')C		932112-TP18-G12(1-12')C		932112-TP19-E12(1-12')C		NYSDEC Identification and Listings of Hazardous Wastes 6 NYCRR Part 371 (mg/L)
	Lab ID	AC52660-011		AC52660-012		AC52667-001		AC52667-002		AC52667-003		
	Sample Type	Fill		Fill		Fill		Fill		Fill		
	Sample Date	5/4/2010		5/4/2010		5/5/2010		5/5/2010		5/5/2010		
TCLP Lead	(mg/L)	**17**		**14**		**8.9**		**37**		**12**		5.0

Parameter List USEPA Method 6010B	Sample ID	932112-TP20-F11(1-12')C		932112-TP21-H11(3-6')C		932112-TP22-E11(5-10')C		932112-TP23-G10(5-10')C		932112-TP24-I10(5-10')C		NYSDEC Identification and Listings of Hazardous Wastes 6 NYCRR Part 371 (mg/L)
	Lab ID	AC52667-004		AC52667-005		AC52667-006		AC52667-007		AC52667-008		
	Sample Type	Fill		Fill		Fill		Fill		Fill		
	Sample Date	5/5/2010		5/5/2010		5/5/2010		5/5/2010		5/5/2010		
TCLP Lead	(mg/L)	**60**		**10**		**6.4**		2.6		**8**		5.0

Parameter List USEPA Method 6010B	Sample ID	932112-TP25-I9(2-6')C		932112-TP29-G2(1-7')C		932112-TP31-H1(2-6')C		932112-TP33-D1(4-10')C		932112-TP34-B1(2-5')C		NYSDEC Identification and Listings of Hazardous Wastes 6 NYCRR Part 371 (mg/L)
	Lab ID	AC52667-009		AC52667-010		AC52667-011		AC52662-001		AC52662-002		
	Sample Type	Fill		Fill		Fill		Fill		Fill		
	Sample Date	5/6/2010		5/6/2010		5/6/2010		5/7/2010		5/7/2010		
TCLP Lead	(mg/L)	3		**13**		(<0.3)	U	1.5		0.32		5.0

Parameter List USEPA Method 6010B	Sample ID	932112-TP35-A1(1-5')C		932112-TP37-C1(2-9')C		NYSDEC Identification and Listings of Hazardous Wastes 6 NYCRR Part 371 (mg/L)
	Lab ID	AC52662-003		AC52662-004		
	Sample Type	Fill		Fill		
	Sample Date	5/7/2010		5/7/2010		
TCLP Lead	(mg/L)	0.6		0.35		5.0

TABLE 4-7A DETECTED TARGET ANALYTE LIST METALS GROUNDWATER ANALYTICAL DATA

Parameter List USEPA Method 6010B/7470A	Sample ID	932112-MW-01		932112-MW-02		932112-MW-03		932112-MW-04		932112-MW-05		NYSDEC Ambient Water Quality Standard Class GA (µg/L)
	Lab ID	AC49836-001		AC49836-007		AC49836-006		AC49836-008		AC49836-004		
	Sample Type	Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		
	Sample Date	2/10/2010		2/11/2010		2/12/2010		2/11/2010		2/10/2010		
Aluminum	(µg/L)	(<180)	U	**260**		**37,000**		**110,000**		**370**		100 (s)
Arsenic	(µg/L)	(<7.5)	U	(<7.5)	U	17		**110**		(<7.5)	U	25 (s)
Barium	(µg/L)	(<50)	U	(<50)	U	240		**8,100**		58		1,000 (s)
Beryllium	(µg/L)	(<4.0)	U	(<4.0)	U	(<4.0)	U	**32**		(<4.0)	U	3 (g)
Cadmium	(µg/L)	(<3.5)	U	(<3.5)	U	(<3.5)	U	**200**		(<3.5)	U	5 (s)
Calcium	(µg/L)	59,000		43,000		790,000		730,000		110,000		---
Chromium	(µg/L)	(<50)	U	(<50)	U	**350**		**2,900**	**J**	**76**		50 (s)
Cobalt	(µg/L)	(<20)	U	(<20)	U	**35**	**J**	**290**		(<20)	U	5 (s)
Copper	(µg/L)	(<50)	U	(<50)	U	70		**17,000**		(<50)	U	200 (s)
Iron	(µg/L)	**460**		**530**		**37,000**		**1,200,000**		**5,000**		300 (s)
Lead	(µg/L)	(<4.0)	U	(<4.0)	U	**130**		**49,000**		(<4.0)	U	25 (s)
Magnesium	(µg/L)	26,000		11,000		**160,000**		**160,000**		27,000		35,000 (g)
Manganese	(µg/L)	(<40)	U	(<40)	U	**2,600**		**21,000**		**550**		300 (s)
Mercury	(µg/L)	(<0.70)	U	(<0.70)	U	(<0.70)	U	**2.6**		(<0.70)	U	0.7 (s)
Nickel	(µg/L)	(<50)	U	(<50)	U	**180**		**1,200**		(<50)	U	100 (s)
Potassium	(µg/L)	8200		(<5,000)	U	20,000		14,000		7300		---
Sodium	(µg/L)	**67,000**		**20,000**		**130,000**		**140,000**		**120,000**		20,000 (s)
Vanadium	(µg/L)	(<50)	U	(<50)	U	130		430		(<50)	U	---
Zinc	(µg/L)	(<50)	U	(<50)	U	160		**120,000**		(<50)	U	2,000 (s)

Parameter List USEPA Method 6010B/7470A	Sample ID	932112-MW-06		932112-MW-DUP[(a)]		NYSDEC Ambient Water Quality Standard Class GA (µg/L)
	Lab ID	AC49836-005		AC49836-009		
	Sample Type	Groundwater		Groundwater		
	Sample Date	2/10/2010		2/11/2010		
Aluminum	(µg/L)	**990**		**73,000**		100 (s)
Arsenic	(µg/L)	(<7.5)	U	**110**		25 (s)
Barium	(µg/L)	160		**7,400**		1,000 (s)
Beryllium	(µg/L)	(<4.0)	U	**33**		3 (g)
Cadmium	(µg/L)	(<3.5)	U	**180**		5 (s)
Calcium	(µg/L)	160,000		800,000		---
Chromium	(µg/L)	(<50)	U	**1,600**	**J**	50 (s)
Cobalt	(µg/L)	(<20)	U	**270**		5 (s)
Copper	(µg/L)	92		**2,500**		200 (s)
Iron	(µg/L)	**7,900**		**1,100,000**		300 (s)
Lead	(µg/L)	**440**		**42,000**		25 (s)
Magnesium	(µg/L)	**36,000**		**150,000**		35,000 (g)
Manganese	(µg/L)	**410**		**23,000**		300 (s)
Mercury	(µg/L)	(<0.70)	U	**3.7**		0.7 (s)
Nickel	(µg/L)	(<50)	U	**1,200**		100 (s)
Potassium	(µg/L)	6,100		14,000		---
Sodium	(µg/L)	**220,000**		**150,000**		20,000 (s)
Vanadium	(µg/L)	(<50)	U	290		---
Zinc	(µg/L)	1,200		**110,000**		2,000 (s)

(a) Duplicate sample collected at 9-32-112-MW-04

NOTE:
USEPA = United States Enivronmental Protection Agency
NYSDEC = New York State Department of Environmental Conservation
µg/L = micrograms per Liter = parts per billion (ppb)
U = Non-detect, detection below the method detection limit
--- = No Standard
J =

Data provided by Hampton-Clarke Veritech. Only analytes that were detected in at least one sample are shown. Data validation completed by Chemworld Environmental, Inc.
Concentration values in **bold** indicate that analyte was detecetd above the NYSDEC AWQS. G = Guidance Value, S = Standard.

TABLE 4-7B DETECTED ANION AND ALKALINITY GROUNDWATER ANALYTICAL DATA

	Sample ID	932112-MW-01		932112-MW-02		932112-MW-03		932112-MW-04		932112-MW-05		NYSDEC Ambient Water Quality Standard Class GA (mg/L)
	Lab ID	AC49836-001		AC49836-007		AC49836-006		AC49836-008		AC49836-004		
	Sample Type	Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		
Parameter List	Sample Date	2/10/2010		2/11/2010		2/12/2010		2/11/2010		2/10/2010		
CHLORIDE AND SULFATE BY USEPA METHOD 300.0												
Chloride	(µg/L)	31,000		32,000		**270,000**		**260,000**		130,000		250,000 (s)
Sulfate	(µg/L)	98,000		43,000		**440,000**		37,000		230,000		250,000 (s)
ALKALINITY BY USEPA Method 2320B												
Alkalinity	(µg/L)	330,000		130,000		890,000		2,700,000		300,000		---

	Sample ID	932112-MW-06		NYSDEC Ambient Water Quality Standard Class GA (µg/L)
	Lab ID	AC49836-005		
	Sample Type	Groundwater		
Parameter List	Sample Date	2/10/2010		
CHLORIDE AND SULFATE BY USEPA METHOD 300.0				
Chloride	(µg/L)	**480,000**		250,000 (s)
Sulfate	(µg/L)	160,000		250,000 (s)
ALKALINITY BY USEPA Method 2320B				
Alkalinity	(µg/L)	340,000		---

NOTE:
NYSDEC = New York State Department of Environmental Conservation
mg/L = Milligrams per liter
USEPA = United States Enivronmental Protection Agency
µg/L = micrograms per Liter = parts per billion (ppb)
--- = No Standard
Data provided by Hampton-Clarke Veritech. Only analytes that were detected in at least one sample are shown.
Concentration values in **bold** indicate that analyte was detecetd above the NYSDEC AWQS. S = Standard.

TABLE 4-7C DETECTED SEMIVOLATILE ORGANIC COMPOUNDS GROUNDWATER ANALYTICAL DATA

Parameter List USEPA Method 8270C	Sample ID	932112-MW-01		932112-MW-02		932112-MW-03		932112-MW-04		932112-MW-05		NYSDEC Ambient Water Quality Standard Class GA (µg/L)
	Lab ID	AC49836-001		AC49836-007		AC49850-001		AC49836-008		AC49836-004		
	Sample Type	Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		
	Sample Date	2/10/2010		2/11/2010		2/12/2010		2/11/2010		2/10/2010		
Acenaphthene	(µg/L)	(<2.1)	U	(<2.0)	U	(<2.2)	U	**22**		(<2.1)	U	20 (g)
Anthracene	(µg/L)	(<2.1)	U	(<2.0)	U	(<2.2)	U	48		(<2.1)	U	50 (g)
Benzo[a]anthracene	(µg/L)	(<2.1)	U	(<2.0)	U	(<2.2)	U	54		(<2.1)	U	---
Benzo[a]pyrene	(µg/L)	(<2.1)	U	(<2.0)	U	(<2.2)	U	**45**		(<2.1)	U	ND (s)
Benzo[b]fluoranthene	(µg/L)	(<2.1)	U	(<2.0)	U	(<2.2)	U	**61**		(<2.1)	U	0.002 (g)
Benzo[g,h,i]perylene	(µg/L)	(<2.1)	U	(<2.0)	U	(<2.2)	U	36		(<2.1)	U	---
Benzo[k]fluoranthene	(µg/L)	(<2.1)	U	(<2.0)	U	(<2.2)	U	**27**		(<2.1)	U	0.002 (g)
bis(2-Ethylhexyl)phthalate	(µg/L)	(<2.1)	U	(<2.0)	U	**12**		**28**		(<2.1)	U	5 (s)
Caprolactam	(µg/L)	(<2.1)	U	(<2.0)	U	29		(<10)	U	(<2.1)	U	---
Carbazole	(µg/L)	(<2.1)	U	(<2.0)	U	(<2.2)	U	15		(<2.1)	U	---
Chrysene	(µg/L)	(<2.1)	U	(<2.0)	U	(<2.2)	U	**61**		(<2.1)	U	0.002 (g)
Dibenzofuran	(µg/L)	(<2.1)	U	(<2.0)	U	(<2.2)	U	21		(<2.1)	U	---
Fluoranthene	(µg/L)	(<2.1)	U	(<2.0)	U	(<2.2)	U	**130**		(<2.1)	U	50 (g)
Fluorene	(µg/L)	(<2.1)	U	(<2.0)	U	(<2.2)	U	31		(<2.1)	U	50 (g)
Indeno[1,2,3-cd]pyrene	(µg/L)	(<2.1)	U	(<2.0)	U	(<2.2)	U	**29**		(<2.1)	U	0.002 (g)
Naphthalene	(µg/L)	(<2.1)	U	(<2.0)	U	(<2.2)	U	**37**		(<2.1)	U	10 (g)
Phenanthrene	(µg/L)	(<2.1)	U	(<2.0)	U	(<2.2)	U	**180**		(<2.1)	U	50 (g)
Pyrene	(µg/L)	(<2.1)	U	(<2.0)	U	(<2.2)	U	**130**		(<2.1)	U	50 (g)

Parameter List USEPA Method 8270C	Sample ID	932112-MW-06		932112-MW-DUP[a]		NYSDEC Ambient Water Quality Standard Class GA (µg/L)
	Lab ID	AC49836-005		AC49836-009		
	Sample Type	Groundwater		Groundwater		
	Sample Date	2/10/2010		2/11/2010		
Acenaphthene	(µg/L)	(<2.0)	U	(<10)	U	20 (g)
Anthracene	(µg/L)	(<2.0)	U	22		50 (g)
Benzo[a]anthracene	(µg/L)	(<2.0)	U	27		---
Benzo[a]pyrene	(µg/L)	(<2.0)	U	**19**		ND (s)
Benzo[b]fluoranthene	(µg/L)	(<2.0)	U	**28**		0.002 (g)
Benzo[g,h,i]perylene	(µg/L)	(<2.0)	U	14		---
Benzo[k]fluoranthene	(µg/L)	(<2.0)	U	(<10)	U	0.002 (g)
bis(2-Ethylhexyl)phthalate	(µg/L)	(<2.0)	U	(<10)	U	5 (s)
Caprolactam	(µg/L)	(<2.0)	U	(<10)	U	---
Carbazole	(µg/L)	(<2.0)	U	(<10)	U	---
Chrysene	(µg/L)	(<2.0)	U	**26**		0.002 (g)
Dibenzofuran	(µg/L)	(<2.0)	U	(<10)	U	---
Fluoranthene	(µg/L)	(<2.0)	U	**57**		50 (g)
Fluorene	(µg/L)	(<2.0)	U	13		50 (g)
Indeno[1,2,3-cd]pyrene	(µg/L)	(<2.0)	U	**13**		0.002 (g)
Naphthalene	(µg/L)	(<2.0)	U	**22**		10 (g)
Phenanthrene	(µg/L)	(<2.0)	U	**75**		50 (g)
Pyrene	(µg/L)	(<2.0)	U	**56**		50 (g)

(a) Duplicate sample collected at 9-32-112-MW-04

NOTE:
USEPA = United States Enivronmental Protection Agency
NYSDEC = New York State Department of Environmental Conservation
µg/L = micrograms per Liter = parts per billion (ppb)
U = Non-detect, detection below the method detection limit
--- = No standard
ND = Non-Detect
Data provided by Chemtech Consulting Group. Only analytes that were detected in at least one sample are shown. Data validation completed by Chemworld Environmental, Inc.
Concentration values in**bold** indicate that analyte was deteceted above the NYSDEC AWQS. G = Guidance Value, S = Standard. ND = Non-detect.

TABLE 4-7D DETECTED VOLATILE ORGANIC COMPOUNDS GROUNDWATER ANALYTICAL DATA

Parameter List USEPA Method 8260B	Sample ID	932112-MW-01		932112-MW-02		932112-MW-03		932112-MW-04		932112-MW-05		NYSDEC Ambient Water Quality Standard Class GA (µg/L)
	Lab ID	AC49836-001		AC49836-007		AC49836-006		AC49836-008		AC49836-004		
	Sample Type	Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		
	Sample Date	2/10/2010		2/11/2010		2/11/2010		2/11/2010		2/10/2010		
1,1,1-Trichloroethane	(µg/L)	2.7		(<1.0)	U	(<1.0)	UJ	(<1.0)	U	1		5 (s)
1,1-Dichloroethane	(µg/L)	**48**		(<1.0)	U	(<1.0)	UJ	(<1.0)	U	**5.5**		5 (s)
1,1-Dichloroethene	(µg/L)	**7.5**		(<1.0)	U	(<1.0)	UJ	(<1.0)	U	(<1.0)	U	5 (s)
Acetone	(µg/L)	(<5.0)	U	(<5.0)	U	23	J	(<5.0)	U	(<5.0)	U	50 (s)
Chloroethane	(µg/L)	**8.7**		(<1.0)	U	(<1.0)	UJ	(<1.0)	U	(<1.0)	U	5 (s)
Chloroform	(µg/L)	(<1.0)	U	**17**		5.6	J	(<1.0)	U	(<1.0)	U	7 (s)
cis-1,2-Dichloroethene	(µg/L)	3.9		**16**		(<1.0)	UJ	**6.3**		**15**		5 (s)
Tetrachloroethene	(µg/L)	(<1.0)	U	(<1.0)	U	(<1.0)	UJ	1.6		3.3		5 (s)
Toluene	(µg/L)	(<1.0)	U	(<1.0)	U	**5.6**	J	(<1.0)	U	(<1.0)	U	5 (s)
trans-1,2-Dichloroethene	(µg/L)	(<1.0)	U	(<1.0)	U	(<1.0)	UJ	(<1.0)	U	1.3		5 (s)
Trichloroethene	(µg/L)	(<1.0)	U	**17**		(<1.0)	UJ	1.7		**11**		5 (s)
Vinyl chloride	(µg/L)	(<1.0)	U	(<1.0)	U	(<1.0)	UJ	**6.6**		**4.5**		2 (s)
Xylenes (Total)	(µg/L)	(<1.0)	U	(<1.0)	U	1.1	J	(<1.0)	U	(<1.0)	U	5 (s)

Parameter List USEPA Method 8260B	Sample ID	932112-MW-06		932112-MW-DUP[(a)]		TRIP BLANK		NYSDEC Ambient Water Quality Standard Class GA (µg/L)
	Lab ID	AC49836-005		AC49836-009		AC49836-010		
	Sample Type	Groundwater		Groundwater		QA/QC Trip Blank		
	Sample Date	2/10/2010		2/11/2010		2/11/2010		
1,1,1-Trichloroethane	(µg/L)	(<1.0)	U	(<1.0)	U	(<1.0)	U	5 (s)
1,1-Dichloroethane	(µg/L)	(<1.0)	U	(<1.0)	U	(<1.0)	U	5 (s)
1,1-Dichloroethene	(µg/L)	(<1.0)	U	(<1.0)	U	(<1.0)	U	5 (s)
Acetone	(µg/L)	(<5.0)	U	(<5.0)	U	(<5.0)	U	50 (s)
Chloroethane	(µg/L)	(<1.0)	U	(<1.0)	U	(<1.0)	U	5 (s)
Chloroform	(µg/L)	(<1.0)	U	(<1.0)	U	(<1.0)	U	7 (s)
cis-1,2-Dichloroethene	(µg/L)	(<1.0)	U	**6.1**		(<1.0)	U	5 (s)
Tetrachloroethene	(µg/L)	(<1.0)	U	1.4		(<1.0)	U	5 (s)
Toluene	(µg/L)	(<1.0)	U	(<1.0)	U	(<1.0)	U	5 (s)
trans-1,2-Dichloroethene	(µg/L)	(<1.0)	U	(<1.0)	U	(<1.0)	U	5 (s)
Trichloroethene	(µg/L)	(<1.0)	U	1.7		(<1.0)	U	5 (s)
Vinyl chloride	(µg/L)	(<1.0)	U	**5.6**		(<1.0)	U	2 (s)
Xylenes (Total)	(µg/L)	(<1.0)	U	(<1.0)	U	(<1.0)	U	5 (s)

(a) Duplicate sample collected at 9-32-112-MW-04

NOTE:
USEPA = United States Enivronmental Protection Agency
NYSDEC = New York State Department of Environmental Conservation
µg/L = micrograms per Liter = parts per billion (ppb)
U = Non-detect, detection below the method detection limit

Data provided by Chemtech Consulting Group. Only analytes that were detected in at least one sample are shown. Data validation completed by Chemworld Environmental, Inc.

Concentration values in **bold** indicate that analyte was detecetd above the NYSDEC AWQS. S = Standard.

TABLE 4-8A DETECTED VOLATILE ORGANIC COMPOUNDS SURFACE WATER/SEWER MANHOLE ANALYTICAL DATA

Parameter List USEPA Method 8260B	Sample ID	932112-SW-01		932112-SW-02		932112-SW-03		932112-SW-04		DUPLICATE[(a)]		Trip Blank		NYSDEC Ambient Water Quality Standard Class D, Type H(FC) (µg/L)
	Lab ID	AC48479-001		AC48479-002		AC48479-003		AC48479-004		AC48479-005		AC48479-008		
	Sample Type	Manhole		Surface Water		Manhole		Surface Water		QA/QC		QA/QC		
	Sample Date	11/19/2009		11/19/2009		11/19/2009		11/19/2009		11/19/2009		NA		
Acetone	(µg/L)	(<5.0)	U	(<5.0)	U	74		(<5.0)	U	74		(<5.0)	U	---
Bromodichloromethane	(µg/L)	(<0.5)	U	(<0.5)	U	(<0.5)	U	(<0.5)	U	(<0.5)	U	(<0.5)	U	---
Chloroform	(µg/L)	(<0.5)	U	2.4		1.4		(<0.5)	U	1.3		(<0.5)	U	---
Dibromochloromethane	(µg/L)	(<0.5)	U	(<0.5)	U	(<0.5)	U	(<0.5)	U	(<0.5)	U	(<0.5)	U	---
1,2-Dichloroethene (total)	(µg/L)	(<0.5)	U	2.1		20		8.7		19		(<0.5)	U	---
Tetrachloroethene	(µg/L)	(<0.5)	U	(<0.5)	U	**7.8**		**3.9**		**7.9**		(<0.5)	U	1 (g)
Toulene	(µg/L)	(<0.5)	U	(<0.5)	U	(<0.5)	U	(<0.5)	U	(<0.5)	U	(<0.5)	U	6,000 (s)
Trichloroethene	(µg/L)	3.9		11		9.1		8.0		9.2		(<0.5)	U	40 (s)
Vinyl chloride	(µg/L)	(<0.5)	U	(<0.5)	U	5.9		(<0.5)	U	5.7		(<0.5)	U	---

Parameter List USEPA Method 8260B	Sample ID	932112-SW-02-0510		932112-MSW-03		932112-MSW-04		932112-MSW-05		932112-SWDUP02[(b)]		Trip Blank		NYSDEC Ambient Water Quality Standard Class D, Type H(FC) (µg/L)
	Lab ID	AC51457-006		AC51457-004		AC51457-003		AC51457-002		AC51457-006		AC51457-005		
	Sample Type	Surface Water		Manhole		Manhole		Manhole		QA/QC		QA/QC		
	Sample Date	5/4/2010		5/4/2010		5/4/2010		5/4/2010		5/4/2010		NA		
Acetone	(µg/L)	(<5.0)	U	71		(<5.0)	U	(<5.0)	U	(<5.0)	U	(<5.0)	U	---
Bromodichloromethane	(µg/L)	2.8		(<0.5)	U	(<0.5)	U	(<0.5)	U	2.3		(<0.5)	U	---
Chloroform	(µg/L)	7.7		(<0.5)	U	(<0.5)	U	(<0.5)	U	7.9		(<0.5)	U	---
Dibromochloromethane	(µg/L)	1.4		(<0.5)	U	(<0.5)	U	(<0.5)	U	1.1		(<0.5)	U	---
1,2-Dichloroethene (total)	(µg/L)	2.8		5.3		(<0.5)	U	(<0.5)	U	2.6		(<0.5)	U	---
Tetrachloroethene	(µg/L)	(<0.5)	U	**3.4**		(<0.5)	U	(<0.5)	U	(<0.5)	U	(<0.5)	U	1 (g)
Toulene	(µg/L)	(<0.5)	U	1		(<0.5)	U	(<0.5)	U	(<0.5)	U	(<0.5)	U	6,000 (s)
Trichloroethene	(µg/L)	12		2.6		(<0.5)	U	(<0.5)	U	11		(<0.5)	U	40 (s)
Vinyl chloride	(µg/L)	(<0.5)	U	(<0.5)	U	(<0.5)	U	(<0.5)	U	(<0.5)	U	(<0.5)	U	---

(a) Duplicate sample collected at 932112-SW-03.

(b) Duplicate sample (SWDUP02) collected at 932112-SW-02-0510

NOTE:
USEPA = United States Enivronmental Protection Agency
QA/QC = Quality Assurance/Quality Control
NYSDEC = New York State Department of Environmental Conservation
µg/L = mircograms per liter = parts per billion (ppb)
U = Non-detect, detection below the method detection limit
--- = No Standard

Data provided by Hampton-Clarke Veritech. Only analytes that were detected in at least one sample are shown. Data validation completed by Chemworld Environmental, Inc.
Concentration values in **bold** indicate that analyte was deteceted above the NYSDEC AWQS for Class D waters. S = Standard Value. G = Guidance Value.

TABLE 4-8B DETECTED TARGET ANALYTE LIST METALS SURFACE WATER/SEWER MANHOLE ANALYTICAL DATA

Parameter List USEPA Method 6010B/200.7/200.8	Sample ID	932112-SW-01		932112-SW-02		932112-SW-03		932112-SW-04		DUPLICATE[(a)]		NYSDEC Ambient Water Quality Standard Class D, Type H(FC) (µg/L)
	Lab ID	AC48479-001		AC48479-002		AC48479-003		AC48479-004		AC48479-005		
	Sample Type	Manhole		Surface Water		Manhole		Surface Water		QA/QC		
	Sample Date	11/19/2009		11/19/2009		11/19/2009		11/19/2009		11/19/2009		
Aluminum	(µg/L)	5,600		340		6,700		430		410		---
Calcium	(µg/L)	41,000	J	47,000	J	41,000	J	68,000	J	29,000	J	---
Iron	(µg/L)	**980**		**440**		**1,100**		**420**		**590**		300 (s)
Lead	(µg/L)	16		(<4.0)	U	27		9.1		(<4.0)	U	---
Mangnesium	(µg/L)	10,000		12,000		11,000		22,000		7,300		---
Manganese	(µg/L)	55		(<40)	U	53		(<40)		(<40)	U	---
Potassium	(µg/L)	12,000	J	(<5,000)	UJ	11,000	J	(<5,000)	UJ	(<5,000)	UJ	---
Sodium	(µg/L)	93,000		150,000		96,000		100,000		110,000		---
Zinc	(µg/L)	170	J	(<50)	UJ	160	J	120	J	(<50)	UJ	---

(a) Duplicate sample collected at 932112-SW-03.

NOTE:
USEPA = United States Enivronmental Protection Agency
NYSDEC = New York State Department of Environmental Conservation
µg/L = mircograms per liter
--- = No Standard
J = The associated numerical value is an estimated quantity.
U = Non-detect, detection below the method detection limit
UJ = The compound analyzed for, but not detected. The sample quantitation limit is an estimated quantity due to variance from quality control limits.

Data provided by Hampton-Clarke Veritech. Only analytes that were detected in at least one sample are shown. Data validation completed by Chemworld Environmental, Inc.
Concentration values in **bold** indicate that analyte was detecetd above the NYSDEC AWQS for Class d waters. S = Standard Value. G = Guidance Value.

TABLE 4-8C DETECTED SEMIVOLATILE ORGANIC COMPOUNDS SURFACE WATER/SEWER MANHOLE ANALYTICAL DATA

Parameter List USEPA Method 8270C	Sample ID	932112-SW-01		932112-SW-02		932112-SW-03		932112-SW-04		DUPLICATE[(a)]		NYSDEC Ambient Water Quality Standard Class D, Type H(FC) (µg/L)
	Lab ID	AC48479-001		AC48479-002		AC48479-003		AC48479-004		AC48479-005		
	Sample Type	Manhole		Surface Water		Manhole		Surface Water		QA/QC		
	Sample Date	11/19/2009		11/19/2009		11/19/2009		11/19/2009		11/19/2009		
bis(2-Ethylhexyl)phthalate	(µg/L)	7.3		(<2.0)	U	6.6		(<2.1)	U	(<2.2)	U	---

(a) Duplicate sample collected at 932112-SW-03.

NOTE:
USEPA = United States Enivronmental Protection Agency
NYSDEC = New York State Department of Environmental Conservation
µg/L = mircograms per liter
U = Non-detect, detection below the method detection limit
--- = No standard

Data provided by Hampton-Clarke Veritech. Only analytes that were detected in at least one sample are shown. Data validation completed by Chemworld Environmental, Inc.

Concentration values in **bold** indicate that analyte was detecetd above the NYSDEC AWQS for Class D waters.

TABLE 4-8D HISTORICAL SURFACE WATER TOTAL CVOC CONCENTRATIONS

SURFACE WATER SAMPLES COLLECTED AT THE BULKHEAD OUTFALL

Collection Date	May-10	Nov-09	Jun-07	Oct-98	Nov-97
Total CVOC Concentration (µg/L)	14.8	13.1	25	NC	NC

SURFACE WATER SAMPLES DOWNSTREAM OF BULKHEAD OUTFALL IN GULF CREEK

Collection Date	May-10	Nov-09	Jun-07	Oct-98	Nov-97
Total CVOC Concentration (µg/L)	NC	20.6	19.1	318.5	22 J

NOTE:
CVOC = Chlorinated Volatile Organic Compounds
µg/L = micrograms per Liter
NC = No sample collected
J = The associated numerical value is an estimated quantity.

TABLE 4-8E DETECTED VOLATILE ORGANIC COMPOUNDS SEWER MANHOLE ANALYTICAL DATA

Parameter List USEPA Method 8260B	Sample ID	932112-SW-03		DUPLICATE(a)		Trip Blank		City of Lockport POTW SPDES Permit Discharge Limits(b) (Permit No. NY 002 7057) (µg/L)
	Lab ID	AC48479-003		AC48479-005		AC48479-008		
	Sample Type	Manhole		QA/QC		QA/QC		
	Sample Date	11/19/2009		11/19/2009		NA		
Acetone	(µg/L)	74		74		(<5.0)	U	---
Chloroform	(µg/L)	1.4		1.3		(<0.5)	U	---
cis-1,2-Dichloroethene	(µg/L)	20		19		(<0.5)	U	33
Tetrachloroethene	(µg/L)	7.8		7.9		(<0.5)	U	15
Trichloroethene	(µg/L)	9.1		9.2		(<0.5)	U	32
Vinyl chloride	(µg/L)	5.9		5.7		(<0.5)	U	---

(a) Duplicate sample collected at 932112-SW-03.

(b) 2006. Appendix N. CSO Charaterization and Monitoring Report for the City of Lockport. Clough, Harbour & Associates LLP. October.

NOTE:
USEPA = United States Enivronmental Protection Agency
QA/QC = Quality Assurance/Quality Control
NA = Not Applicable
POTW = Publicly Owned Treatment Works
SPDES = State Pollutant Discharge Elimination System
µg/L = mircograms per liter
U = Non-detect, detection below the method detection limit
--- = No value listed in permit.
Data validation be completed by Chemworld Environmental, Inc.
Data provided by Hampton-Clarke Veritech. Only analytes that were detected in at least one sample are shown.

TABLE 4-8F DETECTED TARGET ANALYTE LIST METALS SEWER MANHOLE ANALYTICAL DATA

Parameter List USEPA Method 6010B/200.7/200.8	Sample ID	932112-SW-03		DUPLICATE[a]		City of Lockport POTW SPDES Permit Discharge Limits[b] (Permit No. NY 002 7057) (µg/L)	Delphi Thermal Significant Industrial User Permit Discharge Limits (Permit No. CL860103) (µg/L)
	Lab ID	AC48479-003		AC48479-005			
	Sample Type	Manhole		QA/QC			
	Sample Date	11/19/2009		11/19/2009			
Aluminum	(µg/L)	6,700		410.00			
Calcium	(µg/L)	41,000	J	29,000	J	---	---
Iron	(µg/L)	**1,100**		**590**		410	---
Lead	(µg/L)	**27**		(<4.0)	U	8	200
Mangnesium	(µg/L)	11,000		7,300		---	---
Manganese	(µg/L)	53		(<40)	U	---	---
Potassium	(µg/L)	11,000	J	(<5,000)	UJ	---	---
Sodium	(µg/L)	96,000		110,000		---	---
Zinc	(µg/L)	160	J	(<50)	UJ	231	2,800

(a) Duplicate sample collected at 932112-SW-03.

(b) 2006. Appendix N. CSO Charaterization and Monitoring Report for the City of Lockport. Clough, Harbour & Associates LLP. October.

NOTE:
USEPA = United States Enivronmental Protection Agency
QA/QC = Quality Assurance/Quality Control
POTW = Publicly Owned Treatment Works
SPDES = State Pollutant Discharge Elimination System
µg/L = mircograms per liter = parts per billion (ppb)
J = The associated numerical value is an estimated quantity.
--- = No value listed in permit.
U = Non-detect, detection below the method detection limit
UJ = The compound analyzed for, but not detected. The sample quantitation limit is an estimated quantity due to variance from quality control limits.
Data validation completed by Chemworld Environmental, Inc.
Data provided by Hampton-Clarke Veritech. Only analytes that were detected in at least one sample are shown.
Concentration values in **bold** indicate that analyte was detecetd above the SPDES Permit Limit.

TABLE 4-9A TOTAL ORGANIC CARBON SEDIMENT ANALYTICAL DATA

Parameter List USEPA Method 9060	Sample ID	932112-SD-01	932112-SD-02	932112-SD-03	932112-SD-04	932112-SD-05	
	Lab ID	AC48527-003	AC48527-006	AC48527-009	AC48527-013	AC48527-016	
	Sample Type	Sediment/Composite	Sediment/Composite	Sediment/Composite	Sediment/Composite	Sediment/Composite	
	Sample Date	11/20/2009	11/20/2009	11/20/2009	11/20/2009	11/20/2009	
Total Organic Carbon	(mg/kg)	76,000	200,000	48,000	250,000	50,000	

Parameter List USEPA Method 9060	Sample ID	932112-SD-06	932112-SD-07	932112-SD-08	932112-SD-09	932112-SD-10	932112-SD-11
	Lab ID	AC51456-001	AC51456-002	AC51456-003	AC51456-004	AC51456-005	AC51456-006
	Sample Type	Sediment/Grab	Sediment/Grab	Sediment/Grab	Sediment/Grab	Sediment/Grab	Sediment/Grab
	Sample Date	5/4/2010	5/4/2010	5/4/2010	5/4/2010	5/4/2010	5/4/2010
Total Organic Carbon	(mg/kg)	100,000	65,000	110,000	97,000	75,000	75,000

Average Organic Carbon (OC)	mgOC/kg	104,182
Standard Deviation	mgOC/kg	63,774
Confidence Limit (95%)	mgOC/kg	55,900
Lower Confidence Limit	mgOC/kg	48,282

NOTE:
USEPA = United States Enivronmental Protection Agency
mg/kg = milligrams per kilogram
Data provided by Hampton-Clarke Veritech.

TABLE 4-9B DERIVATION OF SEDIMENT CRITERIA FOR SELECT CONTAMINANTS OF CONCERN

				Human Health Bioaccumulation			Benthic Aquatic Life Acute Toxicity			Benthic Aquatic Life Chronic Toxicity			Wildlife Bioaccumulation		
Contaminant	Log K_{ow} $^{(a)}$	Value K_{ow} $^{(a)}$	% Carbon	Water Criteria µg/l	Sediment Criteria µg/gOC	Sediment Criteria µg/kg	Water Criteria µg/l	Sediment Criteria µg/gOC	Sediment Criteria µg/kg	Water Criteria µg/l	Sediment Criteria µg/gOC	Sediment Criteria µg/kg	Water Criteria µg/l	Sediment Criteria µg/gOC	Sediment Criteria µg/kg
VOLATILE ORGANIC COMPOUNDS															
1,2-Dichloroethene	1.48	30.2	4.8282	0.8000	0.0200	1.1665									
Tetrachloroethene	2.88	758.6	4.8282	1.0000	0.8000	36.6256									
Trichloroethene	2.29	195.0	4.8282	11.0000	2.0000	103.5566									
SEMIVOLATILE ORGANIC COMPOUNDS															
Acenaphthene	4.33	21,379.6	4.8282								140.0000	6759.4800			
Anthracene	4.45	28,183.8	4.8282				35.0000	986.0000	47627.0076	3.8000	107.0000	5170.9323			
Benzo(a)pyrene	6.04	1,096,478.2	4.8282	0.0012	1.3000	63.5282									
Benzo(a)anthracene	5.61	407,380.3	4.8282				0.2300	94.0000	4523.9010	0.0300	12.0000	590.0740			
Benzo(a)anthracene	6.04	1,096,478.2	4.8282	0.0012	1.3000	63.5282									
Benzo(b)fluoranthene	6.04	1,096,478.2	4.8282	0.0012	1.3000	63.5282									
Benzo(g,h,i)perylene			4.8282												
Benzo(k)fluoranthene	6.04	1,096,478.2	4.8282	0.0012	1.3000	63.5282									
Bis(2-ethylhexyl)phthalate	5.3	199,526.2	4.8282							0.6000	199.5000	5780.1153			
Carbazole			4.8282												
Chrysene	6.04	1,096,478.2	4.8282	0.0012	1.3000	63.5282									
Dibenzo(a,h)anthracene			4.8282												
Dibenzofuran			4.8282												
Di-n-butylphthalate			4.8282												
Fluoranthene	5.19	154,881.7	4.8282								1020.0000	49247.6400			
Fluorene	4.18	15,135.6	4.8282				4.8000	73.0000	3507.7327	0.5400	8.0000	394.6199			
Indeno(1,2,3-cd)pyrene	6.04	1,096,478.2	4.8282	0.0012	1.3000	63.5282									
2-Methylnaphthalene	3.86	7,244.4	4.8282				42.0000	304.0000	14690.4312	4.7000	34.0000	1643.9292			
Naphthalene	3.37	2,344.2	4.8282				110.0000	258.0000	12450.2461	13.0000	30.0000	1471.3927			
Phenanthrene	4.45	28,183.8	4.8282								120.0000	5793.8400			
Pyrene	5.32	208,929.6	4.8282				42.0000	8775.0000	423676.662	4.6000	961.0000	46402.6821			
Phenols, total unchlorinated	2	100.0	4.8282							5.0000	0.5000	24.1410			
PESTICIDES/POLYCHLORINATED BIPHENYLS (PCBs)															
Aldrin	5.0	100,000.0	4.8282	0.0010000	0.1000	4.8282							0.0077	0.7700	37.1771
a-BHC	3.8	6,309.6	4.8282	0.0090000	0.0600	2.7417	2.0000	12.6000	609.2777	0.0100	0.0600	3.0464	0.2300	1.5000	70.0669
d-BHC	3.8	6,309.6	4.8282	0.0090000	0.0600	2.7417	2.0000	12.6000	609.2777	0.0100	0.0600	3.0464	0.2300	1.5000	70.0669
g-BHC (Lindane)	3.8	6,309.6	4.8282	0.0090000	0.0600	2.7417	2.0000	12.6000	609.2777	0.0100	0.0600	3.0464	0.2300	1.5000	70.0669
Chlordane	2.78	602.6	4.8282	0.0020000	0.0010	0.0582	2.4000	1.4000	69.8227	0.0430	0.0300	1.2510	0.0100	0.0060	0.2909
4,4'-DDD	6.0	1,000,000.0	4.8282	0.0000100	0.0100	0.4828							0.0010	1.0000	48.2820
4,4'-DDE	6.0	1,000,000.0	4.8282	0.0000100	0.0100	0.4828							0.0010	1.0000	48.2820
4,4'-DDT	6.0	1,000,000.0	4.8282	0.0000100	0.0100	0.4828	1.1000	1100.0000	53110.2000	0.0010	1.0000	48.2820	0.0010	1.0000	48.2820
Dieldrin	5.0	100,000.0	4.8282	0.0010000	0.1000	4.8282					9.0000	434.5380	0.0077	0.7700	37.1771
Endosulfan (I)	3.55	3,548.1	4.8282				0.2200	0.7800	37.6884	0.0090	0.0300	1.5418			
Endosulfan (II)	3.55	3,548.1	4.8282				0.2200	0.7800	37.6884	0.0090	0.0300	1.5418			
Endosulfan Sulfate			4.8282												
Endrin	5.6	398,107.2	4.8282	0.0020000	0.8000	38.4428					4.0000	193.1280	0.0019	0.8000	36.5207
Endrin Ketone			4.8282												
Heptachlor	4.4	25,118.9	4.8282	0.0000300	0.0008	0.0364	0.5200	13.1000	630.6503	0.0038	0.1000	4.6086	0.0010	0.0300	1.2128
Heptachlor Epoxide	4.4	25,118.9	4.8282	0.0000300	0.0008	0.0364	0.5200	13.1000	630.6503	0.0038	0.1000	4.6086	0.0010	0.0300	1.2128
Methoxychlor	4.3	19,952.6	4.8282							0.0300	0.6000	28.9006			
PCBs (Total)	6.14	1,380,384.3	4.8282	0.0000006	0.0008	0.0400	2.0000	2760.8000	133295.4261	0.0140	19.3000	933.0680	0.0010	1.4000	66.6477

(a) New York State Department of Environmental Conservation, Division of Fish, Wildlife and Marine Resources, Technical Guidance for Screening Contaminated Sediments, January 1999.

TABLE 4-9C DETECTED TARGET ANALYTE LIST METALS SEDIMENT ANALYTICAL DATA

Parameter List USEPA Method 6010B/7471A	Sample ID	932112-SD-01 (0-2")		932112-SD-01 (2-6")		932112-SD-02 (0-2")		932112-SD-02 (2-6")		932112-SD-03 (0-2")		932112-SD-03 (2-6")		NYSDEC Sediment Criteria Lowest Effect Level (mg/kg)	NYSDEC Sediment Criteria Severe Effect Level (mg/kg)
	Lab ID	AC48527-001		AC48527-002		AC48527-004		AC48527-005		AC48527-007		AC48527-008			
	Sample Type	Sediment		Sediment		Sediment		Sediment		Sediment		Sediment			
	Sample Date	11/20/2009		11/20/2009		11/20/2009		11/20/2009		11/20/2009		11/20/2009			
Aluminum	(mg/kg)	32,000		20,000		3,800		6,200		4,700		7,000		---	---
Antimony	(mg/kg)	(<8.3)	U	(<7.4)	U	(<3.3)	U	(<2.7)	U	(<4.8)	U	**6.1**		2.0	25.0
Arsenic	(mg/kg)	**14**		**11**		**25**		**9.1**		**34**		**38**		6.0	33.0
Barium	(mg/kg)	230		210		140		200		170		1,800		---	---
Cadmium	(mg/kg)	**6.1**		**6**		**4.6**		**2.7**		**4.4**		**6.8**		0.6	9.0
Calcium	(mg/kg)	57,000		52,000		11,000		11,000		32,000		24,000		---	---
Chromium	(mg/kg)	**96**		**95**		**57**		17		**51**		**74**		26.0	110
Cobalt	(mg/kg)	(<10)	U	(<9.3)	U	9.3		6.5		12		14		---	---
Copper	(mg/kg)	**1,000**		**1,100**		**780**		**170**		**8,200**		**740**		16.0	110
Iron	(mg/kg)	**26,000**		**30,000**		**65,000**		**52,000**		**120,000**		**110,000**		2.0%	4.0%
Lead	(mg/kg)	**2,000**		**2,000**		**1,300**		**810**		**1,200**		**590**		31.0	110
Magnesium	(mg/kg)	19,000		17,000		2,200		920		7,100		6,000		---	---
Manganese	(mg/kg)	270		290		230		200		**710**		**500**		460	1,100
Mercury	(mg/kg)	**0.89**		**0.73**		**0.27**		**0.33**		**0.29**		**0.34**		0.15	1.3
Nickel	(mg/kg)	**90**		**89**		**120**		**24**		**60**		**120**		16.0	50.0
Potassium	(mg/kg)	2,900		2,300		(<830)	U	(<670)	U	(<1,200)	U	960		---	---
Selenium	(mg/kg)	12		12		7.6		(<2.4)	U	(<4.3)	U	(<2.8)	U	---	---
Silver	(mg/kg)	(<6.2)	U	(<5.6)	U	(<2.5)	U	(<2)	U	(<3.6)	U	(<2.3)	U	1	2.2
Sodium	(mg/kg)	1,200		1,200		510		360		710		560		---	---
Vanadium	(mg/kg)	(<42)	U	(<37)	U	(<17)	U	(<13)	U	(<24)	U	21		---	---
Zinc	(mg/kg)	**2,500**		**2,600**		**2,200**		**610**		**1,700**		**2,000**		120	270

NOTE:
USEPA = United States Enivronmental Protection Agency
NYSDEC = New York State Department of Environmental Conservation
mg/kg = milligrams per kilogram
--- = No Standard
U = Non-detect, detection below the method detection limit
Data provided by Hampton-Clarke Veritech. Only analytes that were detected in at least one sample are shown. Data validation completed by Chemworld Environmental, Inc.
Concentration values in **bold** indicate that analyte was detecetd above the LEL, **bold and highlighted** indicate that analyte was above the SEL.

TABLE 4-9C DETECTED TARGET ANALYTE LIST METALS SEDIMENT ANALYTICAL DATA

Parameter List USEPA Method 6010B/7471A	Sample ID	932112-SD-04 (0-2")		932112-SD-04 (2-6")		932112-SD-05 (0-2")		932112-SD-05 (2-6")		DUPLICATE$^{(a)}$		RINSATE BLANK$^{(b)}$		NYSDEC Sediment Criteria Lowest Effect Level (mg/kg)	NYSDEC Sediment Criteria Severe Effect Level (mg/kg)
	Lab ID	AC48527-011		AC48527-012		AC48527-014		AC48527-015		AC48527-010		AC48527-017			
	Sample Type	Sediment		Sediment		Sediment		Sediment		QA/QC		QA/QC			
	Sample Date	11/20/2009		11/20/2009		11/20/2009		11/20/2009		11/20/2009		11/20/2009			
Aluminum	(mg/kg)	3,600		4,500		9,100		8,400		11,000		(<2,000)	U	---	---
Antimony	(mg/kg)	(<9.1)	U	(<9.1)	U	(<2.9)	U	(<3.2)	U	(<2.6)	U	(<20)	U	2.0	25.0
Arsenic	(mg/kg)	(<9.1)	U	(<9.1)	U	5.6		**6.8**		4.7		(<20)	U	6.0	33.0
Barium	(mg/kg)	110		76		590		230		220		(<100)	U	---	---
Cadmium	(mg/kg)	**2.9**		(<2.7)	U	(<0.86)	U	**1.4**		(<0.78)	U	(<6)	U	0.6	9.0
Calcium	(mg/kg)	23,000		180,000		37,000		43,000		78,000		(<10,000)	U	---	---
Chromium	(mg/kg)	(<23)	U	(<23)	U	21		20		18		(<50)	U	26.0	110
Cobalt	(mg/kg)	(<11)	U	(<11)	U	4.8		6.6		4.9		(<25)	U	---	---
Copper	(mg/kg)	**47**		**99**		**78**		**99**		**42**		(<50)	U	16.0	110
Iron	(mg/kg)	7,900		17,000		16,000		**23,000**		16,000		(<2,000)	U	2.0%	4.0%
Lead	(mg/kg)	**170**		**240**		**390**		**520**		**250**		(<50)	U	31.0	110
Magnesium	(mg/kg)	3,200		18,000		8,100		15,000		11,000		(<5,000)	U	---	---
Manganese	(mg/kg)	240		410		410		**550**		450		(<100)	U	460	1,100
Mercury	(mg/kg)	(<0.38)	U	(<0.38)	U	0.13		0.14		(<0.11)	U	(<0.5)	U	0.15	1.3
Nickel	(mg/kg)	(<23)	U	(<23)	U	**16**		**22**		15		(<50)	U	16.0	50.0
Potassium	(mg/kg)	(<2,300)	U	(<2,300)	U	1,200		1,200		1,300		(<5,000)	U	---	---
Selenium	(mg/kg)	(<8.2)	U	(<8.2)	U	(<2.6)	U	(<2.9)	U	(<2.3)	U	(<18)	U	---	---
Silver	(mg/kg)	(<6.8)	U	(<6.8)	U	(<2.1)	U	(<2.4)	U	(<1.9)	U	(<15)	U	1	2.2
Sodium	(mg/kg)	(<1,100)	U	1,100		(<360)	U	460		(<320)	U	(<2,500)	U	---	---
Vanadium	(mg/kg)	(<45)	U	(<45)	U	36		21		17		(<100)	U	---	---
Zinc	(mg/kg)	**400**		**390**		**340**		**410**		**290**		(<100)	U	120	270

(a) Duplicate sample collected at 932112-SD-05 (0-2").

(b) Rinsate blank was an aqueous sample, units are in µg/L.

TABLE 4-9C DETECTED TARGET ANALYTE LIST METALS SEDIMENT ANALYTICAL DATA

Parameter List USEPA Method 6010B/7471A	Sample ID	932112-SD-06		932112-SD-07		932112-SD-08		932112-SD-09		932112-SD-10		932112-SD-11		NYSDEC Sediment Criteria Lowest Effect Level (mg/kg)	NYSDEC Sediment Criteria Severe Effect Level (mg/kg)
	Lab ID	AC51456-001		AC51456-002		AC51456-003		AC51456-004		AC51456-005		AC51456-006			
	Sample Type	Sediment		Sediment		Sediment		Sediment		Sediment		Sediment			
	Sample Date	5/4/2010		5/4/2010		5/4/2010		5/4/2010		5/4/2010		5/4/2010			
Aluminum	(mg/kg)	10,000		8,900		14,000		9,100		6,500		11,000		---	---
Antimony	(mg/kg)	(<8)	U	(<6.5)	U	(<7.7)	U	(<5.7)	U	(<5.7)	U	(<4.3)		2.0	25.0
Arsenic	(mg/kg)	**13**		**14**		**19**		**13**		**9.5**		**19**		6.0	33.0
Barium	(mg/kg)	180		160		560		190		110		380		---	---
Cadmium	(mg/kg)	**9.4**		**7.6**		**9.5**		**8**		**4.7**		**4.5**		0.6	9.0
Calcium	(mg/kg)	54,000		86,000		60,000		96,000		130,000		22,000		---	---
Chromium	(mg/kg)	**56**		**54**		**87**		**63**		**40**		**41**		26.0	110
Cobalt	(mg/kg)	(<10)	U	(<8.1)	U	14		(<7.1)	U	(<7.1)	U	8.2		---	---
Copper	(mg/kg)	**1,200**		**770**		**460**		**890**		**270**		**650**		16.0	110
Iron	(mg/kg)	**26,000**		**27,000**		**50,000**		**26,000**		**20,000**		**33,000**		2.0%	4.0%
Lead	(mg/kg)	**2,100**		**1,800**		**920**		**2,100**		**430**		**2,300**		31.0	110
Magnesium	(mg/kg)	14,000		22,000		21,000		31,000		42,000		5,500		---	---
Manganese	(mg/kg)	230		**640**		**2,700**		**610**		**840**		**2,100**		460	1,100
Mercury	(mg/kg)	**0.59**		**0.31**		**0.38**		**0.37**		(<0.24)	U	**0.22**		0.15	1.3
Nickel	(mg/kg)	**63**		**75**		**93**		**62**		**33**		**61**		16.0	50.0
Potassium	(mg/kg)	(<2,000)	U	1,600		(<1,900)	U	(<1,400)	U	(<1,400)	U	2,200		---	---
Selenium	(mg/kg)	12		(<5.9)	U	(<6.9)	U	(<5.1)	U	(<5.1)	U	5.1		---	---
Sodium	(mg/kg)	(<1,000)	U	1,100		(<960)	U	880		1,100		(<530)	U	---	---
Silver	(mg/kg)	(<6.0)	U	**8.7**		(<5.8)	U	**4.5**		(<4.3)	U	**3.5**		1	2.2
Vanadium	(mg/kg)	(<40)	U	37		51		42		37		28		---	---
Zinc	(mg/kg)	**2,600**		**2,000**		**3,700**		**2,400**		**1,100**		**1,700**		120	270

TABLE 4-9C DETECTED TARGET ANALYTE LIST METALS SEDIMENT ANALYTICAL DATA

Parameter List USEPA Method 6010B/7471A	Sample ID	932112-SD-DUP02(c)		932112-SD-Rinsate-02(d)		NYSDEC Sediment Criteria Lowest Effect Level (mg/kg)	NYSDEC Sediment Criteria Severe Effect Level (mg/kg)
	Lab ID	AC51456-007		AC51456-008			
	Sample Type	Sediment		QA/QC			
	Sample Date	5/4/2010		5/4/2010			
Aluminum	(mg/kg)	8,500		(<2,000)	U	---	---
Antimony	(mg/kg)	(<6.7)	U	(<20)	U	2.0	25.0
Arsenic	(mg/kg)	**14**		(<20)	U	6.0	33.0
Barium	(mg/kg)	210		(<100)	U	---	---
Cadmium	(mg/kg)	**8.2**		(<6)	U	0.6	9.0
Calcium	(mg/kg)	75,000		(<10,000)	U	---	---
Chromium	(mg/kg)	**52**		(<50)	U	26.0	110
Cobalt	(mg/kg)	(<8.3)	U	(<25)	U	---	---
Copper	(mg/kg)	**1,000**		(<50)	U	16.0	110
Iron	(mg/kg)	**29,000**		(<2,000)	U	2.0%	4.0%
Lead	(mg/kg)	**2,100**		(<50)	U	31.0	110
Magnesium	(mg/kg)	20,000		(<5,000)	U	---	---
Manganese	(mg/kg)	**610**		(<100)	U	460	1,100
Mercury	(mg/kg)	(<0.28)	U	(<0.5)	U	0.15	1.3
Nickel	(mg/kg)	**54**		(<50)	U	16.0	50.0
Potassium	(mg/kg)	(<1,700)	U	(<5,000)	U	---	---
Selenium	(mg/kg)	(<6)	U	(<18)	U	---	---
Silver	(mg/kg)	(<5)	U	(<15)	U	1	2.2
Sodium	(mg/kg)	1,000		(<2,500)	U	---	---
Vanadium	(mg/kg)	39		(<100)	U	---	---
Zinc	(mg/kg)	**2,100**		(<100)	U	120	270

(c) Duplicate sample (DUP02) collected at 932112-SD-07.

(d) Rinsate blanks are aqueous samples, units are in µg/L.

NOTE: QA/QC = Quality Asssurance/Quality Control

TABLE 4-9D TOTAL LEAD AND TCLP LEAD SEDIMENT ANALYTICAL DATA

Parameter List USEPA Method 6010B	Sample ID	932112-SD-01 (0-2")	932112-SD-01 (2-6")	932112-SD-02 (0-2")	932112-SD-03 (0-2")	NYSDEC Sediment Criteria Lowest Effect Level (mg/kg)	NYSDEC Sediment Criteria Severe Effect Level (mg/kg)
	Lab ID	AC48527-001	AC48527-002	AC48527-004	AC48527-007		
	Sample Type	Sediment	Sediment	Sediment	Sediment		
	Sample Date	11/20/2009	11/20/2009	11/20/2009	11/20/2009		
Lead (total)	(mg/kg)	**2,400**	**2,100**	**530**	**630**	31.0	110

Parameter List USEPA Method 6010B	Sample ID	932112-SD-01 (0-2")	932112-SD-01 (2-6")	932112-SD-02 (0-2")	932112-SD-03 (0-2")	NYSDEC Identification and Listings of Hazardous Wastes 6 NYCRR Part 371 (mg/L)
	Lab ID	AC48527-001	AC48527-002	AC48527-004	AC48527-007	
	Sample Type	Sediment	Sediment	Sediment	Sediment	
	Sample Date	11/20/2009	11/20/2009	11/20/2009	11/20/2009	
TCLP Lead	(mg/L)	3.7	3.8	3.8	0.88	5.0

NOTE:
USEPA = United States Enivronmental Protection Agency
NYSDEC = New York State Department of Environmental Conservation
mg/kg = milligrams per kilogram
TCLP = Toxicity Characteristics Leaching Procedure
mg/L = milligrams per liter
NYCRR = New York Code of Rules and Regulations
Data provided by Hampton-Clarke Veritech.
Concentration values in **bold** indicate that analyte was detecetd above the LEL, **bold and highlighted** indicate that analyte was above the SEL.

TABLE 4-9E DETECTED SEMIVOLATILE ORGANIC COMPOUNDS SEDIMENT ANALYTICAL DATA

	Sample ID	932112-SD-01 (0-2")		932112-SD-02 (0-2")		932112-SD-03 (0-2")		932112-SD-04 (0-2")		932112-SD-05 (0-2")		Sediment Criteria Benthic Aquatic Life Chronic Toxicity or Human Health Bioaccumulation* (mg/kg)
	Lab ID	AC48527-001		AC48527-004		AC48527-007		AC48527-011		AC48527-014		
	Sample Type	Sediment		Sediment		Sediment		Sediment		Sediment		
Parameter List USEPA Method 8270C	Sample Date	11/20/2009		11/20/2009		11/20/2009		11/20/2009		11/20/2009		
Acenaphthylene	(mg/kg)	(<0.28)	U	(<0.11)	U	(<0.16)	U	(<0.3)	U	(<0.09)	U	---
Anthracene	(mg/kg)	(<0.28)	U	(<0.11)	U	(<0.16)	U	(<0.3)	U	(<0.09)	U	5.171
Benzo[a]anthracene	(mg/kg)	**1**		0.17		0.29		(<0.3)	U	0.35		0.590
Benzo[a]pyrene	(mg/kg)	**1.2**		**0.18**		**0.36**		(<0.3)	U	**0.41**		0.064*
Benzo[b]fluoranthene	(mg/kg)	**2.1**		**0.27**		**0.55**		**0.31**		**0.72**		0.064*
Benzo[g,h,i]perylene	(mg/kg)	1.3		0.16		0.69		(<0.3)	U	0.37		---
Benzo[k]fluoranthene	(mg/kg)	**0.7**		(<0.11)	U	(<0.16)	U	(<0.3)	U	**0.2**		0.064*
bis(2-Ethylhexyl)phthalate	(mg/kg)	2		0.24		(<0.16)	U	0.61		(<0.09)	U	5.780
Carbazole	(mg/kg)	(<0.28)	U	(<0.11)	U	(<0.16)	U	(<0.3)	U	(<0.09)	U	---
Chrysene	(mg/kg)	**1.3**		**0.19**		**0.31**		(<0.3)	U	**0.41**		0.064*
Dibenzo[a,h]anthracene	(mg/kg)	**0.3**		(<0.11)	U	(<0.16)	U	(<0.3)	U	**0.12**		0.064*
Fluoranthene	(mg/kg)	2.3		0.36		0.65		0.46		0.69		49.248
Indeno[1,2,3-cd]pyrene	(mg/kg)	**1.1**		**0.12**		**0.4**		(<0.3)	U	**0.31**		0.064*
Phenanthrene	(mg/kg)	1		0.2		0.44		(<0.3)	U	0.3		5.794
Phenol	(mg/kg)	0.38		(<0.11)	U	(<0.16)	U	(<0.3)	U	(<0.09)	U	24.14
Pyrene	(mg/kg)	1.9		0.34		0.54		0.36		0.62		46.403

	Sample ID	DUPLICATE[a]		RINSATE[b]		Sediment Criteria Benthic Aquatic Life Chronic Toxicity or Human Health Bioaccumulation* (mg/kg)
	Lab ID	AC48527-010		AC48527-017		
	Sample Type	QA/QC		QA/QC		
Parameter List USEPA Method 8270C	Sample Date	11/20/2009		11/20/2009		
Acenaphthylene	(mg/kg)	0.12		(<2.1)	U	---
Anthracene	(mg/kg)	0.14		(<2.1)	U	5.171
Benzo[a]anthracene	(mg/kg)	**0.65**		(<2.1)	U	0.590
Benzo[a]pyrene	(mg/kg)	**0.59**		(<2.1)	U	0.064*
Benzo[b]fluoranthene	(mg/kg)	**0.95**		(<2.1)	U	0.064*
Benzo[g,h,i]perylene	(mg/kg)	0.41		(<2.1)	U	---
Benzo[k]fluoranthene	(mg/kg)	**0.31**		(<2.1)	U	0.064*
bis(2-Ethylhexyl)phthalate	(mg/kg)	(<0.08)	U	(<2.1)	U	5.780
Carbazole	(mg/kg)	0.13		(<2.1)	U	---
Chrysene	(mg/kg)	**0.62**		(<2.1)	U	0.064*
Dibenzo[a,h]anthracene	(mg/kg)	**0.12**		(<2.1)	U	0.064*
Fluoranthene	(mg/kg)	1.2		(<2.1)	U	49.248
Indeno[1,2,3-cd]pyrene	(mg/kg)	**0.36**		(<2.1)	U	0.064*
Phenanthrene	(mg/kg)	0.092		(<2.1)	U	5.794
Phenol	(mg/kg)	1		(<2.1)	U	24.14
Pyrene	(mg/kg)	1		(<2.1)	U	46.403

(a) Duplicate sample collected at 932112-SD-05 (0-2").

(b) Rinsate blank was an aqueous sample, units are in µg/L.

NOTE:
USEPA = United States Enivronmental Protection Agency
mg/kg = milligrams per kilogram
U = Non-detect, detection below the method detection limit
Data provided by Hampton-Clarke Veritech. Only analytes that were detected in at least one sample are shown. Data validation completed by Chemworld Environmental, Inc.

TABLE 4-9E DETECTED SEMIVOLATILE ORGANIC COMPOUNDS SEDIMENT ANALYTICAL DATA

Parameter List USEPA Method 8270C	Sample ID	932112-SD-06		932112-SD-07		932112-SD-08		932112-SD-09		932112-SD-10		Sediment Criteria Benthic Auqatic Life Chronic Toxicity or Human Health Bioaccumulation* (mg/kg)
	Lab ID	AC51456-001		AC51456-002		AC51456-003		AC51456-004		AC51456-005		
	Sample Type	Sediment		Sediment		Sediment		Sediment		Sediment		
	Sample Date	5/4/2010		5/4/2010		5/4/2010		5/4/2010		5/4/2010		
Acenaphthylene	(mg/kg)	(<0.53)	U	(<0.65)	U	(<0.26)	U	(<0.57)	U	(<0.57)	U	---
Anthracene	(mg/kg)	(<0.53)	U	0.67		(<0.26)	U	1.3		(<0.57)	U	5.171
Benzo[a]anthracene	(mg/kg)	**1.4**		**2.4**		**0.72**		**3.9**		**2.2**		0.590
Benzo[a]pyrene	(mg/kg)	**1.1**		**2.1**		**0.72**		**3.5**		**2.5**		0.064*
Benzo[b]fluoranthene	(mg/kg)	**1.7**		**3.3**		**1.1**		**4.9**		**4.1**		0.064*
Benzo[g,h,i]perylene	(mg/kg)	0.94		1.7		0.61		2.8		2.6		---
Benzo[k]fluoranthene	(mg/kg)	**0.59**		**1.1**		**0.44**		**1.8**		**1.5**		0.064*
bis(2-Ethylhexyl)phthalate	(mg/kg)	(<0.53)	U	(<0.65)	U	(<0.26)	U	(<0.57)	U	1.4		5.780
Carbazole	(mg/kg)	(<0.53)	U	(<0.65)	U	(<0.26)	U	0.65		(<0.57)	U	---
Chrysene	(mg/kg)	1.5		2.6		0.82		3.7		3.2		0.064*
Dibenzo[a,h]anthracene	(mg/kg)	(<0.53)	U	**0.74**		(<0.26)	U	**0.83**		**0.7**		0.064*
Fluoranthene	(mg/kg)	2.2		4.6		1.4		7.4		5.4		49.248
Indeno[1,2,3-cd]pyrene	(mg/kg)	**0.92**		**1.8**		**0.67**		**2.9**		**2.6**		0.064*
Phenanthrene	(mg/kg)	1.8		2.4		0.66		4.9		2.4		5.794
Phenol	(mg/kg)	(<0.53)	U	(<0.65)	U	(<0.26)	U	(<0.57)	U	(<0.57)	U	24.14
Pyrene	(mg/kg)	2.5		4.5		1.6		7.4		5.3		46.403

Parameter List USEPA Method 8270C	Sample ID	932112-SD-11		932112-SD-DUP02(c)		932112-SD-Rinsate-02(d)		Sediment Criteria Benthic Auqatic Life Chronic Toxicity or Human Health Bioaccumulation* (mg/kg)
	Lab ID	AC51456-006		AC51456-007		AC51456-008		
	Sample Type	Sediment		Sediment		QA/QC		
	Sample Date	5/4/2010		5/4/2010		5/4/2010		
Acenaphthylene	(mg/kg)	(<0.14)	U	(<0.67)	U	(<2)	U	---
Anthracene	(mg/kg)	(<0.14)	U	(<0.67)	U	(<2)	U	5.171
Benzo[a]anthracene	(mg/kg)	0.24		**2.3**		(<2)	U	0.590
Benzo[a]pyrene	(mg/kg)	**0.2**		**2**		(<2)	U	0.064*
Benzo[b]fluoranthene	(mg/kg)	**0.29**		**3.1**		(<2)	U	0.064*
Benzo[g,h,i]perylene	(mg/kg)	0.16		1.4		(<2)	U	---
Benzo[k]fluoranthene	(mg/kg)	(<0.14)	U	**1**		(<2)	U	0.064*
bis(2-Ethylhexyl)phthalate	(mg/kg)	0.44		(<0.67)	U	(<2)	U	5.780
Carbazole	(mg/kg)	(<0.14)	U	(<0.67)	U	(<2)	U	---
Chrysene	(mg/kg)	0.24		2.4		(<2)	U	---
Dibenzo[a,h]anthracene	(mg/kg)	(<0.14)	U	(<0.67)	U	(<2)	U	0.064*
Fluoranthene	(mg/kg)	0.4		3.9		(<2)	U	49.248
Indeno[1,2,3-cd]pyrene	(mg/kg)	**0.16**		**1.6**		(<2)	U	0.064*
Phenanthrene	(mg/kg)	0.26		1.6		(<2)	U	5.794
Phenol	(mg/kg)	(<0.14)	U	(<0.67)	U	(<2)	U	24.14
Pyrene	(mg/kg)	0.44		4.5		(<2)	U	46.403

(c) Duplicate sample collected at 932112-SD-07.
(d) Rinsate are aqueous samples, units are in µg/L.

TABLE 4-9F DETECTED VOLATILE ORGANIC COMPOUNDS SEDIMENT ANALYTICAL DATA

Parameter List USEPA Method 8260B	Sample ID	932112-SD-01 (0-2")		932112-SD-02 (0-2")		932112-SD-03 (0-2")		932112-SD-04 (0-2")		932112-SD-04 (2-6")		Sediment Criteria Benthic Aquatic Life Chronic Toxicity or Human Health Bioaccumulation* (mg/kg)
	Lab ID	AC48527-001		AC48527-004		AC48527-007		AC48527-011		AC48527-012		
	Sample Type	Sediment		Sediment		Sediment		Sediment		Sediment		
	Sample Date	11/20/2009		11/20/2009		11/20/2009		11/20/2009		11/20/2009		
Acetone	(mg/kg)	(<0.1)	U	(<0.04)	U	0.18		(<0.11)	U	1.3		---
2-Butanone	(mg/kg)	(<0.02)	U	(<0.0083)	U	(<0.01)	U	(<0.02)	U	0.2		---
1,2-Dichloroethene (total)	(mg/kg)	**0.022**		**0.058**		(<0.01)	U	(<0.02)	U	(<0.02)	U	0.00117*
Methylene Chloride	(mg/kg)	(<0.02)	U	(<0.0083)	U	(<0.01)	U	(<0.02)	U	(<0.02)	U	---
Tetrachloroethene	(mg/kg)	(<0.02)	U	(<0.0083)	U	0.021		(<0.02)	U	(<0.02)	U	0.03663*
Toulene	(mg/kg)	(<0.0042)	U	(<0.0017)	U	(<0.0023)	U	(<0.0045)	U	0.0069		---
Trichloroethene	(mg/kg)	(<0.02)	U	(<0.0083)	U	0.025		(<0.02)	U	(<0.02)	U	0.10356*
Vinyl chloride	(mg/kg)	(<0.02)	U	0.033		(<0.01)	U	(<0.02)	U	(<0.02)	U	---
m&p-Xylenes	(mg/kg)	(<0.0042)	U	(<0.0017)	U	(<0.0023)	U	(<0.0045)	U	0.0075		---
Xylenes (total)	(mg/kg)	(<0.0042)	U	(<0.0017)	U	(<0.0023)	U	(<0.0045)	U	0.0075		---

Parameter List USEPA Method 8260B	Sample ID	932112-SD-05 (0-2")		932112-SD-05 (2-6")		DUPLICATE$^{(a)}$		RINSATE$^{(b)}$		TRIP BLANK$^{(b)}$		Sediment Criteria Benthic Aquatic Life Chronic Toxicity or Human Health Bioaccumulation* (mg/kg)
	Lab ID	AC48527-014		AC48527-015		AC48479-003		AC48527-017		AC48527-020		
	Sample Type	Sediment		Sediment		QA/QC		QA/QC		QA/QC		
	Sample Date	11/20/2009		11/20/2009		11/20/2009		11/20/2009		---		
Acetone	(mg/kg)	(<0.03)	U	(<0.04)	U	(<0.03)	U	(<5)	U	(<5)	U	---
2-Butanone	(mg/kg)	(<0.0071)	U	(<0.0082)	U	(<0.0065)	U	(<1)	U	(<1)	U	---
1,2-Dichloroethene (total)	(mg/kg)	(<0.0071)	U	(<0.0082)	U	(<0.0065)	U	(<0.5)	U	(<0.5)	U	0.00117*
Methylene Chloride	(mg/kg)	(<0.0071)	U	(<0.0082)	U	0.0067		(<1)	U	(<1)	U	---
Tetrachloroethene	(mg/kg)	(<0.0071)	U	(<0.0082)	U	(<0.0065)	U	(<0.5)	U	(<0.5)	U	0.03663*
Toulene	(mg/kg)	(<0.0014)	U	(<0.0016)	U	(<0.0013)	U	(<0.5)	U	(<0.5)	U	---
Trichloroethene	(mg/kg)	(<0.0071)	U	(<0.0082)	U	(<0.0065)	U	(<0.5)	U	(<0.5)	U	0.10356*
Vinyl chloride	(mg/kg)	(<0.0071)	U	(<0.0082)	U	(<0.0065)	U	(<0.5)	U	(<0.5)	U	---
m&p-Xylenes	(mg/kg)	0.0037		0.002		(<0.0013)	U	(<1)	U	(<1)	U	---
Xylenes (total)	(mg/kg)	0.0037		0.002		(<0.0013)	U	(<0.5)	U	(<0.5)	U	---

(a) Duplicate sample collected at 932112-SD-05 (0-2").

(b) Rinsate and trip blanks are aqueous samples, units are in µg/L.

NOTE:
USEPA = United States Enivronmental Protection Agency
mg/kg = milligrams per kilogram
U = Non-detect, detection below the method detection limit
--- = No Standard
Data provided by Hampton-Clarke Veritech. Only analytes that were detected in at least one sample are shown. Data validation completed by Chemworld Environmental, Inc.

TABLE 4-9F DETECTED VOLATILE ORGANIC COMPOUNDS SEDIMENT ANALYTICAL DATA

Parameter List USEPA Method 8260B	Sample ID	932112-SD-06		932112-SD-07		932112-SD-08		932112-SD-09		932112-SD-10		Sediment Criteria Benthic Aquatic Life Chronic Toxicity or Human Health Bioaccumulation* (mg/kg)
	Lab ID	AC51456-001		AC51456-002		AC51456-003		AC51456-004		AC51456-005		
	Sample Type	Sediment		Sediment		Sediment		Sediment		Sediment		
	Sample Date	5/4/2010		5/4/2010		5/4/2010		5/4/2010		5/4/2010		
Acetone	(mg/kg)	0.73		(<0.07)	U	(<0.09)	U	(<0.07)	U	(<0.07)	U	---
2-Butanone	(mg/kg)	0.15		(<0.01)	U	(<0.01)	U	(<0.01)	U	(<0.01)	U	---
1,2-Dichloroethene (total)	(mg/kg)	(<0.01)	U	(<0.01)	U	(<0.01)	U	(<0.01)	U	(<0.01)	U	0.00117*
Methylene Chloride	(mg/kg)	(<0.01)	U	(<0.01)	U	(<0.01)	U	(<0.01)	U	(<0.01)	U	---
Tetrachloroethene	(mg/kg)	(<0.01)	U	(<0.01)	UJ	(<0.01)	U	(<0.01)	U	(<0.01)	U	0.03663*
Toulene	(mg/kg)	(<0.0039)	UJ	(<0.0032)	UJ	(<0.0039)	U	(<0.0029)	U	0.037	J	---
Trichloroethene	(mg/kg)	(<0.01)	U	(<0.01)	U	(<0.01)	U	(<0.01)	U	(<0.01)	U	0.10356*
Vinyl chloride	(mg/kg)	(<0.01)	U	(<0.01)	U	(<0.01)	U	(<0.01)	U	(<0.01)	U	---
m&p-Xylenes	(mg/kg)	(<0.0039)	UJ	(<0.0032)	UJ	(<0.0039)	U	(<0.0029)	U	(<0.0029)	UJ	---
Xylenes (total)	(mg/kg)	(<0.0039)	UJ	(<0.0032)	UJ	(<0.0039)	U	(<0.0029)	U	(<0.0029)	UJ	---

Parameter List USEPA Method 8260B	Sample ID	932112-SD-11		932112-SD-DUP02(c)		932112-SD-Rinsate-02(d)		Sediment Criteria Benthic Aquatic Life Chronic Toxicity or Human Health Bioaccumulation* (mg/kg)
	Lab ID	AC51456-006		AC51456-007		AC51456-008		
	Sample Type	Sediment		Sediment		QA/QC		
	Sample Date	5/4/2010		5/4/2010		5/4/2010		
Acetone	(mg/kg)	(<0.05)	U	(<0.08)	U	(<5)	U	---
2-Butanone	(mg/kg)	(<0.01)	U	(<0.01)	U	(<1)	U	---
1,2-Dichloroethene (total)	(mg/kg)	(<0.01)	U	(<0.01)	U	(<1)	U	0.00117*
Methylene Chloride	(mg/kg)	(<0.01)	U	(<0.01)	U	(<1)	U	---
Tetrachloroethene	(mg/kg)	(<0.01)	U	(<0.01)	U	(<1)	U	0.03663*
Toulene	(mg/kg)	(<0.0021)	U	(<0.0033)	U	(<1)	U	---
Trichloroethene	(mg/kg)	(<0.01)	U	(<0.01)	U	(<1)	U	0.10356*
Vinyl chloride	(mg/kg)	(<0.01)	U	(<0.01)	U	(<1)	U	---
m&p-Xylenes	(mg/kg)	(<0.0021)	U	(<0.0033)	U	(<1)	U	---
Xylenes (total)	(mg/kg)	(<0.0021)	U	(<0.0033)	U	(<1)	U	---

(c) Duplicate sample collected at 932112-SD-07.
(d) Rinsate aqueous samples, units are in μg/L.

TABLE 4-9G DETECTED PESTICIDES SEDIMENT ANALYTICAL DATA

Parameter List USEPA Method 8081A	Sample ID	932112-SD-01 (0-2")		932112-SD-02 (0-2")		932112-SD-03 (0-2")		932112-SD-04 (0-2")		932112-SD-05 (0-2")		Sediment Criteria Benthic Auqatic Life Chronic Toxicity or Human Health Bioaccumulation* (mg/kg)
	Lab ID	AC48527-001		AC48527-004		AC48527-007		AC48527-011		AC48527-014		
	Sample Type	Sediment		Sediment		Sediment		Sediment		Sediment		
	Sample Date	11/20/2009		11/20/2009		11/20/2009		11/20/2009		11/20/2009		
p,p'-DDD	(mg/kg)	(<0.01)	U	**0.0076**		**0.01**		(<0.01)	U	(<0.0036)	U	0.00043*
p,p'-DDE	(mg/kg)	(<0.01)	U	(<0.0042)	U	(<0.006)	U	**0.015**		**0.0041**		0.00043*
p,p'-DDT	(mg/kg)	(<0.01)	U	0.0073		(<0.006)	U	0.015		0.0072		0.00048*

Parameter List USEPA Method 8081A	Sample ID	DUPLICATE[(a)]		RINSATE[(b)]		Sediment Criteria Benthic Auqatic Life Chronic Toxicity or Human Health Bioaccumulation* (mg/kg)
	Lab ID	AC48527-010		AC48527-017		
	Sample Type	QA/QC		QA/QC		
	Sample Date	11/20/2009		11/20/2009		
p,p'-DDD	(mg/kg)	**0.0041**		(<0.0022)	U	0.00048*
p,p'-DDE	(mg/kg)	**0.0044**		(<0.0022)	U	0.00048*
p,p'-DDT	(mg/kg)	0.0097		(<0.0022)	U	0.00048*

Parameter List USEPA Method 8081A	Sample ID	932112-SD-06		932112-SD-07		932112-SD-08		932112-SD-09		932112-SD-10		Sediment Criteria Benthic Auqatic Life Chronic Toxicity or Human Health Bioaccumulation* (mg/kg)
	Lab ID	AC51456-001		AC51456-002		AC51456-003		AC51456-004		AC51456-005		
	Sample Type	Sediment		Sediment		Sediment		Sediment		Sediment		
	Sample Date	5/4/2010		5/4/2010		5/4/2010		5/4/2010		5/4/2010		
p,p'-DDD	(mg/kg)	(<0.01)	UJ	(<0.0081)	U	(<0.0096)	U	(<0.0071)	UJ	(<0.0071)	UJ	0.00048*
p,p'-DDE	(mg/kg)	(<0.01)	UJ	(<0.0081)	U	(<0.0096)	U	(<0.0071)	UJ	(<0.0071)	UJ	0.00048*
p,p'-DDT	(mg/kg)	(<0.01)	UJ	(<0.0081)	U	(<0.0096)	U	(<0.0071)	UJ	(<0.0071)	UJ	0.00048*

Parameter List USEPA Method 8081A	Sample ID	932112-SD-11		932112-SD-DUP02[(c)]		932112-SD-Rinsate-02[(b)]		Sediment Criteria Benthic Auqatic Life Chronic Toxicity or Human Health Bioaccumulation* (mg/kg)
	Lab ID	AC51456-006		AC51456-007		AC51456-008		
	Sample Type	Sediment		Sediment		QA/QC		
	Sample Date	5/4/2010		5/4/2010		5/4/2010		
p,p'-DDD	(mg/kg)	(<0.0053)	UJ	**0.016**	**J**	(<0.01)	U	0.00048*
p,p'-DDE	(mg/kg)	(<0.0053)	UJ	(<0.0083)	UJ	(<0.01)	U	0.00048*
p,p'-DDT	(mg/kg)	(<0.0053)	UJ	(<0.0083)	UJ	(<0.01)	U	0.00048*

(a) Duplicate sample (DUPLICATE) collected at 932112-SD-05 (0-2").

(b) Rinsate blanks are aqueous samples, units are in µg/L.

(c) Duplicate sample (DUP02) collected at 932112-SD-07.

NOTE:
USEPA = United States Enivronmental Protection Agency
mg/kg = milligrams per kilogram
DDD = Dichlorodiphenyldichloroethane
DDE = Dichlorodiphenyldichloroethylene
DDT = Dichlorodiphenyltrichloroethane
U = Non-detect, detection below the method detection limit
UJ = The compound was analyzed for, but not detected. The sample quantitation limit is an estimated quantity.
J = The assocaited numerical value is an estimated quantity
QA/QC = Quality Assurance/Quality Control
Data provided by Hampton-Clarke Veritech. Only analytes that were detected in at least one sample are shown. Data validation completed by Chemworld Environmental, Inc.

TABLE 4-9H DETECTED POLYCHLORINATED BIPHENYLS SEDIMENT ANALYTICAL DATA

Parameter List USEPA Method 8082	Sample ID	932112-SD-01 (0-2")		932112-SD-02 (0-2")		932112-SD-03 (0-2")		932112-SD-04 (0-2")		932112-SD-05 (0-2")		Sediment Criteria Benthic Aquatic Life Chronic Toxicity or Human Health Bioaccumulation* (mg/kg)
	Lab ID	AC48527-001		AC48527-004		AC48527-007		AC48527-011		AC48527-014		
	Sample Type	Sediment		Sediment		Sediment		Sediment		Sediment		
	Sample Date	11/20/2009		11/20/2009		11/20/2009		11/20/2009		11/20/2009		
Aroclor - 1248	(mg/kg)	(<0.1)	U	(<0.04)	U	(<0.06)	U	(<0.11)	U	(<0.03)	U	---
Aroclor - 1254	(mg/kg)	(<0.1)	U	0.068		(<0.06)	U	(<0.11)	U	(<0.03)	U	---
Aroclor (Total)	(mg/kg)	(<0.1)	U	0.068		(<0.06)	U	(<0.11)	U	(<0.03)	U	0.933

Parameter List USEPA Method 8082	Sample ID	DUPLICATE(a)		RINSATE(b)								Sediment Criteria Benthic Aquatic Life Chronic Toxicity or Human Health Bioaccumulation* (mg/kg)
	Lab ID	AC48527-010		AC48527-017								
	Sample Type	QA/QC		QA/QC								
	Sample Date	11/20/2009		11/20/2009								
Aroclor - 1248	(mg/kg)	(<0.03)	U	(<0.05)	U							---
Aroclor - 1254	(mg/kg)	(<0.03)	U	(<0.05)	U							---
Aroclor (Total)	(mg/kg)	(<0.03)	U	(<0.05)	U							0.933

Parameter List USEPA Method 8082	Sample ID	932112-SD-06		932112-SD-07		932112-SD-08		932112-SD-09		932112-SD-10		Sediment Criteria Benthic Aquatic Life Chronic Toxicity or Human Health Bioaccumulation* (mg/kg)
	Lab ID	AC51456-001		AC51456-002		AC51456-003		AC51456-004		AC51456-005		
	Sample Type	Sediment		Sediment		Sediment		Sediment		Sediment		
	Sample Date	5/4/2010		5/4/2010		5/4/2010		5/4/2010		5/4/2010		
Aroclor - 1248	(mg/kg)	(<0.1)	U	(<0.08)	U	(<0.09)	U	(<0.07)	UJ	(<0.07)	U	---
Aroclor - 1254	(mg/kg)	(<0.1)	U	(<0.08)	U	(<0.09)	U	(<0.07)	UJ	(<0.07)	U	---
Aroclor (Total)	(mg/kg)	(<0.1)	U	(<0.08)	U	(<0.09)	U	(<0.07)	UJ	(<0.07)	U	0.933

Parameter List USEPA Method 8082	Sample ID	932112-SD-11		932112-SD-DUP02(a)		932112-SD-Rinsate-02(b)						Sediment Criteria Benthic Aquatic Life Chronic Toxicity or Human Health Bioaccumulation* (mg/kg)
	Lab ID	AC51456-006		AC51456-007		AC51456-008						
	Sample Type	Sediment		Sediment		QA/QC						
	Sample Date	5/4/2010		5/4/2010		5/4/2010						
Aroclor - 1248	(mg/kg)	0.091		(<0.08)	UJ	(<0.25)	U					---
Aroclor - 1254	(mg/kg)	(<0.05)	U	(<0.08)	UJ	(<0.25)	U					---
Aroclor (Total)	(mg/kg)	0.091		(<0.08)	UJ	(<0.25)	U					0.933

(a) Duplicate sample (DUPLICATE) collected at 932112-SD-05 (0-2").

(b) Rinsate blanks are aqueous samples, units are in µg/L.

(c) Duplicate sample (DUP02) collected at 932112-SD-07.

NOTE:
USEPA = United States Enivronmental Protection Agency
mg/kg = milligrams per kilogram
U = Non-detect, detection below the method detection limit
--- = No Standard
UJ = The compound was analyzed for, but not detected. The sample quantitation limit is an estimated quantity.
Data provided by Hampton-Clarke Veritech. Only analytes that were detected in at least one sample are shown. Data validation completed by Chemworld Environmental, Inc.

TABLE 5-1 ENVIRONMENTAL FATE AND TRANSPORT PARAMETERS FOR CHEMICALS OF CONCERN(a)

Analyte	Water Solubility of Pure Compound (mg/L @ 25°C)	Vapor Pressure (mm Hg @ 25°C)	Henry's Law Constant (atm-m^3/L, @ 25°C)	K$_{ow}$ (L/kg)	K$_{oc}$ (L/kg)
METALS					
Antimony	0.00E+00	0.00E+00	0.00E+00	NA	NA
Aluminum	0.00E+00	0.00E+00	0.00E+00	NA	NA
Arsenic	0.00E+00	0.00E+00	0.00E+00	NA	NA
Barium	0.00E+00	0.00E+00	0.00E+00	NA	NA
Beryllium	0.00E+00	0.00E+00	0.00E+00	NA	NA
Cadmiuim	0.00E+00	0.00E+00	0.00E+00	NA	NA
Chromium	0.00E+00	0.00E+00	0.00E+00	NA	NA
Cobalt	0.00E+00	NA	NA	NA	NA
Copper	0.00E+00	0.00E+00	0.00E+00	NA	NA
Iron(f)	0.00E+00	0.00E+00	0.00E+00	NA	NA
Lead(g)	0.00E+00	0.00E+00	0.00E+00	5.36E+00	1.00E+01
Magnesium(f)	0.00E+00	0.00E+00	0.00E+00	NA	NA
Manganese(g)	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.01E+01
Mercury(g)	3.00E-02	1.30E-03	4.74E-01	3.38E-01	4.00E-02
Nickel	0.00E+00	0.00E+00	0.00E+00	NA	NA
Selenium	0.00E+00	0.00E+00	0.00E+00	NA	NA
Silver	0.00E+00	0.00E+00	0.00E+00	NA	NA
Sodium(g)	NA	0.00E+00	0.00E+00	NA	NA
Zinc(f)	0.00E+00	0.00E+00	0.00E+00	3.38E-01	1.60E+01
SEMIVOLATILE ORGANIC CHEMICALS					
Acenaphthene(b)	4.13E+00	6.49E-09	1.84E-04	9.22E+03	4.90E+03
bis(2-Ethylhexyl)phthalate(b)	3.96E-01	1.12E-11	8.37E-06	1.60E+05	1.11E+05
Benzo(a)anthracene(c)(e)	9.40E-03	5.60E-09	3.35E-06	4.71E+05	3.58E+05
Benzo(a)pyrene(c)(e)	1.62E-03	5.49E-09	1.13E-06	1.28E+06	9.69E+05
Benzo(b)fluoranthene(c)(e)	1.50E-03	8.06E-08	1.11E-04	1.85E+06	1.23E+06
Benzo(k)fluoranthene(c)(e)	8.00E-04	9.59E-11	8.29E-07	1.95E+06	1.23E+06
Chrysene(c)(e)	1.60E-03	7.80E-09	9.46E-05	5.16E+05	3.98E+05
Dibenz(a,h)anthracene(c)(e)	5.00E-04	2.10E-11	4.66E-07	4.98E+06	1.91E+06
Indeno(1,2,3-cd)pyrene(c)(e)	2.20E-05	1.40E-10	1.60E-06	5.27E+06	3.47E+06
VOLATILE ORGANIC CHEMICALS					
Acetone(b)	6.04E+05	3.93E-04	2.88E-05	6.00E-01	9.51E-01
Chloroethane(b)	5.74E+03	2.10E-01	1.8	1.26E+03	3.71E+02
Chloroform(b)	7.96E+03	3.59E-04	4.03E-03	8.90E+01	3.71E+02
1,1-Dichloroethane(b)	5.16E+03	3.96E-04	5.75E-03	6.20E+01	5.30E+01
1,1-Dichloroethene(b)	3.05E+03	1.04E-03	2.55E-02	1.32E+02	6.50E+01
cis1,2-Dichloroethene(b)	4.94E+03	3.02E-04	4.51E-03	3.51E+02	2.65E+02
Tetrachlorethene(b)	2.32E+02	3.18E-05	1.73E-02	3.51E+02	2.65E+02
Trichloroethene(b)	1.18E+03	1.25E-04	1.06E-02	2.71E+02	9.40E+01
Toluene(b)	5.58E+02	5.49E-04	6.13E-03	4.65E+02	1.40E+02
Vinyl chloride(b)	7.30E+02	4.84E-03	3.15E-01	1.40E+01	1.11E+05
PESTICIDES					
Dieldrin(c)(d)(e)	1.95E-01	1.80E-07	1.51E-05	5.01E+03	1.20E+04
4,4-DDE(c)(e)	1.20E-01	6.50E-06	2.10E-05	3.24E+06	5.00E+04
4,4-DDT(c)(d)(e)	2.50E-02	1.88E-07	8.10E-06	8.13E+06	2.40E+04
POLYCHLORINATED BIPHENYLS					
Aroclor (1254)(b)	5.15E-02	1.53E-10	7.37E-04	1.61E+06	9.83E+04
Aroclor (1016)(b)	9.37E-01	1.23E-09	4.23E-04	2.53E+05	2.32E+04

(a) Adapted from: USEPA. 1996. *Soil Screening Guidance: Technical Background Document* , Office of Emergency and Remedial Response, Washington, D.C., EPA/540/R95/128

(b) USEPA, 1999. *Screening Level Ecological Risk Assessment Protocol for Hazardous Waste Combustion Facilities* . August.

(c) USACE, 2010. Summary of Water Quality Screening Guidelines Derived for PAHs and Pesticides. March

(d) IUPAC, 2010. Pesticide Properties Database. March

(e) GSI Environmental, 2009. GSI Chemical Properties Database.

(f) Cornell University, 2005. Material Safety Data Sheets.

(g) NOAA, 2010. Cameo Chemicals Database of Hazardous Materials.

NOTE: NA = Not Applicable

TABLE 6-1 REMEDIAL INVESTIGATION SUMMARY OF CONTAMINANTS OF CONCERN

CONTAMINANTS OF CONCERN					
Medium	Pesticides	Volatile Organic Compounds	Semivolatile Organic Chemicals	Polychlorinated Biphenyls	Metals
Surface Soil	p,p-DDE; p,p-DDT; Dieldrin	NA	Benzo(a)anthracene; Benzo(a)pyrene; Benzo(b)fluoranthene; Benzo(k)fluoranthene; Chyrsene; Dibenzo[a,h]anthracene; Indeno(1,2,3-c,d)pyrene	Aroclor (total)	Arsenic; Barium; Cadmium; Chromium; Copper; Lead; Mercury; Nickel; Selenium; Silver; Zinc
Subsurface Soil	p,p-DDE; p,p-DDT	Acetone; Trichloroethene	Benzo(a)anthracene; Benzo(a)pyrene; Benzo(b)fluoranthene; Benzo(k)fluoranthene; Chyrsene; Dibenzo[a,h]anthracene; Indeno(1,2,3-c,d)pyrene	Aroclor (total)	Arsenic; Barium; Cadmium; Chromium; Copper; Lead; Manganese; Mercury; Nickel; Selenium; Silver; Zinc
Groundwater	NA	1,1-Dichloroethane; 1,1-Dichloroethene; Chloroethane; Chloroform; cis-1,2-Dichloroethene; Toluene; Trichloroethene; Vinyl Chloride	Acenaphthene; Benzo[a]pyrene; Benzo[a]anthracene; Benzo[b]fluoranthene; Benzo[k]fluoranthene; bis(2-Ethyhexyl)phthalate; Chrysene; Fluoranthene; Indeno[1,2,3-cd]pyrene; Naphthalene; Phenanthrene; Pyrene	NA	Aluminum; Arsenic; Barium; Beryllium; Cadmium; Chromium; Cobalt; Copper; Iron; Lead; Magnesium; Manganese; Mercury; Nickel; Sodium; Zinc
Sediment	p,p-DDE; p,p-DDT	1,2-Dichloroethene (total)	Benzo[a]anthracene; Benzo[a]pyrene; Benzo[b]fluoranthene; Benzo[k]fluoranthene; Dibenzo[a,h]anthracene; Indeno[1,2,3-cd]pyrene;	NA	Antimony; Arsenic; Cadmium; Chromium; Copper; Iron; Lead; Manganese; Mercury; Nickel; Silver; Zinc
Surface Water	NA	Tetrachloroethene	NA	NA	Iron

NOTE: DDE = Dichlorodiphenyldichloroethylene
DDT = Dichlorodiphenyltrichloroethane
NA = Not Applicable

TABLE 6-2 EXPOSURE MATRIX

Media		Surface Soil/Fill			Subsurface Soil /Fill		Groundwater		Surface Water		Sediment		Ambient Air
Potential Exposure		Ingestion	Dermal Contact	Particulate Inhalation	Ingestion	Dermal Contact	Dermal Contact	Ingestion	Ingestion	Dermal Contact	Ingestion	Dermal Contact	Inhalation
Scenario	**Receptor**	**Exposure Potential**											
On-site	Trespassers - C	Moderate	Moderate to High	Moderate	None	None	None	None	Low	Low	Low	Low	Low to Moderate
	Adult Construction/ Utility Workers - F	Moderate to High	Moderate to High	Moderate to High	Moderate	Moderate	Low	Low	Moderate	Moderate	Moderate	Moderate	Moderate to High
	Adult Commercial and Industrial Workers - F	Moderate to High	Moderate to High	Moderate to High	Low	Low	Low	Low	Moderate	Moderate	Low	Low	Moderate to High
	Adult and Child Visitors - F	Low	Low	Low	Low	Low	Minimal	Minimal	Low	Low	Low	Low	Low to Moderate
	Adult and Child Residents - F	Low	Low	Low	Low	Low	Minimal	Minimal	Low	Low	Low	Low	Low to Moderate
Off-site	Adult Commercial and Industrial Workers - C, F	Minimal	Minimal	Low	Minimal	Minimal	Low	Low	Moderate	Moderate	Moderate	Moderate	Low
	Adult and Child Visitors - C, F	Minimal	Minimal	Low	Minimal	Minimal	Low	Low	Low	Low	Low	Low	Minimal
	Adult and Child Residents - C, F	Minimal	Minimal	Low	Minimal	Minimal	Low	Low	Low	Low	Low	Low	Minimal
	Adult Construction Workers - C, F	Minimal	Minimal	Low	Minimal	Minimal	Low	Low	Moderate	Moderate	Low	Low	Minimal
	Audlt Nearby Utility Workers - C, F	Minimal	Minimal	Low	Minimal	Minimal	Low	Low	Low	Low	Low	Low	Minimal
	Recreationalist - C, F	Minimal	Minimal	Low	Minimal	Minimal	Low	Low	Moderate	Moderate	Moderate	Moderate	Minimal

NOTE: C = Potential Current Exposure
F = Potential Future Exposure, no Remedial Action

TABLE 7-1 FISH AND WILDLIFE RESOURCES IMPACT ANALYSIS DECISION KEY

	Yes	No
1) Is the site or area of concern a discharge or spill event?	x	
2) Is the site or area of concern a point source of contamination to the groundwater which will be prevented from discharging to surface water? Soil contamination is not widespread, or if widespread, is confined under buildings and paved areas?		x
3) Is the site and all adjacent property a developed area with buildings, paved surfaces and little or no vegetation?		x
4) Does the site contain habitat of an endangered, threatened, or special concern species?		x
5) Has the contamination gone off-site?	x	
6) Is there any discharge or erosion of contamination or the potential for discharge or erosion of contamination?	x	
7) Are the site contaminants PCBs, pesticides, or other persistent, bioaccumulable substances?	x	
8) Does contamination exist at concentrations that could exceed SCGs or be toxic to aquatic life if discharged to surface water?	x	
9) Does the site or any adjacent or downgradient property contain any of the following resources?		
a. Any endangered, threatenend, or special concern species or rare plants or their habitats		x
b. Any NYSDEC designated significant habitats or rare NYS ecological communities		x
c. Tidal or freshwater wetlands	x	
d. Streams, creeks, or river	x	
e. Pond, lake, or lagoon		x
f. Drainage ditch or channel	x	
g. Other surface water features	x	
h. Other marine or freshwater habitats	x	
i. Forest	x	
j. Grassland or grassy field		x
k. Parkland or woodland	x	
l. Shrubby area	x	
m. Urban wildlife habitat	x	
n. Other terresrial habitat	x	
10) Is the lack of resources due to contamination?		x
11) Is the contamination a localized source which has not migrated from the source to impact any on-site or off-site resources?		x
12) Does the site have widespread soil contamination that is not confined under and around buildings or paved areas?	x	
13) Does the contamination at the site or area of concern have the potential to migrate to, erode into or otherwise impact any on-site or off-site habitat of endangered, threatened, or special concern species or other fish and wildlife resources?		x
14) Fish and wildlife resources impact analysis needed?	x	

TABLE 8-1 REMEDIAL INVESTIGATION SUMMARY OF DEGREE OF IMPACTS FROM CONTAMINANTS OF CONCERN

Surface Soil/Fill			
Contaminants of Concern	Concentration Range Detected (ppm)[a]	SCG[b] (ppm)[a]	Frequency of Exceeding SCG
SEMIVOLATILE ORGANIC COMPOUNDS			
Benzo(a)anthracene	0.17 - 5.1	1	7/11
Benzo(a)pyrene	0.12 - 5	1	7/11
Benzo(b)fluoranthene	0.26 - 7.8	1	8/11
Benzo(k)fluoranthene	0.22 - 2.5	0.8	4/11
Chrysene	0.14 - 5.5	1	7/11
Dibenz(a,h)anthracene	0.15 - 1.1	0.33	7/11
Indeno(1,2,3-cd)pyrene	0.0093 - 2.9	0.5	7/11
TARGET ANALYTE LIST METALS			
Arsenic	6.2 - 40	13	7/11
Barium	96 - 1,000	350	6/11
Cadmiuim	1.7 - 20	2.5	8/11
Chromium[c]	9.5 - 190	30	8/11
Copper	65 - 3,700	50	11/11
Lead	170 - 19,000	63	11/11
Mercury	0.16 - 3	0.18	8/11
Nickel	16 - 250	30	10/11
Selenium	2.6 - 8.4	3.9	1/11
Silver	2.3 - 33	2	6/11
Zinc	170 - 33,000	109	11/11
PESTICIDES			
Dieldrin	0.0062	0.005	1/11
p,p'-DDE	0.0043 - 0.028	0.0033	6/11
p,p'-DDT	0.0054 - 0.017	0.0033	5/11
POLYCHLORINATED BIPHENYLS			
Aroclor (Total)	0.27 - 0.33	0.1	2/11

(a) ppm is equivalent to milligrams per kilogram, mg/kg, in soil
(b) 6 NYCRR Part 375 Unrestricted Use Soil Cleanup Objectives
(c) Speciation of hexavalent chromium vs. trvalent chromium was not performed during this RI. The SCG presented is for trivalent chromium.

NOTE: ppm = parts per million
SCG = Standards, criteria, and guidance
DDE = Dichlorodiphenyldichloroethylene
DDT = Dichlorodiphenyltrichloroethane

TABLE 8-1 REMEDIAL INVESTIGATION SUMMARY OF DEGREE OF IMPACTS FROM CONTAMINANTS OF CONCERN

Subsurface Soil/Fill			
Contaminants of Concern	Concentration Range Detected (ppm)[(a)]	SCG[(b)] (ppm)[(a)]	Frequency of Exceeding SCG
VOLATILE ORGANIC COMPOUNDS			
Acetone	0.12	0.005	1/10
Trichloroethene	0.81	0.47	1/10
SEMIVOLATILE ORGANIC COMPOUNDS			
Benzo[a]anthracene	0.14 - 70	1	12/25
Benzo[a]pyrene	0.13 - 50	1	11/25
Benzo[b]fluoranthene	0.12 - 160	1	15/25
Benzo[k]fluoranthene	0.088 - 37	0.8	8/25
Chrysene	0.19 - 78	1	13/25
Dibenzo[a,h]anthracene	0.088 - 22	0.33	12/25
Indeno[1,2,3-cd]pyrene	0.16 - 70	0.5	12/25
METALS			
Arsenic	6.2 - 1,000	13	85/116
Barium	11 - 6,500	350	76/116
Cadmium	0.86 - 130	2.5	69/116
Chromium	7.3 - 1,100	30	66/116
Copper	30 - 45,000	50	59/60
Lead	16 - 23,000	63	107/116
Manganese	190 - 2,400	1,600	5/60
Mercury	0.13 - 20	0.18	90/116
Nickel	15 - 590	30	46/60
Selenium	2.3 - 9.8	3.9	14/60
Silver	2.2 - 130	2	12/60
Zinc	270 - 22,000	109	29/60
PESTICIDES			
p,p'-DDE	0.0042 - 0.013	0.0033	5/24
p,p'-DDT	0.0039 - 0.032	0.0033	7/24
POLYCHLORINATED BIPHENYLS			
Arochlor (Total)	0.058 - 1.4	0.1	2/24

TABLE 8-1 REMEDIAL INVESTIGATION SUMMARY OF DEGREE OF IMPACTS FROM CONTAMINANTS OF CONCERN

Groundwater			
Contaminants of Concern	Concentration Range Detected (ppm)(a)	SCG(b) (ppm)(a)	Frequency of Exceeding SCG
VOLATILE ORGANIC COMPOUNDS			
1,1-Dichloroethane	5.5 - 48	5	2/6
1,1-Dichloroethene	7.5	5	1/6
Chloroethane	8.7	5	1/6
Chloroform	5.6 - 17	7	1/6
cis-1,2-Dichloroethene	3.9 - 16	5	3/6
Toluene	5.6	5	1/6
Trichloroethene	1.7 - 17	5	2/6
Vinyl chloride	4.5 - 6.6	2	2/6
SEMIVOLATILE ORGANIC COMPOUNDS			
Acenaphthene	22	20	1/6
Benzo[a]pyrene	45	ND	1/6
Benzo[b]fluoranthene	61	0.002	1/6
Benzo[k]fluoranthene	27	0.002	1/6
bis(2-Ethylhexyl)phthalate	12 - 28	5	2/6
Chrysene	61	0.002	1/6
Fluoranthene	130	50	1/6
Indeno[1,2,3-cd]pyrene	29	0.002	1/6
Naphthalene	37	10	1/6
Phenanthrene	180	50	1/6
Pyrene	130	50	1/6
METALS			
Aluminum	260 - 110,000	100	5/6
Arsenic	17 - 110	25	1/6
Barium	58 - 8,100	1,000	1/6
Beryllium	32	3	1/6
Cadmium	200	5	1/6
Chromium	76 - 2,900	50	3/6
Cobalt	35 - 290	5	2/6
Copper	70 - 17,000	200	1/6
Iron	460 - 1,200,000	300	6/6
Lead	130 - 49,000	25	3/6
Magnesium	11,000 - 160,000	35,000	3/6
Manganese	410 - 21,000	300	4/6
Mercury	2.6	0.7	1/6
Nickel	180 - 1,200	100	2/6
Sodium	20,000 - 220,000	20,000	5/6
Zinc	160 - 120,000	2,000	1/6

TABLE 8-1 REMEDIAL INVESTIGATION SUMMARY OF DEGREE OF IMPACTS FROM CONTAMINANTS OF CONCERN

Surface Water			
Contaminants of Concern	Concentration Range Detected (ppm)(a)	SCG(b) (ppm)(a)	Frequency of Exceeding SCG
VOLATILE ORGANIC COMPOUNDS			
Tetrachloroethene	3.4 - 7.8	1	3/8
METALS			
Iron	420 - 1,100	300	4/4

TABLE 8-1 REMEDIAL INVESTIGATION SUMMARY OF DEGREE OF IMPACTS FROM CONTAMINANTS OF CONCERN

Sediment			
Contaminants of Concern	Concentration Range Detected (ppm)(a)	SCG(b) (ppm)(a)	Frequency of Exceeding SCG
VOLATILE ORGANIC COMPOUNDS			
1,2-Dichloroethene(total)	0.022 - 0.058	0.00117	2/13
SEMIVOLATILE ORGANIC COMPOUNDS			
Benzo[a]anthracene	0.17 - 3.9	0.590	6/11
Benzo[a]pyrene	0.18 - 3.5	0.064	10/11
Benzo[b]fluoranthene	0.27 - 4.9	0.064	11/11
Benzo[k]fluoranthene	0.2 - 1.8	0.064	7/11
Dibenzo[a,h]anthracene	0.12 - 0.83	0.064	5/11
Indeno[1,2,3-cd]pyrene	0.12 - 2.9	0.064	10/11
METALS			
Antimony	6.1	2	1/16
Arsenic	5.6 - 38	6	13/16
Cadmium	1.4 - 9.5	0.6	14/16
Chromium(c)	17 - 96	26	11/16
Copper	47 - 8,200	16	16/16
Iron	7,900 - 120,000	2%	13/16
Lead	170 - 2,300	31	16/16
Manganese	200 - 2,700	460	8/16
Mercury	0.13 - 0.89	0.15	11/16
Nickel	16 - 120	16	14/16
Silver	3.5 - 8.7	1	3/16
Zinc	340 - 3,700	120	16/16
PESTICIDES			
p,p'-DDD	0.0041 - 0.01	0.00048	3/11
p,p'-DDE	0.0041 - 0.015	0.00048	3/11