Final
Remedial Investigation

for the
Sylvania Corning FUSRAP Site
Hicksville, New York

September 2010

Contract Number: W912DQ-06-D-0008-0003

Prepared for:

UNITED STATES ARMY CORPS OF ENGINEERS
Kansas City District

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List of Abbreviations and Acronyms

ADT	Aquifer Drilling and Testing, Inc.
AEC	Atomic Energy Commission
As	arsenic
AST	aboveground storage tank
ASTM	American Society for Testing and Materials
AT	Air Techniques
B70	Building 70
B100	Building 100
B140	Building 140
BGS	below ground surface
BTV	background threshold value
CD	compact disk
CDM	Camp, Dresser, and Mckee
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act of 1980
COC	contaminant of concern
CERCLIS	Comprehensive Environmental Response, Compensation, and Liability Information System
cpm	counts per minute
cVOC	chlorinated volatile organic compound
DAF	dilution attenuation factor

List of Abbreviations and Acronyms (cont.)

DCE	dichloroethene
°F	degrees Fahrenheit
DOE	Department of Energy
DOT	United States Department of Transportation
dpm	disintegrations per minute
cm^2	square centimeters
DPT	direct-push technology
DUSR	Data Usability Summary Report
E & E	Ecology and Environment, Inc.
EM	electromagnetic
EPA	(United States) Environmental Protection Agency
ESN	ESN Rocky Mountain
F	Fahrenheit
FEMA	Federal Emergency Management Agency
FID	flame ionization detector
ft/d	feet per day
ft/ft	foot per foot
FS	feasibility study
FUSRAP	Formerly Utilized Sites Remedial Action Program
GCDR	golf course driving range
GEL	General Engineering Laboratories, LLC
GI	General Instruments
GIS	geographic information system
GM	Geiger-Mueller
gpd/ft^2	gallons per day per square foot
GPR	ground-penetrating radar

List of Abbreviations and Acronyms (cont.)

GPS	global positioning system
GSSI	Geophysical Survey Systems, Inc.
GTEOSI	GTE Operations Support Incorporated
HEPA	high-efficiency particulate air
Hg	mercury
HHRA	human health risk assessment
Hz	hertz
HSA	hollow-stem auger
HWD	Hicksville Water District
ID	inner diameter
IDL	instrument detection limit
IDW	investigation-derived waste
kg	kilogram
L	liter
L_D	detection limit
LPH	historic leach pool
MARSSIM	Multi-Agency Radiation Survey and Site Investigation Manual
MCL	maximum contaminant level
MDC	maximum detectable concentration
MDL	method detection limit
mg/kg	milligrams per kilogram
MHz	megahertz
mL	milliliter
mL/min	milliliters per minute
MS/MSD	matrix spike/matrix spike duplicate
MSL	mean sea level

List of Abbreviations and Acronyms (cont.)

$\mu g/m^3$	micrograms per cubic meter
µg/kg	micrograms per kilogram
µR/hr	microroentgens per hour
mV	millivolt
NCDOH	Nassau County Department of Health
NCDPW	Nassau County Department of Public Works
NaI	sodium iodide
NRCS	Natural Resources Conservation Service
NTU	Nephelometric turbidity units
NYNHP	New York Natural Heritage Program
NYSDEC	New York State Department of Environmental Conservation
NYSDOL	New York State Department of Labor
OB&G	O'Brien and Gere Engineering, Inc.
OSWER	Office of Solid Waste and Emergency Response
PA	Preliminary Assessment
PARCC	precision, accuracy, representativeness, completeness, and comparability
PCB	polychlorinated biphenyl
PCE	tetrachloroethene
pCi/g	picocuries per gram
PID	photoionization detector
ppb	parts per billion
PPE	personal protective equipment
ppm	parts per million
ppmv	parts per million by volume
PQL	practical quantitation limit
PRG	Preliminary Remediation Goal

List of Abbreviations and Acronyms (cont.)

PVC	polyvinyl chloride
QA	quality assurance
QAPP	Quality Assurance Project Plan
QC	quality control
QCP	Quality Control Plan
QCSR	Quality Control Summary Report
Ra	radium
RI	remedial investigation
RSBC	Rural Soil Background Concentration
RSL	Regional Screening Level
SCO	Soil Cleanup Objective
SEI	Stone Environmental, Inc.
SEP	Sylvania Electric Products, Inc.
SHASP	Site-specific Health and Safety Plan
SOP	standard operating procedure
STL	Severn Trent Laboratory, Inc.
SU	survey unit
SVE	soil vapor extraction
SVOC	semivolatile organic compound
TAL	Target Analyte List
TCE	trichloroethene
TCL	Target Compound List
TCLP	Toxicity Characteristic Leaching Procedure
Th	thorium
TPH	Total petroleum hydrocarbons
U	uranium

List of Abbreviations and Acronyms (cont.)

UFPO	Underground Facilities Protection Organization
UPL	Upper Prediction Limit
URS	URS Corporation
USACE	United States Army Corps of Engineers
USDA	U.S. Department of Agriculture
UST	underground storage tank
VC	Vinyl chloride
VCP	Voluntary Cleanup Program
VOA	Volatile organic analysis
VOC	volatile organic compound
Wendel	Wendel Duchscherer Survey
Zebra	Zebra Environmental Corporation

Executive Summary

The United States Army Corps of Engineers (USACE) conducted a Soil and Groundwater Remedial Investigation (RI) and Baseline Risk Assessment (BLRA) at the Sylvania Corning Plant/former Sylvania Electric Products Facility, Formerly Utilized Sites Remedial Action Program (FUSRAP) site (Sylvania site) in Hicksville, Nassau County, New York. The RI was performed in accordance with the Guidance for Conducting Remedial Investigations and Feasibility Studies under the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) Interim Final OSWER Directive 9355.3-01 (EPA 1988).

The purpose of the FUSRAP is to clean up contaminated sites throughout the United States where work was performed as part of our nation's early atomic energy program. USACE is the lead federal agency for this site, and the New York State Department of Environmental Conservation (NYSDEC) is the lead regulatory agency. USACE's cleanup authority at the site is limited by CERCLA and applicable Energy and Water Development Appropriations Acts to FUSRAP waste, hazardous substances, pollutants, or contaminants resulting from work performed as part of the nation's early atomic energy program.

The Sylvania site is located in the western portion of Long Island, covers 10.5 acres, and is comprised of three properties located at 70, 100, and 140 Cantiague Rock Road. Research, development, and fabrication of nuclear elements (e.g., fuel elements, slugs, cores) were conducted on the site properties under the Atomic Energy Commission (AEC), other government (e.g. U.S. research reactors including those at Hanford), and commercial contracts from 1952 to 1967. Other industrial and commercial activities were conducted on each of the three properties beginning in 1942 and continuing through 2006. The site is bordered on the north by the Nassau County Department of Public Works (NCDPW), on the south by General Instruments' (GI's) inactive hazardous waste disposal site, on the west by Cantiague Rock Road, and on the east by the driving range of the Nassau County Cantiague Park golf course.

GTE, a corporate predecessor of the Verizon entities (Verizon, Inc., and Verizon Communications, Inc.), herein referred to as GTEOSI, is the current property owner of the 70 and 140 properties and lessee of the 100 property. GTEOSI has entered into two voluntary cleanup agreements with NYSDEC to investigate and remediate the soils at the site to allow unrestricted future use of the site. Extensive environmental sampling and remediation work was performed by GTEOSI

from 1992 to the present. The remediation in 2003 and 2004 consisted of a large-scale excavation of soils from 14 remedial cells. Excavation depths ranged from shallow depths to a maximum depth of 54 feet below ground surface (BGS) in a small area.

USACE RI activities began in 2006 with an initial site walkover and continued with the development of phased field activities (Phases I, II, and III), and implementation of those activities. Investigations performed by USACE were used to fill in data gaps, confirm GTEOSI data, and build upon the work performed to date by GTEOSI. This RI report presents the results of the USACE's work and, as appropriate, information obtained from the GTEOSI reports. Each phase of work was conducted in a successive fashion, and the results of each phase of work were reviewed by USACE to supplement and adjust each future phase of work.

It is important to note that several hazardous substances, pollutants, and contaminants present in groundwater and soils did not result from activities associated with the early atomic energy program; thus, they are not considered FUSRAP wastes. In addition, some of the constituents in groundwater are from upgradient sources, did not contribute to risk at the site due to their limited exceedances, or are the result of biodegradation of the organic constituents in groundwater. Nevertheless, for the purpose of completeness, these constituents were evaluated as part of the USACE RI effort, including their potential effects on site risks, and the results of the USACE analyses of these constituents are reported herein.

ES.1 Nature and Extent of Contamination

The site was subdivided into five areas so that the nature and extent of contamination could be evaluated separately. These areas are discussed below.

Upgradient Properties

The results of upgradient groundwater sampling were used to establish baseline water quality. No other environmental media were sampled on these properties. Upgradient groundwater was found to contain low levels of several volatile organic compounds (VOCs), which are originating either on the NCDPW and Cantiague Park properties or other sources further upgradient. Sodium appeared to be the only metal present at elevated concentrations due to upgradient anthropogenic activities. The elevated levels of sodium in the well samples are likely due to the storage and use of road salt on the NCDPW property. Fifteen VOCs were detected in the monitoring well samples. Most of the VOCs were detected at low concentrations in one shallow sample directly upgradient of the site. PCE was detected at low levels in four well samples, both shallow and deep, and TCE was detected at low levels in two deep well samples, indicating potential sources further upgradient. Some of these contaminants are impacting the site, generally in deep groundwater.

Naturally occurring radionuclides were found at low concentrations in the upgradient wells.

140 Property

A soil removal action addressing soil contamination was performed by GTEOSI; however, elevated soil contamination remains beneath the property: radionuclides (primarily uranium) beneath remedial cells on the easternmost portion of the property; and PCE, nickel, and radionuclides (primarily uranium) beneath the eastern portion of the building. PCE contamination beneath the building has resulted in contaminated soil vapors, which represent a potential indoor air vapor intrusion pathway.

Most of the contamination is in the eastern portion of the property. Shallow groundwater is contaminated with elevated levels of PCE and radionuclides (primarily uranium), and intermediate groundwater is contaminated with elevated levels of radionuclides (primarily uranium).

100 Property

Although a soil removal action addressing soil contamination was performed by GTEOSI, elevated levels of soil contamination remains beneath the property. PCE and TCE are present in soils (beneath a remedial cell) on the eastern portion of the property and extending off-site onto the western portion of the Driving Range property; nickel and radionuclides (primarily uranium) are present beneath a remedial cell adjacent to the south-central side of the building. PCE, nickel, and radionuclides (primarily uranium) are present beneath the eastern portion of the building. Contamination beneath the building has resulted in contaminated soil vapors, which represent a potential indoor air vapor intrusion pathway.

Most of the contamination is in eastern and south-central portions of the property. Shallow groundwater is contaminated with elevated levels of PCE, TCE, nickel, and radionuclides (primarily uranium); intermediate groundwater is contaminated with elevated levels of PCE; and deep groundwater is contaminated with elevated levels of PCE and TCE.

70 Property

The GTEOSI remedial soil removal action was performed only along the northern border of the eastern portion of the 70 property. Therefore, elevated levels of soil contamination remain beneath several portions of the property: PCE in the northwestern portion of the property; nickel in the north-central portion of the property; and radionuclides (primarily uranium). Contamination beneath the building has resulted in contaminated soil vapors, which represent a potential indoor air vapor intrusion pathway.

Groundwater contamination is present throughout most of the property. Shallow groundwater is contaminated with elevated levels of PCE and nickel; intermediate and deep groundwater is contaminated with elevated levels of PCE, TCE, and nickel.

Driving Range Property

The GTEOSI remedial soil removal action was performed on the off-site golf course driving range along a narrow strip of land adjacent to the fence bordering the Sylvania property. Elevated soil contamination (nickel, PCE, and TCE) remains beneath the driving range immediately adjacent to the 100 property.

Shallow groundwater is contaminated with elevated levels of PCE, and one shallow well had elevated levels of uranium; intermediate groundwater is contaminated with elevated levels of PCE and TCE; and deep groundwater is contaminated with elevated levels of PCE.

ES.2 Fate and Transport

During past site operations, contamination of site soils and groundwater may have resulted from various types of discharges to on-site recharge basins/sumps/leach pools, surface spills, leaking underground storage tanks, leaking underground pipes, and disposal practices common for the time period. Currently, the main mechanisms affecting further transport of contaminants are volatilization, leaching through storm water infiltration, and through the movement of groundwater carrying dissolved contaminants.

Based on static levels from April 2010, shallow groundwater flow was predominantly to the southwest, intermediate groundwater flow was to the southwest, and deep groundwater flow was predominantly to the south, with a southwestern component in the eastern portion of the site. Groundwater flow is also vertically downward beneath the site. Future water level measurements are planned to obtain a better understanding of any seasonal variations and any site-specific flow conditions.

RI sample results indicate that nickel, PCE, TCE, and uranium are the only contaminants that have leached into the underlying site groundwater in significant concentrations and are migrating off site. The nature and extent of off-site contamination is unknown.

Nickel

Nickel is likely to persist in soils at the site and have a limited capacity to migrate to groundwater. In groundwater at the site, low levels of inorganic nickel species are likely present and will be transported with groundwater flow. Nickel appears to be migrating off-site to the south and southwest.

PCE and TCE

PCE and TCE are likely to have similar and multiple fate and transport mechanisms at the Sylvania site, including volatilizing to the atmosphere, volatilizing to air spaces contained between soil grains (soil gas), leaching to groundwater, and persistence in soil. Persistence in soils occurs in areas where gaseous exchange with the atmosphere is limited (e.g., at greater depths, beneath concrete/asphalt surfaces, etc.). PCE and TCE in soils at the site likely exist as a gas in soil pore spaces and/or liquid adsorbed to soil particles. Because they have a relatively

high water solubility, once PCE and TCE have migrated to the water table, transport within groundwater in dissolved form can be significant.

Both PCE and TCE appear to be migrating off-site to the south and southwest.

Uranium

Uranium may undergo oxidation-reduction reactions or microbial reactions to alter its chemical form. Other than the potential for migration to groundwater, uranium in site soils would be considered persistent.

Elevated levels of uranium in groundwater occur predominantly in localized areas. An elevated concentration of uranium was detected in a monitoring well on the off-site Driving Range property. Once dissolved in groundwater, uranium can remain dissolved or form solid precipitates, depending on the pH; redox potential; concentrations of anions, oxide minerals, and organic materials; and the presence of specific types of bacteria.

ES.3 Baseline Risk Assessment

The Baseline Risk Assessment included a Human Health Risk Assessment and an Ecological Risk Assessment. Several hazardous substances, pollutants, and contaminants present in groundwater and soils did not result from activities associated with the nation's early atomic energy program; thus, they are not considered FUSRAP wastes. In addition, some of the constituents in groundwater are from upgradient sources, did not contribute to risk at the site due to their limited exceedances, or are the result of biodegradation of the organic constituents in groundwater. Nevertheless, for the purpose of completeness, these constituents were evaluated as part of the USACE RI effort, including their potential effects on site risks, as discussed in this section.

Human Health Risk Assessment

A number of metals, organic chemicals, and radionuclides were detected in indoor air, site soils, and groundwater at the Sylvania site. For purposes of completeness, the potential site risks from all substances determined to be COPCs at the site were evaluated. The FUSRAP constituents considered to be COPCs include nickel, PCE, TCE, uranium isotopes (U-234, U-235, U-238), thorium isotopes (Th-228, Th-230, Th-232), and Ra-228.

Current Conditions. The contaminants in site soils and indoor air are not expected to pose cancer risks greater than 1E-04 or noncancer HIs greater than 1 under existing or similar future site conditions (scenario 1 - existing buildings and paving remain intact). Groundwater is not currently being used as a source of potable water at the site and was not assessed under scenario 1.

Future Conditions. Chemical and radiological contaminants in shallow and near-surface soil and groundwater at the Sylvania site could potentially pose cancer risks greater than 1E-04 and/or noncancer HIs greater than 1 to future site users. The greatest risks and hazards would be to long-term continuous users such

as future site workers and future residents. Short-term and intermittent users such as construction or utility maintenance workers, site visitors, site trespassers, and future recreational users of the site are not expected to be exposed to cancer risks greater than 1E-04 or noncancer HIs greater than 1.

The greatest risks and hazards were associated with hypothetical future use of groundwater as tap water. The contaminants driving the risks and hazards were PCE and uranium, with the latter acting both as a radiological (U-234 and U-238) and a chemical (total uranium) contaminant. This is considered a very unlikely scenario because of the availability and required use of a public water supply system at the site. Nevertheless, the groundwater is classified GA by NYSDEC, and the best potential use of GA class waters is as a drinking water source.

Ecological Risk Assessment

An Ecological Risk Assessment was performed in accordance with the Ecological Risk Assessment Guidance for Superfund (ERAGS) process described by the EPA (1997). In its current condition, the Sylvania site is an industrial area with little or no wildlife habitat; in the future, it is not expected that the site will be useful for ecological purposes. Therefore, a quantitative ERA was determined to be unnecessary. The qualitative evaluation determined that no adverse impacts on ecological receptors and/or habitats on the site are expected.

ES.4 Data Limitations and Recommendations for Future Work

The on-site remedial investigations are complete. However, there are several remaining data limitations/gaps, and recommendations are provided below.

Data Limitations/Gaps

- The source of the elevated level of TCE in the plume detected in intermediate and deep groundwater beneath the western portion of the 70 property;
- The source of the elevated level of nickel detected in intermediate groundwater beneath the western portion of the 70 property;
- The source of the elevated level of TCE detected in deep groundwater beneath the central portion of the 100 property; and
- The source of the elevated levels of PCE, nickel, and uranium detected beneath remedial cell 9.

Recommendations

Based on the presence of soil and groundwater contamination on the Sylvania Corning FUSRAP site, the following additional studies are recommended:

- Perform hydrologic modeling of the site groundwater. This modeling effort is needed to evaluate the potential for off-site contamination to impact downgra-

dient public supply wells and to aid in the design of the off-site investigation program.

- Perform off-site characterization of metals, VOCs, and radiological contaminants. This characterization should include a hydrologic evaluation of groundwater movement and off-site migration of contaminants.

- Evaluate remedial options through soil and groundwater feasibility studies consistent with CERCLA.

1 Introduction

Ecology and Environment, Inc. (E & E) was contracted by the United States Army Corps of Engineers (USACE), under Contract Number W912DQ-06-D-0008-0003, to perform a Soil and Groundwater Remedial Investigation (RI) and Baseline Risk Assessment (BLRA) at the Sylvania Corning Plant/former Sylvania Electric Products Facility Formerly Utilized Sites Remedial Action Program (FUSRAP) site (Sylvania site) in Hicksville, Nassau County, New York (see Figure 1-1). The RI was performed in accordance with the Guidance for Conducting Remedial Investigations and Feasibility Studies under the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA), as amended, Interim Final OSWER Directive 9355.3-01 (EPA 1988), which states the following:

> The purpose of the RI is to collect data necessary to adequately characterize the nature of and threat posed by the hazardous substances, pollutants and contaminants and gather data necessary to assess the extent to which the release poses a threat to human health or the environment.

1.1 Purpose of the Remedial Investigation

This Soil and Groundwater RI was prepared pursuant to a scope of work identified in the approved RI workplan (USACE 2007, 2009), and any addendums, technical memoranda, etc. The purpose of the RI was to:

- Fill remaining data gaps not addressed in work by the current property owner;
- Characterize the soil and groundwater environments and prepare a site conceptual model;
- Delineate source areas;
- Define the nature and extent of on-site contamination, including the vertical and areal extent of the soil and groundwater contamination;
- Identify and examine the potential exposure pathways associated with the contamination;
- Provide data for use in conducting this RI and BLRA; and

- Obtain the information needed, including data collection, to properly evaluate the alternatives available for potential future remediation of the site.

1.1.1 Scope of the Remedial Investigation

Pursuant to the workplan, the RI efforts were conducted in three phases and several sub-phases. Phase I included the following reconnaissance surveys/sampling:

- Historical document search and review;
- Soil gas surveys;
- Geophysical surveys;
- Indoor ambient air sampling;
- Outdoor ambient air sampling;
- Subslab soil vapor sampling;
- Transformer pad sampling;
- A walkover gamma radiation survey; and
- Limited radiation surveys in Building 70 (B70).

Phase II activities included characterization of soil in two phases: Phase IIa consisted of shallow soil sampling, and Phase IIb consisted of deeper soil sampling. Both phases of sampling were conducted in the vadose (unsaturated) zone. Phase III activities included characterization of groundwater in two phases: Phase IIIa consisted predominantly of installation of deep monitoring wells using groundwater profiling to determine optimal screen intervals (collection of screening level data at ten foot vertical intervals). Phase IIIb consisted predominantly of shallow and intermediate well installations, with profiling in data gap areas.

1.1.2 Regulatory Requirements and Agency Coordination

With its passage of the 1998 Energy and Water Development Appropriations Act, Congress transferred responsibility for execution and administration of FUSRAP from the U.S. Department of Energy (DOE) to USACE. In so doing, Congress directed USACE to administer and execute this cleanup program (FUSRAP) at eligible sites in accordance with and subject to CERCLA, as amended, and the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). The purpose of FUSRAP is to clean up contaminated sites throughout the United States where work was performed as part of the nation's early atomic energy program. The Sylvania Corning site was added to FUSRAP in 2004. USACE is the lead federal agency for the Sylvania Corning FUSRAP Site. The Sylvania site is not on the National Priorities list; therefore, the New York State Department of Environmental Conservation (NYSDEC) is the lead regulatory agency. The

USACE's cleanup authority at the Site is limited by CERCLA and applicable Energy and Water Development Appropriations Acts to FUSRAP waste, hazardous substances, pollutants, and contaminants that actually resulted from work performed as part of the nation's early atomic energy program.

1.2 Site Background

The Sylvania site is a 10.5-acre area located in Hicksville, Nassau County, New York, on the western portion of Long Island, approximately 30 miles east of lower Manhattan (see Figure 1-1). It is currently divided into three separate but contiguous properties: the property located at 140 Cantiague Rock Road (140 property), the property located at 100 Cantiague Rock Road (100 property), and the property located at 70 Cantiague Rock Road (70 property) (see Figure 1.2-1). Industrial and commercial properties are located directly north, south, and west of the site, and these properties are surrounded by residential areas. Cantiague Park, a county recreational area, lies immediately east of the site. The site is bordered on the north by the Nassau County Department of Public Works (NCDPW), on the south by General Instruments' (GI's) inactive hazardous waste disposal site, on the west by Cantiague Rock Road, and on the east by the driving range of the Cantiague Park golf course.

Previous investigations by NYSDEC and the current property owner identified chlorinated volatile organic compounds (VOCs) (primarily trichloroethene [TCE] and tetrachloroethene [PCE]), and metals (primarily nickel, uranium, and thorium) as the primary contaminants of concern. Non-chlorinated VOCs (e.g., toluene, xylene, acetone) were also identified as site contaminants.

GTE is a corporate predecessor of the Verizon entities (Verizon, Inc., and Verizon Communications, Inc.). Together these entities are referred to as GTEOSI. GTEOSI is the current owner of the 140 and 70 properties and lessee of the 100 property. GTEOSI entered into two voluntary cleanup agreements with NYSDEC to investigate and remediate the soils at the site to allow unrestricted future use of the site. The agreements were signed on April 7, 1999, and January 6, 2003. The 1999 agreement was for investigation activities (soil and groundwater), and the 2003 agreement was for remediation of soils at the site.

1.2.1 Site Description

The site is currently occupied by individual buildings, associated paved areas, or areas covered with gravel backfill from previous removal actions conducted by GTEOSI (see Figure 1.2-1). Most of the original buildings associated with the former Sylvania Electric Products Facility have been demolished; the only exception is the western portion of B70 (further discussed in Section 1.2.2). The site is surrounded by industrial and commercial areas to the north, south, and west, and a recreational area (Cantiague Park) located immediately east of the site. A section of the Long Island Railroad is located approximately 1,000 feet to the south of the 70 Cantiague Rock Road property. Site topography is relatively flat, with a general gradient to the south.

70 Cantiague Rock Road Property (70 Property)

The 70 property is the southernmost of the three site properties (Town of Oyster Bay, Tax Map Section 11, Block 499, Lot 94). Some historical documents referred to this property as Parcel S, and older tax maps referred to it as Lot 79. It is bordered to the north by the 100 property, to the east by the golf course driving range (Driving Range property), to the south by the GI facility, and to the west by Cantiague Rock Road. This property contains an approximately 79,210-square-foot, one-story brick building (B70) and a paved parking lot. The western half of this building is the only original building remaining from the former Sylvania facility (historically called Building 9); the eastern portion is a 30,000-square-foot addition that was constructed in the late 1980s. The building, which is mostly open warehouse space with offices on the west side, is currently vacant.

100 Cantiague Rock Road Property (100 Property)

The 100 property is the central portion of the site (Town of Oyster Bay, Tax Map Section 11, Block 499, Lot 99). Some historical documents referred to the 100 and 140 properties as Parcel N, and older tax maps referred to them as Lot 80. It is bordered to the north by the 140 property, to the east by the Driving Range property, to the south by the 70 property, and to the west by Cantiague Rock Road. This property contains an 80,100-square-foot warehouse with office space on the west side (Building 100 [B100]), a paved parking lot, and gravel cover over recent contaminant removal areas. The offices are currently vacant, and the warehouse is used for storage.

140 Cantiague Rock Road Property (140 Property)

The 140 property is the northernmost of the three site properties (Town of Oyster Bay, Tax Map Section 11, Block 499, Lot 100). It is bordered to the north by the NCDPW facility, to the east by the Driving range property, to the south by the 100 property, and to the west by Cantiague Rock Road. This property contains a 54,500-square-foot, one-story warehouse with office space on the west side, which is reported to have been constructed in 1968 (GTEOSI 1997); a paved parking lot; and gravel cover over recent contaminant removal areas. The offices are sporadically occupied, and the warehouse is used for storage.

1.2.2 Site History

Press Wireless Manufacturing, Inc. was the operator of the site from 1942 to 1952. The property was transferred from Press Wireless Manufacturing, Inc. to Jefferson Standard Life in 1948 which was then transferred to Jefferson Standard Broadcasting in 1951. Former Buildings 1 and 2 are visible on the 1951 aerial photo (which is the earliest photo in the project file). Sylvania Electric Products, Inc. (SEP) entered into contract with the Atomic Energy Commission (AEC) in 1951 to do nuclear element research and development. In February 1952, SEP acquired the site from Jefferson Standard Broadcasting. The facility was in operation from 1952 to 1967 and was involved in the research, development, and fabrication of nuclear elements (e.g., fuel elements, slugs, cores) under the AEC, other government (e.g., U.S. research reactors, including those at Hanford), and commercial contracts. Figure 1.2-2 identifies the former locations of the build-

ings used for manufacturing operations. Buildings 1 and 2 existed prior to Sylvania operations. Several buildings were built on the 100 and 140 properties between 1952 and 1957. Building 4 was built circa 1957 to 1958 and was used for atomic fuel element manufacturing. The names of the facility were identified by GTEOSI as follows:

- Sylvania Atomic Energy Division Facility: circa 1952-1957
- Sylvania-Corning Nuclear Corporation Facility: circa 1957-1960
- Sylvania Sylcor Division Facility: circa 1960
- Sylvania Parts Division (Parcel S only): circa 1967-1978
- Sylvania Chemical and Metallurgical Division, High Temperature Composites Laboratory (Parcel S only): circa 1970

The site was originally identified as Tax Map Section 11, Block 499, Lots 79 and 80. Before construction of the current buildings, the site was divided into three new parcels with new tax map lot numbers (Lot 94, Lot 99, and Lot100). The three current properties (70 property, 100 property, and 140 property) were considered a single site in the 1950s and 1960s, during the Sylvania facility's operations. These operations included work that Sylvania performed under special nuclear material and source material licenses with the AEC, as well as work performed under direct contract with AEC (mostly under a single prime AEC contract - Contract No. AT (30-1)-1293, referred to herein as Contract 1293). Although most of the Contract 1293 activities took place at the 140 and 100 properties and most licensed work took place at the 70 property, operations do not appear to have been bound by current property lines (USACE 2005).

Based on the success of the Contract 1293 operations, Sylvania decided to expand into licensed nuclear work. Sylvania applied for AEC licenses to use natural and enriched uranium. In some historical site documents, this licensed work is also referred to as "commercial work." AEC-licensed operations at the site occurred primarily at the 70 property and a portion of former Building 2, where many different kinds of fuel elements for various reactors were produced (USACE 2005). The 25,000-square-foot building on the 70 property was operational between 1959 and 1966. This licensed work was performed under at least 13 different licenses. Natural, enriched, and depleted uranium were handled, as well as lesser amounts of thorium. The production of nuclear fuel elements ceased in 1966 with the sale of Sylvania Nuclear Division's equipment, tooling, and license assets to National Lead Industries (GTEOSI 1997). Once nuclear operations ceased in 1965 at the site, all of the historical buildings except Building 4 were removed in 1967. Non-nuclear production activities on the 70 property ceased in 1972.

High-temperature coatings, ceramics, and composite alloys for the space and aircraft industries were also fabricated on the site between 1952 and 1969 (GTEOSI 2002).

The United States government has never owned a real property interest in any of the parcels comprising the Sylvania site. Table 1.2-1 presents a summary of ownership and operational history based on readily available information.

1.2.3 Operational History and Waste Characteristics

Sylvania and related entities conducted nuclear work on the privately owned site under Contract 1293 with the AEC from 1952 to 1965, as well as other nuclear work for commercial and other government contracts. Commercial work began in 1957 and lasted through approximately 1967. During these operations, government and commercial nuclear elements (e.g., cores, slugs, fuel elements) were manufactured for reactors used in research and electric power generation. As mentioned earlier, two separate reactor element-manufacturing processes were employed at the site: one process involved the handling of natural, enriched, and depleted uranium for AEC-licensed work, and the other involved the handling of natural uranium (Kingsley 1959).

Some of the elements produced by both the licensed and non-licensed work were coated with nickel to improve corrosion resistance and decrease oxidation and diffusion of uranium metal. Process wastes, which included PCE, were discharged to on-site sumps and leaching pools, which was a commonly accepted waste disposal practice of the era (USACE 2005). Scrap materials from the manufacturing processes were burned in former Building 8 (see Figure 1.2-2). Handling of this residue potentially contaminated site soils (Davis 1955).

1.2.3.1 Non-Licensed Work at the Site

Non-licensed work at the site primarily occurred on the 100 and 140 properties (see Figure 1.2-2). These two parcels (Tax Map lots 99 and 100, formerly known as single lot 80) were referred to as “Parcel N.” Non-licensed government work was conducted under Contract 1293 in former (demolished) Buildings 1, 2, 3, 5, 6, 7, 8, 9, and 16. Non-licensed work involved the production of nuclear elements under Contract 1293 and other smaller AEC contracts using primarily non-worked uranium natural metal (derby) (Kingsley 1959) and, to a lesser degree, natural thorium metal for the construction of and/or research related to nuclear elements (USACE 2005).

Example processes associated with non-licensed work are as follows (USACE 2005):

1. Cast ingot or derby was cleaned by acid pickling and dried.

2. The cleaned ingot or derby was heated to 450 degrees Fahrenheit (°F) with hydrogen to form uranium hydride (UH_3).

3. The hydride powder was decomposed at 900° F to uranium metal powder under vacuum or inert gas.

4. The metal powder was blended and cold pressed into compacts.

5. The compacts were hot pressed at 1,166 ° F under vacuum to a solid uranium slug or specification density.

6. The pressed slugs were cooled and then cleaned by acid pickling or surface grinding.

7. The ground slug was contour ground, and the end radii were machined.

8. The cleaned slugs were inspected and packed for shipment.

SEP slug canning processes evolved through the years to include nickel and aluminum plating (DOE 1962), and a procedure was developed to solvent-clean and acid-clean bare metal prior to plating (Huber 1955).

The site's liquid effluents (except for sanitary sewage) flowed into a sump pond immediately behind former Building 4 (i.e., the former sump was located beneath the eastern-most warehouse area of current B70) (USACE 2005). AEC authorized Sylvania to study ways of reducing uranium and nickel in the wastewaters; however, the findings could not guarantee reduction below the desired 0.05 parts per million (ppm).

Approximately 2.6 million kilograms of uranium metal were handled during the Contract 1293 manufacturing processes. U.S. Department of Energy (DOE) documentation indicates that this number could potentially be as high as 6 million kilograms (USACE 2005).

In 1953, AEC gave SEP permission to use a portion of one of its leased buildings on the l40 property for non-Contract 1293 work. The AEC element-manufacturing work was completed in 1965, and the AEC plant (Contract 1293 area) was decontaminated and released for other work by Isotopes, Inc., a contractor for the AEC (Giboney 1973). The decontamination (completed in December 1965) addressed buildings and land areas where Contract 1293 manufacturing had occurred. Limited soil excavation was completed (to 4 inches below ground surface [BGS]) in sump 2 and the drum storage area between Buildings 6 and 7 (see Figure 1.2-2). Decontamination of sump 3 was more difficult. The depth of the sump (15 feet below surface) prevented the use of a bulldozer. Due to the soft nature of the soils, personnel could not stand in the bottom of the sump to perform manual operations. Therefore, topsoil removal (to 4 inches BGS) was performed using a crane with a bucket (Bradley 1966). Approximately 300 tons of excavated soil, concrete, and macadam were drummed and removed off-site for disposal (USACE 2005). Five samples were analyzed for uranium-238 (U-238) upon completion of the soils decontamination efforts at the non-licensed operations area (Bradley 1966). U-238 concentrations ranged from 15 to 136 picocuries per gram (pCi/g); thus, residual materials remaining at the site exceeded the

current voluntary cleanup criterion in three of the five samples. The mean value for U-238 residuals was 66 pCi/g (USACE 2005).

In 1966, the New York State Department of Labor (NYSDOL) informed SEP that the Contract 1293 area was fit for use as other than a radiation installation. Any sumps still in use by SEP's licensed operations, including sump 1, were excluded from this clearance (Giboney 1973). In May 1966, the AEC declared Buildings 1 and 2 and the surrounding grounds fit for unconditional release (Giboney 1973).

In January 1967, the NYSDOL conducted its own survey of Building 4 (70 property) and areas of Building 2 (100 property and 140 property). Based on the findings of this survey, Building 4 was declared fit for non-radiological use, but the release excluded sump 1 and three rooms in Building 2 until further analytical results were confirmed (Kleinfeld 1967a); the sump and three rooms in Building 2 were released shortly thereafter (Kleinfeld 1967b). The buildings on the 100 and 140 properties were demolished in 1967 (USACE 2005).

1.2.3.2 Licensed Work at the Site

Licensed work at the site primarily occurred on the 70 property. This work involved the production of many kinds of fuel elements for various types of reactors, and natural, enriched, and depleted uranium were handled during the manufacturing processes. Production of the fuel elements and components ended on June 10, 1966 (Rusinko 1996).

The major steps of the commercial operations changed very little over the period of operations, but some modifications were made based on the desired product. Examples of commercial work include the following (USACE 2005):

1. Material was received, identified by a process number, and brought to the incoming vault storage area.

2. Accountability personnel entered the vault to remove raw material in order to make up charges. The charges were made up in the accountability room.

3. The material was then taken to the melt furnace area and placed in a vacuum-induction furnace. The criticality limit for this area was 2 kilograms (kg) of U-235 per melt. Enriched uranium-molybdenum and enriched uranium-aluminum were melted in graphite and ceramic crucibles in a vacuum melting furnace.

4. Vacuum heat treatment of uranium-molybdenum and depleted uranium was performed in a heat-treating furnace.

5. Sintering of uranium oxide-powdered stainless steel was performed in a hydrogen atmosphere in sintering furnaces.

6. Uranium oxide-stainless steel fuel plates and aluminum fuel plates were annealed in a hydrogen atmosphere in sintering furnaces.

7. Stainless steel and aluminum fuel elements were brazed in a hydrogen atmosphere in brazing furnaces.

8. After the material was made into an ingot, it was heated in a furnace and then rolled to the proper dimensions. Uranium-stainless steel billets were rolled in a hydrogen atmosphere in rolling furnaces and rolling mills; uranium-aluminum fuel plates were rolled in normal atmosphere (air) in heating furnaces and hot and cold rolling mills.

9. Clad and unclad uranium rods and pins were swaged.

10. Uranium rods and stainless steel tubes were loaded with sodium, which involved the use of argon gas, special furnaces, a sodium metal dispenser, and vacuum pumps.

11. Isostatic pressing of uranium pellets-aluminum tubing, which was performed in an argon atmosphere in an isostatic pressure vessel and compressor.

12. Uranium oxide-stainless steel powder compacts were desiccated using vacuum and chemical desiccators and vacuum pumps.

13. Products were chemically cleaned with hot and cold acid, caustic solvent solutions and vapors, water and demineralized water, and anodizing solvents. This work was performed in cleaning tanks with hoods and exhaust blowers, and vapor degreasers. An inspection report from February 27, 1959, stated that degreasing "is done in an electrically heated perchlorethylene vapor degreaser" (Kingsley 1959).

14. Uranium oxide-powdered stainless steel was compacted in hydraulic presses and dies.

15. Pinch cores were made, and each piece was greased and taken to process storage. In the process storage facility, the cores, the skull, the dross, and the scrap were placed on shelves located on 18-inch centers.

16. The cores were then pressed into aluminum plates called picture frames, taken to the heating furnace, and rolled into a rolling mill. After rolling, the material was then brought back for in-plant storage.

17. Uranium-bearing alloys and non-uranium-bearing fuel element plates, pins, assembled fuel elements, and fuel element components were machined using milling machines, lathes, and centerless grinders.

18. Other operations that were then performed on the material included cutting off and forming curvatures on the plates, acid cleaning, inspection, assembly of the elements, machining, and welding.

19. Finished elements were checked by Production Control and further inspection was performed prior to and after assembly.

Due to significant data gaps, an accurate depiction of the amount of uranium metal handled for the licensed operations does not exist (USACE 2005).

Based on an AEC compliance inspection (June 1958) of the activities at the licensed-work plant, waste water from the chemical cleaning baths containing uranium at a concentration of less than 0.5 gram per liter was released to the septic system. Records of sample results indicated that the highest measured concentration released up to the inspection date (June 1958) was 0.025 grams per liter (Klevin 1958).

In November 1966, Atcor, Inc., began a survey and decontamination effort in Building 4, which focused on the building's interior (Swiger 1967). In January 1967, the NYSDOL conducted its own surveys of Building 4 and areas of Building 2. Based on the findings of these surveys, Building 4 was declared fit for non-radiological use, but the release excluded sump 1 and three rooms in Building 2 until further analytical results were confirmed (Kleinfeld 1967a); the sump and three rooms in Building 2 were released shortly thereafter (Kleinfeld 1967). Based on the findings of these surveys, in April 1967 the AEC removed the Hicksville site as a place of use on license SNM-82 (Nussbaumer 1967). Based on the AEC surveys, the Atcor survey, and its own investigation, the State of New York released the site for non-radiological use on September 19, 1967, and cancelled New York State Radioactive Materials License No. 325-0083.

In 1967, licensed element manufacturing ended and the area was decontaminated. In 1987, after the acquisition of Lot 103 (the eastern part of the 70 Cantiague Rock Road property) from Nassau County, buried drums and some contaminated soils were discovered on the current 70 Cantiague Rock Road property during the construction of an addition to former Building 4. The drums were in various conditions, but the analytical results for samples of the remaining contents indicated the presence of PCE, polychlorinated biphenyls (PCBs), arsenic, and TCE (GTEOSI 1993).

1.2.4 Previous Investigations

The following is a summary of the non-USACE RI investigations and remedial actions that have been performed on this site from the 1960s to the present.

- **1965.** The 1293 Contract area was decontaminated by Isotopes, Inc., a contractor for the AEC. Limited soil excavation was performed to a depth of 4 inches in sump 3, sump 2, and the drum storage area between Buildings 6 and 7. The 1293 Contract area was released for other work by the AEC.

- **1967.** The historical Sylvania buildings on the 100 and 140 properties were demolished.

- **September 19, 1967.** The NYSDOL released the site for non-radiological use based on AEC surveys, an Atcor survey, and its own investigation, and canceled New York State Radioactive Materials License No. 325-0083.

- **1987.** Thirty buried drums and some contaminated soils were discovered on the current 70 property during construction of an addition to former Building 4 (USACE 2005). The analytical results for soil and drum samples collected by the Nassau County Department of Health (NCDOH) and NYSDEC indicated the presence of chlorinated solvents (primarily TCE and PCE), PCBs, arsenic, and less than 0.05% uranium (i.e., less than approximately 165 pCi/g U-238, assuming natural uranium). ERM-Northwest (ERM) was retained by Air Techniques for further subsurface investigations. In total, 57 drums (including the initial 30) and 90 cubic yards of soil (excavated from 0 to 12 feet BGS) were removed. The source of those drums is unknown.

- **Air Techniques 1987.** A Remedial Excavation and Subsurface Investigation of the 70 property was performed (Air Techniques 1987). The investigation included a geophysical survey, subsequent excavations, and post-excavation soil sampling.

- **Gilbert Displays 1991.** An environmental investigation of the 140 (Gilbert Displays) property was performed (Gilbert Displays 1991). The objective of this investigation was to identify all financial liability issues as well as significant environmental problems that would restrict property use by current and future owners.

- **GTEOSI 1992.** GTEOSI performed a Phase II investigation at the 70 property to collect the information necessary to classify the site for no further action and to develop a final Hazard Ranking Score (GTEOSI 1993). This investigation included a soil gas survey (to evaluate soil quality in the vicinity of boring B-1, where chlorinated solvents were detected after the removal of the drums); installation of four soil borings/monitoring wells; and collection of groundwater samples (to evaluate groundwater quality upgradient and downgradient of the drum burial site and to identify any impacts from the buried materials on groundwater quality). Two upgradient wells (north of the building extension) and two downgradient wells (southwest of the building extension) were installed and sampled for the full Target Compound List/ Target Analyte List (TCL/TAL). An existing off-site well located within the former waste lagoon on the GI property was also sampled for VOCs during this investigation as a third downgradient monitoring point.

- **GTEOSI 1992.** GTEOSI performed a Supplemental Phase II Investigation for the 70 property (GTEOSI 1993). The objective of this investigation was to

collect sufficient information to permit proper classification of the property. This investigation included installation of three soil borings and one new upgradient monitoring well.

- **1995.** NYSDEC reclassified the 70 property because of high solvent concentrations. Some contribution to groundwater contamination was suspected at the 70 property.

- **GTEOSI 1997.** GTEOSI prepared a Summary Report on the Groundwater Monitoring Program at the Air Techniques facility.

- **GTEOSI 1998.** GTEOSI performed a ground-penetrating radar (GPR) survey and an exterior radiation survey of the site (GTEOSI 1998). More than 305 GPR profiles were obtained, with a 20-foot maximum depth of penetration. The walkover gamma radiation survey was performed over selected outdoor areas of the site to measure and map above-background radiation levels that may indicate the presence of subsurface process residuals.

- **April 7, 1999.** A Voluntary Cleanup Program (VCP) Agreement was established between GTEOSI and NYSDEC. Soil cleanup levels were established as: 100 pCi/g total uranium; 50 pCi/g for U-238; 2.8 pCi/g for Th-232; 1.82 ppm for PCE; 0.7 ppm for TCE; 560 ppm for nickel; and 0.16 ppm or site background or background for New York State soils (0 to 7 ppm) for beryllium. These criteria were used for the 2004 remediation.

- **GTEOSI 2000.** GTEOSI conducted an investigation to verify the nature and extent of process residuals, including uranium, thorium, and chlorinated solvents (GTEOSI 2000). They also conducted a site survey to locate historic structures. The report also included a summary of the GPR and radiation survey from the 1998 report listed above. A soil gas survey included 128 borings to 4 feet in general areas; to 8 feet in suspected radioactive contaminant areas; and to 16 feet in leach pool areas. The groundwater investigation included sampling of five existing monitoring wells on the 70 property, three off-site upgradient wells (MW-01 to MW-05), and five newly installed temporary well points (TW-01 to TW-05). The samples were analyzed for VOCs, semivolatile organic compounds (SVOCs), metals, and radionuclides.

- **GTEOSI 2001.** GTEOSI performed a supplemental investigation to further evaluate areas identified during the initial investigation where process residuals consisting of uranium, thorium, and PCE were potentially located (GTEOSI 2001). This investigation included a soil gas survey to a depth of approximately 4 feet (32 exterior locations, 19 interior locations at Building 140 [B140], and three interior locations at B100); installation of more than 128 borings 4 to 24 feet deep; installation and sampling of five temporary wells to 70 feet; and sampling of five existing wells on the 70 property (MW-1 through MW-5) and three upgradient existing wells on the NCDPW property (W-24, W-24D, and W-25).

- **GTEOSI 2002.** GTEOSI performed a soil investigation to verify the vertical and horizontal extent of selected contaminants in the soil and delineate non-impacted areas for sheet pile placement (GTEOSI 2003a). The investigation included 170 soil borings, installation of monitoring wells, and collection of soil and groundwater samples. Most of the soil borings were advanced to 20 feet BGS; however, 14 borings were advanced until no impacts were noted (approximately 40 feet BGS) in order to define the vertical boundaries. The soil samples were analyzed for radionuclides, VOCs, and metals.

- **GTEOSI 2003.** GTEOSI installed 27 additional soil borings at the site in response to a request by NYSDEC (GTEOSI 2003b). The additional soil investigation was performed in order to characterize the potential mixed waste areas. The soil borings were advanced to a maximum of 18 feet BGS, with most of the borings advanced to a total depth of 12 feet BGS. The soil samples were analyzed for radionuclides, VOCs, and nickel.

- **GTEOSI 2003.** GTEOSI performed a radiological survey inside B70 to determine whether residual radioactivity was present in building materials (GTEOSI 2003c). The survey involved the sampling of interior surfaces of the portion of the building utilized by Sylvania, including floors, lower walls, and other locations deemed suspect. Scans and direct measurements of random and biased building surface locations were performed for gross alpha and beta contamination, removable alpha and beta contamination, and area gamma exposure rates.

- **GTEOSI 2003, 2004.** Based on the results of previous investigations, GTEOSI assembled a team of environmental companies to perform a soil removal and restoration program on portions of all three properties known to contain process residuals. Removal areas were designated as cells, and the cells were further divided into subcells (see Figure 1.2-3). The excavation of each cell, which was guided by instrument screening and on-site analysis of soil samples, was performed with the intent of removing soil until cleanup levels established in the 1999 VCP agreement were attained. A final Phase I soil remediation report was issued in December 2006 (GTESOI 2006a).

- **GTEOSI 2004.** GTEOSI prepared a letter report regarding the underground storage tank (UST) removed from Cell 2 during the soil remediation program (GTEOSI 2006b). The tank was encountered during the excavation of soil within Cell 2 (Subcells V10 and W10) at approximately 4 feet BGS. The 6,000-gallon tank was 19 feet long and measured approximately 7 feet in diameter. The tank contained approximately 875 gallons of sludge and liquid. A pipe was attached to the top-center portion of the tank. The tank was removed from the ground and examined for content, corrosion, and integrity, and was scanned for radiological and chemical impacts. Subsequent to tank removal, five soil samples were collected from the bottom and sidewalls of the tank pit. An emulsifier was added to the UST to solidify and immobilize

the contents and, after it was scanned for VOCs and radiological activity, it was double-wrapped in plastic and shipped off-site for disposal.

- **USACE 2004.** USACE held a site visit and meeting with Verizon, Inc. A records search and review was performed, which included electronic searches and visits to NYSDEC offices and the Hicksville Public Library.

- **NYSDEC April 2005.** NYSDEC performed a limited soil gas survey with a photo-ionization detector (PID) in the backfilled soil boring holes for survey unit 04 (SU04) (central portion of B100) and SU07 (western half of B140). Elevated readings were observed at SU04, and additional borings were requested (NYSDEC 2005a). For SU07, no elevated readings were observed and no additional borings were installed.

- **NYSDEC May 2005.** NYSDEC performed a limited soil gas survey with a PID for SU05 (100 property), but elevated readings were not observed (NYSDEC 2005b). NYSDEC also installed six additional borings at SU04 and SU03, and soil gas readings were collected at five of these borings. A 2,500-gallon UST was found during installation of the sixth boring, which resulted in the installation of two more borings to a depth of 15 feet to the north and south of the UST. Additional soil surveys were recommended for selected areas under the building in order to evaluate potential indoor air exposure routes.

- **GTEOSI 2005.** GTEOSI performed a systematic subsurface soil investigation beneath B100 from February to April 2005 (GTEOSI 2005a). The soil borings were advanced to 30 feet BGS in a triangular sampling pattern. Samples were analyzed for radionuclides, TCE, PCE, nickel, and beryllium. Additional investigations performed prior to and concurrent with the systematic soil investigation beneath B100 included the following:

  - A focused sampling effort beneath the building prior to the systematic soil investigation (March through April 2004), which involved 19 borings in areas of suspected floor drains, catch basins, historic leach pools (LPH) LPH01, -03, -04, -05, and -06, and outside the footprint of the historic building.

  - LPH characterization to identify and delineate contaminants associated with 14 suspected LPHs beneath the building; this was done concurrently with the systematic soil investigation.

  - Cell 9 investigation to identify and delineate contaminants that originated from the LPHs removed during the remediation in Cell 9, south of B100; this was performed concurrently with the systematic soil investigation.

- Six additional soil borings were advanced to further delineate the residual PCE and TCE contamination in SU04 (central portion of B100) at soil boring location 009.

- Eight additional borings to supplement the systematic soil investigation grid were installed to further investigate the shallow soils beneath the building.

- A 2,500-gallon UST (5 feet in diameter and 15 feet long) was encountered in subcell L17, approximately 5.5 feet below the bottom of the concrete slab. Approximately 150 gallons of liquid and 250 gallons of sludge were found in the UST. The UST appeared to be intact without having released contaminants to surrounding soils. Because the UST could not be removed without compromising the integrity of the building, an emulsifier was added to the UST to solidify and immobilize the contents and prevent potential future releases.

■ **GTEOSI 2005.** GTEOSI performed a systematic subsurface soil investigation west of B140 and B100 (GTEOSI 2005b). The soil borings were advanced to 30 feet BGS. Samples were analyzed for radionuclides, VOCs, nickel, and beryllium. An additional soil investigation was performed to identify and delineate contaminants associated with six LPHs.

■ **GTEOSI 2005.** GTEOSI performed a systematic subsurface soil investigation beneath B140 (GTEOSI 2005c). The soil borings were advanced to 30 feet BGS. Samples were analyzed for radionuclides, VOCs, nickel, and beryllium. An additional soil investigation was performed to identify and delineate contaminants associated with two LPHs.

■ **GTEOSI 2005.** GTEOSI performed a systematic subsurface soil investigation and remediation north of B140 (GTEOSI 2005d). The investigation was focused on the surface and subsurface soils located between the B140 north wall and the northern 140 property. The soil borings were advanced via hand auger to 8 feet BGS and samples were collected every foot. Samples were analyzed for radionuclides, VOCs, nickel, and beryllium. A limited excavation to a maximum depth of 5 feet BGS was performed at the investigated area and an area of residual nickel contamination was re-excavated.

■ **GTEOSI 2005.** GTEOSI performed a soil investigation to delineate the extent of VOC contamination in cells 3, 4, 12, and 14 and the Driving Range property (GTEOSI 2005e). Thirty-five borings were advanced to 64 feet BGS (approximately 5 feet above the water table). Fourteen additional borings were advanced on the Driving Range property after the delineation sampling described above to assess the potential migration of soil contaminants to the groundwater and describe the subsurface soil lithology beneath the site.

- **GTEOSI 2005.** GTEOSI performed a systematic subsurface soil investigation to delineate residual contamination in Cell 9 remaining after soil remediation at the site (GTEOSI 2005f). Sixty-four soil borings were advanced to 64 feet BGS (approximately 5 feet above the water table) in Cells 9 and 8 as well as areas surrounding these cells. Samples were analyzed for uranium, thorium, TCE, PCE, and nickel.

- **USACE 2005.** The USACE prepared a fact sheet in January 2005 and performed a Preliminary Assessment (PA) and met with NYSDEC in May. The purpose of the PA was to review readily available information to determine the need for further activities by the USACE to ensure protection of human health and the environment. The USACE determined that there was evidence of a release and/or threat of a release into the environment of radiological substances resulting from work performed as part of the nation's early atomic energy program that is not a federally permitted release. USACE also determined that there was evidence of a release and/or threat of a release into the environment of hazardous substances (chemicals) that is not a federally permitted release, although USACE could not determine whether the release was attributable to the nation's early atomic energy program. Considerable licensed work took place on the site that involved radioactive materials similar to those used in non-licensed work under the Contract 1293 and other AEC contracts. Although there is a reasonable likelihood that some of the on-site contamination resulted from non-licensed work, the USACE could not find any sufficient geographic segregation of non-licensed and licensed activities to state definitely the portions attributable to each. USACE recommended a more detailed analysis such as a CERCLA Remedial Investigation (RI) to determine which areas of the site should be designated for FUSRAP cleanup.

- **GTEOSI 2006.** GTEOSI prepared a report on the findings and activities associated with a 2,500-gallon UST discovered beneath B100 (GTEOSI 2006b). The UST was 15 feet long and measured 5 feet in diameter. The liquid and sludge contained in the UST was approximately 15 inches deep (approximately 400 gallons). An emulsifier was added through access holes to the UST to solidify and immobilize the contents and prevent potential future releases.

- **GTEOSI 2006.** GTEOSI prepared a report detailing the findings and results of the Phase I Soil Remediation in which 14 remedial cells were excavated to remove contaminated soils (GTEOSI 2006a). The soil remediation began in April 2003 and ended in September 2004.

- **GTEOSI 2007.** A multi-phase groundwater investigation was performed to characterize the nature and extent of VOCs, nickel, and radionuclides in unsaturated soil and groundwater at the 70, 100, and 140 Cantiague Rock Road properties and the surrounding properties, including the NCDPW, GI, the Driving Range property, Crown Lift, King Kullen, New York Blood Bank, and Waste Management properties (GTEOSI 2007a). This investigation con-

sisted of collecting two rounds (October 2002 and March 2003) of groundwater samples from 12 existing on-site monitoring wells (MW-1 through MW-12); collection of depth-specific groundwater samples at 10-foot intervals to depths down to more than 500 feet from 55 on-site and off-site boring locations between October 2002 and February 2004; and decommissioning of five monitoring wells (MW-01, MW-02, MW-05, MW-06, and MW-07) in April 2003.

- **GTEOSI 2008.** GTEOSI drilled and sampled six off-site groundwater profile borings (P102, P104, P110, P112, P113, and P114) under the VCP. A data report was submitted to NYSDEC in January 2008 (GTEOSI 2008a).

- **GTEOSI 2008.** GTEOSI drilled and sampled three on-site groundwater profile borings (P103, P107, and P108) under the VCP. A data report was submitted to NYSDEC in February 2008 (GTEOSI 2008b).

- **GTEOSI 2008.** GTEOSI drilled and sampled five off-site groundwater profile borings (P118, MWP110-355, MWP110-440, MWP114-170, and MW114-290) under the VCP. A data report was submitted to NYSDEC in April 2008 (GTEOSI 2008c).

- **GTEOSI 2009.** GTEOSI drilled and sampled two off-site groundwater profile borings (P119 and P120) under the VCP. A data report was submitted to NYSDEC in November 2009 (GTEOSI 2009).

2 Remedial Investigation Activities

2.1 Previous Site Investigations

2.1.1 Soil Investigations

GTEOSI project teams performed numerous soil investigations throughout the 140 and 100 properties and to a lesser extent the 70 property between 1997 and 2005. During these investigations, they collected and analyzed thousands of samples, many of which were analyzed by an onsite laboratory. Soil investigations were performed to support and design the soil excavation remedial effort (GTEOSI 2003a, 2003b). For informational purposes, the highest concentration of uranium-238 (U-238) detected during these investigations was 800 pCi/g; the highest concentration of PCE detected was 540,000 micrograms per kilogram (µg/kg); and the highest concentration of nickel detected was 28,000 milligrams per kilogram (mg/kg). TCE and thorium-232 (Th-232) were detected at lower concentrations than PCE and U-238, respectively (GTEOSI 2003b). The vast majority of the soil that was sampled during these investigations was excavated and disposed of during the remedial effort.

GTEOSI's Phase I Soil Remediation effort began on April 30, 2003, and was completed on September 23, 2004. During this effort, thousands of samples were collected from soils removed for waste disposal characterization, residual process materials discovered in soils during the excavation, and wastes created from laboratory operations. Additional samples were collected to guide excavation activities. After reaching final excavation depths, GTEOSI collected samples (called confirmation samples [CF]) from the resulting surfaces (walls and floor) of the remedial cells. At Remedial Cells 2, 4, 7, 8, 13, and 14, soil samples were collected from excavation walls. CF samples were first collected and analyzed at the on-site laboratory (discussed below) to determine whether 1999 VCP cleanup objectives had been met. When it was deemed that remedial goals had been met, samples (called verification [VF] samples) were collected from the remedial cells and sent for off-site laboratory analysis to verify that cleanup goals had been met. A total of 1,261 VF samples were collected as part of this effort. At several locations, cleanup objectives were not met (beneath remedial cells 1, 4, 6, 9, 13, and 14 as a result of technical limitations, e.g., depth).

GTEOSI project teams conducted supplementary investigations, including focused and systematic soil investigations. The supplementary investigations began concurrently with the GTEOSI Phase I Soil Remediation in November 2003 and concluded in May 2005. The sample results from the supplementary investiga-

tions were used in defining the nature and extent of contamination addressed in this RI report (discussed further in Section 5). Focused investigations were conducted to identify and delineate contaminants (if present) associated with leach pools, soil below the remedial cell excavations, historic floor drains, and two USTs discovered during investigations. Systematic investigations using the Multi-Agency Radiation Survey and Site Investigation Manual (MARSSIM) approach were conducted on the 140 and 100 properties in areas outside of the remedial cells. Portions of the 140 and 100 property were divided into survey units as part of this approach (survey units SU01 through SU07). Other systematic investigations (various non-formal grid approaches) were also employed to investigate suspected contaminated soil beneath and around remedial cell excavations and contaminants detected during leach pool investigations. Based on the results of subsurface sampling and soil excavations, most impacts were noted from surface to depths less than 24 feet BGS (GTEOSI 2005a). Therefore, boring depths were generally completed to 30 feet in areas that were not excavated (e.g., survey unit and leach pool borings). Borings were often advanced to 64 feet when investigating soil below the remedial cell excavations or when contaminants were suspected to be present below 30 feet. Borings were generally advanced using split-spoon samplers and hand augers, as necessary. A total of more than 300 borings were completed within the remedial cells, and more than 300 additional borings were completed in areas on the 140 and 100 properties outside of the remedial cell areas. Figure 2.1-1 presents a generalized depiction of GTEOSI's investigation areas.

The majority of boring samples were termed delineation (DL) samples and collected at 1-foot intervals. All DL samples were analyzed for U-238 and Th-232 at the on-site laboratory. DL samples were also analyzed on-site for VOCs if they were collected from previously identified source areas or if the PID screening results were greater than 25 ppm. DL samples were also analyzed on-site for nickel at various frequencies, but generally one sample every 2 feet.

Select samples collected from soil borings were called sample point (SP) samples. These samples were analyzed at the on-site laboratory, and a duplicate sample was sent for off-site laboratory analysis to confirm the on-site analytical results. The frequency at which these samples were collected varied between borings and investigations. A minimum of one SP sample was collected from each boring at the terminal depth. Three SP samples were collected from each boring installed during MARSSIM survey unit investigations.

Soil samples were analyzed for radionuclides, VOCs, and nickel in an on-site laboratory by Stone Environmental, Inc. (SEI). The radioanalyses were performed using gamma spectroscopy with a 10-minute count (nominal detection limits of 0.014 for Th-232 and 3.6 for U-238). Aliquots for samples that were sent to an off-site laboratory (e.g., VF and SP samples) were also analyzed on-site using 30-minute counts. The U-238 and Th-232 concentrations were obtained from their gamma-emitting daughter concentrations, Th-234 and Ac-228, respectively. This analytical method assumes that the site soil contains natural uranium and thorium

in which the parents and daughters are in equilibrium; therefore, this data can not be used to evaluate whether the samples contained enriched uranium. The on-site VOC analyses were performed using solid-phase micro-extraction and capillary gas chromatography. The on-site nickel analysis was performed using x-ray fluorescence spectroscopy (XRF), which had a minimum detection limit (MDL) of 40 mg/kg (GTEOSI 2006a). For the purposes of this RI, the analytical results for all samples analyzed on-site are considered to be screening-level data and are used only to help define the nature and extent of contamination addressed in this RI report. On-site laboratory results were not used to complete the HHRA.

Samples that were analyzed off site were sent to Severn Trent Laboratories (STL) of Earth City, Missouri, and analyzed using gamma spectroscopy (Method DOE EML Ga-01-R MOD) to establish a correlation with the on-site gamma analytical results. The gamma spectroscopy analysis was discontinued after an acceptable correlation with the on-site data was established and approved by NYSDEC in August 2004 (GTEOSI 2006a). STL also analyzed samples for isotopic thorium and isotopic uranium using alpha spectroscopy (Methods NAS TH-NAS-NS-3004 and U-NAS-NS-3050 or DOE RP-725). The results from these analyses are used in defining the nature and extent of contamination addressed in this RI report and in the HHRA.

All data collected during the GTEOSI Phase I soil remediation and the GTEOSI supplementary investigations were provided to the USACE project team in electronic format. A total 30,854 unique samples were collected and analyzed as part of these efforts (GTEOSI 2007a, 2007b). Further discussion on the use of this data is provided in Section 4.

2.1.2 Groundwater Investigations

GTEOSI has performed several groundwater investigations since 2002. The first investigation consisted of the collection of two rounds of groundwater samples from 12 existing on-site monitoring wells (MW-1 through MW-12) in October 2002 and March 2003 (see Figure 2.1-2). In April 2003, following the second round of sampling, five wells (MW-01, MW-02, MW-05, MW-06, and MW-07) were decommissioned. The wells were sampled using EPA Region II low-flow techniques and analyzed by STL in Earth City, Missouri, for the following parameters:

- VOCs using EPA Methods 5030 and 8260B;
- Select metals (nickel, chromium, copper, beryllium, and thallium) using EPA Method 6010A;
- Hexavalent chromium using EPA Method 7196A;
- Radionuclides by gamma spectroscopy using Method DOE EML (HASL 300) Ga-01-R MOD;

- Isotopic thorium and uranium by alpha spectrometry using Method NAS/DOE 3050 and 3004 RP;

- Radium-226 (Ra-226), radium-228 (Ra-228), and gross alpha by gas-flow proportional counting using EPA Methods 9315 MOD, 9320 MOD, 9310 MOD; and
- Technetium-99 by liquid scintillation counting using Method DOE TC-02-RC MOD.

As part of this study, GTEOSI also drilled and profiled 55 groundwater borings (see Figure 2.1-3). The first 15 profile borings were drilled and sampled between October and December 2002, and the remaining 40 profile borings were drilled and sampled between April 2003 and February 2004. These profile borings were drilled both on-site and on neighboring off-site properties such as the NCDPW to the north; Cantiague Park to the east; the former GI and King Kullen to the south; Crown Lift to the southeast; and New York Blood Bank/former PRD Electronics and Waste Management to the southwest (see Figure 2.1-3).

GTEOSI later performed the following supplemental on-site and off-site groundwater profiling activities:

- Drilled and sampled six off-site groundwater profile borings (P102, P104, P110, P112, P113, and P114) (see Figure 2.1-4) to depths of 524 feet from February through July 2007 (GTEOSI 2008a);

- Drilled and sampled three on-site groundwater profile borings (P103, P107, and P108) (see Figure 2.1-3) to depths of 404 feet from April through May 2005 (GTEOSI 2008b);

- Drilled and sampled five off-site groundwater profile borings/wells (P118, MWP110-355, MWP110-440, MWP114-170, and MW114-290) (see Figure 2.1-4) to depths of 581 feet from October through November 2007 (GTEOSI 2008c); and

- Drilled and sampled two off-site groundwater profile borings (P119 and P120) (see Figure 2.1-3) to depths of 481 feet from March through May 2009 (GTEOSI 2009).

Groundwater profile samples were collected using the Waterloo Profiler® system. The Waterloo Profiler® system is a subsurface data acquisition system that collects both groundwater samples and an integrated set of companion data in a single, continuous direct push. The system includes a profiler tip with 16 ports and stainless steel tubing that fits into the bottom of a gas driven pump. Hydraulic conductivity is continuously measured as the profiler is advanced by pumping water from the surface into the formation. The pressure potential of the water entering the formation is measured by the profiler to determine hydraulic conductivity. When the sampler reaches the specified depth to be sampled, the flow is reversed

by allowing the pump to fill with formation water. Compressed nitrogen is then used to force the water up the sampling line to the surface. All lines were purged of injection water prior to sampling (GTEOSI 2007c).

On-site samples were collected from the top of the water table (approximately 65 feet BGS) to a depth of approximately 379 feet BGS; off-site samples were collected from the top of the water table (approximately 65 feet BGS) to a depth of approximately 505 feet BGS. Using an on-site laboratory, SEI analyzed the groundwater profile samples for VOCs and inorganics, including chloride, iron (total and Fe2+), ammonia, and chlorine. Groundwater samples collected while conducting the first 15 profiles were analyzed in the on-site laboratory for PCE, TCE, cis-1,2-dichloroethene (cis-1,2-DCE), trans-1,2-dichloroethene (trans-1,2-DCE), vinyl chloride (VC), and the inorganic parameters identified above. Groundwater samples collected while conducting the remaining 40 profiles were analyzed in the on-site laboratory.

For the purposes of this RI, the analytical results for all samples analyzed on-site are considered to be screening-level data and used only to help define the nature and extent of contamination.

2.2 Records Search and Scope of Work Development

The USACE commenced a records search, literature review, and development of the conceptual site model in 2004. The records search consisted of a review of electronic files and documents obtained from numerous sources, including NYSDEC, the Nuclear Regulatory Commission (NRC), DOE, Hicksville public library, GTEOSI, and EPA. All documents were initially scanned. The types and number of files are presented in Table 2.3-1. Many of the records were illegible due to the quality of the scanning and the scale of the maps, and some files were incomplete. Therefore, a second records search was performed on eight file boxes that contained hard copy documents.

Upon completion of the site reconnaissance and record searches, a conceptual site model was developed and an RI work plan was written. The project scoping meeting and presentation of the conceptual site model was held on July 6, 2006.

The RI was designed to be conducted in three phases, with each phase providing data necessary for refining the planned work for the next phase. Phase I included reconnaissance studies based on geophysical and surface radiation surveys and soil gas and surface soil sampling. Phase II consisted of two subsurface soil investigations and included a shallow drilling phase followed by a deeper drilling phase. The soil investigation at the 70 property was designed using the MARRSIM approach for final status surveys to potentially allow the release of clean areas during the remediation stage without the need for additional soil sampling. Phase III consisted of two groundwater investigations using rotosonic drilling and groundwater profiling techniques to depths of 400 feet. Quick turnaround off-site laboratory analysis of groundwater profile samples allowed for in-field decisions regarding the design of the deep monitoring well network. The use of

these data also provided flexibility in the performance of the shallow groundwater phase, allowing source area determinations to be made quickly and unnecessary shallower well pairs to be identified and eliminated.

Table 2.3-2 presents the chronology of relevant project planning documents, meetings, and field activities that supported development of the scope of work.

2.3 USACE Site Reconnaissance

The USACE performed a RI of the properties located at 70, 100, and 140 Cantiague Rock Road in Hicksville, New York. As mentioned in Section 1, extensive environmental sampling and remediation work was performed by GTEOSI between 1992 (GTEOSI 1993) through the present. Investigations performed by the USACE were used to fill in identified data gaps, confirm GTEOSI data, and build upon the work performed to date by GTEOSI, but not to duplicate their work. This document presents the results of USACE's work and the appropriate information obtained from the GTEOSI reports. For a complete evaluation of all the available information, a review of the referenced GTEOSI reports is recommended.

The USACE project team performed an initial site reconnaissance on May 18, 2006. The reconnaissance consisted of a walkover of all three properties (140, 100, and 70 Cantiague Rock Road) and two of the three buildings (B140 and B100) and meeting with the GTEOSI team. Building 70 was not inspected during this reconnaissance because the building was being occupied by a dental equipment manufacturer and access was not available at that time. Following the site walkover, the USACE Project Team met with the GTEOSI team and discussed the following:

- The current status of the site buildings
- A review of recent groundwater investigations by GTEOSI
- Previous radiation investigations and results

The dental equipment manufacturer vacated Building 70 in June 2006, and a site reconnaissance of this building was performed in July 2006.

2.4 RI Study Area

This RI focused mainly on the three former Sylvania Corning Plant/former Sylvania Electric Products Facility (Syclor) properties (i.e., the 140, 100, and 70 properties). Investigative sampling and testing during Phases I and II (reconnaissance and soils) were performed solely on these three properties. During Phase III, the study area was expanded to include sampling locations on the NCDPW property immediately north of the 140 property (i.e., hydraulically upgradient of the site) and on the Nassau County Parks property immediately east of all three site properties (see Figure 1.2-1).

The media studied during this RI mainly consisted of soil and groundwater. Other media sampled during the early stages of the investigation (Phase I) included soil gas, soil vapor, indoor and outdoor air, drywell sediment, drill water, drain water, and building materials (concrete cores). Surface water was not sampled because there are no permanent surface water features within the RI study area. The majority of the surface of the site is paved; the exceptions are areas that have been excavated by property owners/tenants.

Extensive sampling of site soils and groundwater was conducted by GTEOSI between 1997 and 2005 under the VCP agreement with NYSDEC. Data gathered during these investigations was used to support this RI. Groundwater data collected by GTEOSI was used to aid in the development of the scope work for the groundwater portion of the RI.

2.5 USACE RI Activities

The RI field activities were conducted over a four-year period beginning in 2006 and comprised three major phases (Phases I, II, and III). Each phase of work was conducted in a successive fashion, and the results of each phase of work were reviewed by the USACE Project Team to supplement and adjust each future phase of work.

2.5.1 Phase I – Reconnaissance Surveys

Phase I RI activities included geophysical surveys, exterior soil gas and sub-slab soil vapor surveys, indoor air surveys, transformer pad surveys, and radiation surveys. Details of the sampling and chemical analysis for Phase I are presented in Table 2.5-1. This phase of work was conducted in September and November 2006.

2.5.1.1 Geophysical Survey

Geophysical surveys were performed by Geo View, Inc., of St. Petersburg, Florida, in areas identified by the USACE during literature searches as not previously surveyed. The surveys were performed in accordance with the USACE–approved work plan (USACE 2007) utilizing a combination of metal detection (electromagnetic [EM]) EM-61 surveys and ground-penetrating radar (GPR) surveys. Both types of surveys were performed on areas not previously investigated. The GPR surveys were predominantly used to support the EM-61 results by performing targeted surveys on EM-61 anomalies identified through real-time analysis of data in the field. Suspected leach pools, drains, and drywells not previously investigated (DRYH-A, DRY-B, DRYH-C, DRY-D, DRY-E, LPH-A, LPH-B, and LPH-C) were also targeted with the GPR. Planned GPR surveys inside the three buildings were attempted but later aborted due to poor signal penetration through the concrete slabs, which was caused by interference from steel reinforcement in the slabs. The steel reinforcement in the slabs also rendered the EM-61 incapable of performing a reliable indoor survey; therefore, follow-up surveys at DRH-A and DRH-B could not be performed. The Phase I geophysical survey areas are identified on Figure 2.5-1. A more detailed description of the methodologies and results are presented in Appendix A.

2.5.1.2 Soil Gas Sampling for Source Area Determination

During Phase I, two types of soil gas survey were performed in accordance with the USACE-approved work plan (USACE 2007) in on-site areas not previously investigated: a passive survey at exterior locations across all three properties, and a sub-slab survey inside Building 70 (see Figure 2.5-2). These surveys were performed to determine whether VOC contamination from historical operations or disposal activities was present in the vadose zone and, if present, identify the source areas.

The passive soil gas survey was performed across the designated portions of the Sylvania property at 89 locations along a grid with 50-foot station and line spacings using VaporTec soil gas modules.

The sub-slab soil vapor survey was performed beneath the Building 70 slab at 12 locations using Summa canisters. Sub-slab samples were collected beneath B140, B100, and again beneath B70 as a part of the indoor air survey performed during the heating season, as described below in Section 2.5.1.4.

2.5.1.3 Transformer Pad Survey

A review of historical maps and observations of current conditions during site reconnaissance indicated that only one transformer pad currently remains on-site (see Figure 2.5-2). This pad is located on the south side of Building 70. Buildings 140 and 100 currently receive power from transformers mounted on a telephone pole near the northwest corner of Building 100. Historically, the transformer pad for former Building 2 was located beneath the current Building 140; the transformer pads for former Building 1 was located beneath current Building 100; and the historical transformer yard for the original Building 70 was located immediately adjacent to the west side of the current B70 transformer pad (see Figure 2.5-2). The area that had contained the historic building 1 transformer pad, and the current Building 100 pad were excavated as part of the recent VCP effort. Therefore, transformer pad sampling was performed in accordance with the approved work plan (USACE 2007) only at the current transformer pad location and the adjacent former transformer yard location at Building 70. The transformer pad associated with historic building 2 was not investigated. No transformer pad associated with B140 is known to have existed.

2.5.1.4 Indoor Air Survey

An indoor air survey was performed in November during the heating season in New York. The survey consisted of the collection of concurrent sub-slab soil vapor, indoor air, and outdoor samples at all three site parcels (the 140, 100, and 70 properties). The purpose of this sampling was to determine whether groundwater and subsurface soil vapor contamination could potentially affect indoor air quality and human health. This survey was performed in accordance with the USACE-approved work plan (USACE 2007), which incorporated the New York State Department of Health's *Guidance for Evaluating Soil Vapor Intrusion in the State of New York, Public Comment Draft* (2005).

Three sub-slab samples, three indoor air samples, and one outdoor sample were collected on each property (see Figure 2.5-3). A pre-sampling inspection was conducted prior to the indoor air sampling to identify conditions that might interfere with the proposed testing, including the type of structure, floor layout, physical conditions, and airflows in the building(s) being studied. A commercial product inventory (e.g., cleaning supplies, lubricants, etc.) was also performed prior to sampling in order to identify and containerize/remove any products that could potentially interfere with the results of the surveys by contributing contaminants not associated with the groundwater or soil. No conditions warranting action were identified during the pre-sampling inspection or product survey.

2.5.1.5 Radiation Surveys

Phase I radiation surveys were performed by Cabrera Services of East Hartford, Connecticut, in accordance with the USACE-approved work plan (USACE 2007). Background levels for field instruments were measured in areas not suspected to be impacted by former site operations. The radiation survey results and a more detailed description of survey methodologies are presented in Appendix A. In 1997 and 1998, walkover gamma radiation surveys were performed across much of the exterior portion of the GTEOSI site (GTEOSI 1998).

Walkover Gamma Radiation Surveys

During the RI, a walkover gamma radiation survey was conducted at outdoor areas on the 70 property using a 3-inch sodium iodide (NaI) gamma scintillation detector/ratemeter combination connected to a global positioning system (GPS) receiver (see Figure 2.5-4). The survey was performed to assess the potential for elevated radioactive contamination at ground surface (i.e., the top 6 inches). The correlated gamma count rate and geospatial location were recorded once every second during the survey. The survey was performed over 100% of the reasonably accessible areas surrounding Building 70 using approximately 3-meter-wide transects.

Walkover gamma radiation surveys conducted by GTEOSI and NYSDEC were performed using a 2-inch NaI gamma scintillation detector/ratemeter combination connected to a GPS receiver. Surveys were performed on the parking areas to the south and east side of B140, the south and east side of B100, and on the Cantiague Park Driving Range property to the east of the site along the fenceline. The surveys were performed using 3-foot-wide transects (GTEOSI 1998).

Radiation Surveys Inside Building 70

Radiation surveys inside Building 70 were performed The surveys included verification measurements at locations identified as having elevated radiation levels during a radiological characterization survey performed by GTEOSI in 2003 (GTEOSI 2003c), and new surveys in the rear warehouse (not previously surveyed), which included the former recharge basin, and within building drains and other floor penetrations in Building 70. The measurements were obtained with a 2-inch NaI detector, alpha/beta scintillation detector, dose ratemeter, and a Gei-

ger-Mueller (GM) detector. All surface measurements were recorded, and the survey areas were marked.

Radiation Contamination Surveys

Contamination surveys were performed on sampling equipment. Surveys included surface scans and static measurements for alpha and beta radiation, wipes for removable alpha and beta contamination, and representative background measurements for all surveyed surfaces.

2.5.2 Phase II/III Soil Investigations

The Phase II RI was designed both to target data gaps in on-site areas where soils had not been previously sampled by GTEOSI and to confirm the GTEOSI sample results. While all three properties (B140, B100, and B70) were investigated, the major focus of Phase II was on the 70 property, which, as a result of its occupation by Air Techniques, Inc., until July 2006, was the property where the fewest previous investigations had been performed. GTE purchased this property just prior to the onset of this RI. The Phase II field activities were conducted following the completion of Phase I and the evaluation the data collected, which allowed for adjustments to the sampling plan (e.g., the addition of test pit activities at geophysical anomalies). Phase II was conducted in two sub-phases, Phase IIa (May and June 2007) and Phase IIb (October and November 2007). The main components of this investigation were as follows:

- Soil borings in areas not previously investigated to fill data gaps (see Figure 2.5-5);
- Confirmatory subsurface soil sampling beneath previously excavated remedial cells (see Figure 2.5-5);
- Investigation of leach pool/drain/drywells not previously investigated (see Figure 2.5-6); and
- Test trenching of areas with geophysical anomalies identified during Phase I (see Figure 2.5-6).

The objective of this effort was to determine whether contaminant sources were present in the unsaturated soils at the site. Releases of contaminants tend to leave a trail, or “footprint,” in their flow path as they move through unsaturated media, with contaminants being adsorbed or deposited onto the unsaturated soils. Depending on contaminant concentrations, the footprint can serve as a continual source of contamination to groundwater. Infiltrating water, mainly precipitation, can transport contaminants downward to the groundwater.

The majority of the USACE soil borings were installed for sample collection to a depth of 16 feet. Exceptions to this included borings in the former recharge basin area on the 70 property, which were installed to be advanced to a depth of 32 feet, and confirmatory borings, which were installed for sample collection at depths

just below the various excavation depths of the remedial cells. In addition, 20 borings were advanced to just above the water table (approximately 65 feet BGS) to aid in characterization of the full unsaturated zone. The boring locations were selected based on the likelihood of identifying areas of deep contamination and to provide full coverage around the site. Borings installed to 32 feet in the former recharge basin area were designated with an "I" in the sample ID for "Intermediate," and borings drilled to the water table were designated with a "D" in the sample ID for "Deep." The locations of these borings are identified on Figures 2.5-5 and 2.5-6.

An additional 60 shallow soil samples were collected at the beginning of the Phase IIIa investigation to supplement the data collected during Phase II and to support the USACE risk assessment. Soil boring logs for all investigations are included in Appendix D.

2.5.2.1 Soil Sampling and Field Screening

Unsaturated soils at the site were arbitrarily divided into 8-foot depth intervals, or zones (e.g., Z1, Z2), beginning from ground surface to near the top of the water table surface at 64 feet BGS (Z1 through Z8). Continuous soil sample cores were collected from surface to total depth from all borings, with the following exception: Confirmatory borings (described in greater detail below) were advanced to a point 5 feet above the expected clean backfill/native soil horizon prior to collecting soil samples so that the geologist could identify the interface between fill and native soils and then sample below it as necessary.

Soil samples were also collected from test trenches at the rate of two samples per test trench. One sample was collected from soils exhibiting the highest gamma and/or PID reading (SO-01), and one soil sample was collected from the deepest point (SO-02). All Phase II soil samples were tested in an off-site laboratory for nickel using EPA Method SW6010B; for VOCs using EPA Method 8260B; for uranium and thorium using Method DOE-A-01-R; and for Ra-226, Ra-228, and other gamma emitters using Method DOE-GA-01-1. Details regarding sampling and chemical analysis for Phases II and III are presented in Tables 2.5-2 and 2.5-3, respectively. In addition, due to the detection of PCBs in the Phase I RI surface and near-surface soil samples collected at the current and former B70 transformer pads, near-surface samples from borings SU14-11, SU14-12, SU14-13, and SU14-19, which were collected in the vicinity of these pads, were tested for PCBs. Laboratory analyses were performed by Test America (formerly known as Severn Trent Laboratories) of Saint Louis, Missouri.

Soil borings were installed using direct-push techniques (DPT)/Geoprobe and/or hollow-stem augers (HSAs) coupled with 2-foot split-spoon samplers (as described below). Soil cores collected with HSA/split-spoon samplers were stored until the complete 8-foot interval/zone (four split-spoons) was available for screening as a whole. The spoons were then split, field screened, and sampled in accordance with the USACE-approved work plan (USACE 2007, 2009). Soil cores collected with the Geoprobe macro-core or dual-tube systems were col-

lected into acetate sleeves and stored until the complete 8-foot interval (two sleeves) was available for screening as a whole. The soil borings were field screened to determine which interval of each 8-foot zone to collect soil samples from and to identify the most contaminated zone, which would be sampled while test pits were being installed. Sampling was conducted in accordance with the approved work plan (USACE 2007, 2009).

Three target depth borings were installed during the Phase IIb sampling. Shallow borings were intended to extend to a minimum of 16 feet BGS but were completed deeper if field screening indicated the presence of contamination toward the bottom of the boring. Intermediate borings were intended to extend to 32 feet BGS but were also completed deeper if field screening indicated the presence of contamination toward the bottom of the boring. Deep soil borings were completed by collecting continuous soil samples from ground surface to the top of the water table (or first saturated soils encountered). No samples were collected from saturated soil intervals, although some borings were continued after saturated soils were encountered to ensure that only a minor perched aquifer was not encountered. The water table was encountered at 64 feet BGS or less in each of the deep borings, and sample collection was terminated after reaching the water table.

After completing each boring, the borehole was sleeved with a polyvinyl chloride (PVC) pipe to prevent borehole collapse. For borings completed with the Geoprobe, 1.5-inch-diameter PVC piping was used; for borings completed with the HSA, 2-inch-diameter PVC was used. Downhole gamma logging surveys were then performed with a 1-inch NaI detector at 1-foot intervals with one-minute integrated measurements (see Appendix B and photo 21 in Appendix C). Data from the downhole gamma survey were used to help determine the sub-interval within each 8-foot zone to be sampled. All radiological screening was performed by Cabrera Services.

2.5.2.2 Drilling

All Phase IIa drilling services were provided by Zebra Environmental Corporation (Zebra) of Lynbrook, New York, using DPT/Geoprobe methods; and all Phase IIb drilling services were provided by Aquifer Drilling and Testing, Inc. (ADT), of New Hyde Park, New York, using both HSA/split-spoon sampling and DPT methods in accordance with the USACE-approved work plan (USACE 2007). One hundred and fifty-nine soil borings were completed during Phase IIa, and 66 soil borings were completed during Phase IIb. Shallow borings were drilled to 16 feet, intermediate borings (I) were drilled to 32 feet, and deep borings (D) were drilled to 64 feet. Eleven of the borings completed during Phase IIa were chosen for additional sampling during Phase IIb because of early refusal during the first attempt or sample results that indicated vertical delineation of contaminants was not completed at that location (100-11, SU09-10/D, SU11-05/D, SU12-03/I, SU12-12/I, SU13-07/D, DRH-A1, DRH-A2, DR-D, DR-J, and DR-K). In some cases, further delineation could not be performed at borehole locations as a result of restricted access (e.g., borings in the office location of B70).

2.5.2.3 Data Gap Areas

The review of previous GTEOSI site investigations revealed that soils at a number of areas throughout the three properties comprising the site had not been thoroughly investigated. These were considered data gap areas in the site conceptual model and were the main focus of the soils RI investigation (see Figure 2.5-5). Soils in areas with limited access inside B140 and B100 (mainly office space) and at the rear of each property were not fully assessed during previous investigations; therefore, soil borings were installed in these areas. The 70 property represented the largest data gap area, as very limited sampling had been conducted on this property during the VCP activities conducted by GTE. The 70 property was occupied by Air Techniques during the VCP soils investigation. Just prior to the beginning of this RI, the property was vacated and GTE acquired it, which allowed for full access. In order to determine boring locations, the 70 property was divided into six survey units (SU09 through SU14) using the MARSSIM approach. The MARSSIM approach also was used to select boring locations in the area between B140 and B100 (SU08). The MARSSIM approach employs a systematic triangular grid to establish boring locations using a randomly selected start point. This approach also was used during GTEOSI investigations on the B140 and B100 properties, and the resulting grids comprised survey units SU01 through SU07.

70 Property (Exterior) - Survey Units SU09, SU13, and SU14

Survey units SU09, SU13, and SU14 covered the exterior portion of the 70 property. A total of 49 borings were installed within these survey units (see Figure 2.5-5). Five of these were deep borings completed near or to the water table. Table 2.5-4 provides details of each boring installed during the Phase II RI. As mentioned previously in Section 2.5.2.1, samples collected from borings SU14-11, SU14-12, SU14-13, and SU14-19 were also analyzed for PCBs because of their proximity to the current and former transformer pads on the south side of B70.

One sample was inadvertently collected from the SU09-10/D boring at 64-66 feet BGS (SU09-10/D-Z9) during Phase IIb as opposed to the planned 56-64 feet BGS (Z8) interval. Therefore, no Z8 sample was collected from this boring. Boring SU09-08/D was originally planned as a deep boring to the top of the water table; however, during Phase IIa, it met refusal at 55 feet prior to encountering the water table. After reviewing the sample results, the decision was made to not continue this boring.

B70 (Interior) – Survey Units SU10, SU11, and SU12

Survey units SU10, SU11, and SU12 cover the area investigated inside B70. A total of 63 borings were completed inside B70 within these three survey units (see Figure 2.5-5). Six of these were completed as intermediate borings, five were completed as deep borings, and the remainder were considered shallow borings. Table 2.5-4 identifies the depths of these soil borings and number of samples collected from each boring during Phase IIb activities.

Survey unit SU10 encompassed the entire current office space portion of B70. Because of ceiling heights and doorway access limitations, only drill rigs with limited size and power could access this portion of the building. Consequently, 16 of the 19 borings completed here resulted in early refusal, and no deep borings could be completed in this portion of the building. All deep borings completed inside B70 were completed either in survey unit SU11 (the historical warehouse portion) or survey unit SU12 (the warehouse addition), and each extended 2 feet into the water table and terminated at 66 feet BGS. All intermediate borings were completed within survey unit SU12 in the area above the former recharge No. 4 (also referred to as Sump No. 4) and completed to 32 feet BGS.

140 Property (Exterior) – Survey Unit SU08

Survey unit SU08 covers the area between B140 and B100. Fourteen borings were completed in this survey unit, including two deep borings to the top of the water table (see Figure 2.5-5). Table 2.5-4 identifies the depths of these soil borings and number of samples collected from each boring during Phase IIb activities.

Sample collection from deep borings SU08-02/D and SU08-11/D were terminated at 48 and 56 feet BGS, respectively, where saturated soils were encountered. However, extra soil cores were collected below the water table from both of these borings to ensure that saturated soils were not just the result of a perched aquifer. These extra soil cores were field screened and the lithology was recorded in geotechnical logs, but no samples were collected for laboratory analysis.

In 2003, GTEOSI installed a series of 48 leach pools/dry wells in this area to manage on-site storm water. These leach pools/dry wells are 12 feet in diameter and are interconnected to one another. They are also bottomless, allowing storm water to infiltrate into the subsurface. This system manages water collected from roof drains of both B140 and B100 and the areas to the east behind both buildings. This may intermittently cause mounding of the water table and may be the cause of the saturated soils that were encountered in deep borings SU08-02/D and SU08-11/D at shallower depths than in other portions of the site. The presence of these structures also necessitated the relocation of two borings (SU08-04 and SU08-05) that had been planned through the MARSSIM approach.

Planned shallow boring SU08-14 was completed as part of the drywell investigation (described below) when the colocated shallow DRY-B boring was completed. The sample results of this boring are reported as DRY-B samples in this report.

140 Property and B140 - Data Gap Borings

The borings installed as part of this investigation were not completed using the MARSSIM approach. Investigations conducted prior to this RI using the MARSSIM approach in and to the east of this building omitted several areas (i.e., office space) because of limited access. Eleven soil borings installed as part of this RI were completed in areas not previously investigated within and immedi-

ately east of B140 (see Figure 2.5-5). Table 2.5-4 identifies the depths of these soil borings and the number of samples collected from each boring. Boring 140-07/D was completed as a deep boring to the top of the water table at 64 feet BGS. Borings 140-01 through 140-05 and 140-09 could not be completed to 16 feet BGS as planned because the limited access did not allow for the use of rigs powerful enough to achieve that depth. Exterior borings 140-10 and 140-11 were completed within the former footprint of B140 where a portion of the building had been removed during previous remedial cell installation activities conducted by GTEOSI.

100 Property and B100 - Data Gap Borings

The borings installed as part of this investigation were not completed using the MARSSIM approach. Investigations conducted prior to this RI using the MARSSIM approach in and to the east of this building omitted several areas (i.e., office space) because of limited access. Eleven soil borings installed as part of this RI were completed in areas not previously investigated within and immediately east of B100 (see Figure 2.5-5). Table 2.5-4 identifies the depths of these soil borings and number of samples collected from each boring. Boring 100-06/D was completed as a deep boring to 56 feet BGS where saturated soils were encountered and sampling was terminated. Borings 100-01 through 100-05 could not be completed to 16 feet BGS as planned because the limited access did not allow for the use of larger drill rigs to achieve that depth.

2.5.2.4 Confirmatory Soil Borings in Remedial Cells

In 2003 and 2004, soil was excavated from 13 on-site remedial cells. Excavation depths were based on the findings of previous investigations and contamination found through sampling during the excavation activities (GTEOSI 2006a). A total of 32 borings were performed as part of confirming previous sampling results below the remedial cells (see Figure 2.5-5). Table 2.5-4 identifies the depths of these soil borings and the number of samples collected from each boring. To determine whether contamination remained in the remedial cells following excavation, boreholes were installed in the cells to depths greater than the total previously excavated depth (based on sub-cell data). In order to ensure the sampling of native soils, the boreholes were drilled 5 to 10 feet below the reported maximum excavation cell depth before beginning soil core collection. Soil boring depths were adjusted if field geologists determined that clean fill was being encountered at a depth greater or shallower than anticipated. The sampling depths for 10 of these borings were adjusted in the field based on geologist observations and a re-evaluation of individual remedial cell depth variances. These adjustments are noted in Table 2.5-4.

All of the deep (i.e., drilled to the water table) confirmatory borings (C4-01/D, C6-02/D, C9-02/D, C9-03/D, and C9-04/D) were completed using a combination of DPT and HSA drilling techniques to prevent the transport of any contamination from native soils up the auger flights and through the clean fill material. The other confirmatory borings were drilled only to the bottom of the former excavation,

and one split-spoon sampler was advanced through the native soils (HSA technique). The drilling methods are described in Section 2.5.2.2.

2.5.2.5 Leach Pool/Drain/Drywell/Sump Borings

Historic leach pools, drains, historic drains, drywells, and sumps (LPH/DR/DRH/DRY/SMP) that had not been previously investigated were targeted for subsurface soil investigation during the Phase II RI. Historically, these features have been sources of contamination to soils and groundwater at industrial facilities. Soil borings were installed at historic locations or adjacent to existing structures throughout the three properties, with the exception of remedial cell areas (see Figure 2.5-6). Table 2.5-4 identifies the depths of these soil borings and the number of samples collected from each boring.

A total of 39 borings were completed as part of this investigation. Two of these borings (LPH-A/D and LPH-C/D) were completed as deep borings, with samplings collected from ground surface to the water table, which was encountered at 48 and 66 feet BGS, respectively.

Three historic leach pools (LPH-A/D through LPH-C/D), three historic drains (DRH-A1, DRH-A2, and DRH-B), 25 existing drains (DR-C through DR-CC), two historic drywells (DRYH-A and DRYH-C), three drywells (DRY-B, DRY-D, and DRY-E), and one sump boring (SMP-1) were investigated because they are likely sources of site contamination. Soil borings at drains DR-W through DR-CC were added while in the field when seven additional floor drains were discovered after removing the carpet from the office space portion of B70. Soil boring DR-BB1/2 was completed between two closely spaced drains (DR-BB1 and DR-BB2). Soil samples collected from each borehole were analyzed for VOCs, nickel, and radionuclides.

2.5.2.6 Test Trench Investigation

Based on review of the Phase I geophysical survey results, 21 test trenches were installed to investigate areas with significant GPR and/or electromagnetic anomalies. Figure 2.5-6 identifies the locations, dimensions, and orientation of these test trenches; Table 2.5-4 identifies the depths and number of samples collected from each trench and provides comments for each trench. The test trenches were excavated using a backhoe/front loader (see photos 10 through 18 and 24 through 53 in Appendix C). A 2-foot-wide standard backhoe bucket was used to dig these trenches. Each bucket of soil was screened with a minimum of a shielded, 2-inch NaI gamma detector and a PID (see photos 10, 25, 33, 34, 41, 46, and 52 in Appendix C). Two soil samples were collected from each test trench location: One soil sample was collected from the area exhibiting the highest gamma reading and/or PID reading, and the second soil sample was collected from the bottom of the deepest portion of the test trench.

Anomalies EM-8 and EM-9 were investigated in a single test trench that extended through both. Each anomaly was sampled separately; therefore, four samples were collected from this test trench.

2.5.2.7 Concrete Core Sampling

Concrete core samples were collected from the B70 slab at seven locations where above-background radiation readings were obtained during previous investigations and reconfirmed during the RI radiation survey. The cores were collected to determine whether the concrete or the soil beneath the concrete was contaminated. The cores were collected at locations D8-02, F6-01, F6-02, G4-01, F3-01, A3-01, and D9-01 (see Figure 2.5-6). The cores were collected by using a standard concrete coring machine with a 4-inch core bit (see photo 5 in Appendix C). The concrete and the soil beneath the slab were screened with the 2-inch NaI detector and a PID after removal of the concrete core (see photo 6 in Appendix C). Concrete cores from D8-02 and F6-02 were sent to the laboratory for characterization of radiological activity based on elevated activity detected during field screening. Soil boring F6-01 was installed and sampled due to above-background gamma readings in the soil beneath concrete core F6-01, and soil boring A3-01 was installed and sampled due to above-background PID readings in the soil beneath concrete core A3-01.

2.5.2.8 Phase IIIa Soil Sampling

Additional shallow soil samples were collected during the Phase IIIa investigation in accordance with the USACE-approved work plan (USACE 2009). Thirty surface soil samples (see Figure 2.5-7) were collected from zero to two feet BGS and submitted to General Engineering Laboratories, LLC (GEL) of Charleston, South Carolina, for analysis. The purpose of these samples was obtain appropriate soil data in the 0 to 2-foot depth interval to support the risk assessment. The samples were analyzed for TCL VOCs using EPA Method 8260B; TAL metals using EPA Method SW6010B; radiological parameters for uranium and thorium using Method DOE-A-01-R; and Ra-226, Ra-228, and other gamma emitters using Method DOE-GA-01-1. An additional 30 subsurface soil samples were collected from the same locations from the 2- to 8-foot BGS depth interval. These samples were analyzed only for TAL metals using EPA Method 6010B. Sample locations were equally spaced along a grid established across the entire site (see Figure 2.5-7). Soil sampling was conducted via DPT in accordance with the procedures outlined in the USACE-approved work plan (USACE 2009). Table 2.5-5 provides details of each soil boring installed using a Geoprobe drill rig during the Phase III RI.

2.5.3 Phase III Groundwater Investigation

Phase III was performed primarily to identify groundwater contamination on the site and nearby at the NCDPW (to the north) and Cantiague Park (to the east). In addition, smoke tests were performed to identify some B70 floor drain discharge locations.

The Phase III field program was divided into two phases, Phase IIIa and Phase IIIb, as described below. This approach allowed for a review of Phase IIIa results to identify data gaps prior to proceeding with Phase IIIb. Phase IIIa was completed between October 2008 and March 2009. During this phase, the soil data gap borings were drilled and sampled; the building floor drain survey was con-

ducted; and groundwater profiling, monitoring well installation, and monitoring well sampling were conducted. The results of the Phase IIIa investigation were reviewed during a Phase IIIb scoping meeting held on June 16 and 17, 2009. Adjustments to the planned Phase IIIb field investigations were made during this meeting and incorporated into the USACE-approved Phase III work plan as an addendum. Phase IIIb field activities were completed in April 2010. Table 2.5-6 provides details of each boring/well installed during the Phase IIIa and IIIb RI.

2.5.3.1 General Approach

During previous investigations, several monitoring wells and numerous groundwater profile borings were drilled and installed throughout the three properties by GTEOSI. Most of the existing on-site wells installed prior to this RI have been decommissioned (the exceptions are MW-3, MW-4, MW-8, MW-9, MW-10, MW-11, and MW-12). The results from previous investigations indicated the presence of chlorinated solvents, nickel, uranium, and thorium in on-site groundwater (GTEOSI 2005-2009). Several potential source areas were identified, but the locations of some source areas remain unknown. In order to delineate and monitor the chemical and radiological contamination on the site, a series of groundwater profiles and a network of groundwater monitoring wells were drilled and installed as part of this RI. Table 2.5-3 includes a summary of the Phase III sampling and chemical analysis.

The Phase IIIa program included:

- Drilling and groundwater profiling of four borings (i.e., no wells were installed at these locations);
- Drilling, groundwater profiling, and installation, development, and sampling of 19 deep wells and four shallow wells;
- Drilling of 30 shallow data gap soil borings; and
- Locating the drain pipes of some of the B70 floor drains (DR-BB-1 and-2, and others determined in the field).

The quantity, location, and total depth of vertical profiling points were based on historical data, including soil gas and geophysical surveys and historical groundwater sampling. Results from historical vertical groundwater profiling were used to generally locate proposed well locations and screen intervals. The results from Phase IIIa groundwater profiling along with quick turnaround results were used to determine final placement of well screens. The same approach was used during Phase IIIb (i.e., results from Phase IIIa along with any new quick turnaround profile data was used to modify well screen placement). Table 2.5-3 includes a summary of the Phase III sampling and chemical analysis.

The Phase IIIb program included:

- Drilling and groundwater profiling of five borings (wells were not installed at these locations); and
- Drilling, installation, and development of 24 shallow, 13 intermediate, and four deep wells.

The original scope of work was modified to include one additional boring (RI-P-54) requested by NYSDEC and two additional wells (MW-55S and MW-56S) added to the program to help define the nature and extent of uranium contamination detected in the northeast corner of the site. One proposed monitoring well (MW-40S) was completed as a profile boring only (i.e., no well was installed); a well at this location was deemed unnecessary based on the profile sample results and the proximity of MW-15S, which serves the same purpose. All Phase IIIa, IIIb, and seven previously existing wells were sampled as part of the Phase IIIb RI. The locations of all Phase IIIb groundwater borings and wells are identified on Figure 2.5-8. Table 2.5-6 provides details of each boring/well installed during the Phase IIIa and IIIb RI.

2.5.3.2 Drilling Methods

Groundwater profile borings/monitoring well borings were drilled using sonic drilling techniques in accordance with the USACE-approved work plan (USACE 2009). Sonic drilling is an exploratory technique that uses high-frequency vibrations to obtain continuous core samples, advance the casing for well construction, and other purposes. The method provides continuous samples from a wide range of unconsolidated formations and many consolidated formations (including bedrock). The drill stem and sampler barrel are vibrated vertically at frequencies between about 50 and 180 hertz (Hz), allowing the sampler barrel to advance by slicing through the soil. Sonic drilling is a dual-cased system.

Groundwater samples were analyzed for the presence of VOCs, metals, and/or radiological constituents in accordance with the USACE-approved work plan (USACE 2009). All of the shallow boring profile samples and the bottom 50 feet of the deeper boring profile samples requiring VOC analyses were also screened in the field for chlorinated VOCs using AQR Color-Tec® field kits. Field screening and quick turnaround laboratory analysis were used to determine whether additional profile samples beyond the planned sampling intervals were necessary.

2.5.3.3 Groundwater Profiling

Groundwater samples for screening purposes were collected using the Push-Ahead™ Vertical Aquifer Sampler and a stainless steel bailer in accordance with the USACE-approved work plan (USACE 2009).

During drilling of the boreholes, the use of drilling water was necessary. Drilling water was obtained from the local municipal supply from a permitted fire hydrant. An additive was occasionally used on deep borings as a lubricant to reduce fric-

tion on the outer casing of the drill rod. The exact type of drilling fluid additive was approved by the USACE prior to initiation of drilling activities and did not contain barium or other metals. When an additive was used, its use was discontinued beginning at 50 feet above the proposed well screen intervals to avoid compromising the hydraulic integrity of the well.

All groundwater profile samples were sent to a local laboratory America Analytical Laboratories (AAL) for VOC analysis, and, in accordance with the USACE-approved Phase III work plan, selected samples were also sent for metals analysis. VOC samples were analyzed by EPA SW846 Method 8260B using low-level detection limits (approximately 0.5 parts per billion [ppb]), and metals samples were analyzed by EPA SW846 Methods 6010B and 7470A using the lowest possible detection limits per compound. VOC results from the laboratory were used in conjunction with on-site field screening methods (as described below in section 2.5.3.4) to determine the vertical extent of contamination in the groundwater.

2.5.3.4 AQR Color-Tec® Groundwater Sample Field Screening

Groundwater samples were screened using the AQR Color-Tec® field screening analysis in accordance with the USACE-approved work plan (USACE 2009). AQR's Color-Tec® screening technique uses colorimetric detector tubes capable of detecting chlorinated alkenes to a detection limit of 5 parts per billion (ppb).

2.5.3.5 Groundwater Monitoring Well Installation

The locations of all Phase IIIa soil borings are identified on Figure 2.5-7, and the locations of all Phase III profile borings and groundwater wells are identified on Figure 2.5-8. A typical monitoring well construction diagram is included as Figure 2.5-9. The groundwater well network consists of 69 wells, including 62 newly installed monitoring wells (30 shallow, 16 intermediate, 19 deep, and four very deep) and seven existing shallow/intermediate monitoring wells. Phase III monitoring wells were installed using the aforementioned drilling methods and constructed using methods and materials described in the USACE-approved work plan (USACE 2009).

2.5.3.6 Groundwater Monitoring Well Development

Monitoring wells were developed in accordance with the procedures outlined in the USACE-approved work plan (USACE 2009). In accordance with the work plan, development occurred no sooner than 48 hours after final grouting of the well casing to prevent any uncured gout from entering the sand filter pack and well screen. Wells are developed to allow the restoration of natural flow conditions to the aquifer surrounding the well.

2.5.3.7 Groundwater Monitoring Well Purging, Sampling, and Analysis

In addition to the groundwater profiling discussed in Section 2.5.3.3, samples were collected from seven existing wells (MW-3, MW-4, and MW-8 through MW-12) situated along the southern border of the site and the 62 newly installed monitoring wells and submitted to an off-site subcontracted laboratory. The sam-

ples were analyzed for TCL VOCs by EPA Method 8260B; total TAL metals by EPA Method 6010B/7470; uranium and thorium isotopes by Method DOE-A-01-R; Ra-226 and Ra-228 by EPA Method 9315/9320; gross alpha/beta by EPA Method 9310; and gamma spectroscopy by EPA Method 901.1 (see Table 2.5-3). Low-flow purging/sampling using dedicated bladder pumps was used to obtain groundwater samples from the monitoring wells per the EPA Region II Guidance document titled *Groundwater Sampling Procedure, Low Stress (Low-Flow) Purging and Sampling* (USACE 2009). Groundwater parameters collected during the groundwater monitoring purging process included: pH, temperature, specific conductance, oxygen reduction potential, dissolved oxygen, and turbidity. Most groundwater samples collected and analyzed were non-filtered. However, both filtered (0.45 micron) and unfiltered metals and radiological samples were collected from three samples in Phase IIIa and five samples in Phase IIIb due to high turbidity (greater than 50 nephelometric turbidity units [NTUs])

2.5.3.8 Floor Drain Discharge Survey

During the Phase IIb investigation, elevated radiation readings were measured inside drain DR-BB in B70. During Phase IIIa investigations, an attempt was made to determine the discharge location of this drain, as well as other historical floor drains throughout the site. Two methods were used: a video camera survey coupled with a Sonde radio transmitter to determine pipe integrity and discharge location; and then, when necessary, in situ smoke testing (forcing smoke through pipe via a blower).

DR-BB was determined to flow north and outside of B70, under the parking lot. However, it could be traced only approximately 12 feet into the parking lot before hitting a “V” junction where the camera could not pass. Smoke test results were indeterminate. In the middle warehouse of B70, it was determined that drain DR-E contained water. Sample DR-E-W-01 was collected from it and sent for laboratory analysis. Drain DR-F, also located in the middle warehouse of B70, was found to have low volumes of water flowing in it, possibly as part of the roof drain system or as part of the water system. This water flowed to a drywell located on the south side of B70. A water sample could not be collected, so a sediment sample was collected from the bottom of the drywell (DR-F-SD-01). Both samples were analyzed for TCL VOCs using EPA Method 8260B; TAL metals using EPA Method SW6010B; radiological parameters for uranium and thorium using Method DOE-A-01-R; and Ra-226, Ra-228, and other gamma emitters using Method DOE-GA-01-1. The results of the sampling are discussed in Section 4.8, Miscellaneous Samples.

2.6 Site Survey

A horizontal and vertical site survey was performed by Wendel Duchscherer Survey (Wendel) of Lockport, New York. As part of this survey, a topographic map with1-foot contours was generated in support of base map development. All planned boring/sample locations were established and marked prior to drilling/sampling activities. If a sample location was adjusted in the field, follow-up surveys were performed.

Wendell developed the topographic map of the site using vertical elevations referenced to the North American Vertical Datum of 1988 (nearest ±0.1 foot) and horizontal measurements referenced to the New York State Plane Long Island Zone, North American Datum of 1983 (accuracy of ±0.5 foot).

2.7 Investigation-Derived Waste (IDW) Management

During the Phase II soil investigations, IDW soils from each boring were containerized in U.S. Department of Transportation (DOT) -approved 55-gallon drums. The soil in each drum was characterized based on the highest concentrations of chemical and radioactive contaminants from the associated borings. In addition, soil samples were collected from several drums to confirm the concentrations of contaminants in those drums. A total of 133 drums were shipped to US Ecology in Grand View, Idaho, for disposal. One drum contained a presumed lead-lined pail and was shipped as hazardous waste to the same disposal facility. Several drums that potentially contain enriched uranium in soil are currently being stored in a radiation area (roped off with signage) in B70 while disposal locations and drum sampling requirements are being evaluated.

During Phase II, decontamination water was held in 55-gallon drums and sampled and analyzed for Toxicity Characteristic Leaching Procedure (TCLP) VOCs, SVOCs, metals, pesticides/PCBs, reactivity, corrosivity, ignitibility, and radionuclides. The water was later transferred to on-site steel frac tanks.

During the Phase IIIa groundwater investigations, IDW soil was placed in roll-off boxes and analyzed for TCLP VOCs, SVOCs, pesticides/PCBs, herbicides, metals, and radionuclides. Based on the sample results, the roll-offs were sent to US Ecology in Grand View, Idaho, for disposal. The IDW water generated during the Phase IIIa groundwater investigation was stored in on-site steel frac tanks and sampled and analyzed for TCLP VOCs, SVOCs, metals, pesticides/PCBs, reactivity, corrosivity, ignitibility, and radionuclides. Based on the sample results, the water was shipped to Clean Water of New York in Staten Island, New York, for treatment and disposal.

Other IDW included used PVC from the boreholes, personal protective equipment (PPE), and other site trash. Based on site contamination surveys and site activities, the materials were classified as either not contaminated or potentially contaminated. The majority of materials were classified as not contaminated and were double-bagged and disposed of off-site as non-regulated solid waste. A small quantity of materials classified as potentially contaminated was placed in drums and shipped with the soil drums to US Ecology. One drum containing IDW (PPE and plastic) is being stored in a secure location in B70, as described above.

2.8 Deviations from the Work Plan

Field activities from Phases I, II, and III were performed in accordance with the USACE-approved work plans (USACE 2007, 2009). Deviations from the work plans, including the numbers and locations of borings/samples and collection procedures, occurred as a result of unanticipated field conditions and were approved by the USACE during the course of the investigations. Deviations to the work plan for Phases I, II and III are summarized in Table 2.8-1. Deviations to the approved work plans were generally minor and involved adjustments made to improve the overall quality of the assessment.

3 Physical Characteristics of the Study Area

3.1 Environmental Setting

3.1.1 Physiography and Topography

The site lies within the Atlantic Coastal Plain physiographic province of the United States. The region is underlain by poorly consolidated sedimentary formations of Cretaceous, Tertiary, and Quaternary age that gently dip to the south (seaward). In addition to being underlain by Cretaceous sediments, the surface deposits consist predominantly of massive moraine and outwash from the Pleistocene continental glaciers (USGS 2003).

The site topography is relatively flat except for man-made earthen berms located on the east property boundary near B100. The only vegetation onsite are weeds and a few areas of ornamental landscaping. Based on a site survey, the elevation is approximately 140 to 145 feet above mean sea level.

3.1.2 Climate

Climate data was obtained from the Western Regional Climate Center (http://www.wrcc.dri.edu). Based on records collected from the climate center in Mineola, New York, from 1938 to 2009, the average temperature in July is 74.7 degrees Fahrenheit (°F) and the average temperature in January is 32.0°F. The average annual precipitation is 44.68 inches, and the average seasonal snowfall is 24.30 inches. The climate of the region is representative of the humid area of the northeastern United States, with mild summers and cold, not commonly severe winters. The humid climate is controlled primarily by the prevailing westerly winds, causing most weather systems to approach from the continental United States. Temperature extremes tend to be subdued by the proximity of the Atlantic Ocean (Isbister 1966). Precipitation recharges Long Island's groundwater resource, or it is lost through direct runoff or evapotranspiration (Peterson 1988).

3.1.3 Threatened and Endangered Species

Based on the Federally Listed Endangered and Threatened Species and Candidate Species for Nassau County (USFWS 2010), one threatened plant species, the Seabeach amaranth (*Amaranthus pumilus*), and one endangered plant species, the Sandplain gerardia (*Agalinis acuta*), might potentially occur in the central portion of Nassau county, where the site is located. However, given the highly developed

condition of the site and surrounding area, suitable habitat for either species currently does not exist on or near the site.

In February 2010, the New York Natural Heritage Program (NYNHP) was contacted for information on species listed as endangered, threatened, or of special concern in New York State that may occur in the site vicinity. The NYNHP indicated that one state-listed threatened species, the green milkweed (*Asclepias viridiflora*), has been observed in a meadow environment approximately 1.5 miles north of the site in the Town of Jericho, Nassau County, New York. In addition, the NYNHP indicated that one state-listed endangered species, the tiger salamander (*Ambystoma tigrinum*), has been observed approximately 2 miles north of the site in the Town of Oyster Bay, Nassau County, New York. Residual contamination in soil and groundwater at the site and/or future remedial work to address the contamination is not expected to impact the natural habitats where these two species have been observed. A copy of the letter received from the NYNHP is included in Appendix E.

3.1.4 Historical Aerial Photographs Review

USACE reviewed numerous aerial photographs. The following photos of particular importance are discussed below and are included in Appendix F.

- January 1, 1951
- December 2, 1953
- January 24, 1957
- March 18, 1962
- May 5, 1966
- April 11, 1969
- April 18, 1972
- March 29, 1976
- April 6, 1980
- March 8, 1982
- March 4, 1990
- March 2000
- April 2007

3.1.4.1 B140

- 1951– The photograph shows a parking lot located on the west side of the site. A large production building (Building 2) and a small building (Building 9) are located on the east side of the site. None of the site appears to be paved, and vegetation covers approximately 50% of the property.

- 1953 – The property appears relatively unchanged from the 1951 photo.

- 1957 – A small building (Building 8) has been added to the property at the rear (east) of Building 2.

- 1962 – The photograph shows that an additional parking lot, building (Building 16), and a storage tank have been added east of the current parking lot. The parking areas appear to have been paved. East of Building 2, additional structures are present, including a sump/recharge basin (known as Sump 3) and a small structure next to it (Building 8).

- 1966 – The property appears relatively unchanged from the 1962 photo with the exception that Building 8 has been removed.

- 1969 – All buildings and parking areas from the previous photograph have been removed from the property. A new building (B140) is present on the site, and this building still exists on the property. Three-quarters of the property is paved, and the eastern quarter of the property lightly vegetated. South of the building is a single-lane access road to the parking area located east of the building.

- 1972 – The property appears to be the same as depicted in the 1969 photo.

- 1976 – There is an addition to the eastern portion of the existing building over what was previously a parking area. The eastern quarter of the site remains lightly vegetated. The single-lane road south of the building has been expanded to the southern border of the property which was previously disturbed soils.

- 1980 and 1982 – The property remains unchanged from the 1976 photo.

- 1990 – The building has been expanded again to the east and the entire lot has been paved.

- 2007 – Approximately 1/5 of the building on the east side had been removed (to allow for excavation activities that were conducted from 2003 through 2004). Steel beams and sheet piling are stored east of the building). No significant differences are observed from the present condition (2010) of the site.

3.1.4.2 B100

- 1951 – A production building (Building 1) was located in the center of the site and an L-shaped building (administrative Building 3) is located on the west side of the site. The property appears unpaved throughout with light vegetation. The eastern portion of the site does not appear to have any structures but the vegetation appears disturbed.

- 1953 – The property appears relatively the same as in the 1951 photo with the exception of a small building (Building 7) added to eastern portion of the property. The vegetation across the property appears much lighter.

- 1957 – A paved parking lot has been added immediately east of the administrative building (Building 3). Two sumps/recharge basins (known as Sumps 1 and 2) have been added along the southeastern border. A small production area or storage area was added east of Building 2 and adjacent to Building 7.

- 1962 – A small building (Building 5) west of Building 1 and three small sheds near Building 7 are visible.

- 1966 – The property appears relatively unchanged from the 1962 photo.

- 1969 – All buildings on the site have been removed. A small portion of parking area remains in the northwest portion of the property. The soils are disturbed with light vegetation across the property with the exception of a few bare areas.

- 1972 – The soils on the western portion of the property appear to have been disturbed. Otherwise, the property remains vacant of structure.

- 1976 – The soils on the western portion of the property appear to have been further disturbed with some mounding across the site. This is possibly related to the addition to the building on the 140 property.

- 1980 – Soils on the entire site have been disturbed. Vegetation along the eastern property line has been removed. A dirt road is visible leading from the western portion to the eastern portion of the property. A mound of soils is present in the north central portion of the property. Sixteen containers, possibly trailers, are located along the south central portion of the property.

- 1982 – The current B100 appears on this photo. The surrounding area does not appear to be paved.

- 1990 – The entire property (surrounding the building) is covered in asphalt parking areas. A small structure is located south of the southeastern corner of the building which may be the gas pump described in site records.

- 2000 – The property remains unchanged from the 1990 photo.

- 2007 – The parking area south and east of the building have been removed and replaced with gravel as a result of the soil excavation performed from 2003 through 2004. No significant differences are observed from the present condition (2010) of the site.

3.1.4.3 B70

- 1951/1953/1957 – The aerials show an undeveloped lot with the western half wooded and the eastern half having light vegetation. Some trails are visible through the wooded portion of the lot.

- 1962 – A large building (Building 4 [western portion of the current B70]) is present on the western portion of the lot with several other buildings north of it (Buildings 10, 11, 12, and 15). A sump/recharge basin (Sump 4) is present on the northeast portion of the property. The eastern most portion of the property is wooded or heavily vegetated with the exception of a trail and three areas where the vegetation appears to have been cleared.

- 1966 – The property appears relatively unchanged from the 1962 photo.

- 1969 – The buildings north of Building 4 (western portion of the current B70) have been removed and a parking lot now covers the entire area. This parking lot covers a small portion of what had previously been part of the property to the north. The eastern portion of the site remained undeveloped and vegetated.

- 1972/1976/1980/1982 - The property remained relatively unchanged from the 1969 photo.

- 1990 – An addition to the east side of Building 4 (western portion of the current B70) is present and extends into the previously wooded/vegetated property to the east. The property appears to be paved around the entire building and the sump/recharge basin (Sump 4) is no longer present. No significant differences are observed from the present day (2010) condition of the property.

- 2007 – The property appears relatively unchanged from the 1990 photo.

3.1.4.4 Properties Immediately Surrounding the Sylvania Site

- 1951/1953/1957 – North, east, and south of the site appears to be used for farming. Properties west of the site (across Cantiague Rock Road) appear to be used for industrial purposes.

- 1962 – The property north of the site appears lightly disturbed and largely stripped of vegetation. East of the site does no longer appears to be farmland. No structures are apparent, and the area is mostly covered with light vegetation. South of the site appears to have been developed for industrial use with the installation of a parking lots, buildings, and a sump/recharge basin along the southern boundary of the present day 70 property.

- 1966 – The property north of the site has been developed with the addition of an L-shaped building (as present today [2010]) and used for DPW operations. The southeast corner of this property appears to have an exposed salt pile. East of the site has been developed into the Cantiague Park with golf course and driving range facilities. The property south of the site appears relatively unchanged and industrial activities continue. A school building which is now a Nassau Board-Co-Op-Educational Services (BOCES) school has been built on a portion of one of the properties west of the site (directly west of current B100).

- 1969 – The properties north and east of the site remain relatively unchanged from the 1966 photo. The industrial property to the south shows a major addition to the main building on the property and the addition of another building located along the property line of the 70 property next to the sump/recharge basin. The building directly west of the current 140 property (west side of Cantiague Rock Road) has been demolished and is vacant with disturbed soils.

- 1972/1976/1980/1982 – The properties surrounding the site remain relatively unchanged from the 1969 photo.

- 1990 – A dome shaped building that currently houses a salt/sand mix used for de-icing roads has been constructed on the DPW property to the north. The sump/recharge basin and building along the southern boundary of the 70 property have been removed and replaced with a parking lot. All remaining properties appear relatively unchanged from the 1982 photo.

- 2007 – The previously vacant property immediately west of B140 has had a building constructed on it. No other significant differences from present day (2010) conditions are notable.

3.1.5 Soils

Soils at the site are classified as urban land (USDA 1987). Urban lands are defined as areas where 85% of the surface is covered with asphalt, concrete, or other impervious building material. These areas are mostly parking lots, shopping centers, industrial parks, or institutional sites. In general, most areas are nearly level, and some are gently sloping. Slopes range from 0 to 8% but predominantly range from 0 to 5%. In general, urban land soil consists of sandy loam (0 to 11 inches BGS), very gravelly loamy sand, gravelly loamy sand, and loamy fine sand (11 to 18 inches BGS) and stratified sand to gravel (18 to 60 inches BGS). In many ar-

eas, rapid or very rapid runoff prevents adequate discharge of runoff from intense rainstorms to safe outlets (see Section 3.1.8).

3.1.6 Floodplains

The Federal Emergency Management Agency (FEMA) delineates the regulatory 100-year and 500-year floodplain for use in the National Flood Insurance Program. The USACE team reviewed the FEMA 100-year and 500-year floodplain maps and concluded that the site is not located within a 100-year or 500-year floodplain.

3.1.7 Sole Source Aquifer

The principal drinking water source for the site lies within the Nassau-Suffolk Aquifer System, which meets the technical requirements for sole source aquifer designation. A sole source aquifer is defined as an aquifer system that supplies more than 50% of the drinking water for the aquifer service area (EPA 1975). The sole source aquifer designation helps to protect drinking water supplies since there are few or no alternative sources to the groundwater resources. The Sylvania site is located within this designated area.

3.1.8 Surface Water/Storm Water

Regionally, surface water in Nassau County consists of a few small streams, ponds, and marshes. Surface water collection is mainly controlled by precipitation rates, infiltration, runoff rates, and by perched water tables. Numerous perched ponds, marshes, and effluent streams occur north of the Ronkonkoma Moraine, which is north of the site (Isbister 1966).

There are no permanent surface water features within the site investigation area. The closest sizable surface waterbody to the site is Long Island Sound, which is located approximately 5.5 miles northwest of the site and includes tidal wetlands.

The majority of the site surface is paved, with the exception of areas that have been excavated, which were backfilled with clean fill and have a gravel surface. Surface runoff is not considered a pathway for off-site migration of contaminants. Virtually all storm water collected at the site is directed into numerous on-site dry wells and/or leach pools that allow for infiltration of storm water into subsurface soils and the underlying aquifer.

The on-site drywells are approximately 8 to 12 feet wide, 8 to 15 feet deep, and cylindrical in shape. Surrounding B70, five drywells were observed south of the building, 10 were observed east of the building, and five were observed north of the building. Surrounding B100, three drywells were observed south of the building, one was observed east of the building, two were observed north of the building, and two were observed west of the building. Near B140, one drywell was observed west of the building. Water from between buildings and from excavation areas, water from the excavated areas east of B100 and B140, and water from roof drains is directed into these drywells or into the leach pool/drywell system, which is described below.

In 2003 GTE installed a series of 48 leach pools/dry wells to manage on-site storm water collected between B140 and B100. These leach pools/dry wells are 12 feet in diameter and are interconnected to one another. They are bottomless, allowing storm water to infiltrate into the subsurface. This system manages water collected from the roof drains of B140 and B100 and the areas behind both buildings to the east.

Precipitation data obtained from the Western Regional Climate Center (http://www.wrcc.dri.edu) from the climate center in Mineola, New York, from 1938 to 2009 was used to calculate the approximate amount of on-site infiltration into the aquifer. Assuming no loss to evaporation and no water escaping offsite, on-site dry wells could collect and allow 1,059,951 gallons per month (12,719,412 gallons per year) to infiltrate through unsaturated soils at the site. This could cause intermittent mounding of the water table in the vicinity of the Site.

3.2 Geology

3.2.1 Regional Geology

In the New York City region, the Atlantic Coastal Plain physiographic province encompasses Long Island, a small portion of Staten Island, and all of southern New Jersey. The region is underlain by poorly consolidated sedimentary formations of Cretaceous, Tertiary, and Quaternary age that gently dip to the south (seaward) (USGS 2003). The unconsolidated sediments overlying bedrock are approximately 1,100 feet thick near the site, thinner in the northwestern part of Nassau County, and thicker southward. The overburden (unconsolidated deposits) consists of residual or weathered bedrock, sand, silt, clay, and gravel of alluvial or glacial origin. The deposits are divided into seven geologic units: two members of the Raritan Formation (Lloyd Sand member and Clay member), the Magothy Formation, two distinct units of the Port Washington Deposit, the Port Washington Clay Unit, and the Upper Pleistocene Deposits (Isbister 1966; Smolensky and Feldman 1988).

In addition to Long Island and the southern and eastern shores of Staten Island being underlain by Cretaceous sediments, the surface deposits consist dominantly of massive moraine and outwash from the Pleistocene continental glaciers. The coastal plain is continuous, with the shallow continental shelf extending from the shoreline seaward to the break in slope along the outer continental shelf (USGS 2003).

The bedrock underlying Long Island is Precambrian to lower Paleozoic in age. The bedrock geology predominantly consists of schist and gneiss with igneous intrusions. The bedrock is known to have some fractures. However, the fractures are not considered significant within the regional hydrogeology because of relatively low fracture permeability in comparison to the unconsolidated deposits (USACE 2005).

The unconsolidated, Cretaceous-age Raritan Formation dips and thickens southward and overlies the crystalline-bedrock surface. The Raritan Formation is subdivided on the Lloyd Sand member and the Clay member, which is the uppermost part. The Lloyd Sand member consist of fine- to coarse-grained sand and gravel commonly within a clayey matrix and forms the Lloyd aquifer, the lowermost principal aquifer on Long Island. The clay member has a maximum thickness of about 300 feet and consists of massive silty clay with a few lenses of sand and lignite. The clay member forms a leaky confining unit (USGS 1995).

The Magothy Formation, which unconformably overlies the Raritan Formation, is composed of unconsolidated fine- to medium-grain quartzose sand with layers and lenses of clay, silt, and coarse sand and gravel. The Raritan part of the Magothy Formation is overlain by Jameco Gravel, which ranges from fine sand to gravel, with some lenses of clay and silt. The Jameco Gravel is overlain by a marine deposit identified as Gardiners Clay. The Gardiners Clay is clayey and silty in the western half of its extent but becomes increasingly sandy to the east. Where present, the clay forms a confining unit that separates the upper glacial aquifer from the Magothy and Jamesco aquifers (USGS 1995).

The stratigraphy of the Atlantic Coastal Plain has 100 million years of transgressions and regressions of seas across the region. Shoreline migrations were driven by major changes in sea level. Erosion and tectonic submergence prior to the Late Cretaceous had probably reduced the topography of the Atlantic Coastal Plain to a broad, low plain near sea level (USGS 2003).

3.2.2 Site Geology

Four distinct geologic units underlie the site (see Figure 3.2-1). These units are, from youngest to oldest; glacial deposits composed of the Ronkonoma and/or Harbor Hill glacial outwash (Upper Glacial); the Magothy Formation and Matawan Group (Magothy); a clay member of the Raritan Formation (Raritan Clay); and the Lloyd Sand member of the Raritan Formation (Lloyd) (USGS 1995). Only two of these units (Upper Glacial and Magothy) were encountered during site investigations.

The Upper Glacial unit beneath the site consists of Pleistocene outwash deposits (brown, medium- to coarse-grained sand with minor amounts of fine sand and silt, and gravel). The Magothy Formation is primarily composed of brown, fine- to medium-grained sand with some gravel, silty sand, silt, and clay layers. The silt and clay layers are discontinuous and relatively thin (USGS 1995). Based on subsurface drilling investigations conducted at the site by USACE, the transition from the Upper Glacial unit to the Magothy Formation was not distinct and is estimated to occur from approximately 40 feet to 67 feet BGS.

During subsurface soil investigations conducted at the site by USACE, soil cores were collected from ground surface to approximately 400 feet BGS. Most of the soil cores consisted of sand or silty sand, with varying amounts of distributed gravel observed to depths of 289 feet BGS. The sand and silty sand varied from light

brown, to medium brown, to reddish brown, poorly graded to well-graded, gravel to no gravel, subangular and fine-grained to coarse-grained. Several gravel lenses were observed from approximately 11 feet to 265 feet BGS in one boring located in the southwest corner of the site. Clay was mainly observed in deeper intervals, ranging from approximately 235 feet to 375 feet BGS at thicknesses of 10 to 30 feet. However, one shallow 10-foot-thick layer of clay was observed near the west side of the site from 45 feet to 55 feet BGS. Some thin clay layers were observed in shallower cores (<100 feet) but were not persistent throughout the site. The clays were very stiff, gray, dense, and dry, had some banding, and had a high silt content. In general, clay units across the site were noted as being discontinuous and would not act as an aquitard/aquiclude at this site. Sandy silt layers up to 30 feet thick were observed in some of the borings and were described as silt with very fine-grained sand, gray, wet, with no gravel and having a pasty consistency. Detailed geological descriptions of the soil cores are included as Appendix D.

3.3 Hydrogeology

3.3.1 Regional Hydrogeology

The three most important Long Island aquifers are the Upper Glacial, Magothy, and Lloyd aquifers (see Figure 3.3-1). The Upper Glacial aquifer, which is an unconfined aquifer directly underlying the ground surface, was formed during the Pliocene-Quaternary glaciation. The Harbor Hill Moraine and Ronkonkoma Moraine (both part of the Upper Glacial Magothy) represent two different glacial advances and run east to west for the length of Long Island. They comprise poorly sorted glacial till (sand, pebbles, rock, boulders) deposited at the glacier's leading edge. Found between these moraines and to the south, are outwash plains of well sorted sand and gravel (NYSDEC 2000).

The Magothy is the largest of Long Island's aquifers. Consisting of sand deposits alternating with clay, it attains a maximum thickness of approximately 1,100 feet and is the source of water for most of Nassau County and about half of Suffolk County (NYSDEC 2000). A groundwater divide trending predominantly east–west is located near the center of Long Island. Groundwater flow on either side of the divide is predominantly to the north and south. Groundwater flow near the groundwater divide is nearly vertical (Buxton and Modica 1992). Storativity in the Magothy ranges from water table conditions (0.25) to confined conditions (0.0006) (GTEOSI 2007c). Hydraulic conductivity for the Magothy Formation (based on aquifer tests of permeable portions of the aquifer) range from 200 gallons per day per square foot (gpd/ft^2) to 1,100 gpd/ft^2, with an average of 500 gpd/ft^2, or approximately 27 feet per day (ft/d) to 150 ft/d, with an average of 67 ft/d. The horizontal hydraulic gradient in shallow portions of the Magothy can range from 0.0001 to 0.001 feet per foot; however, the hydraulic gradient can be affected by hydraulic stresses such as local pumping, recharge basins, and remediation systems (Busciolano et al. 1998). Groundwater velocities can range from a low of 0.01 foot per day near the groundwater divide to more than a foot per day in shallow portions of the Magothy (Buxton and Modica 1992).

The Lloyd aquifer underlies the Magothy aquifer. The Raritan confining unit between the Magothy and Lloyd aquifers has two primary units, an upper clay member, and a lower sand member named the Lloyd Sand. The clay member separates the Magothy and Lloyd aquifers and serves as a confining unit for the underlying Lloyd Sand aquifer. The clay member has a maximum thickness of 300 feet (NYSDEC 2000).

The Lloyd aquifer is the deepest and oldest of Long Island's aquifers. It is a sand and gravel formation ranging in thickness from zero to 500 feet. At its deepest, it is 1,800 feet BGS, and is underlain by bedrock (NYSDEC 2000). The water contained in the Lloyd aquifer is about 6,000 years old. Not many wells tap this formation, and New York Environmental Conservation Law §15-1528 establishes a moratorium on the use of water from this formation in order to maintain it for future generations. The Lloyd aquifer has been estimated to contain about 9% of Long Island's freshwater (Garber 1985) but receives only 3.1% of the recharge that enters the Long Island aquifer system (Buxton et al. 1991; Buxton and Modica 1992). The Lloyd aquifer receives this recharge through a corridor generally less than 0.5 mile wide that lies along the regional groundwater divide (USGS 1998), near the center of Long Island (see Figure 3.3-1).

The principal drinking water source for the site lies within the Nassau-Suffolk Aquifer System, which meets the technical requirements for sole source aquifer designation (EPA 1975; see Section 3.1.7).

Three other geologic units partially underlie Long Island and are of local importance. In Brooklyn and southern Queens counties, the Upper Glacial aquifer is underlain by the Pleistocene Gardiners Clay (serving as a confining layer) and the Jameco Gravel aquifer. On the south shore of Long Island, the upper Cretaceous Monmouth Group overlies and forms a confining unit for the Magothy aquifer (NYSDEC 1999).

3.3.2 Site Hydrogeology

As part of the work plan, groundwater wells were named with a depth qualifier (shallow, intermediate, or deep) according to the total depth of the well. The depth range for these designations was later revised and assigned during the Phase IIIb program to include: shallow wells (S) with total depths extending from the top of the water table to 120 feet BGS; intermediate wells (I) with total depths extending from 120 feet BGS to 250 feet BGS; deep wells (D) with total depths extended from 250 feet BGS to 350 feet BGS; and deeper wells (DD) with total depths beyond 350 feet BGS.

Groundwater occurs as an unconfined aquifer in the shallow portions of the Magothy Formation. Groundwater elevations are provided in Table 3.3-1. Based on static groundwater level data collected by USACE in March 2009 (mainly deep wells), groundwater at the site occurred at approximately 65 feet BGS, which is the depth near the contact between the Magothy and the Upper Glacial aquifers. Groundwater elevations ranged from approximately 77 to 79 feet above mean sea

level (AMSL), with an average elevation of 78.4 feet AMSL. The horizontal hydraulic gradient was approximately 0.0014 feet per foot, which is an average based on the following well pairs from Phase IIIa: MW-15D and MW-32D; MW-14D and MW-31D; and MW-13D and MW-30D).

In April 2010, groundwater elevations ranged from approximately 80 to 82 feet AMSL, with an average elevation 80.9 feet AMSL. Based on Phase IIIb groundwater elevation data measured on April 6, 2010, shallow groundwater flow was predominantly to the southwest; intermediate groundwater flow was to the southwest; and deep groundwater flow was predominantly to the south, with a southwestern component in the eastern portion of the site (see Figures 3.3-2 through 3.3-4, respectively). Future water level measurements are planned to obtain a better understanding of any seasonal variations and any site-specific flow conditions.

The horizontal hydraulic gradient was approximately 0.0011 feet per foot, which is an average based on three sets of well pairs across the site (MW-15D and MW-32D; MW-14D and MW-31D; and MW-13D and MW-30D). The average vertical hydraulic gradient is approximately 0.0069 feet per foot between shallow and intermediate wells; 0.0026 feet per foot between shallow and deep wells; 0.0048 feet per foot between shallow and deeper (DD); 0.0022 feet per foot between intermediate and deep (D) wells; and 0.0050 feet per foot between deep (D) and deeper (DD) wells. No site-specific hydrologic investigations (e.g., slug tests or pumps tests) were performed during the RI, as a wealth of hydrologic data for areas in immediate proximity to the site are publicly available.

Storm water is collected into on-site drywells and/or leach pools, which allow for infiltration through unsaturated soils of the site into the underlying aquifer. Build-up of storm water in these devices may intermittently cause mounding of the water table. This may explain the reading in monitoring well MW-19S, which was 0.73 foot higher than in monitoring well MW-17S (see Figure 3.3-2). MW-19S is located directly beneath a series of drywells that collects much of the storm water collected on the 140 and 100 properties. As much as a million gallons per month are directed into on-site drywells, assuming no loss to evaporation and no water escaping off site. See section 3.1.8 for further details. Future measurements of water levels are planned to obtain a better understanding of the dynamics of groundwater flow at the site.

The average groundwater elevation at the site was approximately 74 feet AMSL in December 1999 (GTEOSI 2000) and 74 feet AMSL in December 2000 (GTEOSI 2001). During the most recent site activities, the average groundwater elevation at the site was approximately 78.4 feet AMSL in March 2009 and 80.9 feet AMSL in April 2010. Based on this data, it appears that over the past 10 years the average groundwater elevations at the site have been rising.

3.4 Public Water Supply Wells

The site is located within the Hicksville Water District (HWD), which supplies public water to the site and surrounding area. The HWD is one of Long Island's

largest public drinking water suppliers and has been in operation for over 75 years. The HWD provides approximately 48,000 customers with more than 2 billion gallons of water from nine plants and 15 supply wells located in a 7.9-square-mile area. These wells extend approximately 600 feet BGS into Long Island's Magothy aquifer. The water is carried through more than 165 miles of pipelines to homes and businesses in Hicksville, as well as portions of Bethpage, East Meadow, Jericho, Levittown, Syosset, and Westbury. Five of 15 of the district's plant sites have air-stripping equipment to remove VOCs that may be present in the groundwater (HWD 2010a).

The site is located near the confluence of several water districts. Below is a summary of five water districts that have public supply wells completed within a 2-mile-radius of the site (Hicksville, Jericho, Old Westbury, Westbury, and Bowling Green). Figure 3.4-1 identifies the locations of these water districts and public supply wells in relation to the Sylvania site. Records regarding other potential potable supply wells were not reviewed at this time.

3.4.1 Hicksville Water District

The site is located within the HWD. The HWD operates two active public supply wells (N-13097 and N-03878), located northeast of the site within a 1-mile radius, and six active public supply wells (N-07562, N-06193, N-09180, N-08526, N-09212 and N-07561) located from south to east-northeast of the site within a 1- to 2-mile radius. The HWD also has four abandoned wells (N-03953, N-03552, N-05936 and N-03553), two inactive wells (N-08249 and N-09488), and one emergency well (N-10208) within a 1- to 2-mile radius of the site.

3.4.2 Jericho Water District

The Jericho Water District operates one active well (N-04245) within a 1- to 2-mile radius northeast of the site and one inactive well (N-07030) within a 1-mile radius north of the site.

3.4.3 Old Westbury Water District

The Old Westbury Water District is located approximately 1.25 miles northwest of the site. This district operates one active well (N-00152) within a 1- to 2-mile radius of the site.

3.4.4 Westbury Water District

The Westbury Water District is located approximately 0.25 mile southwest of the site. This district operates four active wells (N-07353, N-05007, N-02602, and N-08497) within a 1- to 2-mile radius of the site and two emergency wells (N-05855 and N-06819) within a 1-mile radius of the site.

3.4.5 Bowling Green Water District

The Bowling Green Water District is located approximately 0.75 mile south-southwest of the site. This district operates two active wells (N-08956 and N-08957) within a 1- to 2-mile radius of the site.

4 Nature and Extent of Contamination

4.1 Introduction

This section describes the nature and extent of soil, groundwater, indoor air, and soil gas contamination at the Sylvania site. The nature and extent of contamination in soils relies on a combination of data collected by USACE and GTEOSI data collected during the Phase I Soil Remediation (GTEOSI 2007a) and Supplemental Investigations (GTEOSI 2007b). GTEOSI's Phase I Soil Remediation Report identified radioactive materials (processed natural uranium, thorium, and associated radioactive progeny), VOCs (PCE and TCE), and nickel as site contaminants to be remediated. For the purposes of this RI, all in situ contaminant data were considered in identifying contaminants of potential concern (COPCs). The USACE's authority at the Site is limited by CERCLA and applicable Energy and Water Development Appropriations Acts to FUSRAP waste, hazardous substances, pollutants and contaminants that actually resulted from work performed as part of the nation's early atomic energy program. Hazardous substances, pollutants and contaminants that are not FUSRAP wastes were detected at the site. Some of these constituents were not from the early atomic energy program-related activities but were from other site activities, some (in groundwater) were from upgradient sources, and some were the result of biodegradation of the organic constituents. These constituents do not contribute significant risk at the site due to limited exceedance. Nevertheless, these were evaluated as part of the USACE RI effort for completeness and for potential effects on site risk, and the results of the USACE analyses of these constituents are reported herein.

- Section 4.2 provides a discussion of the usability of the data used to define nature and extent in this section of the report.
- Section 4.3 discusses the interactive database produced to present data to support this RI.
- Section 4.4 describes the results of the USACE Phase I reconnaissance investigations and the nature and extent of VOCs in soil gas, indoor air, and PCBs in soils surrounding the transformer pad at B70.

- Section 4.5 discusses the current nature and extent of existing soil contamination at the site based on samples collected by the USACE and GTEOSI.
- Section 4.6 provides a summary of the findings of the GTEOSI Phase I Soil Remediation (GTEOSI 2006a).
- Section 4.7 discusses the nature and extent of groundwater contamination.
- Section 4.8 discusses the results of miscellaneous samples that were collected during the USACE remedial investigations.
- Section 4.9 discusses how COPCs for soils were identified.

All data presented in tables, maps, text, and the interactive database (discussed below) reflect current conditions of the site.

4.2 Quality Assurance/Quality Control

4.2.1 Data Quality Evaluation

All data were reviewed according to applicable procedures outlined in the work plans. Overall, the data quality was acceptable and the laboratory analysis and reporting procedures were representative of the appropriate methodologies for vapor, water, and soil samples. The completeness goals for the project were met for each phase. Results that were qualified as estimated are considered usable for the purposes of this project, while results qualified with an R (rejected), or a UR (not detected and rejected), are not usable. For detailed information on Phases I, II, or IIIa, see the Quality Control Summary Report (QCSR), which is included as Appendix G. For detailed information on the GTEOSI data, see Appendix D of the Phase I Soil Remediation Report (GTEOSI 2006a), and for Phase IIIb, see the Data Usability Assessment Report included in Appendix G.

The validation qualifiers that were added to the data in the final report tables and the electronic database, as appropriate, are defined as follows:

J – This qualifier indicates an estimated value because the associated QC data indicated a potential laboratory or matrix problem or interference. In addition, J flags assigned by the laboratory to chemical data indicate the results are below the practical quantitation limit (PQL) but above the instrument detection limit (IDL) or method detection limit (MDL).

J+ – Results with a “+” have the potential for positive bias and are considered estimated.

J- – Results with a “-” have the potential for negative bias and are considered estimated.

R – The positive results were rejected because of serious deficiencies in the ability to analyze the sample. The presence or absence of the analyte can-

not be verified. Negative radiochemical results with absolute values greater than their 2-sigma uncertainty were rejected in accordance with the USACE Kansas City and St. Louis District Radionuclide Data Quality Evaluation Guidance for Alpha and Gamma Spectroscopy, Revision 01, June 27, 2004.

U – The result is considered non-detect at the reported value. The laboratory assigned this flag to analytes not present at detectable concentrations (above the IDL or MDL). The data validator assigned this qualifier when an analyte was considered non-detect as a result of blank contamination. If the result is above the PQL, the PQL is considered elevated.

UJ – The reported value for the PQL (or MDC for radiological data) is considered estimated.

UR – The result is considered non-detect, but the reported value is rejected and not usable for environmental data assessment.

4.2.2 PARCC Parameters

Sampling and analysis were performed using methods and techniques designed to optimize and evaluate precision, accuracy, representativeness, completeness, and comparability (PARCC; the primary data quality indicators) in the data. Meeting PARCC objectives was optimized by following the work plans; using quality laboratories; and management oversight of the work. Instances of questionable QC performance were evaluated and addressed in the QCSR (for GTEOSI data, see the Phase I Soil Remediation Report (GTEOSI 2006a) and for Phase IIIb, see the Data Usability Assessment Report included in Appendix G. The PARCC parameters are defined as follows:

- **Precision.** Precision was evaluated through the use of field and analytical duplicate samples.
- **Accuracy.** Accuracy was evaluated through the use of analytical standards, QC samples such as spikes and LCSs, and blank samples.
- **Representativeness.** Representativeness of the data was evaluated through the use of field and analytical duplicate samples.
- **Completeness.** The analytical completeness, i.e., the percentage of obtained measurements that are judged to be valid and usable (excludes data that are qualified with R or UR).
- **Comparability.** Comparability of the data was evaluated through the use of field and analytical QC samples; through the use of consistent CRDLs and ensuring that the laboratories met them; and by management oversight, which determined that the work was performed consistently with previous techniques.

4.2.3 Data Usability

4.2.3.1 GTEOSI Data

All PARCC parameters met the objectives for usability except as noted below. Quality control results that did not meet PARCC objectives and did not impact data usability are discussed in detail in the QCSR, which is included in Appendix G. The analytical completeness exceeds 90% for each of the two on-site laboratories used, and 98.7% for the samples analyzed at Severn Trent Laboratories, Inc. Several VOC/TPH results were rejected due to laboratory recovery issues. Positive Ra-226 results were rejected due to poor peak shapes. The data from the two on-site laboratories should be considered screening data due to the lack of laboratory certification and other concerns; however, it is considered usable for determining the nature and extent of contamination. The data from Severn Trent Laboratories, as evidenced by the higher completeness, was of a higher quality overall than that from the on-site labs and is therefore usable for the purpose of this RI.

4.2.3.2 USACE Phase I Data

All PARCC parameters met the objectives for usability except as noted below. Quality control results that did not meet PARCC objectives and did not impact data usability are discussed in detail in the QCSR, which is included in Appendix G. The analytical completeness is 96%. Several of the passive soil gas results should be considered estimated due to high variability in field duplicate results and VOCs found in laboratory blanks and trip blank. The blank levels were much lower than levels found in the samples. The results of two subslab and indoor air survey samples were rejected due to suspected leaking air canisters. One of the suspected leaking air canisters was a replicate sample and the original sample was acceptable. The sub-slab air sample trip blank had several compounds (acetone, benzene, chloroform, chloromethane, dichlorodifluoromethane, hexane, methyl ethyl ketone, methylene chloride, toluene, and trichloroethene) detected; low level results found in the associated sample were qualified “U” (resulting in slightly elevated detection limits). The purpose of the sampling program was to identify hot spots and data are usable for this purpose. The Phase I data is usable for the purpose of this RI; other uses should be evaluated closely.

4.2.3.3 USACE Phase IIa Data

All PARCC parameters met the objectives for usability except as noted below. Quality control results that did not meet PARCC objectives and did not impact data usability are discussed in detail in the QCSR, which is included in Appendix G. The analytical completeness is 99.1%. Acetone was detected in equipment and field blanks due to suspected contamination in the source water that was supplied by the laboratory, but this did not significantly affect data usability. Some or all of the VOC results for seven soil samples were rejected due to laboratory issues. The remaining data are usable for the purpose of this RI.

4.2.3.4 USACE Phase IIb Data

All PARCC parameters met the objectives for usability except as noted below. Quality control results that did not meet PARCC objectives and did not impact

data usability are discussed in detail in the QCSR, which is included in Appendix G. The analytical completeness is 99.7%. Several VOC results for soil samples 100-06/D-Z3, 100-996-Z1, and LPH-C/D-Z1 were rejected due to laboratory issues, and the Ra-228 result for sample RB-14 was rejected due to a large negative value. The remaining data are usable for the purpose of this RI. Approximately 55% of gamma spectroscopy results for the soil samples were qualified as estimated due to density differences between the samples and the calibration standard; however, later comparisons showed that the densities in question affected the results to a minimal extent. Some of the low-level Th-230 results were qualified due to low levels of Th-230 detected in the method blanks, which was found in many cases to be due to tailing from the tracer peak. Tetrachloroethene (PCE) results for samples SU08-11/D-Z6 and SU08-11/D-Z7 are suspect due to carry-over from high-level sample SU08-11/D-Z5, for which results are also suspect. Several samples were not analyzed for 1,4-dioxane due to the use of two laboratories for VOC analyses with different compound lists, one of which did not include 1,4-dioxane; however, in those samples for which the analysis was performed, 1,4-dioxane was not detected; therefore, the data is usable for purpose of this RI.

4.2.3.5 USACE Phase IIIa Data

All PARCC parameters met the objectives for usability except as noted below. Quality control results that did not meet PARCC objectives and did not impact data usability are discussed in detail in the QCSR, which is included in Appendix G. The analytical completeness is 99.1%. Bromoform and 1,1,2-trichloroethane results for sample RI-SB-17-NS were rejected based on low spike recoveries. Several radiological results were rejected due to large negative values. A few radiological detection limits were elevated due to re-analyses with limited sample volumes. Data qualified as estimated due to duplicate variability, low levels of common laboratory contaminants found in trip and method blanks, or other minor issues are usable.

4.2.3.6 USACE Phase IIIb Data

All PARCC parameters met the objectives for usability except as noted below. Quality control results that did not meet PARCC objectives and did not impact data usability are discussed in detail in the QCSR, which is included in Appendix G. The analytical completeness is 98%. Several metals, VOC, and radiological results were rejected due to quality issues. All 1,4-dioxane results were nondetect and were rejected due to poor relative response factors. Data qualified as estimated due to minor quality issues are considered usable. The gamma spectroscopy results, although not rejected or qualified as estimated, had high detection limits and uncertainties in some cases, and were not used for this RI.

4.3 Interactive Database

An interactive data retrieval system developed using Microsoft Access, is provided on compact disc as Appendix H. This interactive system includes all sample results (both GTEOSI and USACE data) used to determine the nature and extent of contamination for all media. This system allows for the retrieval of specific data sets using multiple filters (e.g., property, depth, analyte, etc.) to aid in

the evaluation of the data. Rejected data records were not included in this database in order to provide useable data only. Only sample data that represents current in situ conditions on the site are included in this database. The data available to support the determination of nature and extent of contamination in soils is extensive and is not suitable for presentation in summary tables due to the extensive numbers of pages that would need to be generated. The data available for other media (e.g., from air samples) are not as extensive; therefore, tables summarizing the sample results for these media are provided. However, this data is also included in the database for review.

For many GTEOSI soils samples, the analytical data included the results from duplicate analyses performed by both their on-site and off-site labs. In instances where these duplicate analyses were performed, the analytical results from the off-site laboratory, which were considered more reliable, were incorporated into the database. In addition, the data under the groundwater monitoring well tab in the database includes sample results from both the Phase IIIa sampling event, which was performed prior to the full installation of the monitoring well network, and the Phase IIIb sampling event, which was performed after the monitoring well network was completed.

4.4 USACE Phase I Reconnaissance Investigations

4.4.1 Geophysical Survey

The EM survey identified many areas of elevated response throughout the survey area. The majority of these areas were determined to be readily identifiable features, including reinforced concrete (visible at surface), fencing, underground utilities, manholes/drains, monitoring wells, or other known metallic structures. However, 36 of the areas of elevated response were determined to be anomalies and may be the result of buried debris or other unknown structures. Targeted surveys were performed using GPR to confirm the presence of or add detail to anomalies identified by the EM survey and to determine whether selected historic structures (e.g., leach pools) were still present. In addition, the GPR survey identified seven anomalies associated with the general exterior and targeted surveys. None of the anomalies indicated the presence of buried drums or storage tanks. The difference in the number of EM anomalies versus GPR anomalies may have been due to the greater penetration of the EM-61, which in some areas may have been responding to features that were buried deeper than the penetration of the GPR signal.

The geophysical survey report is provided as Appendix A, and a discussion of each anomaly is provided in Table 1 of Appendix A. Figures 1 and 3 of Attachment 1 in Appendix A present the results of the EM-61 survey with the GPR survey results superimposed. Figures 2 and 4 of Attachment 1 in Appendix A present the results of the GPR survey with the EM-61 survey results superimposed.

Based on the results of the geophysical survey, the USACE installed 21 test trenches at 20 anomaly locations during Phases IIa and IIb. Two test trenches were installed at two of the anomalies (EM-15 and EM-29) to target the highest

response areas within the anomaly. A single test trench was installed at EM-8 and EM-9 due to their proximity to each other. A description of the findings at each anomaly is included in Table 2.5-4. Soil samples were collected from each test trench, and the results for those samples are included in the discussion presented in Section 4.5.

The results of the GPR surveys that targeted the suspected leach pool, drain, and drywell are also discussed in Table 1 of Appendix A. In summary, existing catch basins were identified at two of the drywell locations (DRY-B and DRY-D), and subsurface anomalies were associated with five targeted locations (DRYH-C, DRY-E, LPH-B, LPH-C, and DRH-A). Three anomalies (DRYH-A, DRH-B, and LPH-A) remain as "unknowns" because of poor signal penetration due to the presence of reinforced concrete.

4.4.2 Exterior Soil Gas and Building 70 Sub-Slab Survey

4.4.2.1 Passive Soil Gas Survey

A total of 89 passive soil gas samples were collected from areas throughout the three properties by the USACE in September 2006, and the samples were analyzed by an off-site laboratory. One or more VOCs were detected in 77 of the samples. Nineteen unique VOCs were detected in the exterior soil gas samples (see Table 4.4-1). Sample results for the passive soil gas survey can be compared only relatively to each other because the results determined are measured in mass (nanograms [ng]) and not concentration. Although acetone, benzene, PCE, TCE, and toluene were detected in a majority of the samples, the levels of PCE were significantly higher than all of the other compounds detected. The levels of PCE ranged up to 94.3 ng. All other compounds were at levels below 5 ng. The highest levels of PCE (> 1.0 ng) occurred at two locations (see Figure 4.4-1):

- Between Buildings 140 and 100 at sample locations 12, 13, 14, 15, and 26. These elevated concentrations of PCE and TCE are likely related to high concentrations of these compounds detected in soils beneath B140 (see Section 4.5); and

- Between Buildings 100 and 70 at sample locations 38, 42, 44, 47, 48, 49, 50, 54, 55, 56, 57, 58, and 59. These elevated concentrations of PCE and TCE are likely related to the high concentrations of these compounds detected in shallow soils in this area (see Section 4.5).

4.4.2.2 Building 70 Sub-slab Survey

In September 2006, a total of 12 sub-slab soil vapor samples were collected beneath B70 and analyzed for VOCs. A total of 13 VOCs were detected in the sub-slab soil vapor samples, and one or more VOCs were detected in each sample (see Table 4.4-2). Although acetone, methyl ethyl ketone, PCE, TCE, toluene, and trichlorofluoromethane were detected in more than 50% of the samples, the levels of PCE and TCE were significantly higher than all of the other compounds detected, and they were the most frequently detected. The other contaminants could be potentially related to background conditions (see Section 4.2). PCE concentra-

tions ranged from 88 micrograms per cubic meter ($\mu g/m^3$) to 120,000 $\mu g/m^3$, and TCE concentrations ranged from ND to 26,000 $\mu g/m^3$. The highest concentrations of PCE and TCE were detected in sample B70-SSA-011 (see Figure 4.4-2). These compounds were also detected in shallow soils beneath the B70 during the USACE soil investigation (see Section 4.5).

4.4.3 Indoor Air Surveys

Sub-slab and outdoor air sampling results are presented in this section for comparison against indoor air results.

4.4.3.1 Building 140

- **Sub-Slab.** Twelve VOCs were detected in the three sub-slab samples collected from beneath B140 (see Table 4.4-2). The levels of PCE and TCE were significantly higher than all of the other compounds detected, and they were the most frequently detected. PCE concentrations ranged from 600 $\mu g/m^3$ to 27,000 $\mu g/m^3$, and TCE concentrations ranged from ND to 590 $\mu g/m^3$. The highest concentration of PCE was detected in sample B140-SSA-03, which was collected in the eastern portion of the building, and the TCE concentrations in samples B140-SSA-01 and -02, which were collected in the central and eastern portions of the building, were of the same order of magnitude (see Figure 4.4-2).

- **Indoor Air.** Twenty VOCs were detected in the three indoor air samples collected inside B140 (see Table 4.4-3). PCE concentrations ranged from 4.4 $\mu g/m^3$ to 24 $\mu g/m^3$, and TCE concentrations ranged from 0.46 $\mu g/m^3$ to 2.6 $\mu g/m^3$. The highest concentrations of PCE and TCE were detected in sample B140-IA-03, which was collected in the eastern portion of the building (see Figure 4.4-2).

- **Outdoor Air.** Eighteen VOCs were detected in the one outdoor air sample collected from the 140 property (see Table 4.4-3 and Appendix B). PCE was detected at a concentration of 0.24 $\mu g/m^3$ in sample OA-3, and TCE was detected at a concentration of 0.064 $\mu g/m^3$ in the same sample (see Figure 4.4-2).

The highest concentrations of VOCs were detected in sub-slab samples, and the lowest concentrations were detected in outdoor air samples, as would be expected when contaminated soils are located beneath a building. Elevated concentrations of VOCs in B140 samples correlate well spatially with the elevated concentrations of VOC detected in soil samples (see Section 4.5).

4.4.3.2 Building 100

- **Sub-Slab.** Ten VOCs were detected in the three sub-slab soil vapor samples collected beneath B100 (see Table 4.4-2). The levels of PCE were significantly higher than all of the other compounds detected, and PCE was one of

the most frequently detected VOCs. PCE concentrations ranged from 290 μg/m^3 to 7,500 μg/m^3. The highest concentration of PCE was detected in sample B100-SSA-03, which was collected in the eastern portion of the building (see Figure 4.4-2).

- **Indoor Air.** Nineteen VOCs were detected in the three indoor air samples collected inside B100 (see Table 4.4-3). PCE concentrations ranged from 1.2 μg/m^3 to 15 μg/m^3, and TCE concentrations ranged from 0.07 μg/m^3 to 0.34 μg/m^3. The highest concentrations of PCE and TCE were detected in sample B100-IA-02, which was collected in the central portion of the building. Because the indoor air data from the eastern portion of Building 100 (from samples B100-IA-03) were rejected, a correlation between indoor air levels and sub-slab levels at this location cannot be made.

- **Outdoor Air.** Twenty VOCs were detected in the one outdoor air sample collected from the B100 property (see Table 4.4-3). PCE was detected at a concentration of 0.46 μg/m^3 in sample OA-02, and TCE was detected at a concentration of 0.075 μg/m^3 in the same sample (see Figure 4.4-2).

The highest concentrations of VOCs were detected in sub-slab samples, and the lowest concentrations were detected in outdoor air samples, as would be expected when contaminated soils are located beneath a building. Elevated concentrations of VOCs in B100 sub-slab samples correlate well spatially with the elevated concentrations of VOCs detected in soil samples (see Section 4.5).

4.4.3.3 Building 70

- **Sub-Slab.** Fifteen VOCs were detected in the three sub-slab vapor samples collected from beneath B70 (see Table 4.4-2). The levels of PCE and TCE were significantly higher than all of the other compounds detected, and they were the most frequently detected VOCs. PCE concentrations ranged from 880 μg/m^3 to 20,000 μg/m^3, and TCE concentrations ranged from 28 μg/m^3 to 4,200 μg/m^3. The highest concentrations of PCE and TCE were detected in sample B70-SSA-014, which was collected in the central portion of the building (see Figure 4.4-2).

- **Indoor Air.** Eighteen VOCs were detected in the three indoor air samples collected inside B70 (see Table 4.4-3). PCE concentrations ranged from 7.5 μg/m^3 to 8.1 μg/m^3, and TCE concentrations ranged from 0.51 μg/m^3 to 0.97 μg/m^3. The highest concentrations of PCE and TCE were detected in sample B70-IA-02, which was collected in the central portion of the building (see Figure 4.4-2).

- **Outdoor Air.** Eighteen VOCs were detected in the one outdoor air sample collected from the 70 property (see Table 4.4-3). PCE was detected at a con-

centration of 0.24 μg/m^3 in sample OA-01, and TCE was detected at a concentration of 0.064 μg/m^3 in the same sample (see Figure 4.4-2).

The highest concentrations of VOCs were detected in sub-slab samples, and the lowest concentrations were detected in outdoor air samples, as would be expected when contaminated soils are located beneath a building. Elevated concentrations of VOCs in B70 samples correlate well spatially with the elevated concentrations of VOCs detected in soil samples (see Section 4.5).

4.4.4 Transformer Pad Survey (70 Property)

PCBs (Aroclor 1254 and Aroclor 1260) were detected in the historic transformer pad samples (NS-02 through NS-04), and Aroclor 1260 was detected in the current transformer pad samples (SS-01 and NS-01) from the (see Table 4.4-4). Aroclor 1254 was detected in samples NS-02, NS-03, and NS-04 at concentrations ranging from 43 μg/kg (NS-04) to 1,000 μg/kg (NS-02). Aroclor 1260 was detected in samples SS-01, NS-01, NS-03, and NS-04 at concentrations ranging from 20 μg/kg (NS-04) to 69 μg/kg (NS-03).

Samples collected from delineation borings (SU14-11, SU14-12, SU14-13, and SU14-14) were analyzed only for Aroclor 1254. Aroclor 1254 was detected in three of the eight samples submitted for PCB analysis at concentrations ranging from 39 μg/kg (SU14-11-Z1) to 140 μg/kg (SU14-13-Z2, collected at the southwest corner of the current transformer pad). The only samples that did not contain PCBs were the shallow samples from borings SU14-12 and SU14-14 and sample SU14-11-Z2 (see Figure 4.4-1).

4.4.5 Radiation Surveys

4.4.5.1 Exterior Walkover Gamma Radiation Survey

In 1997 and 1998, walkover gamma radiation surveys were performed across much of the exterior portion of the GTEOSI site (GTEOSI 1998). On the 140 property, the survey was conducted in the east side parking area and the south side parking area and driveway. On the 100 property, the survey was conducted on the east and south side parking areas. On the 70 property, the survey was conducted on the north and east side parking areas. On the Driving Range property, the survey was conducted along the fenceline bordering the Sylvania properties. Several areas with radiation levels above background levels were identified during the surveys. Most of the measurements were between two and four times background; however, the radiation level measured at one very localized area on the northeast side of the 70 property was 50 times the background level. Further investigation of areas with radiation levels above background resulted in soil remediation in the affected areas during GTEOSI's Phase I Soil Remediation effort.

A walkover gamma radiation survey was performed on the 70 property during Phase I of the RI. A graphical representation of the survey data set is presented on the contour plot in Appendix A, Attachment 3. As shown, the survey measurements for most of the area surrounding Building 70 demonstrated little vari-

ability in radiological constituents. The results for the four areas identified below were statistically different from the mean, indicating a potential for residual contamination.

- **Area 1.** A grassy area to the northwest of Building 70, near the gate to Cantiague Rock Road.
- **Area 2.** The northwest corner of the parking lot near the north entrance door.
- **Area 3.** The grassy area between the west boundary of Building 70 and Cantiague Rock Road.
- **Area 4.** A small grassy area at the southwest property boundary.

However, none of these areas is believed to be a source of residual contamination from historical Sylvania operations. The contour plots from multiple surfaces (asphalt, concrete, and grass) were combined into a single dataset. Areas 1 and 4 were small grassy areas within the asphalt area and had slightly higher count rates than the asphalt, which would be expected. Elevated count rates in Areas 2 and 3 appeared to be caused by the adjacent brick facing on the exterior western wall of Building 70 and the concrete walkway, rather than residual contamination in the underlying soil.

4.4.5.2 Radiation Surveys Inside Building 70

In 2003, GTEOSI performed a radiological characterization survey in B70. The survey included approximately 50,000 square feet of floor surface area, and wall surfaces, roof penetrations, and miscellaneous objects (GTEOSI 2003c). This survey did not include the eastern warehouse. Based on the comparison of building survey results to then acceptable removable surface contamination levels, no locations had removable surface contamination levels that exceeded the criteria. However, beta radiation levels exceeded the criteria in some areas due to fixed contamination. A dose assessment performed at the time of the survey indicated that the dose to a member of the general public, due to residual radioactivity in the building, was below New York State criteria used in the report.

During the RI, the locations of all previously identified areas of surface contamination were reconfirmed (see Appendix A). Only elevated levels of beta and gamma radiation were found (no alpha contamination), which confirmed the original survey findings that the contamination was contained underneath surface coatings or within the expansion joints of the concrete floors. At the F3 location, although readings were elevated, the elevated spot that was originally identified was believed to be underneath a new divider wall installed since the original survey. The results of the drain and penetration gamma surveys also are presented in Appendix A. All results were at background levels. A walkover gamma radiation survey performed in the eastern warehouse identified only background radiation levels.

4.4.6 Concrete Cores

A total of seven concrete cores were collected by the USACE at locations within B70 and analyzed through field screening to determine whether radiological contamination was present (see Figure 2.5-6). Based on the results of the field screening, two cores (F6-02 and D8-02, from the historical portion of B70) were submitted for off-site radiological analysis. Field readings of the concrete cores included ambient exposure rates of 5 to 50 microroentgens per hour (µR/hr) on contact and surface activities up to 127 alpha disintegrations per minute/100 square centimeters (dpm/100 cm^2) and 235,000 beta dpm/100 cm^2 (measured with the alpha-beta scintillator). At concrete core location F6-01, field screening beneath the core identified radiation levels above background, and at concrete core location A3-01, the field screening beneath the core identified PID readings above background. Therefore, soil borings were completed at each location to depths of 7 and 8 feet, respectively. The analytical results of soil samples from these borings are evaluated in Section 4.5. Table 4.4-5 summarizes all of the radiological results for the two concrete core samples.

4.5 Nature and Extent of In Situ Soil Contamination

The data used to determine the nature and extent of remaining in situ soil contamination includes data collected by the USACE and GTEOSI during their Phase I Remediation and Supplemental Investigations conducted from 2003 through 2005 (GTEOSI 2007a, 2007b). The data collected from the 70, 100, and 140 properties are a combination of both USACE and GTEOSI efforts. The sample results from the Cantiague Park Driving Range (Driving Range), located immediately east of the site, consist solely of GTEOSI data. All soil sample collected by the USACE were analyzed at an off-site laboratory. Samples collected by GTEOSI were analyzed at either an on-site laboratory or an off-site laboratory.

The nature and extent of contamination are discussed in the sections below by property. Figure 4.5-1 presents the horizontal locations of all sample points evaluated in this section (both GTEOSI and USACE sample points). In addition, overlain on this map is a grid of more than 1,200 subcells, which were arbitrarily assigned, surveyed, and used by GTEOSI during the Phase I Soil Remediation. This subcell grid was used to organize sample location information. Each subcell measures 400 square feet (20 feet by 20 feet) and is named using a single letter and a number. The subcell grid was expanded twice after the initial layout; therefore, there are two transition lines where the subcell naming scheme changes (see Figure 4.5-1). This subcell grid is used herein to identify the locations of soil samples.

Generally, there are no distinct/continuous aquitards beneath the site that would significantly influence vertical contaminant migration through the unsaturated subsurface soil zone. Hence, there are no natural subsurface boundaries by which to divide unsaturated subsurface soil data for discussion purposes. Therefore, for the purposes of USACE data collection and presentation, soils were divided into arbitrary 8-foot-deep vertical zones between 0 to 64 feet BGS (e.g., 0 to 8 feet, 8

to 16 feet, etc). Surface soil contaminants (0 to 2 feet) are evaluated separately in the Human Health Risk Assessment (see Section 6).

The data collected by the USACE and used to determine the nature and extent of soil contamination included the following: data gap borings (focused and systematic investigations), leach pool/drain/drywell/sump borings (focused investigations), borings installed at concrete core locations (focused investigations), Phase IIIa soil borings (systematic investigation), and test trench soil samples (focused investigation). In most cases, one sample from each boring was collected from each 8-foot interval beneath the site (e.g., 0 to 8 feet = Z1, 8 to 16 feet = Z2, etc.). Test trenches were completed to depths of less than 8 feet in most cases, and two soil samples were collected from each trench. For the Phase IIIa borings, one sample was collected from 0 to 2 feet BGS and another sample was collected from 2 to 8 feet BGS for metals analysis only. The following number of samples were evaluated for this data set: 599 samples were analyzed for VOCs and radionuclides; 629 samples were analyzed for nickel; and 61 samples were analyzed for Target Analyte List (TAL) metals.

GTEOSI collected 30,854 samples during their Phase I Soil Remediation and Supplemental Investigation (GTEOSI 2007a, 2007b). This data set includes numerous samples that do not represent in situ conditions, including samples to characterize soils being remediated, samples used to guide excavation activities, samples used to classify wastes produced during remedial activities, samples of residual process materials discovered during the remediation, and samples of wastes created from on-site laboratory operations. To determine which samples were representative of in situ conditions (post-remediation), sample identification numbers were compiled from tables included in the various reports submitted to NYSDEC in support of the effort. A list of the tables used to compile sample identification numbers from GTEOSI reports is provided in Table 4.5-1. These sample identifiers were then used to extract the relevant samples from the GTEOSI database. Both samples analyzed in the off-site and on-site laboratories were used to determine the nature and extent of contamination. This resulted in the use of 1,227 samples analyzed for VOCs, 14,728 for radionuclides, and 5,686 for nickel from on-site laboratory analyses; and 1,905 samples analyzed for VOCs, 2,132 for radionuclides, 1,815 for nickel, and 744 for beryllium from off-site laboratory analyses.

The interactive database (see Section 4.3) is provided on compact disc as Appendix H. This database provides a searchable means to present this large data set. Tables 4.5-2 through 4.5-5 provide a statistical summary of sampling results. Summary tables of the soil sampling results are not provided as the data set is too large to be presented efficiently in this manner.

4.5.1 Soil Background Threshold Value Development

Background levels of metals and radionuclides for soil were determined on a site-specific basis using samples collected from soil approved by NYSDEC for use as clean backfill at the site. The backfill soils originated from off-site borrow areas

in close proximity to the site. A total of 45 samples were available for use from this data set to determine the background threshold values (BTVs) for metals, and 51 samples available for use from this data set to determine the BTVs for radionuclides. The ProUCL program, version 4.00.04 (EPA 2009a), was used to evaluate the background data sets. The distribution of each data set was examined graphically using Q-Q plots and Box plots generated by ProUCL. A small number of high and low outliers identified by inspection of these plots were eliminated from the data sets before performing statistical analyses to identify BTVs. ProUCL includes two statistical tests for outliers, the Dixon and Rosner tests. Both of these tests start with the basic assumption that the data sets being examined for outliers are normally distributed, i.e., the values in the data sets follow a "Normal" statistical distribution. The statistical procedures used in these tests are built upon that assumption. Most of the data sets being examined for outliers do not exhibit a "Normal" statistical distribution; therefore, a basic assumption upon which the Dixon and Rosner test are constructed would be violated for most of the data sets of interest. Therefore, the results of these tests, if used, would have been unreliable, and identification of outliers was based instead on inspection of the Q-Q plots.

Summary statistics for the datasets are provided in Table 4.5-6. As recommended in the ProUCL Technical Guide (EPA 2009a), 95% upper prediction limits (UPLs) were used as BTVs. The statistical methods used to estimate the 95% UPLs, which are recommended in the ProUCL output, are noted in the table. The RESRAD User's Manual (USDOE 2001) recommends using the mean plus two standard deviations as the BTVs for radionuclides; therefore, these values were included in Table 4.5-2 for comparison with the 95% UPLs, which, for consistency, were used as the BTVs for both metals and radionuclides. Rural Soil Background Concentrations (RSBCs), Table 9.1-9, provided in NYSDEC/DOH Soil Cleanup Objectives Technical Background Document (NYSDEC/DOH 2006) also are noted in the table as additional indicators of background concentrations of metals in New York State soils. Since the BTVs are based on a 95% UPL, up to 5% of samples would be expected to have a value higher than the BTV.

Cadmium and sodium were not detected in any of samples used to determine BTVs; therefore, BTVs could not be developed for them. In addition, the samples used to determine the BTVs were not analyzed for calcium, magnesium, or potassium; therefore, BTVs for these metals were not developed. These metals are considered essential nutrients and therefore are not discussed further in this section.

4.5.2 Development of Soil Contaminant Figures

Contaminant concentration maps were developed for contaminants found in soils that (1) were identified as COPCs in the BLRA (see Section 4.9), (2) had a large data set, (3) were not present as a by-product/breakdown of another contaminant (e.g., TCE), and (4) had multiple samples at significantly different concentrations. Therefore, these maps were developed for nickel, PCE, and U-238 and are pre-

sented on Figures 4.5-2a through 4.5-4b, respectively. In addition, contaminant maps were also developed to present the analytical results for metals, excluding nickel, in shallow soils (0-2 and 2-8 feet BGS) due to the smaller available data set. These maps are presented on Figures 4.5-5a and 4.5-5b.

The contaminant maps present ranges of contaminant concentrations in 8-foot intervals from 0 to 64 feet BGS. Each contaminant is presented on two sheets: sheet "a" depicts the results from the first four 8-foot subsurface intervals (from 0 to 32 feet BGS), and sheet "b" depicts the results from the next four 8-foot subsurface intervals (from 32 to 64 feet BGS). The GTEOSI data used to support these figures were reduced by extracting the highest result per 8-foot zone (e.g., 0 to 8 feet, 8 to 16 feet, etc.) per contaminant within each subcell because of the numerous samples collected within each 8-foot interval (often one sample every foot). The results from all samples collected by the USACE are included in these depictions, with the exception of a few instances where two samples were collected from the same location within the specified interval. Examples of these instances are test trench samples where two samples were collected from each trench and most often were both collected at depths of less than 8 feet. In rare cases where two sample results were available for a particular interval, the higher concentration was selected for presentation on the maps. Sampling results representing native soils beneath remedial cells are included as appropriate per depth interval.

4.5.3 140 Property Soil Sampling Results

A total of 3,805 samples collected from the 140 property were evaluated. Statistical summaries of the results for metals, VOCs, and radionuclides are presented in Table 4.5-2.

4.5.3.1 Metals

Soil sampling for metals from the 140 property consisted of the following:

- 18 soil samples (nine from 0 to 2 feet BGS and nine from 2 to 8 feet BGS) were collected by the USACE and analyzed for the full suite of TAL metals;
- 1,354 samples were analyzed for nickel: 117 samples were collected by the USACE; 401 samples were collected by GTEOSI and analyzed by an off-site laboratory; and 836 samples were collected by GTEOSI and analyzed by the on-site laboratory.
- 191 samples collected by GTEOSI were analyzed for beryllium by an off-site laboratory.

Table 4.5-2 presents a summary of the metals analytical results and a comparison of the results to the BTVs. More detailed results can be reviewed in the interactive database included as Appendix H. Figures 4.5-5a and 4.5-5b present metals results, and Figures 4.5-2a and 4.5-2b present only the nickel results. Metals results are discussed below in relation to the respective BTV. They are also com-

pared to an arbitrary concentration of three times the respective BTV to help identify metals that clearly may be present as a result of site activities.

Generally, metal concentrations (except nickel) were higher in samples collected from 0 to 2 feet BGS than deeper samples collected from the three site properties. The site is located in an industrial area, and part of this trend is likely the result of general anthropogenic pollution sources. Otherwise, most of the metals did not exhibit specific lateral or vertical trends in distribution or concentration. If other trends were observed, they are noted below.

Twenty-two metals were detected in samples collected from the 140 property. Thallium was the only metal analyzed for but not detected in the samples. Nine of the metals (antimony, arsenic, beryllium, cobalt, copper, nickel, selenium, silver, and vanadium) were detected in at least one sample at a concentration greater than three times the corresponding BTV. These metals are discussed below.

- **Antimony** was detected in eight of the 18 TAL samples at concentrations greater than its BTV (0.639 mg/kg). Antimony was detected in one sample at a concentration more than three times its BTV. The highest concentration, 4.4 mg/kg, was detected in RI-SB-12-SS, which was collected in subcell P10 from 2 to 8 feet BGS.

- **Arsenic** was detected in 13 of the 18 TAL samples at concentrations greater than its BTV (2.42 mg/kg). Arsenic was detected in three samples at concentrations more than three times its BTV. The highest concentration, 15.3 mg/kg, was detected in sample RI-SB-12-SS, which was collected in subcell P10 from 2 to 8 feet BGS. Arsenic was also detected at more than three times its BTV in RI-SB-05-NS (11.2 mg/kg), which was collected in subcell K07 from 0 to 2 feet BGS, and in RI-SB-03-SS (8.4 mg/kg), which was collected in subcell Z56 from 2 to 8 feet BGS.

- **Beryllium** was detected in 14 of the 209 samples (18 TAL samples and 191 samples collected by GTEOSI specifically for beryllium analysis) at concentrations greater than its BTV (0.35 mg/kg). Only sample 28746, which was collected in subcell D05 at 1 foot BGS, exhibited a concentration of beryllium (1.2 mg/kg) more than three times its BTV.

- **Cobalt** was detected in four of the 18 TAL samples at concentrations greater than its BTV (4.6 mg/kg). Cobalt was detected in three samples at concentrations more than three times its BTV. The highest concentration of cobalt (156 mg/kg) was detected in sample RI-SB-04-NS, which was collected in subcell F04 from 0 to 2 feet BGS. Cobalt was also detected at concentrations more than three times its BTV in sample RI-SB-02-NS (15.3 mg/kg), which was collected in subcell U53 from 0 to 2 feet BGS, and in sample RI-SB-03-NS (14.8 mg/kg), which was collected in subcell Z56 from 0 to 2 feet BGS. These three samples were collected from shallow depths beneath the central to western portion of B140.

- **Copper** was detected in three of the 18 TAL samples at concentrations greater than its BTV (9.19 mg/kg). The highest concentration of copper, 60.7 mg/kg, was detected in sample RI-SB-12-SS, which was collected in subcell P10 from 2 to 8 feet BGS. This was the only sample that had a concentration more than three times the BTV.

- **Nickel** was detected at concentrations greater than its BTV (16.1 mg/kg) in 56 of the 1,354 samples for which it was analyzed. The highest concentration (1,100 mg/kg) was detected in sample 20133, which was collected in subcell L05. This sample was obtained from 1 foot below the slab of B140, approximately 10 feet north of historic leach pool LPH-20. In four other borings completed within this subcell, samples collected from 1 foot beneath the slab also had concentrations greater than three times the BTV (85 to 330 mg/kg). Three samples collected in adjacent subcells L04 and M06 at depths less than 1 foot beneath the slab had nickel concentrations greater than three times the BTV (92 to 330 mg/kg). Ten other samples, all of which were collected beneath B140 and seven of which were collected at depths less than 4 feet BGS, had concentrations of nickel greater than three times the BTV (54.3 to 449 mg/kg).

- **Selenium** was detected in all 18 TAL samples at concentrations greater than its BTV (0.376 mg/kg), and all but one sample had concentrations more than three times the BTV. The highest concentration (6.4 mg/kg) was detected in sample RI-SB-08-SS, which was collected in subcell U60 from 2 to 8 feet BGS. The concentrations and location of these samples do not show a specific distribution trend.

- **Silver** was detected in six of the 18 TAL samples at concentrations greater than its BTV (0.137 mg/kg), and four of these samples had concentrations more than three times the BTV. The highest concentration (2.7 mg/kg) was detected in sample RI-SB-04-NS, which was collected in subcell F04 from 0 to 2 feet BGS. The concentrations in the remaining three samples ranged from 0.74 mg/kg to 2.3 mg/kg. The concentrations and location of these samples do not show a specific distribution trend.

- **Vanadium** was detected in three of the 18 TAL samples at concentrations greater than its BTV (14.7 mg/kg), and one of these samples, RI-SB-12-SS, had a concentration more than three times the BTV. This sample, collected in subcell P10 from 2 to 8 feet BGS, had a concentration of 53 mg/kg. All other detected concentrations were 15.9 mg/kg or less. The concentrations and location of these samples do not show a specific distribution trend.

Below is a summary of the 13 metals that did not have a concentration more than three times the BTV.

- **Barium, manganese, and mercury** were each detected once above the respective BTV and within the expected exceedance of the BTV (5%).

- **Aluminum, iron, sodium, and zinc** are common, naturally occurring metals and do not show any specific trends in distribution.

- **Chromium** was detected in three of the 18 TAL samples at a concentration greater than its BTV (7.56 mg/kg). The highest concentration, 17.9 mg/kg, was detected in sample RI-SB-05-NS, which was collected in subcell K07 from 0 to 2 feet BGS.

- **Lead** was detected in two of the 18 TAL samples at concentrations greater than its BTV. The highest concentration, 23.8 mg/kg, was detected in sample RI-SB-05-NS, which was collected in subcell K07 from 0 to 2 feet BGS.

Cadmium was not analyzed for in the background data set; therefore, a BTV could not be determined. It was detected in four of the 18 TAL samples, with a maximum concentration of 0.41 mg/kg.

Sample RI-SB-12-SS, which was collected in subcell P10 from 2 to 8 feet BGS, had the highest concentration of 11 metals on the 140 property: aluminum, antimony, arsenic, barium, cadmium, copper, iron, manganese, potassium, vanadium, and zinc. Subcell P10 is located adjacent to remedial cell 6. No operations on the property that may have used this combination of metals are known to have occurred.

Sample RI-SB-05-NS, which was collected in subcell K07 from 0 to 2 feet BGS, contained the highest concentration of six metals on the 140 property: calcium, chromium, lead, magnesium, mercury, and sodium. Subcell K07 is located beneath B140. No operations on the property that may have used this combination of metals are known to have occurred.

4.5.3.2 VOCs

A total of 544 samples were collected from the 140 property and analyzed for VOCs, including:

- 107 samples collected by the USACE,

- 410 samples collected by GTEOSI and analyzed by an off-site laboratory, and

- 27 samples collected by GTEOSI and analyzed by an on-site laboratory.

Table 4.5-2 presents a statistical summary of the analytical results for VOCs. More detailed results can be reviewed in the interactive database included as Appendix H. Figures 4.5-3a and 4.5-3b present the sampling results for PCE. The VOC results are discussed below with regard to detection frequency and an arbitrary concentration of 1,000 µg/kg in order to describe areas of the property with

higher concentrations of VOCs. Twenty-eight VOCs were detected in the samples. Five compounds (PCE, TCE, trichlorofluoromethane, methylene chloride, and acetone) were detected in more than 5% of the samples. Trichlorofluoromethane, methylene chloride, and acetone are common laboratory and field background contaminants identified during data validation (see Section 4.3). Specific samples were qualified as appropriate, but low level contamination also should be evaluated relative to expected site conditions.

- **PCE** was detected in 100 of the 544 samples, and three of the samples had concentrations greater than 1,000 µg/kg. Two of the three samples (19221 and 19222) were collected from a GTEOSI boring located in subcell I06. Sample 19221, which was collected at 16 feet BGS, had a PCE concentration of 40,000,000 µg/kg. This sample also had the highest concentrations of PCE degradation products (TCE, cis-1,2-dichloroethene, trans-1,2-dichloroethene, and vinyl chloride). Sample 19222, which was collected at 19 feet BGS, had a PCE concentration of 1,300,000 µg/kg. The third sample (RI-SB-05-NS), which was collected immediately below the concrete slab (0 to 2 feet BGS) of B140 in subcell K07, had a PCE concentration of 4,100 µg/kg. No samples collected below 24 feet exhibited concentrations of PCE greater than 100 µg/kg. Further discussion of these samples are provided below.

- **TCE** was detected in 32 of the 537 samples, and two samples had TCE concentrations greater than 1,000 µg/kg. These two samples, 19221 and 19222, are the same samples in which the highest PCE concentrations were detected (see above). Further discussion of these samples is provided below.

- **Trichlorofluoromethane** was detected in eight of the 107 samples analyzed for this compound. The highest concentration, 6.1 µg/kg, was detected in sample 140-01-Z1, which was collected in subcell R53 at 0 to 1 foot BGS. The five other detections of trichlorofluoromethane were at concentrations of 2.8 µg/kg or less.

- **Methylene chloride** was detected in 88 of 518 samples analyzed for this compound. The highest concentration, 150 µg/kg, was detected in sample DRH-A1-Z1, which was collected from subcell Z55. Other VOCs (PCE, TCE, and toluene) were also detected in this sample. All other detections of methylene chloride were at concentrations of 30 µg/kg or less. Methylene chloride did not exhibit specific lateral or vertical trends in distribution or concentration.

- **Acetone** was detected in 81 of 391 samples analyzed for this compound. The highest concentration, 140 µg/kg, was detected in sample DRH-A2-Z2, which was collected from subcell A06 at 14 to 15 feet BGS. All other detections of acetone were at concentrations of 47 µg/kg or less. Acetone did not exhibit specific lateral or vertical trends in distribution or concentration.

Sample 19221 contained the highest concentrations of nine compounds detected on the property: 1,1- dichloroethene (15,000 µg/kg); 1,4-dichlorobenzene (83,000 µg/kg); cis-1,2-dichloroethene (210,000 µg/kg); PCE (40,000,000 µg/kg); toluene (20,000 µg/kg); trans-1,2-dichlorothene (6,900 µg/kg); trichloroethene (1,600,000 µg/kg); vinyl chloride (3,700 µg/kg); and total xylenes (850 µg/kg). The boring this sample was collected from was on the interior of the leach pool as part of GTEOSI's historic leach pool investigation at LPH-21. A review the boring log indicated that the sample was collected from the bottom of the historic leach pool across a 6-inch-thick layer of sludge. The leach pool appeared to have been filled with construction debris and sandy fill material (GTEOSI 2006c). Samples 19222, 19227, and 19240 were collected immediately below the bottom of this historic leach pool at depths of 19, 21, and 22 feet BGS, respectively. The results for these samples showed a decreasing trend in PCE concentration with depth (220 µg/kg at 22 feet). No VOCs were detected in sample 19279, which was collected from the same boring at 30 feet BGS, although the PCE data was rejected. Seven samples were collected for VOC analysis from five borings installed within subcell I06 around the former leach pool. One sample was collected at 7 feet BGS, one sample was collected at 17 feet BGS, and five samples were collected at 30 feet BGS. No VOCs were detected in these samples.

Sample RI-SB-05-NS, which was collected from 0 to 2 feet BGS in subcell K07, had PCE (4,100 µg/kg), TCE (250 µg/kg), cis-1,2-dichloroethene (48 µg/kg), and 1,2,3-trichlorobenzene (37 µg/kg). This was the only sample collected for VOC analysis from subcell K07. It should be noted that this sample also exhibited the highest concentrations of six metals.

4.5.3.3 Radionuclides

A total of 3,805 samples were collected from the 140 property and analyzed for radionuclides, including:

- 108 samples collected by the USACE,
- 487 samples collected by GTEOSI and analyzed by an off-site laboratory, and
- 3,210 samples collected by GTEOSI and analyzed by the on-site laboratory using gamma spectroscopy.

Table 4.5-2 presents a statistical summary of the analytical results for radionuclides. More detailed results can be reviewed in the interactive database included as Appendix H. Figures 4.5-4a and 4.5-4b present the sampling results for U-238.

Uranium is the major contributor to radioactive contamination on the 140 property, with concentrations of U-238 ranging from background to 210 pCi/g, and concentrations of U-234 ranging from background to 612 pCi/g. The highest Th-232 concentration was 20.5 pCi/g. The areas exhibiting the highest concentrations of uranium, thorium, and their daughter products are described below.

- **Uranium.** U-238 was detected in 2,606 of 3,805 samples collected from the 140 property at concentrations greater than its BTV (0.901 pCi/g) and in 1,800 samples at concentrations greater than three times its BTV. U-234 was detected in 299 of 595 samples collected from the 140 property at concentrations greater than its BTV (0.81 pCi/g) and in 213 samples at concentrations greater than three times its BTV. U-235 was detected in 2,941 of 3,805 samples collected from the 140 property at concentrations greater than its BTV (0.091 pCi/g) and in 2,054 samples at concentrations greater than three times its BTV.

  Elevated levels of uranium were detected in the northeast corner of the 140 property (subcells S05, U04, U05, U06, U07, V04, V05, V06, V07, W06, and W07) below the depth to which the remedial cells were excavated. Approximately 1,675 samples were collected in this area. The highest concentrations of U-238 were detected in samples collected from 24 to 64 feet BGS (on-site lab data). The highest concentrations in the subcells ranged from 100 pCi/g (the highest concentration in subcell U05, at 32 to 40 feet BGS) to 210 pCi/g (the highest concentration in S05, at 40 to 48 feet BGS). The highest concentration of U-235 in this area (9.5 pCi/g) also was detected in subcell S05, at a depth of 40 to 48 feet BGS. U-234 was not reported in the on-site lab data. The U-238 concentrations above the BTV in the 16- to 24-foot depth interval in the northeast corner of the 140 property ranged from 2.9 to 41.6 pCi/g.

  Elevated levels of uranium were detected below remedial cell 6 in subcells R08, U08, U09, and R09. The highest concentrations of U-238 were detected at 36 feet BGS in subcells R08 (40 pCi/g) and U08 (44 pCi/g). The highest concentrations of U-235 were detected in the same samples (2.4 pCi/g and 1.5 pCi/g, respectively). Of the six samples analyzed for U-234, the highest concentration was 16.6 pCi/g at 50 to 52 feet BGS (subcell U08).

  In B140, elevated levels of uranium were detected below the slab in several locations. The highest concentrations of uranium (U-234 at 612 pCi/g, U-235 at 23.6 pCi/g, and U-238 at 82 pCi/g) were detected in sample 19221 from leach pool LPH-21I (subcell I06) at a depth of 16 feet BGS. Due to the high concentration of U-234 compared to U-238 in sample 19221, the weight percentage of U-235 was calculated. The U-235 weight percentage in natural uranium is approximately 0.7%. In sample 19221, the U-235 weight percentage was calculated at 4.53%, indicating that this sample potentially contained enriched uranium. The weight percentage of U-235 in four other samples from LPH-21 (in which all three isotopes were reported), yielded percentages of 1.02 to 1.40%, which also could be an indication that the uranium was enriched. The calculations should be considered estimates because the uncertainties and minimum detectable concentrations, which should be considered for an enriched uranium determination, are not available for the GTEOSI data.

  Elevated uranium concentrations were detected in subcell Z55 in B140. The highest concentrations of uranium (U-234 at 36.9 pCi/g, U-235 at 1.94 pCi/g,

and U-238 at 36.0 pCi/g) were detected in sample DRH-A1, which was collected at 2 to 3 feet BGS. Elevated uranium concentrations also were detected in adjacent subcell A06 in sample DRH-A2, which is due east of sample DRH-A1. The highest concentrations (U-234 at 18.0 pCi/g, U-235 at 1.15 pCi/g, and U-238 at 18.5 pCi/g) were detected in samples collected at 3 to 4 feet BGS.

Twenty-four samples were collected in subcell X56 in B140 at depths ranging from 1 to 30 feet BGS. The highest concentrations of uranium (U-235 at 1.7 pCi/g and U-238 at 34 pCi/g) were detected in sample 29618, which was collected at 1 foot BGS. Only four samples were analyzed for U-234 and all of the results were below the BTV.

In subcell E04 in B140, the highest concentrations of uranium (U-234 at 53.8 pCi/g, U-235 at 2.6 pCi/g, and U-238 at 44.7 pCi/g) were detected in sample 140-06-Z1, which was collected at 2 to 7.5 feet BGS. In adjacent subcell F04, the highest concentrations of uranium (U-234 at 20.1 pCi/g, U-235 at 1.03 pCi/g, and U-238 at 4.72 pCi/g) were detected in sample RI-SB-04-NS at a depth of 0 to 2 feet BGS. An enriched uranium assessment yielded a 2.7 weight percentage of U-235, indicating that the soil sample potentially contained enriched uranium.

In subcell L05 in B140, the highest concentrations of uranium (U-235 at 2.6 pCi/g and U-238 at 40 pCi/g) were detected in sample 19978, which was collected at 1 foot BGS. Only five samples in subcell L05 were analyzed for U-234 and all of the results were below the BTV.

- **Thorium.** Th-232 was detected in 70 of 3,805 samples at concentrations greater than its BTV of 1.18 pCi/g and in one sample at a concentration greater than three times its BTV. Th-228 was detected in eight of 595 samples at concentrations greater than its BTV of 1.2 pCi/g and in one sample at a concentration greater than three times its BTV. Th-230 was detected in 28 of 595 samples at concentrations greater than its BTV of 1.02 pCi/g and in one sample at a concentration greater than three times its BTV.

  Elevated concentrations of thorium were detected in leach pool LPH-21 in subcell I06. The highest concentrations (Th-232 at 20.5 pCi/g, Th-228 at 23.2 pCi/g, and Th-230 at 3.18 pCi/g) were detected in sample 19221, which was collected at 16 feet BGS. Slightly elevated concentrations also were detected in sample DRH-A1, which was collected in subcell Z55. The highest concentrations (Th-232 at 2.25 pCi/g and Th-228 at 2.04 pCi/g; Th-230 was below the BTV) were detected in sample DRH-A1-Z1, which was collected at 2 to 3 feet BGS.

- **Radium.** Ra-226 was detected in 17 of 1,500 samples (below the 5% expected exceedance of the BTV) at concentrations greater than its BTV of 0.504 pCi/g; no sample concentrations exceeded three times its BTV. Ra-228

was detected in 10 of 243 samples (below the 5% expected exceedance of the BTV) at concentrations greater than its BTV of 0.733 pCi/g; no sample concentrations exceeded three times the BTV. The highest concentration of Ra-226 was 0.98 pCi/g in sample 140-05-Z2, collected in subcell U56 at 8 to 10 feet BGS. The highest concentration of Ra-228 was 1.2 pCi/g in sample RI-SB-05-NS, collected in subcell K07 at 0 to 2 feet BGS.

- **Other Radionuclides.** The majority of the radionuclides reported as detected in Table 4.5-2 are short-lived daughter products of the uranium and thorium decay chains. For the most part, Th-234 and Pa-234 had concentrations similar to their parent nuclide, U-238.

  Trace amounts of cesium-137 (Cs-137) were detected in approximately 40% of the samples at concentrations ranging from 0.002 to 0.14 pCi/g. Cs-137 is present in the environment as a result of atmospheric nuclear weapons testing conducted in the 1950s and 1960s, which dispersed and deposited Cs-137 worldwide. Potassium-40, which was also detected, is naturally occurring and ubiquitous in the environment.

4.5.3.4 Summary

Contaminant maps for nickel, PCE, and U-238 are presented on Figures 4.5-2a through 4.5-4b. TAL metal results are presented on Figures 4.5-5a and 4.5-5b.

Eighteen samples collected from across the 140 property were analyzed for the full suite of TAL metals. All of these samples were collected at 8 feet BGS or less. Two samples, RI-SB-12-SS (from subcell P10, located to the east of the northeast corner of B100) and RI-SB-05- NS (from subcell K07, located along the eastern section of B140 along the southern wall) contained 17 of the highest metals concentrations. Sample RI-SB-05-NS, which was collected from immediately beneath the B140 slab, also contained elevated concentrations of VOCs. Sample RI-SB-12-SS was collected from an area immediately adjacent to remedial cell 6. No historical operations on the property that may have used this combination of metals are known to have occurred.

Nickel concentrations on the 140 property above the BTV appear to be limited to depths less than 32 feet BGS, with the highest concentration detected immediately beneath the slab of B140. Nickel concentrations detected in soils beneath the B140 slab in the subcell L05 area at shallow depths (less than 1 foot) were well above the BTV. Eight samples collected within and in the vicinity of this subcell had concentrations of nickel greater than three times the BTV, including the highest concentration detected on the property (1,100 mg/kg). Nickel was also detected at elevated concentrations in other areas, mostly from shallower than 4 feet BGS and all beneath the B140 slab. This distribution may have occurred during the preparation of the foundation soils prior to constructing B140. Process residuals may have been present at a single location and spread at shallow depths by construction activities.

The VOC contamination in soils on the 140 property appears to be limited to depths less than 24 feet. The highest VOC concentrations detected on the property were from a single boring completed inside historic leach pool LPH-21 in subcell I06. Nine VOCs were detected at concentrations ranging from 850 µg/kg (total xylenes) to 40,000,000 µg/kg (PCE) at a depth of 16 feet BGS, which, according to the borehole log (GTEOSI 2006c), appears to be the bottom of the leach pool. The sample results indicate that the contaminants have not migrated more than 24 feet BGS at this location and that they have not migrated horizontally. In another impacted area, subcell K07, a single sample collected from 0 to 2 feet BGS revealed the presence of PCE (4,100 µg/kg), TCE (250 µg/kg), cis-1,2-dichloroethene (48 µg/kg), and 1,2,3-trichlorobenzene (37 µg/kg). This sample also contained the highest concentrations of six metals in samples collected from the 140 property. No other samples have been collected for VOC analysis in this subcell.

Elevated concentrations of uranium and thorium also were found at a depth of 16 feet BGS in the boring at LPH-21. The uranium results indicate the potential presence of enriched uranium at this location. Isolated areas of uranium contamination occurred in shallow soils (0 to 8 feet BGS) at approximately three locations beneath the west-central portion of B140, and elevated concentrations of uranium were detected below remedial cells 1 and 6 in the northeastern portion of the site at depths ranging from 16 to 64 feet BGS. The highest detected concentration of U-238 in this area was 210 pCi/g (subcell S05, at 40 to 48 feet BGS). Elevated concentrations of uranium were detected at several other locations in B140 at concentrations up to 44.7 pCi/g U-238 and 53.8 pCi/g U-234 (subcell E04).

4.5.4 100 Property Soil Sampling Results

A total of 10,785 samples collected from the 100 property were evaluated. Statistical summaries of the results for metals, VOCs, and radionuclides are presented in Table 4.5-3.

4.5.4.1 Metals

Soil sampling for metals from the 100 property consisted of the following:

- 19 soil samples (0 to 2 and 2 to 8 feet BGS) were collected by the USACE and analyzed for the full suite of TAL metals;
- 5,050 samples were analyzed only for nickel: 103 samples were collected by the USACE; 1,077 samples were collected by GTEOSI and analyzed by an off-site laboratory; and 3,870 samples were collected by GTEOSI and analyzed by the on-site laboratory; and
- 521 samples were collected by GTEOSI and analyzed only for beryllium by an off-site laboratory.

Table 4.5-3 presents a summary of the metals sample results and a comparison to the BTVs. More detailed results can be reviewed in the interactive database in-

cluded as Appendix H. Figures 4.5-5a and 4.5-5b present metals results, and Figures 4.5-2a and 4.5-2b present only nickel results. The metals results are discussed below with regard to each respective BTV. They are also compared to an arbitrary concentration of three times the respective BTV to help identify metals that clearly may be present as a result of site activities.

Generally, metal concentrations (except nickel) were higher in samples collected from 0 to 2 feet BGS than deeper samples collected from the three site properties. The site is located in an industrial area, and part of this trend is likely the result of general anthropogenic pollution sources. Otherwise, most of the metals did not exhibit specific lateral or vertical trends in distribution or concentration. If other trends were observed, they are noted below.

Twenty-two metals were detected in the samples collected from this property. Thallium was the only metal analyzed for but not detected on the property. Ten of the metals (antimony, arsenic, beryllium, chromium, copper, lead, nickel, selenium, silver, and vanadium) were detected in at least one sample at a concentration more than three times the corresponding BTV. These results are discussed below.

- **Antimony** was detected in 12 of the 19 TAL samples at concentrations greater than its BTV (0.639 mg/kg). In two samples, the concentration of antimony was more than three times the BTV. The highest concentration, 2.4 mg/kg, was detected in sample RI-SB-11-SS, which was collected from subcell K14 at 2 to 8 feet BGS. The other sample, RI-SB-15-NS, was collected in subcell A21 at 0 to 2 feet BGS and had a concentration of 2.13 mg/kg.

- **Arsenic** was detected in 12 of 19 TAL samples at concentrations greater than its BTV (2.42 mg/kg). In eight samples, the concentration of arsenic was more than three times the BTV. The highest concentration, 15.7 mg/kg, was detected in sample RI-SB-13-NS, which was collected from subcell P70 at 0 to 2 feet BGS. The seven remaining samples were collected at 0 to 8 feet BGS and had concentrations ranging from 7.9 to 12.8 mg/kg.

- **Beryllium** was detected in 30 of the 539 samples at concentrations greater than its BTV (0.35 mg/kg). In one sample, the concentration of beryllium was more than three times the BTV. The highest concentration, 1.4 mg/kg, was detected in sample 24530, which was collected from subcell B22 at 1 foot BGS.

- **Chromium** was detected in eight of 19 TAL samples at concentrations greater than its BTV (7.56 mg/kg). In one sample, the concentration of chromium was more than three times the BTV: Sample RI-SB-13-NS, collected from subcell P70 at 0 to 2 feet BGS, had a concentration of 34.4 mg/kg.

- **Copper** was detected in seven of 19 TAL samples at concentrations greater than its BTV (9.19 mg/kg). In one sample, the concentration of copper was more than three times the BTV: Sample RI-SB-15-NS, collected from subcell A21 at 0 to 2 feet BGS, had a concentration 168 mg/kg.

- **Lead** was detected in six of 19 TAL samples at concentrations greater than its BTV (10.4 mg/kg). In three samples, the concentration of lead was more than three times the BTV. The highest concentration, 180 mg/kg, was detected in sample RI-SB-15-NS, which was collected in subcell A21 at 0 to 2 feet BGS. The two remaining samples, RI-SB-13-NS and RI-SB-14-NS, were both collected at 0 to 2 feet BGS in subcells P70 and V66, respectively, and had respective concentration of 57 mg/kg and 54.4 mg/kg.

- **Nickel** was detected at concentrations greater than its BTV (16.1 mg/kg) in 595 of 5,050 samples collected from this property. Sample C9-03/Z6, collected from subcell F20, contained the highest concentration of nickel detected on the property (8,020 mg/kg). This sample was collected beneath remedial cell 9, south of B100, at 45 to 46 feet BGS. The 19 samples exhibiting the highest concentration of nickel on the 100 property were all collected from beneath remedial cell 9 at depths between 37 and 46 feet BGS, with concentrations ranging from 2,100 mg/kg (sample 21723) to 8,020 mg/kg (sample C9-03/Z6).

  Nickel concentrations appear to show a downward trend in concentration beneath 46 feet BGS in this area. However, elevated concentrations still remain at depths of 60 feet or more. Thirty-one of 109 samples collected from the 100 property were detected at concentrations greater than 3 times the BTV, and all of these samples were collected from areas beneath or in subcells surrounding remedial cell 9. Concentrations of nickel ranged up to 1,100 mg/kg in sample 22503, which was collected from subcell D21 beneath remedial cell 9 at 61 feet BGS.

  Samples collected from two other areas on the 100 property (subcells G18 and N15) contained nickel at concentrations much greater than the BTV. Subcell G18 is located north of remedial cell 9, and a historic leach pool (LPH-05) is located in subcell N15. The sample from subcell G18 contained nickel at a concentration of 921 mg/kg (3 feet BGS), and sample from subcell N15 contained nickel at a concentration of 955 mg/kg (24 feet BGS) (bottom of the leach pool). Nickel concentrations remained above background to depths up to 51 feet BGS in subcell G18 and 25 feet in subcell N15.

- **Selenium** was detected in 18 of the 19 TAL samples at concentrations greater than its BTV (0.376 mg/kg). In 16 samples, the selenium concentration was more than three times the BTV. The highest concentration (7.3 mg/kg) was detected in sample RI-SB-13-NS, which was collected from subcell P70 at 0 to 2 feet BGS.

- **Silver** was detected in 3 of the 19 TAL samples at concentrations greater than its BTV (0.137 mg/kg). In one sample, the concentration of silver was more than three times the BTV. The highest concentration (0.78 mg/kg) was detected in sample RI-SB-14-SS, which was collected in subcell V66 at 2 to 8 feet BGS.

- **Vanadium** was detected in 8 of 19 TAL samples at concentrations greater than its BTV (14.7 mg/kg). In one sample, the concentration was more than three times the BTV. The highest concentration (51.9 mg/kg) was detected in sample RI-SB-13-NS, which was collected in subcell P70 at 0 to 2 feet BGS.

Below is a summary of the 13 metals that were not detected at a concentration more than three times their respective BTVs.

- **Mercury** was detected in one sample above its BTV. The maximum concentration was 0.183 mg/kg in subcell P70.

- **Aluminum, barium, cobalt, iron, and zinc** were detected in two to six samples at concentration above their respective BTVs. The maximum concentrations were: aluminum 17,200 mg/kg (subcell K14); barium 37.2 mg/kg (subcell P70); cobalt 8.5 mg/kg; iron 15,700 mg/kg (subcell Z63); and zinc 72.8 mg/kg (subcell P70).

- **Manganese, mercury, and thallium** were either not detected in any samples above their respective BTVs, or were detected but at a frequency within the expected 5% exceedance of their respective BTVs.

Cadmium and sodium were not analyzed for in the background data set; therefore, a BTV could not be determined. These metals were detected at maximum concentrations of 0.33 mg/kg and 254 mg/kg, respectively.

It appears that a large source area for nickel is present beneath and around remedial cell 9. Portions of this remedial cell were excavated to depths of up to 45 feet BGS (GTEOSI 2006a). Many of the highest detections of nickel on this property were located beneath the excavation depths of this cell. During remedial excavation activities in this cell, four leach pools, three drywells, several pipe fragments, and two historic building structures were encountered. This remedial cell is located at the rear portion of historic Building 1. Elevated levels of uranium isotopes were also noted in samples collected beneath this remedial cell as described in the radionuclide section below.

Other notable metals results were obtained from sample RI-SB-13-NS, which was collected from subcell P70 at 0 to 2 feet BGS and contained the highest concentration of three metals detected on the 100 property: arsenic, selenium, and vanadium. Lead was also detected in this sample at a concentration of 57 mg/kg, which is more than twice its BTV. Subcell P70 is located near the western 100

property boundary. No operations on the property that may have used this combination of metals are known to have occurred.

4.5.4.2 VOCs

A total of 1,641 samples were collected from the 100 property and analyzed, including:

- 94 samples collected by the USACE,
- 1,043 samples collected by GTEOSI and analyzed by an offsite laboratory, and
- 504 samples collected by GTEOSI and analyzed by the on-site laboratory.

Table 4.5-3 presents a statistical summary of the VOC analytical results. More detailed results can be reviewed in the interactive database included as Appendix H. Figures 4.5-3a and 4.5-3b present PCE sampling results. The VOC results are discussed below with regard to detection frequency and an arbitrary concentration of 1,000 µg/kg in order to describe areas of the property with higher VOC concentrations. Thirty VOCs were detected in samples collected from this property. Five VOCs (PCE, TCE, trichlorofluoromethane, methylene chloride, and acetone) were detected in more than 5% of the samples that the compounds were analyzed for.

PCE was detected in 392 of 1,594 samples, with 68 of these samples exhibiting concentrations greater than 1,000 µg/kg. Samples exhibiting concentrations greater than 1,000 µg/kg were collected from two main areas: beneath or near B100 and east of B100 and beneath remedial cells 3 and 4.

- Forty-two of the samples with PCE concentrations higher than 1,000 µg/kg were collected from beneath remedial cells 3 and 4. The highest concentration of PCE detected on the 100 property (7,000,000 µg/kg) was detected in sample 19157, which was collected in adjacent subcell X17 at a depth of 52 feet BGS. Remedial cell 4 was excavated to depths up to 24 feet BGS. Concentrations of PCE higher than 1,000 µg/kg were detected in samples collected from 24 to 58 feet BGS. Of the 42 samples collected from beneath remedial cells 3 and 4 that had PCE concentrations higher than 1,000 µg/kg, 20 were collected at depths between 50 and 58 feet BGS. A review of boring logs indicated that a clay layer up to 2 feet thick was found between these depths in borings completed in this general area.

In addition, the remaining 26 of 68 samples detected PCE at concentrations greater than 1,000 µg/kg in samples collected from beneath or close to B100. Below is a discussion of areas with concentrations of PCE higher than 1,000 µg/kg beneath or near B100.

- The highest PCE concentration from this area, 380,000 µg/kg, was detected in sample 12422, which was collected in subcell H19 at a depth of 4 feet BGS. This sample was collected near a historic trench drain associated with historic Building 2. Sample 12437, which was collected from the same boring at 6 feet BGS, exhibited a concentration of 43,000 µg/kg. PCE degradation products TCE, cis-1,2-dichloroethene, and trans-dichloroethene were also detected in these samples at lower concentrations. PCE was not present at detectable concentrations in four other samples collected in this subcell (17081, 17063, 16958, and 16949) at depths of 16 and 30 feet BGS.

- PCE was detected at concentrations higher than 1,000 µg/kg in four samples collected from borings completed in subcell L17 at depths of 5 feet or less. During installation of one of these borings (DECH), an abandoned UST was discovered at approximately 5.5 feet BGS along the northern border of this subcell. Liquid and sludge inside the tank contained PCE and the PCE degradation product TCE, with substantially more PCE than TCE. Also detected were uranium, various metals, and Aroclor 1260. The sludge inside of the UST was solidified, and the tank was abandoned in place (GTEOSI 2005a). In samples collected from around the tank, PCE was detected at concentrations up to 4,300 µg/kg, and TCE was also present in these samples at much lower concentrations. PCE was not detected in samples collected from a boring completed on the south side of the tank at depths of 6 feet or below.

- PCE was detected in samples 30791 and 30792, which were collected at depths of 2 and 4 feet BGS from a boring completed in subcell L16, at concentrations of 13,000 µg/kg and 4,300 µg/kg, respectively. The PCE degradation product TCE was present in each sample at much lower concentrations. These samples were collected from a boring installed just north of an abandoned UST that was discovered during drilling investigations along the southern border of subcell L16. PCE was not detected in three samples collected from borings within this subcell at depths of 6, 16, and 30 feet.

- PCE was detected at a concentration of 4,200 µg/kg in a sample collected from subcell M19 at 1 foot BGS. Samples collected below this sample from 3, 7, and 9 feet BGS showed decreasing concentrations of PCE, beginning with 210 µg/kg and decreasing to 100 µg/kg.

- PCE was detected at a concentration of 4,000 µg/kg in sample 100-06-Z1, which was collected from subcell M15 at 2 to 4 feet BGS. Seven samples were collected from boring 100-06, with the deepest sample collected at 51 to 52 feet BGS. PCE was detected in the six samples collected at depths greater than 4 feet at concentrations ranging from 0.97 µg/kg to 53 µg/kg, with the highest concentration detected in the deepest sample. This boring was completed near three historic leach pools (LPH-03 through LPH-05).

- PCE was detected at a concentration of 280,000 µg/kg in sample 16301, which was collected from subcell E20 at a depth of 16 feet BGS beneath re-

medial cell 9. The PCE degradation product TCE (11,000 µg/kg) and acetone (14,000 µg/kg) were also detected in this sample. Acetone and methylene chloride were detected at concentrations of 10 µg/kg or less in samples collected at depths of 17.5 feet or greater within this subcell. No other VOCs were detected in samples collected from this subcell.

- PCE was detected in samples collected from two different borings in subcell L15. The highest concentration of PCE (12,000 µg/kg) was detected in sample 21968, which was collected from boring 05 at 16 feet BGS. Sample 21511, which was collected from boring 01 at 6 feet BGS, had a PCE concentration of 2,000 µg/kg. These borings were installed as part of an investigation of historic leach pool LPH-03, and both were installed 5 to 10 feet south of the reported location of this leach pool. The boring logs indicate that soils at these locations had been disturbed. In boring 05, a 4-inch-thick layer of asphalt was found at 11 feet BGS, and in boring 01, brick, asphalt, concrete, and wood debris were found from 14 to 15 feet BGS. One sample was collected at 30 feet BGS from each of these borings, and neither sample had detectable concentrations of PCE. No other VOCs were detected in samples collected from subcell L15. Debris was not encountered below 4 feet BGS in boring 02, which was completed within the reported location of LPH-03.

- PCE was detected in four of 14 samples (21947, 22208, 22204, and 22566) collected from nine borings completed in subcell M14. These borings were completed as part of an investigation of historic leach pool LPH-04. PCE concentrations ranged from 1,300 µg/kg to 6,400 µg/kg in samples collected at depths of 9 to 22 feet BGS. Nine samples collected from inside and around this leach pool at 30 feet BGS had no detectable concentrations of PCE. Methylene chloride, acetone, and bromomethane were detected in samples collected from these borings at concentrations of 14 µg/kg or less.

- PCE was detected in nine of 11 samples collected from subcell N15 as part of an investigation of historic leach pool LPH-05. Sample 12389, which was collected at a depth of 25 feet BGS, had a PCE concentration of 6,100 µg/kg. This sample was collected from boring DL07 at the bottom of the leach pool. The boring logs record that a void space was encountered inside this leach pool from 5 to 25 feet BGS. Samples collected from this boring at 27 and 30 feet BGS had PCE concentrations of 190 µg/kg (sample 12393) and 15 µg/kg (sample 12421). The highest PCE concentration detected in samples collected at 30 feet BGS from borings completed outside of this leach pool was only 18 µg/kg. PCE degradation products TCE and trans-1,2-dichloroethane were detected in samples at concentrations significantly less than associated concentrations of PCE in some samples. Chloromethane and toluene were also detected in three samples at concentrations significantly less than the associated concentrations of PCE, with a maximum of 0.78 µg/kg.

Other VOCs that were detected at a frequency greater than 5% include the following:

- TCE was detected in 139 of 1,636 samples, and 10 samples had concentrations higher than 1,000 µg/kg. The highest concentration of TCE (12,000 µg/kg) was detected in sample 19157, which was collected from subcell X17 at a depth of 52 feet BGS. The highest detected concentration of PCE on the 100 property was also detected in this sample (7,000,000 µg/kg). All TCE concentrations higher than 100 µg/kg were detected in samples with PCE present and at significantly higher concentrations. The presence of TCE is likely the result of degradation and/or impurities in the original PCE product. TCE was present at concentrations higher than or without the presence of PCE in several samples, but only at concentrations less than 20 µg/kg.

- Trichlorofluoromethane was detected in 22 of the 93 samples analyzed for this compound. The highest concentration (1.3 µg/kg) was detected in sample LPH-C/Z6, which was collected in subcell T69 at a depth of 46 to 48 feet BGS. This subcell is located near a former leach pool area. In the 21 other samples in which trichlorofluoromethane was detected, the concentrations ranged from 0.29 µg/kg to 0.72 µg/kg. Trichlorofluoromethane did not exhibit specific lateral or vertical trends in distribution or concentration.

- Methylene chloride was detected in 179 of 1,135 samples. The highest concentration (40,000 µg/kg) was detected in sample 05276, which was collected from subcell W16 at a depth of 24 feet BGS, beneath remedial cell 4. This sample also had a high concentration of PCE (400,000 µg/kg) and the highest concentration of acetone (46,000 µg/kg). In the 178 other samples in which methylene chloride was detected, the concentrations ranged from 0.47 µg/kg to 33 µg/kg.

- Acetone was detected in 176 of 810 samples. The highest concentration (46,000 µg/kg) was detected in sample 05276, which was collected from subcell W16 at a depth of 24 feet BGS, beneath remedial cell 4. This sample also had a high concentration of PCE (400,000 µg/kg) and the highest concentration of methylene chloride (40,000 µg/kg). Sample 16301, which was collected from subcell E20 at 16 feet BGS beneath remedial cell 9, had an acetone concentration of 14,000 µg/kg. This sample also had a high concentration of PCE (280,000 µg/kg). In the remaining 174 samples in which acetone was detected, the concentrations ranged from 1.5 µg/kg to 160 µg/kg.

Total petroleum hydrocarbons (TPH), m,p-xylenes, o-xylene, and toluene were not detected at a frequency greater than 5%, but high concentrations of these analytes were detected on the 100 property. Sample 17671, which was collected at 12 feet BGS beneath remedial cell 9 (subcell C21), exhibited the highest concentrations TPH (95,000 µg/kg), toluene (6,900 µg/kg), and m,p-xylenes (2,100 µg/kg) detected on the property. This sample also exhibited a concentration of o-xylene (930 µg/kg). This was the only sample that contained detectable concentrations of TPH on the 100 property. Thirty-seven samples in total were analyzed for TPH. Seven other samples collected in subcell C21, including a sample

(17689) that was collected from the same boring at 30 feet, did not contain detectable concentrations of any VOCs. None of the TPH detections appear to be related to the former gas pump island located just south of B100.

The highest concentration of o-xylene (8,600 µg/kg) detected on the 100 property was found in sample 19157, which was collected in subcell X17 along the eastern property border. O-xylene was not detected in any of the other 15 samples collected from this subcell and its presence appears to be an isolated occurrence at this location. The only other petroleum-related compound detected in this sample was m,p-xylene, which was detected at a concentration of 330 µg/kg. PCE (7,000,000 µg/kg) and TCE (12,000 µg/kg) were also detected in this sample. Besides sample 17761 discussed above in the TPH discussion, o-xylene was detected in four other samples at concentrations of 550 µg/kg or less. Neither of these petroleum-related compounds appear to be related to the former gas pump island, which was located just south of the southeast corner of B100 (subcells O20 and P20).

PCE was detected at concentrations greater than 1,000 µg/kg in five distinct areas beneath B100 and in one area along the eastern border of the property, beneath remedial cells 3 and 4. Elevated PCE concentrations were encountered beneath the eastern portion of B100 during investigations of three historic leach pools, in soils surrounding an abandoned UST discovered during drilling, and near a historic trench drain. The majority of these elevated concentrations of PCE appeared to be limited in both vertical (less than 25 feet BGS) and horizontal extent. During the investigations of the leach pools, PCE was largely absent until reaching what appeared to be the bottom of the structure, and it was not detected in samples towards the bottoms of boreholes generally at 30 feet BGS.

Highly elevated PCE concentrations (>1,000,000 µg/kg) were detected beneath the northern portions of remedial cell 4 and the southern portions of remedial cell 3 to depths up to 57 feet BGS. Historically, this portion of the property has not been used as other than a parking lot since the Sylvania operations ended around 1966. During Sylvania operations, Building 7 was located in this vicinity and was called a pump house. A reservoir was located adjacent to the building. During the Phase I Soil Remediation, a leach pool was found in the remedial cell 3 and 4 dividing line, numerous pipes were found along the eastern border of the property, and what appears to be the remnants of the Building 7 reservoir and other construction/building debris were encountered (GTEOSI 2006a).

4.5.4.3 Radionuclides

A total of 10,785 samples were evaluated for the 100 property, including:

- 94 samples collected by the USACE;
- 1,075 samples collected by GTEOSI and analyzed by an off-site laboratory; and

- 9,616 samples collected by GTEOSI and analyzed by the on-site laboratory using gamma spectroscopy.

Table 4.5-3 presents a statistical summary of the analytical results for radionuclides. More detailed results can be reviewed in the interactive database included as Appendix H. Figures 4.5-4a and 4.5-4b present the sampling results for U-238.

Uranium is the major contributor to radioactive contamination on the 100 property, with concentrations of U-238 ranging from background to 1,300 pCi/g. The highest Th-232 concentration was 15 pCi/g. The areas exhibiting the highest concentrations of uranium, thorium, and their daughter products are described below.

- **Uranium.** U-238 was detected in 7,226 of the 10,785 samples collected from the 100 property at concentrations greater than its BTV (0.901 pCi/g) and in 3,489 samples at concentrations greater than three times its BTV. U-234 was detected in 666 of 1,169 samples collected from the 100 property at concentrations greater than its BTV (0.81 pCi/g) and in 397 samples at concentrations greater than three times its BTV. U-235 was detected in 8,023 of 10,785 samples collected from the 100 property at concentrations greater than its BTV (0.091 pCi/g) and in 4,664 samples at concentrations greater than three times its BTV.

  The highest concentrations of uranium (U-238 at 1,300 pCi/g and U-235 at 77 pCi/g) were detected in sample 16301 (on-site lab data), which was collected beneath remedial cell 9 in subcell E20 at 16 feet BGS. U-234 was not reported in the on-site lab data. The highest concentration of U-234 detected in subcell E20 (53.1 pCi/g) was from sample 16890, which was collected at 16 feet BGS. In the same sample (16890), the U-238 concentration was 52.3 pCi/g and the U-235 concentration was 2.76 pCi/g, which indicate the presence of natural uranium. This contaminated area of the 100 property includes subcells E19, E20, F20, F21, G20, and G21, beneath remedial cell 9. The contamination is likely due to the presence of historic leach pools, drywells, and drains. The area is contaminated at a depth of 16 feet and again at depths of 24 to 56 feet BGS. The highest concentrations of U-238 detected in samples collected in these subcells from 24 to 56 feet BGS ranged from 32 pCi/g (the highest concentration in subcell G21, at 40 to 48 feet) to 354 pCi/g (the highest concentration in subcell F20, at 40 to 48 feet BGS).

  To the west of the area described above, concentrations of U-238 ranging from 33 to 77 pCi/g were detected at the same depth interval of 40 to 48 feet in subcells C19, C20, D19, D20, and D21. To the east of the area described above, the U-238 concentration in subcell H19 was 220 pCi/g at 0 to 8 feet BGS (sample 12422).

  In the southeast corner of the site, south of remedial cell 11 and former recharge basin No. 2, uranium was detected at concentrations of 47.8 pCi/g (U-234), 3.05 pCi/g (U-235), and 51.5 pCi/g (U-238) in subcell P23 at a depth of

11 feet BGS (sample 04895). In the same area, uranium was detected at concentrations of 34.1 pCi/g (U-234), 1.54 pCi/g (U-235), and 34.5 pCi/g (U-238) in samples collected from 9 feet BGS in subcell W22.

To the north of remedial cell 9 and inside B100, elevated levels of uranium, potentially associated with a trench drain, were detected in subcells F18, G-18, and H-18. Fifteen samples, all of which were collected between 1 and 7 feet BGS, exceeded 20 pCi/g (U-238). The highest concentrations of uranium, which ranged from 70 pCi/g to 110 pCi/g (U-238), were detected in samples collected at depths of 5 to 7 feet BGS.

Elevated levels of uranium, potentially associated with an underground storage tank, were detected in subcell L17. Samples were collected from 0 to 30 feet BGS in this subcell, and the highest concentrations were detected in sample 28209 at 2 feet BGS (U-238 at 50 pCi/g and U-235 at 2.3 pCi/g [U-234 was not measured]).

Elevated levels of uranium were detected in subcell M14 at the location of historic leach pool LPH-04. Samples were collected from 0 to 30 feet BGS, and the highest concentrations were detected at 22 feet BGS (U-238 at 79 pCi/g and U-235 at 6.5 pCi/g [U-234 was not measured]).

On the east side of B100, elevated levels of uranium were detected in subcell N15, which is the location of historic leach pool LPH-05. U-238 was detected in two out of 137 samples (samples 12386 and 12387) at 120 pCi/g at a depth of approximately 24 feet BGS. The concentrations in the remaining samples collected from 0 to 64 feet were all below 23 pCi/g.

Samples collected from test trenches EM-11, EM-13, EM-15b, and EM-21, located on the west side of the B100 property, exhibited elevated levels of uranium. Based on the results obtained using portable survey equipment, samples were collected from the areas exhibiting the highest radiation levels. The uranium concentrations in EM-11 (in subcell C22) and EM-13 (in subcell A21) were approximately 60 pCi/g for both U-234 and U-238. The uranium concentrations in EM-15B (in subcell Y70), which contained green pebble-sized granules, were 66 pCi/g U-234, 2.6 pCi/g U-235, and 52.1 pCi/g U-238. The uranium concentrations in EM-21 (in subcell T70) were 88 pCi/g U-234, 4.4 pCi/g U-235, and 95 pCi/g U-238.

- **Thorium.** Th-232 was detected in 565 of 10,785 samples collected on the 140 property at concentrations equal to or greater than its BTV (1.18 pCi/g) and in seven samples at concentrations greater than three times its BTV. The highest Th-232 concentrations were detected in subcell E20 at 16 feet BGS and subcell N13 at 4 feet BGS at concentrations of 15 pCi/g and 11 pCi/g, respectively. Th-228 and Th-230 were not measured at these locations. Th-228 was detected in 43 of 1,168 samples collected on the 100 property at concentrations equal to or greater than its BTV (1.2 pCi/g) and in two samples at

concentrations greater than three times its BTV. Th-230 was detected in 30 of 1,169 samples collected on the 100 property at concentrations equal to or greater than its BTV (1.02 pCi/g), and no sample had a concentration greater than three times the BTV. The highest concentrations of Th-228 and Th-230 were detected in test trench EM-15B at 0 to 2 feet BGS. Thorium concentrations in EM-15B were 9.8 pCi/g (Th-228), 2.32 pCi/g (Th-230), and 9.5 pCi/g (Th-232).

- **Radium.** Ra-226 was detected in 36 of 7,444 samples (below the 5% expected exceedance of the BTV) collected on the 100 property at concentrations greater than its BTV (0.504 pCi/g), and no samples had a concentration greater than three times the BTV. Ra-228 was detected in 43 of 598 samples at concentrations greater than its BTV (0.733) and in two samples at concentrations greater than three times its BTV. The highest concentration of Ra-226 was 1.47 pCi/g in sample EM-7-SO-01, which was collected in a test trench in subcell P13 at a depth of approximately 3 feet BGS. The highest concentration of Ra-228 was 5.02 pCi/g in sample EM-15B-SO-01, which was collected in a test trench in subcell Y70 at a depth of 0 to 2 feet BGS.

- **Other Radionuclides.** The majority of the radionuclides reported as detected above their respective BTVs (see Table 4.5-3) are short-lived daughter products of the uranium and thorium decay chains. For the most part, Th-234 and Pa-234m had concentrations similar to their parent nuclide, U-238.

  Trace amounts of Cs-137 were detected in approximately 45% of the samples at concentrations ranging from 0.00084 to 0.4 pCi/g. Cs-137 is present in the environment as a result of atmospheric nuclear weapons testing conducted in the 1950s and 1960s, which dispersed and deposited Cs-137 worldwide. Potassium-40, which was also detected, is naturally occurring and ubiquitous in the environment.

4.5.4.4 Summary

Contaminant maps for nickel, PCE, and U-238 are presented on Figures 4.5-2a through 4.5-4b. TAL metal results are presented on Figures 4.5-5a and 4.5-5b.

Although GTEOSI performed remedial excavation activities, contamination remaining on the 100 property is below the eastern portion of B100 (subcells L15 and L16) in the vicinity of former leach pools and a UST (primarily PCE, uranium, and some nickel); below remedial cell 4, located to the east of B100 along the property line with the Driving Range (primarily PCE); and below remedial cell 9, located on the south side of the east-central portion of B100 (primarily nickel, PCE, and uranium). During the excavation of remedial cell 4, a historic building foundation, pipes, and tank remnants were discovered. A historic leach pool, brick structure, and pipe remnants were discovered in subcell W16, samples from which contained many of the highest detected concentrations of PCE on the property (over 1,000,000 µg/kg). During the excavation of remedial cell 9, four historic leach pools, three dry wells, and a historic drainage structure were en-

countered. Boring logs indicate that the historic leach pools were never removed from the site and remain; some were filled with dirt and debris and several were found to be vacant (GTEOSI 2006a).

Sample RI-SB-13-NS, collected from subcell P70 at 0 to 2 feet BGS, contained the highest concentrations of arsenic, selenium, and vanadium on the 100 property. Lead was also detected in this sample at a concentration of 57 mg/kg, which is more than twice the BTV. Subcell P70 is located near the western boundary of the 100 property.

Nickel was present at concentrations greater than 500 mg/kg at two locations on the 100 property: in N15 (located inside B100 along the eastern wall) at 24 feet BGS (bottom of a historic leach pool LPH-05); and beneath remedial cell 9 (and the adjacent subcell G18, located inside B100 along the southern wall adjacent to remedial cell 9). Nickel does not appear to have migrated much deeper than the bottom of LPH-05. The nickel concentrations beneath remedial cell 9 appear widespread and remain well above an order of magnitude higher than the BTV to depths of 64 feet BGS, with the highest concentration (8,020 mg/kg) detected at a depth of 45 to 46 feet BGS.

VOCs (primarily PCE) were detected in site soils mainly in five distinct areas. The VOC plume detected beneath remedial cell 4 is composed primarily of PCE, which was detected in subcell W16 at concentrations up to 450,000 µg/kg at 57 feet BGS. Beneath the eastern half of B100 and just south of it (in remedial cell 9), PCE was detected at concentrations greater than 1,000 µg/kg in the following locations: near and above an abandoned UST (subcell L17), near the bottom of three historic leach pools (subcells L15, M14, and N15), and in a historic trench drain (subcell H19). PCE also was detected in subcell E20 at 16 feet BGS beneath remedial cell 9, but it does not appear to be widespread. With the exception of the PCE plume detected beneath remedial cell 4, the PCE does not appear to have migrated to depths exceeding 25 feet BGS; the deepest occurrence of PCE at a concentration greater than 1,000 µg/kg was detected at 25 feet BGS in subcell N15.

Petroleum-related compounds (TPH, m,p-xylenes, o-xylene, and toluene) were detected at concentrations greater than 1,000 µg/kg in two isolated areas beneath remedial cells 9 and 4. The presence of these compounds does not appear to be related to the former gas pumps that were located just south of the southeastern corner of B100. There does not appear to be a widespread occurrence of these compounds on the property.

The highest concentrations of uranium (U-238 at 1,300 pCi/g) were detected beneath remedial cell 9 at 16 feet BGS. The entire area beneath remedial cell 9 from 24 to 56 feet (subcells E19, E20, F20, F21, G20, and G21) also had elevated concentrations of uranium, with the highest concentrations (U-238 at 350 pCi/g) occurring at 40 to 48 feet. To the west of remedial cell 9, in subcells C-19, C-20, D-19, D-20, and D-21, uranium concentrations were also elevated at this depth

interval (U-238 at 33 to 77 pCi/g). In the southeast corner of the 100 property (subcells P23 and W22), south of a former recharge basin, uranium concentrations were elevated (U-238 up to 51.5 pCi/g) at depths of 9 and 11 feet BGS.

Concentrations of uranium greater than 100 pCi/g, which could be associated with a trench drain, were present in B100 north of remedial cell 9 in subcells F-18, G-18, and H-18. U-238 concentrations ranging from 50 to 80 pCi/g were associated with leach pools on the east side of B100, in subcells M14 and N15. Uranium concentrations also were elevated in test trenches EM-11, EM-13, EM-15b, and EM-21 (subcells C22, A21, Y70 and T70), with U-238 concentrations up to 95 pCi/g.

4.5.5 70 Property Soil Sample Results

A total of 896 samples were evaluated for the 70 property. Statistical summaries of the metals, VOC, and radionuclide results are presented in Table 4.5-4.

4.5.5.1 Metals

Soil sampling for metals from the 70 property consisted of the following:

- 24 soil samples (12 collected from 0 to 2 feet and 12 collected from 2 to 8 feet BGS) were collected by the USACE and analyzed for the full suite of TAL metals;

- 711 samples were analyzed only for nickel: 407 samples were collected by the USACE; 193 samples were collected by GTEOSI and analyzed by an off-site laboratory; 111 samples collected by GTEOSI and analyzed by the on-site laboratory.

- 4 samples were collected by GTEOSI and analyzed uniquely for beryllium by an off-site laboratory

Table 4.5-4 presents a summary of the metals analytical results and a comparison to BTVs. More detailed results can be reviewed in the interactive database included as Appendix H. Figures 4.5-5a and 4.5-5b present metals results, and Figures 4.5-2a and 4.5-2b present only nickel results. Metals results are discussed below in relation to their respective BTV. They are also compared to an arbitrary concentration of three times the respective BTV to help identify metals that clearly may be present as a result of site activities.

Generally, metal concentrations (except nickel) were higher in samples collected from 0 to 2 feet BGS than deeper samples collected from the three site properties. The site is located in an industrial area, and part of this trend is likely the result of general anthropogenic pollution sources. Otherwise, most of the metals did not exhibit specific lateral or vertical trends in distribution or concentration. If other trends were observed, they are noted below.

Twenty-two metals were detected in the samples collected from this property. Thallium was the only metal analyzed for but not detected on the property. Seven of the metals (antimony, arsenic, chromium, copper, nickel, selenium, and silver) were detected in at least one sample at a concentration greater than three times their BTV, and these are discussed below.

- **Antimony** was detected in 12 of the 24 TAL samples at concentrations greater than its BTV (0.639 mg/kg), and its concentration in two samples was greater than three times its BTV. The highest concentration, 2.26 mg/kg, was detected in RI-SB-24-NS, which was collected in subcell Q25 at 0 to 2 feet BGS. The other sample, RI-SB-29-NS, had a concentration of 2.18 mg/kg and was collected in subcell L34 from 0 to 2 feet BGS.

- **Arsenic** was detected in 17 of 24 samples at concentrations greater than its BTV (2.42 mg/kg), and its concentration in six samples was greater than three times its BTV. The highest concentration, 13.6 mg/kg, was detected in sample RI-SB-29-NS, which was collected in subcell L34 at 0 to 2 feet BGS. The five other samples with arsenic concentrations greater than three times its BTV—RI-SB-21-NS (from 0 to 2 feet BGS in subcell A27), RI-SB-27-NS (from 0 to 2 feet BGS in subcell A34), RI-SB-19-NS (from 0 to 2 feet BGS in subcell P77), RI-SB-30-SS (from 2 to 8 feet BGS in subcell P30), and RI-SB-24-NS (from 0 to 2 feet BGS in subcell Q25)—had concentrations of 12.9 mg/kg, 12.5 mg/kg, 8.9 mg/kg, 8.7 mg/kg, and 8.7 mg/kg, respectively.

- **Chromium** was detected in seven of 24 samples at concentrations greater than its BTV (7.56 mg/kg), and its concentration in one sample was greater than three times its BTV. Sample RI-SB-29-NS, which was collected in subcell L34 at 0 to 2 feet BGS, had a chromium concentration of 37.8 mg/kg.

- **Copper** was detected in three of 24 samples at concentrations greater than its BTV (9.19 mg/kg), and its concentration in two samples was greater than three times its BTV. The highest concentration of copper (50 mg/kg) was detected in sample RI-SD-01, which was collected in subcell F34 at 10 feet BGS. Sample RI-SB-24-NS, which was collected in subcell Q25 at 0 to 2 feet BGS, had a copper concentration of 44.5 mg/kg.

- **Nickel** was detected in 71 of 711 samples at concentrations greater than its BTV (16.1 mg/kg), and its concentration in 32 samples was greater than three times its BTV. All 32 samples that were detected at concentration greater than three times its BTV were found at locations along the north-central property boundary, just south of remedial cell 9 of the 100 property (subcells C22, D22, I22, H22, E23, F24, and R24). These concentrations were detected at a wide range of depths (1 to 64 feet BGS) and appear to be related to nickel contamination found in and around remedial cell 9. The highest concentration of nickel (1,020 mg/kg) was detected in sample 22921, which was collected in subcell D22 at 47 feet BGS.

- **Selenium** was detected in 24 of 24 samples at concentrations greater than its BTV (0.376 mg/kg), and its concentration in 24 samples was greater than three times its BTV. The highest concentration of selenium (11 mg/kg) was detected in sample RI-SB-21-NS, which was collected in subcell A27 at 0 to 2 feet BGS. In the remaining 23 samples with selenium concentration greater than three times the BTV, the concentrations ranged from 1.3 to 7.1 mg/kg. The samples were collected from various cells throughout the 70 property, and no specific trends in distribution were observed.

- **Silver** was detected in six of 24 samples at concentrations greater than its BTV (0.137 mg/kg), and its concentration in five samples was greater than three times its BTV. The highest concentration of silver (12.6 mg/kg) was detected in sample RI-SB-29-NS, which was collected in subcell L34 at 0 to 2 feet BGS. The four other samples with silver concentrations greater than three times its BTV—RI-SD-01 (from 10 feet BGS in subcell F34), RI-SB-23-NS (from 0 to 2 feet BGS in subcell L27), RI-SB-29-SS (from 2 to 8 feet BGS in subcell L34), and RI-SB-21-NS (from 0 to 2 feet BGS in subcell A27)—had silver concentrations of 3.2 mg/kg, 2.3 mg/kg, 1.7 mg/kg, and 0.44 mg/kg, respectively.

Below is a summary of the 15 metals that did not have a concentration greater than three times BTV.

- Beryllium, cobalt, and thallium were not detected in any samples above their respective BTVs.

- Barium, manganese, and mercury were each detected in one sample above their respective BTVs. These frequencies of detection are within the expected 5% exceedence of the respective BTVs.

- Zinc was detected in three of 24 samples at concentrations greater than its BTV (25.1 mg/kg). The highest concentration was 40 mg/kg.

- Aluminum, iron, lead, and vanadium were detected in 4 to 6 samples above their respective BTVs. The maximum concentrations were 16,100 mg/kg, 20 mg/kg, 300 mg/kg, 19.9 mg/kg, and 30.3 mg/kg, respectively.

The maximum concentration of cadmium was 0.38 mg/kg and was detected in 5 of the 25 samples. The maximum concentration of sodium was 151 mg/kg and was detected in 23 of 25 samples.

4.5.5.2 VOCs

A total of 584 samples were collected from the 70 property and analyzed for VOCs, including:

- 393 samples collected by the USACE, and

- 191 samples collected by GTEOSI and analyzed by an off-site laboratory.

Table 4.5-4 presents a statistical summary of VOC analytical results. More detailed results can be reviewed in the interactive database included as Appendix H. A total of 27 VOCs were detected in samples collected from this property. Seven compounds—PCE, TCE, trichlorofluoromethane, methylene chloride, acetone, toluene and m, p-xylenes—were detected at a frequency of more than 5% in samples that the compound was analyzed for.

Figures 4.5-3a and 4.5-3b present the PCE sampling results. The VOC results are discussed below with regard to the detection frequency and an arbitrary concentration of 1,000 µg/kg in order to describe areas where higher concentrations were detected on the property.

- **PCE** was detected in 180 of 584 samples, and five samples has PCE concentrations greater than 1,000 µg/kg. The highest concentration (8,900 µg/kg) was detected in sample EM-35-SO-01, collected in subcell T73 at 1 foot BGS. The four other elevated concentrations of PCE ranged from 1,600 µg/kg to 5,300 µg/kg and were from samples collected at depths less than 8 feet BGS. Two of these samples were collected beneath the south-central portion of B70 and two were collected within the boundaries of a historic recharge basin.

- **TCE** was detected in 53 of 583 samples, and one sample had a concentration greater than 1,000 µg/kg (1,700 µg/kg). This was detected in the same sample (RI-SB-27-NS) where the second highest PCE concentration (5,300 µg/kg) was detected. This sample was collected in subcell A34 at 0 to 2 feet BGS, beneath the south-central portion of B70.

- **Trichlorofluoromethane** was detected in 42 of the 392 samples. The highest concentration (3.2 µg/kg) was detected in sample SU11-03-Z1, collected in subcell C27 at 0 to 2 feet BGS. The 41 other detected concentrations of trichlorofluoromethane ranged from 0.27 µg/kg to 1.4 µg/kg. It did not exhibit specific lateral or vertical trends in distribution or concentration.

- **Methylene chloride** was detected in 53 of 583 samples. The highest concentration (24 µg/kg) was detected in sample SU12-17/Z4, collected in subcell H31 between 25 and 26 feet BGS. This sample was collected from within the boundaries of a historic recharge basin. The 52 other detected concentrations of methylene chloride ranged from 0.34 µg/kg to 19 µg/kg. Methylene chloride did not exhibit specific lateral or vertical trends in distribution or concentration.

- **Acetone** was detected in 43 of 467 samples. The highest concentration (250 µg/kg) was detected in sample SU11-22-Z1, collected in subcell D34 at a depth of 6 to 8 feet BGS. The 42 other detected concentrations of acetone ranged from 3.2 µg/kg to 240 µg/kg. Acetone did not exhibit specific lateral or vertical trends in distribution or concentration.

- **Toluene** was detected in 55 of 584 samples. The highest concentration (12 µg/kg) was detected in sample SU12-07/Z1, collected in subcell H28 at a depth of 5 to 6 feet BGS. This sample, which also had the highest concentration of m,p-xylenes, was collected within the boundaries of a historic recharge basin. The other 54 detected concentrations of toluene ranged from 0.19 µg/kg to 9.7 µg/kg and did not exhibit specific lateral or vertical trends in distribution or concentration.

- **M, p-xylenes** were detected in 19 of 397 samples. The highest concentration (4.2 µg/kg) was detected in sample SU12-07/Z1, collected in subcell H28 at a depth of 5 to 6 feet BGS. This sample, which also had the highest concentration of toluene, was collected within the boundaries of a historic recharge basin. The 19 other detected concentrations of m,p-xylenes ranged from 0.42 µg/kg to 3.8 µg/kg. M,p-xylenes did not exhibit specific lateral or vertical trends in distribution or concentration.

4.5.5.3 Radionuclides

A total of 896 samples were collected from the 70 property and analyzed, including:

- 395 samples collected by the USACE,

- 283 samples collected by GTEOSI and analyzed by an off-site laboratory, and

- 218 samples collected by GTEOSI and analyzed by the on-site laboratory using gamma spectroscopy.

Table 4.5-4 presents a statistical summary of the analytical results for radionuclides. More detailed results can be reviewed in the interactive database included as Appendix H. Figures 4.5-4a and 4.5-4b present the sampling results for U-238.

Uranium is the major contributor to radioactive contamination on the 70 property, with concentrations of U-238 ranging from background to 194 pCi/g. Based on the ratios of the uranium isotopes, there is an indication that enriched uranium and depleted uranium may exist on this property in several locations. The highest detected Th-232 concentration was 2.7 pCi/g. The areas exhibiting the highest concentrations of uranium, thorium, and their daughter products are described below.

- **Uranium.** U-238 was detected in 436 of the 896 samples at concentrations greater than its BTV (0.901 pCi/g) and in 195 samples at concentrations greater than three times its BTV. U-234 was detected in 323 of 678 samples at concentrations greater than its BTV (0.81 pCi/g) and in 177 samples at concentrations greater than three times its BTV. U-235 was detected in 366 of 896 samples at concentrations greater than its BTV (0.091 pCi/g) and in 178 samples at concentrations greater than three times its BTV.

The soil sample (GPR-F-SO-01) collected within 2 feet of a slag nugget that exhibited high concentrations of uranium (see Section 4.8) yielded elevated uranium concentrations (U-234 at 41.2 pCi/g, U-235 at 2.17 pCi/g, and U-238 at 94 pCi/g). These levels are indicative of depleted uranium. The soil collected at 4 feet BGS at the same location yielded a U-238 concentration of 1.33 pCi/g.

Elevated levels of uranium were detected in subcell X78 inside B70 in the soil directly beneath concrete core sample F6-01. Uranium concentrations included U-234 at 65 pCi/g, U-235 at 6.1 pCi/g, and U-238 at 194 pCi/g. The soil sample collected 6 to 7.5 feet beneath the concrete core yielded concentrations of uranium below the BTVs.

Elevated levels of uranium were detected in subcell C22, located at the north-central portion of the 70 property. The highest concentrations of uranium (U-238 at 72 pCi/g and U-235 at 4.2 pCi/g [U-234 was not analyzed]) were detected in sample 23290, which was collected at 1 foot BGS. At 3 feet BGS, the concentrations were 46 pCi/g U-238 and 2.5 pCi/g U-235.

Uranium concentrations exceeded BTVs at varying depths in the B70 warehouse. The highest uranium concentration was detected in sample SU12-03/Z3, collected in subcell I26 (beneath the former recharge basin) at 16 to 18 feet BGS (U-234 at 63.7 pCi/g, U-235 at 3.05 pCi/g, and U-238 at 9.8 pCi/g). Other samples with concentrations exceeding 20 pCi/g included:

- SU12-01/Z5, collected at 32 to 34 feet in subcell E26 (25 pCi/g U-234, 1.09 pCi/g U-235, and 10.9 pCi/g U-238);
- SU12-07/Z3, collected at 17 to 18 feet BGS in subcell H28 (36.6 pCi/g U-234, 1.68 pCi/g U-235, and 0.87 pCi/g U-238);
- SU12-11/Z2, collected at 10 to 12 feet in subcell G29 (41.3 pCi/g U-234, 1.72 pCi/g U-235, and 5.73 pCi/g U-238); and
- 01378, collected at 6 feet BGS in subcell J25 (71.6 pCi/g U-234, 2.18 pCi/g U-235, and 7.2 pCi/g U-238).

All of these results, which were detected in samples from beneath or in the vicinity of a former recharge basin, indicate the potential presence of enriched uranium.

The highest concentrations of uranium near the drains in B70 were detected in the sample collected next to drain DR-K in subcell I26. Uranium concentrations at 15 to 16 feet BGS were 133 pCi/g U-234, 6.2 pCi/g U-235, and 28.5 pCi/g U-238, indicating the potential presence of enriched uranium. The U-234 concentration decreased to 11.4 pCi/g at this location from 19 to 20 feet BGS. Additional samples with elevated uranium concentrations up to 22

pCi/g included those collected next to drains DR-J and DR-U. The results for these samples did not indicate the potential presence of enriched uranium.

A buried cylindrical concrete drywell was found during the excavation of test trench EM-28 in subcell B26. Uranium concentrations in sample EM-28-SO-01, collected at 9 feet BGS from inside the drywell, were 95 pCi/g U-234, 5.8 pCi/g U-235, and 41.9 pCi/g U-238. In sample EM-28-SO-02, which was collected from the bottom of the drywell (12 feet BGS), the concentrations of uranium were 69 pCi/g U-234, 3.3 pCi/g U-235, and nondetect for U-238. The results for both samples indicate the potential presence of enriched uranium.

- **Thorium.** Th-232 was detected in 34 of 896 samples at concentrations greater than its BTV (1.18 pCi/g); no sample concentrations exceeded three times the BTV. Th-228 was detected in 20 of 678 samples at concentrations greater than its BTV (1.2 pCi/g); no sample concentrations exceeded three times the BTV. Th-230 was detected in 62 of 678 samples at concentrations greater than its BTV (1.02 pCi/g); no sample concentrations exceeded three times the BTV. The highest Th-228 concentration (1.78 pCi/g) was detected in a sample collected in subcell G24 at 3 feet BGS. The highest Th-230 concentration (2.53 pCi/g) was detected in a sample collected in subcell H25 at 5 feet BGS. The highest Th-232 concentration (2.7 pCi/g) was detected in a sample collected in subcell C22 at 1 foot BGS.

- **Radium.** Ra-226 was detected in 76 of 854 samples at concentrations greater than its BTV (0.504 pCi/g); no sample concentrations exceeded three times the BTV. Ra-228 was detected in 41 of 674 samples at concentrations greater than its BTV (0.733 pCi/g); no sample concentrations exceeded three times the BTV. The highest concentration of Ra-226 (1.51 pCi/g) was detected in sample DR-AA-Z1, collected in subcell T80 at 4 to 6 feet BGS. The highest concentration of Ra-228 (1.62 pCi/g) was detected in sample RI-SB-21-NS, collected in subcell A27 at 0 to 2 feet BGS.

- **Other Radionuclides.** The majority of the radionuclides reported as detected in Table 4.5-4 are short-lived daughter products of the uranium and thorium decay chains. For the most part, Th-234 and Pa-234m had concentrations similar to their parent nuclide, U-238.

  Trace amounts of Cs-137 were detected in approximately 40% of the samples at concentrations ranging from 0.0031 to 0.144 pCi/g. Cs-137 is present in the environment as a result of atmospheric nuclear weapons testing conducted in the 1950s and 1960s, which dispersed and deposited Cs-137 worldwide. Potassium-40 is naturally occurring and ubiquitous in the environment.

4.5.5.4 Summary

Contaminant maps for nickel, PCE, and U-238 are presented on Figures 4.5-2a through 4.5-4b. TAL metals results are presented on Figures 4.5-5a and 4.5-5b.

Nickel is present on the 70 property at concentrations greater than the BTV to depths of 64 feet BGS. The highest concentrations of nickel detected on the property appear to be associated with the source area below and around remedial cell 9 on the 100 property. All 32 samples that had a concentration greater than three times the BTV were collected from a small area along the north-central property boundary (subcells C22, D22, I22, H22, E23, F24, and R24). No specific trends were noted in the results for samples collected for TAL metals other than that concentrations of metals (not including nickel) appear to be higher in samples collected from 0 to 2 feet BGS.

The highest VOC contamination in soils on the 70 property consists mainly of PCE and appears to be limited to depths less than 16 feet. The highest PCE concentrations detected on the property were found in three subcell areas: A33 and A34 (5,300 µg/kg at 0 to 2 feet BGS), located in the southwest corner of the B70 central warehouse; T73 and U73 (8,900 µg/kg at 1 foot BGS), located in the northwestern portion of the parking lot north of B70; and I26 (4,600 µg/kg at 4 to 5 feet BGS), located within the footprint of the former recharge basin beneath the easternmost B70 warehouse. One or two samples from all three subcell areas had PCE concentrations of over 1,000 µg/kg near the surface. The remaining sample results for each of the three subcell areas indicate a decreasing trend in PCE concentrations at these locations until the bottom of the borings.

The uranium concentrations detected in samples collected on the 70 property indicate the potential presence of natural, depleted, and enriched uranium. The highest uranium concentration detected on the 70 property (1,450 pCi/g U-238) was in a slag nugget discovered in test trench GPR-F in subcell W74, located in the central portion of the parking lot north of B70. The soil collected within 2 feet of the slag nugget in test trench GPR-F (subcell W74) had elevated levels of U-238, indicative of depleted uranium. Another area that potentially has depleted uranium in the soil is subcell X78, which is located in the northeastern area of the western portion of B70, in the soil beneath a concrete core in B70 (194 pCi/g U-238).

Enriched uranium from the site operations time frame generally has a significantly greater concentration of U-234 than U-238 and an increased percentage of U-235. Locations of potentially enriched uranium include areas in the easternmost B70 warehouse, primarily under the former recharge basin (e.g., subcells E26, G29, H28, I 26, J25) at depths from 6 to 34 feet BGS (U-234 concentrations up to 71.6 pCi/g). Other areas of potentially enriched uranium include drain DR-K in subcell I26 and test trench EM-28 in subcell B26.

The remaining samples from the 70 property, including those from subcell C22 (located just west of remedial cell 8), which had elevated U-238 concentrations, indicated the presence of natural uranium.

4.5.6 Cantiague Park Driving Range Soil Sampling Results

A total of 1,960 samples were evaluated for the Driving Range property. Summaries of the metals, VOC, and radionuclide results are presented in Table 4.5-5.

4.5.6.1 Metals

Soil sampling for metals from the Driving Range property consisted of the following:

- 1,002 were analyzed uniquely for nickel: No samples were collected by the USACE on this property; 134 samples were collected by GTEOSI and analyzed by an off-site laboratory; and 868 samples were collected by GTEOSI and analyzed by the on-site laboratory; and

- 28 samples were collected by GTEOSI and analyzed for beryllium by an off-site laboratory.

Table 4.5-5 presents a summary of the metals analytical results and a comparison to the BTVs. More detailed results can be reviewed in the interactive database included as Appendix H. Figures 4.5-5a and 4.5-5b present metals results, and Figures 4.5-2a and 4.5-2b present nickel results, specifically. Metals results are discussed below in relation to each respective BTV. Metals results are also compared to an arbitrary concentration of three times the respective BTV to help identify metals that clearly may be present as a result of site activities.

- **Beryllium** was detected in 19 of 28 samples; no sample had a concentration greater than the BTV (0.35 mg/kg). The highest concentration of beryllium (0.15 mg/kg) was detected in two samples: 25675, collected in subcell 16A at 64 feet BGS; and 26366, collected in subcell 29D at 64 feet BGS.

- **Nickel** was detected in 8 of 1002 samples at concentrations greater than the BTV (16.1 mg/kg). Three samples had nickel concentrations greater than three times the BTV. The highest concentration detected was 75 mg/kg from sample 21499, collected at 55 feet BGS in boring DL01 in subcell Y14. The other samples with nickel concentrations greater than three times the BTV were: 21476 (57 mg/kg), collected at 33 feet BGS in boring DL01 in subcell Y14; and 20405 (54 mg/kg), collected at 53 feet BGS in boring DL01 in subcell Z17. These sample results do not appear to exhibit any specific trends.

4.5.6.2 VOCs

A total of 964 samples from the Driving Range property were analyzed for VOCs by the GTEOSI project team. Twenty-five VOCs were detected in samples collected from this property. Four compounds—PCE, TCE, methylene chloride, and acetone—were detected at a frequency of more than 5% in samples that the compound was analyzed for. Figures 4.5-3a and 4.5-3b present the PCE sampling results. The VOC results are discussed below with regard to the detection frequency and an arbitrary concentration of 1,000 µg/kg in order to describe areas

where higher concentrations were detected on the property. The sample results for these four VOCs are discussed below.

- **PCE** was detected in 74 of 960 samples, and five samples had concentrations greater than 1,000,000 µg/kg. The highest concentration detected (9,900,000 µg/kg) was in sample 20410, collected at 54 feet BGS in borehole DL01 in subcell Z17. Three samples collected from borehole DL02 in subcell X16 (19735, 19749, and 19754) had at concentrations of 1,700,000 µg/kg (52 feet BGS), 7,100,000 µg/kg (54 feet BGS), and 6,600,000 µg/kg (56 feet BGS), respectively. The fifth sample (19885) was collected at 56 feet BGS in borehole DL02 in subcell X17 and had a concentration of 3,100,000 µg/kg. The highest concentrations of PCE degradation products were also present either in sample 19885 (TCE and cis-1,2-dichloroethene) or sample 20410 (trans-1,2-dichloroethene). No sample collected above 24 feet BGS had a concentration of PCE greater than 150 µg/kg.

- **TCE** was detected in 64 of 946 samples, and six samples had concentrations greater than 1,000 µg/kg. Five of the six samples were collected in the same borehole where the highest PCE concentrations were detected, and the sixth sample (19878; 1,300 µg/kg) was collected at 52 feet BGS in borehole DL01 in subcell X17. PCE was detected at a much higher concentration in this sample (880,000 µg/kg). No sample collected above 20 feet BGS had a concentration of TCE greater than 15 µg/kg.

- **Methylene chloride** was detected in 28 of 270 samples, and four samples had concentrations greater than 10 µg/kg. The highest concentration detected was 27 µg/kg in sample 06239, collected at 6 feet BGS in borehole C in subcell X10. Methylene chloride did not exhibit specific lateral or vertical trends in distribution or concentration.

- **Acetone** was detected in 17 of 162 samples. The highest concentration (22 µg/kg) was detected in sample 06246, collected at 6 feet BGS in subcell X09. All other detections of acetone were at concentrations of 10 µg/kg or lower. Methylene chloride did not exhibit specific lateral or vertical trends in distribution or concentration.

Two other VOCs (o-xylene and toluene) were also detected at significant concentrations (>1,000 µg/kg). O-xylene was detected in 3 of 718 samples, with concentrations ranging from 290 µg/kg to 7,100 µg/kg. PCE was detected in each of these samples at a concentration significantly higher than the o-xylene concentration. Toluene was detected in seven of 964 samples; the highest concentration (3,100 µg/kg) was detected in sample 25438, collected at 8 feet BGS in borehole DL01 in subcell 16B. This appears to be a random isolated detection as the other six detections of toluene ranged from 0.4 µg/kg and 1.6 µg/kg and no not appear to have any significant distributional pattern.

4.5.6.3 Radionuclides

A total of 1,960 samples were collected from the Driving Range property and analyzed, including:

- 285 samples collected by GTEOSI and analyzed by an off-site laboratory; and
- 1,675 samples collected by GTEOSI and analyzed by the on-site laboratory using gamma spectroscopy.

Table 4.5-5 presents a statistical summary of the analytical results for radionuclides. More detailed results can be reviewed in the interactive database included as Appendix H. Figures 4.5-4a and 4.5-4b present the sampling results for U-238.

Uranium concentrations on the Driving Range property did not exceed 20 pCi/g. The highest Th-232 concentration was 2.34 pCi/g. The areas exhibiting the highest concentrations of uranium, thorium, and their daughter products are described below.

- **Uranium.** U-238 was detected in 1,143 of 1,960 samples at concentrations greater than its BTV (0.901 pCi/g) and in 178 samples at concentrations greater than three times its BTV. U-234 was detected in 285 of 285 samples at concentrations greater than its BTV (0.81 pCi/g) and in 53 samples at concentrations greater than three times its BTV. U-235 was detected in 1,193 of 1,960 samples at concentrations greater than its BTV (0.091 pCi/g) and in 406 samples at concentrations greater than three times its BTV.

  The highest concentration of U-238 (20 pCi/g) was detected in sample 25102, collected in subcell 15A at 53 feet BGS (1.1 pCi/g U-235; U-234 was not analyzed). Uranium was also detected in sample 07157, collected in subcell Z21 at 6 feet BGS (12.8 pCi/g U-234, 0.53 pCi/g U-235, and 12.6 pCi/g U-238) and in sample 07115, collected in subcell X21 at 3 feet BGS (10 pCi/g U-234, 3.51 pCi/g U-235, and 11.4 pCi/g U-238). Uranium concentrations exceeded 10 pCi/g in five additional samples in subcells 27I, Y15, 12D, 18A, and 15B at depths ranging from 3 feet BGS to 55 feet BGS. All of the samples appeared to contain natural uranium.

- **Thorium.** Th-232 was detected in 68 of 1,960 samples at concentrations greater than its BTV (1.18 pCi/g); no sample concentration exceeded three times the BTV. Th-228 was detected in 41 of 281 samples at concentrations greater than its BTV (1.2 pCi/g); no sample concentration exceeded three times the BTV. Th-230 was detected in 81 of 285 samples at concentrations greater than its BTV (1.02 pCi/g); no sample concentration exceeded three times the BTV. The highest concentrations of Th-232 were detected in sample 07183, collected in subcell Z23 at 7 feet BGS (2.26 pCi/g Th-228, 1 pCi/g Th-230, and 2.34 pCi/g Th-232). In general, the slightly elevated levels of thorium were found in the vicinity of areas with elevated uranium levels.

- **Radium.** Ra-226 was detected in 64 of 1,660 samples (below the 5% expected exceedance of the BTV) at concentrations greater than its BTV (0.504 pCi/g); no sample concentration exceeded three times the BTV. Ra-228 was detected in 45 of 255 samples at concentrations greater than its BTV (0.733 pCi/g); no sample concentration exceeded three times the BTV. The highest concentration of Ra-226 (1.31 pCi/g) was in subcell X22 at 2.5 feet BGS. The highest concentration of Ra-228 (1.72 pCi/g) was in subcell X25 at 3.5 feet.

- **Other Radionuclides.** The majority of the radionuclides reported as detected in Table 4.5-5 are short-lived daughter products of the uranium and thorium decay chains. For the most part, Th-234 and Pa-234m had concentrations similar to their parent nuclide, U-238.

  Trace amounts of Cs-137 were detected in approximately 40% of the samples at concentrations ranging from 0.0022 pCi/g to 0.31 pCi/g. Cs-137 is present in the environment as a result of atmospheric nuclear weapons testing conducted in the 1950s and 1960s, which dispersed and deposited Cs-137 worldwide. Potassium-40 is naturally occurring and ubiquitous in the environment.

4.5.6.4 Summary

Contaminant maps for nickel, PCE, and U-238 are presented on Figures 4.5-2a through 4.5-4b. TAL metal results are presented on Figures 4.5-5a and 4.5-5b.

VOC contamination appears to be concentrated in one main area of the Driving Range property: 48 to 62 feet BGS beneath subcells X16, X17, Y16, Y17, Z16, and Z17, all beneath remedial cell 14. The soils in remedial cell 14 were previously excavated up to 14 feet BGS, and few to no VOCs were detected in samples collected between 14 and 20 feet BGS. A review of the boring logs and sampling results in remedial cell 4, the area immediately west of this area, suggests that VOCs (primarily chlorinated compounds) traveled vertically downward in remedial cell 4, encountered one or more hydraulically conductive layers, and moved eastward onto the Driving Range property. Most of the contamination appears to present at 48 feet to 56 feet BGS.

Eight samples had concentrations of nickel above the BTV (16.1 mg/kg), and three of these samples had concentration greater than three times the BTV. The highest concentration was 75 mg/kg. There did not appear to be distribution trends in samples collected from this property.

Natural uranium was detected on the Driving Range property at concentrations above the BTVs. U-238 concentrations ranged from background up to 20 pCi/g in samples collected in subcell 15A at 53 feet BGS. U-238 concentrations exceeded 10 pCi/g in samples collected in eight subcells (12D, 15A, 15B, 18A, 27I, X21, Y15, and Z21) at depths ranging from 3 feet to 55 feet BGS. There did not appear to be a pattern related to the elevated concentrations. Thorium isotope concentrations were all below 2.5 pCi/g, and radium isotope concentrations were all below 1.72 pCi/g.

4.6 GTEOSI Findings during Soil Remediation

During GTEOSI excavation activities conducted in 2003 and 2004 to remove and dispose of impacted soils from 14 remedial cells, various unanticipated historic features (anomalies) were discovered (see Figure 4.6-1). These anomalies included leach pools, dry wells, pipes (various sizes and materials), USTs, drum and tank remnants, and construction/building debris. GTEOSI photographed, surveyed, and assigned a unique identifier to each anomaly as they were encountered. In addition, GTEOSI also collected samples from the material inside and/or soils surrounding the anomalies. All anomalies and soils in their immediate vicinity were removed and disposed of as part of the excavation. Appendix I presents tables and figures from the GTEOSI Phase I Remediation Report (GTEOSI 2006a) that detail the locations of the anomalies and the sampling results.

As stated previously, GTEOSI and NYSDEC identified PCE, TCE, uranium, thorium, and nickel as site contaminants targeted for remediation. Below is a summary of the highest concentrations of each of these constituents associated with the anomaly sampling in each remedial cell prior to removal from the site.

- **Remedial Cell 1.** The highest radionuclide concentrations obtained from this cell (1.98 pCi/g Th-232, 8.35 pCi/g U-235, and 150.4 pCi/g U-238) were detected in sample 00058, collected from soil beneath an excavated pipe. The highest VOC concentration (36,114 µg/kg of PCE) was detected in sample 00059, collected from soil inside a pipe elbow. No samples associated with anomalies from this remedial cell were analyzed for nickel.

- **Remedial Cell 2.** The highest radionuclide concentrations (224.1 pCi/g Th-232, 23,500 pCi/g U-234, 1,645 pCi/g U-235, and 35,103.45 pCi/g U-238) were detected in samples 01110 and 01124, collected from liquid and sludge samples taken from a UST, which was subsequently removed. PCE was detected in the sludge sample (01124) at a concentration of 11,000,000 µg/kg. TCE was not detected in significant concentrations in this remedial cell. The highest nickel concentration (27.6 mg/kg) was detected in sample 02074, which was collected from soil inside a dry well.

- **Remedial Cell 3.** The highest radionuclide concentrations (7.28 pCi/g Th-232, 332.91 pCi/g U-235, and 11,669.37 pCi/g U-238) were detected in sample 12736, which was collected from soil under a pipe. The highest concentration of chlorinated compounds (500,000 µg/kg PCE and 41,000 µg/kg TCE) were detected in sample 12918, collected from material beneath the remnants of two 55-gallon drums. The highest concentration of nickel (1,510 mg/kg) was also detected in this sample.

- **Remedial Cell 4.** The highest radionuclide and VOC concentrations (20.4 pCi/g Th-232, 56.7 pCi/g U-235, 1,258.57 pCi/g U-238, 704,000 µg/kg PCE, and 14,000 µg/kg TCE) were detected in sample ID 03905, collected from material found inside a brick structure. The highest nickel concentration

(1,370 mg/kg) was detected in sample 04318, collected from soil under a concrete structure.

- **Remedial Cell 5.** The highest radionuclide and nickel concentrations (1.71 pCi/g Th-232, 2.87 pCi/g U-235, 58.0 pCi/g U-238, and 506 mg/kg nickel) were detected in sample 07324, collected from soil directly under a concrete slab/grate. PCE and TCE were also detected in this sample at concentrations of 12 μg/kg and 4.7 μg/kg, respectively.

- **Remedial Cell 6.** The highest radionuclide concentrations (11.8 pCi/g Th-232, 36.3 pCi/g U-235, and 726 pCi/g U-238) were detected samples 08029 and 08583, collected from inside a historic leach pool. The highest concentrations of PCE and TCE were also detected in these samples at concentrations of 5,500,000 μg/kg and 1,900 μg/kg, respectively. No samples associated with anomalies from this remedial cell were analyzed for nickel.

- **Remedial Cell 7.** The highest radionuclide concentrations (26.2 pCi/g Th-232, 2.26 pCi/g U-235, and 31.8 pCi/g U-238) were detected in sample 04550, collected from soil directly under a pipe. The only concentrations of PCE and TCE associated with anomalies were detected in this sample at concentrations below 100 μg/kg. No samples associated with anomalies in this remedial cell were analyzed for nickel.

- **Remedial Cell 8**. Only one anomaly, a pipe, was found in remedial cell 8; no analytical samples were collected from inside or around this anomaly.

- **Remedial Cell 9.** The highest radionuclide concentrations (29.8 pCi/g Th-232, 153 pCi/g U-235, and 2,850 pCi/g U-238) were detected in sample 15627, collected from material inside a pipe. The highest concentrations of chlorinated compounds (6,500,000 μg/kg PCE and 64,000 μg/kg TCE) were detected in sample 15750, collected in material at the bottom of a wood and concrete building structure. The highest nickel concentration (55,000 mg/kg) was detected in sample 16389, collected from soil from inside a leach pool (noted in field as a dry well).

- **Remedial Cell 10.** The highest radionuclide concentrations were detected in sample 09997 (47.9 pCi/g Th-232), collected from material found inside a pipe; and sample 09969 (5.31 pCi/g U-235 and 105 pCi/g U-238), collected from soil directly under a pipe. The highest PCE concentration (18,000 μg/kg) was detected in sample 09973, collected from material found inside a pipe. The highest TCE concentration (705 μg/kg) was detected in sample 09966, collected from a under a pipe. The highest nickel concentration (204 mg/kg) was detected in sample 10536, collected as an excavation wall sample as part of a historic UST removal in this remedial cell.

- **Remedial Cell 11.** The highest radionuclide concentrations were detected in sample 06690 (10.3 pCi/g Th-232), collected from material found inside a

pipe; sample 06959 (53.4 pCi/g U-235), collected from material found inside drum remnants; and sample 06803 (417 pCi/g U-238), collected from material found inside a pipe. The highest concentrations of PCE (61,000 µg/kg) and TCE (1,700 µg/kg) were detected in sample 06963, collected from material found inside drum remnants. In three samples analyzed for nickel, the highest concentration (39 mg/kg) was detected in sample 06984, collected from material within a drum remnant.

- **Remedial Cell 12.** The highest radionuclide concentrations were detected in sample 05906 (0.81 pCi/g Th-232 and 0.72 pCi/g U-235), collected from material outside of a pipe; and sample 06235 (9.7 pCi/g U-238), collected from soil directly under a pipe union. The highest PCE concentration (10,800 µg/kg) was detected in sample 05908, collected from material found inside a pipe. TCE was detected only at a low estimated concentration (>20 µg/kg).

- **Remedial Cell 13**. No samples were collected from the one anomaly, a pipe, found in this remedial cell.

- **Remedial Cell 14.** The highest radionuclide concentrations were detected in sample 05669 (2.23 pCi/g Th-232), collected from soils under a pipe; and sample 07054 (8.17 pCi/g U-235 and 155 pCi/g U-238), collected from material found inside a pipe. The highest PCE concentration (625 µg/kg) was detected in sample 6610, collected from soil under a pipe.

4.7 Nature and Extent of Groundwater Contamination

The on-site RI groundwater investigation was conducted in two phases (Phase IIIa in 2008/2009 and Phase IIIb 2009/2010). The objective of the first phase was to obtain screening-level groundwater profile data at 10-foot intervals from the top of the water table (approximately 65 feet BGS) to depths ranging down to approximately 300 feet BGS. The main purpose of this screening-level profile data was to determine the optimal depth interval for the monitoring wells to be installed in the profile borings. The main purpose of non-well profile borings was to obtain supplemental screening-level data to help determine whether or not the monitoring well network was properly placed to determine the nature and extent of contamination. In areas where contamination was detected at the target depth, drilling continued until no contamination or no significant level of contamination was detected. The overall program was to include well clusters with a shallow well (top of water table to approximately 120 feet BGS), an intermediate well (120 to 250 feet BGS), and a deep well (250 to 350 feet BGS). However, after review of the Phase IIIa profile sample data and newly installed monitoring well sample data, the program was modified to include additional profile borings and monitoring wells at various depths (some deeper than 350 feet BGS), and of some of the intermediate wells that were deemed unnecessary were eliminated. Thus, shallow wells are designated with an “S,” intermediate wells are designated with an “I,” deep wells are designated with a “D,” and wells deeper than 350 feet are designated with a “DD.” Phase IIIa well locations and depths were chosen based on the results of the GTEOSI groundwater investigation (GTEOSI 2007c), and

Phase IIIb well locations and depths were chosen based on the results of the USACE Phase IIIa groundwater investigation.

The Phase IIIa program included the installation and sampling of 19 deep wells, four shallow wells, and four shallow groundwater profile borings (i.e., borings drilled without installing a well for the purpose of obtaining profile data only). The Phase IIIb program included the installation and sampling of four deep wells (>350 feet BGS), 12 intermediate wells, 23 shallow wells, five intermediate groundwater profile borings, and one deep groundwater profile boring, along with the sampling of seven existing wells and all of the Phase IIIa wells.

The total number of wells used for the groundwater evaluation in this RI report is as follows:

- 31 shallow wells (top of water table to 120 feet BGS)
- 15 intermediate wells (120 feet to 250 feet BGS)
- 19 deep wells (250 feet to 350 feet BGS)
- 4 deeper wells (350 feet to 400 feet BGS)

4.7.1 Groundwater BTV Development

Background threshold values of VOCs, metals, and radionuclides for groundwater were determined using data from upgradient wells MW-13S, -13D, -14S, -14D, -14DD, -15S, -15D, -15DD, -16S, and -16D (see Figure 2.5-8). Ten samples were used to determine the BTVs. The ProUCL program, version 4.00.04 (EPA 2009a), was used to evaluate the background data sets. The distribution of each data set was examined graphically using Q-Q plots generated by ProUCL. Only a single high outlier for manganese was eliminated from the data sets (see Table 4.7-1). Most of the data sets were not normally distributed; therefore, the formal statistical outlier tests included in ProUCL (Dixon's and Rosner's), which require the data sets to be normally distributed, could not be used.

Summary statistics for the datasets from groundwater monitoring wells are provided in Tables 4.7-2 through 4.7-6. The 95% Upper Prediction Limits (95% UPLs) were used as BTVs, as recommended in the ProUCL Technical Guide (EPA 2009a). The statistical methods used to estimate the 95% UPLs, recommended in the ProUCL output, are noted in the table. The RESRAD User's Manual (USDOE 2001) recommends using the mean plus two standard deviations as the BTVs for radionuclides; therefore, these values were included in Table 4.7-1 for comparison with the 95% UPLs, which, for consistency, were used as the BTVs. Since the BTVs are based on a 95% UPL; up to 5% of samples would be expected to have a value higher than the BTV.

4.7.2 RI Results

Tables 4.7-2 through 4.7-6 present statistical summaries of the metal, radiological, and VOC analytical results for groundwater monitoring well samples, as well as a comparison of the results to the appropriate BTVs. A discussion of the metal, radiological, and VOC results for vertical profile samples and tables summarizing the positive analytical results are presented in Appendix H. Groundwater monitoring well water quality parameters measured during sampling, and the list of groundwater monitoring well analytical parameters and methods, are included in Table 4.7-7.

On-site (140, 100, and 70 properties) and Driving Range property groundwater monitoring well sample results were compared to BTVs and an arbitrary concentration of three times the respective BTV to help identify whether a particular contaminant is present as a result of on-site activities and not as naturally occurring concentrations or preexisting upgradient conditions.

The concentrations of selected COPCs, which were determined as part of the risk assessment process (see Section 4.9 and Section 7 of this report) are shown on contaminant distribution maps (see Figures 4.7-1 [shallow groundwater], 4.7-2 [intermediate groundwater], and 4.7-3 [deep groundwater]).

A comparison of monitoring well sample results from samples collected in 2009 and approximately one year later in 2010 and associated profile sample results collected from the same depth range as the monitoring well screens is presented in Table 4.7-8. In general, there was a good correlation between profile sample data and associated monitoring well data, and between monitoring well data from 2009 and 2010. However, profile sample data in some cases tended to exhibit higher contaminant concentrations (especially for metals and, in some cases, radionuclides) than the associated monitoring well sample. The difference in these results may have been caused by several factors:

- **Sampling Methodology.** Profile samples were grab samples collected with a bailer from a sampling device that was advanced ahead of the drill stem into undisturbed soils. The sampler was only exposed to a small portion of the formation (6 inches to 4 feet, depending upon the sampler being used at the time). Monitoring well samples were collected from developed wells with a 10-foot screen using low-flow sampling techniques. This resulted in the profile samples being more turbid than the monitoring well samples. All profiles samples tested for metals and radionuclides were filtered, whereas monitoring well samples were predominantly unfiltered (in four well samples, both filtered and unfiltered metals and radionuclides were collected due to high turbidity). In addition, the profile sample was not collected at the exact same location as the monitoring well sample.

- **Sample Analyses.** Profile samples and monitoring well samples were analyzed by different methods (i.e., profile data is screening-level data with elevated reporting limits as compared to the monitoring well data). Differences

in results between monitoring wells sampled in 2009 and again in 2010 were infrequent, and the cause of any significant difference is unknown.

The sections below summarize the results for groundwater monitoring well samples from Phase IIIb activities. The groundwater monitoring well results are provided in Tables 4.7-9 and 4.7-10.

4.7.2.1 Upgradient Properties

Three well clusters were installed on the NCDPW property (MW-13S/D, MW14S/D/DD, and MW-15S/D/DD), and one cluster was installed on the Cantiague Park property (MW-16S/D) (see Figure 2.5-8). Since no significant contamination was detected in the intermediate depth range (120 to 250 feet BGS) on the NCDPW, Cantiague Park, or 140 properties, no intermediate wells were installed at the upgradient well cluster locations.

All groundwater profile samples were tested for VOCs, samples from three of the four well clusters were tested for metals (MW-13D, -14D/14DD, and -15D/DD), and two of the four well clusters were tested for radiological parameters (MW-15DD [only to a depth of 150 feet BGS] and MW-16D). The results from the profile samples are presented in Appendix H.

All monitoring well samples were tested for VOCs, metals, and radiological parameters. The results from the groundwater monitoring well samples are described below.

Metals in Upgradient Monitoring Well Samples

Groundwater samples were collected from 10 monitoring wells (MW-13S, -13D, -14S, - 14D, -14DD, -15S, -15D, -15DD, -16S, and -16D) on the upgradient properties (NCDPW and Cantiague Park). Table 4.7-2 presents a summary of the metals analytical results. Eighteen of the above-mentioned metals were also detected in the monitoring well samples, including aluminum, arsenic, barium, beryllium, cadmium, calcium, chromium, cobalt, iron, lead, magnesium, manganese, nickel, potassium, sodium, thallium, vanadium, and zinc. The following is a summary of the metals detected (excluding those considered essential nutrients) in the upgradient monitoring well samples. Most of the metals did not exhibit specific lateral or vertical trends in distribution or concentration. Metal that did exhibit a trend are noted below.

- **Aluminum** was detected in five of the 10 upgradient monitoring well samples, with concentrations ranging from 51.8 µg/L (MW-16S, screened at 70 to 80 feet BGS) to 3,210 µg/L (MW-16D, screened at 280 to 290 feet BGS). The higher levels of aluminum (>100 µg/L) were all detected at greater than 280 feet BGS.

- **Arsenic** was detected in two of the 10 upgradient monitoring well samples, with concentrations ranging from 0.16 µg/L (MW-16S, screened at 70 to 80 feet BGS) to 1.6 µg/L (MW-16D, screened at 280 to 290 feet BGS).

- **Barium** was detected in all 10 upgradient monitoring well samples, with concentrations ranging from 9.5 µg/L (MW-14S, screened at 70 to 80 feet BGS) to 89.4 µg/L (MW-13S, screened at 70 to 80 feet BGS).

- **Beryllium** was detected in five of the 10 upgradient monitoring well samples, with concentrations ranging from 0.05 µg/L (MW-14D, screened at 294 to 304 feet BGS) to 0.19 µg/L (MW-13S, screened at 70 to 80 feet BGS).

- **Cadmium** was detected in seven of the 10 upgradient monitoring well samples, with concentrations ranging from 0.11 µg/L (MW-16S, screened at 70 to 80 feet BGS; and MW-16D, screened at 280 to 290 feet BGS) to 0.52 µg/L (MW-13S, screened at 70 to 80 feet BGS).

- **Chromium** was detected in six of the 10 upgradient monitoring well samples, with concentrations ranging from 0.1 µg/L (MW-13S, screened at 70 to 80 feet BGS) to 7.2 µg/L (MW-14DD, screened at 365 to 375 feet BGS).

- **Cobalt** was detected in seven of the 10 upgradient monitoring well samples, with concentrations ranging from 0.43 µg/L (MW-15DD, screened at 360 to 370 feet BGS) to 2.7 µg/L (MW-15D, screened at 300 to 310 feet BGS).

- **Iron** was detected in five of the 10 upgradient monitoring well samples, with concentrations ranging from 154 µg/L (MW-13D, screened at 290 to 300 feet BGS) to 3,790 µg/L (MW-16D, screened at 280 to 290 feet BGS).

- **Lead** was detected in four of the 10 upgradient monitoring well samples, with concentrations ranging from 0.068 µg/L (MW-15S, screened at 70 to 80 feet BGS) to 3.5 µg/L (MW-16D, screened at 280 to 290 feet BGS).

- **Manganese** was detected in all 10 upgradient monitoring well samples, with concentrations ranging from 11.3 µg/L (MW-14S, screened at 70 feet to 80 feet BGS) to 736 µg/L (MW-16S, screened at 70 to 80 feet BGS).

- **Nickel** was detected in four of the 10 upgradient monitoring well samples, with concentrations ranging from 0.66 µg/L (MW-13D, screened at 290 to 300 feet BGS) to 3.9 µg/L (MW-13S, screened at 70 to 80 feet BGS).

- **Sodium** was detected in all 10 upgradient monitoring well samples, with concentrations ranging from 7,640 µg/L (MW-13D, screened at 290 to 300 feet BGS) to 491,000 µg/L (MW-15S, screened at 70 to 80 feet BGS). The three highest levels of sodium were in the three shallow wells (MW-13S, -14S, -15S) nearest to the salt dome.

- **Thallium** was detected in all 10 upgradient monitoring well samples, with concentrations ranging from 0.036 µg/L (MW-13D, screened at 290 to 300 feet BGS) to 0.15 µg/L (MW-13S, screened at 70 to 80 feet BGS).

- **Vanadium** was detected in two of the 10 upgradient monitoring well samples, with concentrations ranging from 2.2 µg/L (MW-14D, screened at 294 to 304 feet BGS) to 9.5 µg/L (MW-16D, screened at 280 to 290 feet BGS).

- **Zinc** was detected in nine of the 10 upgradient monitoring well samples, with concentrations ranging from 3 µg/L (MW-15S, screened at 70 to 80 feet BGS; and MW-15DD, screened at 360 to 370 feet BGS) to 52.5 µg/L (MW-14DD, screened at 365 to 375 feet BGS).

VOCs in Upgradient Monitoring Well Samples

Groundwater samples were collected from 10 monitoring wells (MW-13S, -13D, -14S, -14D, -4DD, -15S, -15D, -15DD, -16S, and -16D) on the upgradient properties (NCDPW and Cantiague Park) and analyzed for VOCs. Table 4.7-2 presents a summary of the VOC analytical results. Fifteen VOCs were detected in the monitoring well samples, including: 1,1-DCA, 1,2,3-trichlorobenzene, 1,2,4-trichlorobenzene, 1,2-dibromoethane, 2-hexanone, 4-methyl-2-pentanone, acetone, bromodichloromethane, bromoform, chloroform, dibromochloromethane, dichlorodifluoromethane, PCE, trans-1,3-dichloropropene, and TCE. The following is a summary of the VOCs detected in the upgradient monitoring well samples. Most of the VOCs did not exhibit specific lateral or vertical trends in distribution or concentration. VOCs that did exhibit a trend are noted below.

- **1,1-DCA** was detected in one of the 10 upgradient monitoring well samples at a concentration of 1.0 µg/L (MW-16D, screened at 280 to 290 feet BGS).

- **1,2,3-trichlorobenzene** was detected in one of the 10 upgradient monitoring well samples at a concentration of 2.0 µg/L (MW-15S, screened at 70 to 80 feet BGS).

- **1,2,4-trichlorobenzene** was detected in one of the 10 upgradient monitoring well samples at a concentration of 2.0 µg/L (MW-15S, screened at 70 to 80 feet BGS).

- **1,2-dibromoethane** was detected in one of the 10 upgradient monitoring well samples at a concentration of 2.0 µg/L (MW-15S, screened at 70 to 80 feet BGS).

- **2-Hexanone** was detected in one of the 10 upgradient monitoring well samples at a concentration of 3.0 µg/L (MW-15S, screened at 70 to 80 feet BGS).

- **4-Methyl-2-Pentanone** was detected in one of the 10 upgradient monitoring well samples at a concentration of 2.0 µg/L (MW-15S, screened at 70 to 80 feet BGS).

- **Acetone** was detected in two of the 10 upgradient monitoring well samples at concentrations of 3.0 µg/L (MW-16S, screened at 70 to 80 feet BGS) and 4.0 µg/L (MW-14DD, screened at 365 to 375 feet BGS).

- **Bromodichloromethane** was detected in one of the 10 upgradient monitoring well samples at a concentration of 2.0 µg/L (MW-15S, screened at 70 to 80 feet BGS).

- **Bromoform** was detected in two of the 10 upgradient monitoring well samples at a concentration of 4.0 µg/L (MW-15S, screened at 70 to 80 feet BGS, and MW-14DD, screened at 365 to 375 feet BGS).

- **Chloroform** was detected in one of the 10 upgradient monitoring well samples at a concentration of 3.0 µg/L (MW-15S, screened at 70 to 80 feet BGS).

- **Dibromochloromethane** was detected in three of the10 upgradient monitoring well samples at a concentration of 3.0 µg/L (MW-15S, screened at 70 to 80 feet BGS; MW-14D, screened at 294 to 304 feet BGS; and MW-14DD, screened at 365 to 375 feet BGS).

- **Dichlorodifluoromethane** was detected in one of the 10 upgradient monitoring well samples at a concentration of 1.0 µg/L (MW-15S, screened at 70 to 80 feet BGS).

- **PCE** was detected in four of the 10 upgradient monitoring well samples at concentrations of 2 µg/L (MW-13S, screened at 70 to 80 feet BGS; MW-15S, screened at 70 to 80 feet BGS; and MW-16S, screened at 70 to 80 feet BGS) and 3 µg/L (MW-16D, screened at 280 to 290 feet BGS).

- **trans-1,3-dichloropropene** was detected in one of the 10 upgradient monitoring well samples at a concentration of 0.9 µg/L (MW-15S, screened at 70 to 80 feet BGS).

- **TCE** was detected in two of the 10 upgradient monitoring well samples at concentrations of 0.5 µg/L (MW-14D, screened at 294 to 304 feet BGS) and 2 µg/L (MW-16D, screened at 280 to 290 feet BGS).

Radionuclides in Upgradient Monitoring Well Samples

Groundwater samples were collected from ten monitoring wells (MW-13S, -13D, -14S, -14D, -14DD, -15S, -15D, -15DD, -16S, and -16D) on the upgradient properties (NCDPW and Cantiague Park) and analyzed for radiological parameters. Table 4.7-2 presents a summary of the radioanalytical results. The samples were analyzed for isotopic uranium, isotopic thorium, Ra-226, Ra-228, total gross alpha radiation (for screening purposes), gross beta radiation (for screening purposes), and gamma emitters. The isotopic uranium results were used to calculate total uranium in µg/L. The following is a summary of the primary radionuclides detected in the upgradient monitoring wells. (U-235 and Th-228 results were all

qualified as nondetect.) No specific lateral or vertical trends in distribution or concentration were noted in the data.

- **U-234** was detected in two of the 10 upgradient monitoring well samples at concentrations of 0.371 pCi/L (MW-14D, screened at 294 to 304 feet BGS) and 0.457 pCi/L (MW-16D, screened at 280 to 290 feet BGS).

- **U-238** was detected in three of the 10 upgradient monitoring well samples, with concentrations ranging from 0.117 pCi/L (MW-16S, screened at 70 to 80 feet BGS) to 0.243 pCi/L (MW-15S, screened at 70 to 80 feet BGS).

- **Total uranium** was calculated from detected values in three of the 10 upgradient monitoring well samples, with concentrations ranging from 0.427 pCi/L (MW-16S, screened at 70 to 80 feet BGS) to 0.773 pCi/L (MW-15S, screened 70 to 80 feet BGS).

- **Th-230** was detected in three of the 10 upgradient monitoring well samples, with concentrations ranging from 0.437 pCi/L (MW-15DD, screened at 360 to 370 feet BGS) to 0.828 pCi/L (MW-13D, screened at 290 to 300 feet BGS).

- **Th-232** was detected in one of the 10 upgradient monitoring well samples at a concentration of 0.137 pCi/L (MW-15D, screened at 300 to 310 feet BGS).

- **Ra-226** was detected in eight of the 10 upgradient monitoring well samples, with concentrations ranging from 0.296 pCi/L (MW-13D, screened at 290 to 300 feet BGS) to 1 pCi/L (MW-13S, screened at 70 to 80 feet BGS).

- **Ra-228** was detected in seven of the 10 upgradient monitoring well samples, with concentrations ranging from 0.453 pCi/L (MW-13D, screened at 290 to 300 feet BGS) to 1.51 pCi/L (MW-15D, screened at 300 to 310 feet BGS).

- **Gross alpha total (screening)** was detected in seven of the 10 upgradient monitoring well samples, with concentrations ranging from 0.819 pCi/L (MW-16S, screened at 70 to 80 feet BGS) to 5.33 pCi/L (MW-16D, screened at 280 to 290 feet BGS).

- **Gross beta (screening)** was detected in eight of the 10 upgradient monitoring well samples, with concentrations ranging from 1.48 pCi/L (MW-13D, screened at 290 to 300 feet BGS) to 15.8 pCi/L (MW-15S, screened 70 to 80 feet BGS).

Summary

The analytical results from samples collected from three groundwater well clusters on the NCDPW property (upgradient of the 140 property, 100 property, and 70 property sites) and one well cluster on the Cantiague Park property (upgradient of the Driving Range property) were used to establish a baseline (upgradient conditions) of groundwater quality just prior to it entering the site. The results from

the upgradient samples were used to generate BTVs to assist in the evaluation of groundwater beneath the three properties and the adjacent Driving Range property. Comparison of site well data to contaminant-specific BTVs allowed for a determination of whether site groundwater had been impacted by site activities, upgradient sources, or both. The summaries below describe the findings of upgradient well testing.

- **Metals.** Eighteen metals were detected in the monitoring well samples: aluminum, arsenic, barium, beryllium, cadmium, calcium, chromium, cobalt, iron, lead, magnesium, manganese, nickel, potassium, sodium, thallium, vanadium, and zinc. Of these metals, three (calcium, magnesium, and potassium) are considered naturally occurring essential nutrients in soil; therefore, their presence in the groundwater is not a concern.

  Based on the sample results, upgradient groundwater contained elevated levels of iron and manganese. Iron and manganese are common constituents of groundwater and are often detected at high levels due to the nature of the geologic formations (glacial sand, silt, clay, and gravel) making up the aquifers of Long Island. Most of the metals did not exhibit any specific lateral or vertical trends in distribution or concentration. The exception was sodium, which was detected at anomalously high levels in three shallow wells (MW-13S, -14S, and -15S). The elevated sodium in these well samples is likely due to the presence of the salt dome on the NCDPW property.

  In summary, sodium appears to be the only metal present at elevated concentrations due to upgradient anthropogenic activities.

- **VOCs.** Fifteen VOCs were detected in the monitoring well samples, including: 1,1-DCA, 1,2,3-trichlorobenzene, 1,2,4-trichlorobenzene, 1,2-dibromoethane, 2-hexanone, 4-methyl-2-pentanone, acetone, bromodichloromethane, bromoform, chloroform, dibromochloromethane, dichlorodifluoromethane, PCE, trans-1,3-dichloropropene, and TCE. Under normal conditions, VOCs typically do not exist naturally in the environment; therefore, their presence in these wells would be due to other local sources of contamination or sources that are further upgradient.

  Most of the VOCs were detected at low concentrations in one sample from MW-15S. This sample contained 1,2-dibromoethane at 2 µg/L, which is above the EPA's screening level of 0.5 µg/L. PCE was detected at low levels in four well samples, both shallow and deep, and TCE was detected at low levels in two deep well samples, indicating potential sources further upgradient.

  In summary, numerous VOCs are present at low levels, predominantly in shallow groundwater from MW-15S, suggesting local or additional upgradient sources.

- **Radionuclides.** Naturally occurring radionuclides, including U-238, U-234, Th-232, Th-230, Ra-226, Ra-228, and several daughter products, were detected in upgradient monitoring well samples at very low concentrations. The U-235 and Th-228 results were all qualified as nondetect.

4.7.2.2 140 Property

Three well clusters (MW-18S/I, -19S/D, and -20S/I/D) three individual wells (MW-17S, -41S, and -42I), and two groundwater profile borings (RI-P-40I and RI-P-45DD) were installed on the 140 property (see Figure 2.5-8). Profile boring samples and monitoring well samples were collected from the each monitoring well.

All profile samples except those from MW-17S were tested for VOCs; samples from MW-17S, MW-19D, and RI-P-45DD were tested for metals; and all profile samples except those from MW-17S and MW-19D were tested for radiological parameters. The results from the profile samples are presented in Appendix H.

All groundwater monitoring well samples were tested for VOCs, metals, and radiological parameters. The analytical results from the groundwater monitoring well samples are described below.

Metals in 140 Property Monitoring Well Samples

Groundwater samples were collected from ten monitoring wells (MW-17S, -18S, -18I, -19S, -19D, -20S, -20I, -20D, -41S, and -42I) on the 140 property and analyzed for metals. Table 4.7-3 presents a summary of the analytical results for metals. Fifteen metals were detected in the monitoring well samples: aluminum, barium, cadmium, calcium, chromium, cobalt, copper, iron, magnesium, manganese, nickel, potassium, sodium, thallium, and zinc. Only calcium, magnesium, and manganese were detected in one or more samples at concentrations greater than three times their respective BTV. Since calcium and magnesium are essential nutrients, only manganese is presented below. In addition, calcium, iron, magnesium, and potassium are not CERCLA hazardous substances. Most of the metals did not exhibit specific lateral or vertical trends in distribution or concentration. Metals that did exhibit a trend are noted below.

- **Manganese** was detected in all 10 monitoring well samples, with concentrations ranging from 9 µg/L (MW-18S, screened at 62 to 72 feet BGS) to 929 µg/L (MW-17S, screened at 65 to 75 feet BGS), which was greater than three times the BTV (107 µg/L). The range was similar to upgradient wells levels.

The following is a summary of metal detections on the 140 property that were above the BTV but less than three times the BTV for each respective metal.

- **Barium** was detected in all 10 monitoring well samples, with concentrations ranging from 23.5 µg/L (MW-19S, screened at 70 to 80 feet BGS) to 164 µg/L (MW-18I, screened at 118 to 128 feet BGS). The range was higher than upgradient well levels.

- **Cadmium** was detected in three of the 10 monitoring well samples, with concentrations ranging from 0.13 µg/L (MW-18I, screened at 118 to 128 feet BGS) to 1.1 µg/L (MW-42I, screened at 140 to 150 feet BGS). The range was only slightly higher than the upgradient well levels.

- **Cobalt** was detected in five of the 10 monitoring well samples, with concentrations ranging from 0.4 µg/L (MW-20I, screened at 140 to 150 feet BGS) to 3 µg/L (MW-42I, MW-18I, and MW-17S, screened at 140 to 150 feet BGS, 118 to 128 feet BGS, and 65 to 75 feet BGS, respectively). The range was similar to upgradient well levels.

- **Iron** was detected in all 10 monitoring well samples, with concentrations ranging from 41.9 µg/L (MW-18S, screened at 62 to 72 feet BGS) to 4,000 µg/L (MW-17S, screened at 65 to 75 feet BGS). The range was similar to upgradient well levels;

- **Nickel** was detected in nine of the 10 monitoring well samples, with concentrations ranging from 0.35 µg/L (MW-20D, screened at 300 to 310 feet BGS) to 9.9 µg/L (MW-18I, screened at 118 to 128 feet BGS). The range was slightly higher than upgradient well levels.

- **Sodium** was detected in all 10 monitoring well samples, with concentrations ranging from 5,080 µg/L (MW-19S, screened at 70 to 80 feet BGS) to 455,000 µg/L (MW-20D, screened at 300 to 310 feet BGS). The range was similar to upgradient well levels.

A BTV could not be developed for the following metal because it was not detected in the upgradient wells:

- **Copper** was detected in one of the 10 monitoring well samples at a concentration of 2.3 µg/L (MW-18S, screened at 62 to 72 feet BGS). Copper was not detected in upgradient well samples.

VOCs in 140 Property Monitoring Well Samples

Groundwater samples were collected from ten monitoring wells (MW-17S, -18S, -18I, - 19S, -19D, -20S, -20I, -20D, -41S, and -42I) on the 140 property and analyzed for VOCs. Table 4.7-3 presents a summary of the analytical results for VOCs. Six VOCs were detected in the monitoring well samples: 1,1,1-TCA, 1,1-DCA, 1,1-DCE, chloroform, PCE, and TCE. However, only chloroform and PCE were detected in one or more samples at concentrations greater than three times their respective BTV. Most of the VOCs did not exhibit specific lateral or vertical trends in distribution or concentration. VOCs that did exhibit a trend are noted below.

- **Chloroform** was detected in six of the 10 monitoring well samples, with concentrations ranging from 0.4 µg/L (MW-41S, screened at 65 to 75 feet BGS)

to 22 µg/L (MW-42I, screened at 140 to 150 feet BGS). Three samples had concentrations greater than three times the BTV (3.0 µg/L): 12 µg/L in MW-20I (screened at 140 to 150 feet BGS), 17 µg/L in MW-18I (screened at 118 to 128 feet BGS), and 22 µg/L in MW-42I (screened at 140 to 150 feet BGS). The highest concentrations were detected in the eastern portion of the property, and the concentrations in three of the samples were much higher than upgradient levels.

- **PCE** was detected in five of the 10 monitoring well samples, with concentrations ranging from 2 µg/L (MW-19D, screened at 296 to 306 feet BGS and MW-19S, screened at 70 to 80 feet BGS) to 9 µg/L (MW-41S, screened at 65 to 75 feet BGS), which was above three times the BTV (2.71 µg/L). The highest concentrations were detected in the eastern portion of the site and were higher than upgradient levels.

The following is a summary of the VOC detections on the 140 property that were above the respective BTV but less than three times the BTV.

- **1,1-DCA** was detected above the BTV (1.0 µg/L) in one of the 10 monitoring well samples at a concentration of 2 µg/L (MW-19D, screened at 296 to 306 feet BGS). 1,1-DCA, 1,1-DCE, and 1,1,-TCA were all detected only in deep samples from MW-19D. 1,1-DCA was detected at a concentration similar to that detected in the upgradient well (MW-16D).

- **TCE** was detected above the BTV (1.51 µg/L) in one of the 10 monitoring well samples at a concentration of 4 µg/L (MW-19D, screened at 296 to 306 feet BGS). This concentration was slightly higher than that detected in the upgradient well.

Two compounds were not detected in upgradient monitoring wells but were detected on site. The results for these compounds are discussed below.

- **1,1,1-TCA** was detected in one of the 10 monitoring well samples at a concentration of 2 µg/L (MW-19D, screened at 296 to 306 feet BGS). 1,1,1-TCA, 1,1-DCA, and 1,1-DCE were all detected only in deep samples from MW-19D. 1,1,1-TCA was not detected in any of the upgradient wells.

- **1,1-DCE** was detected in one of the 10 monitoring well samples at a concentration of 2 µg/L (MW-19D, screened at 296 to 306 feet BGS). 1,1-DCE, 1,1-DCA, and 1,1,1-TCA were all detected only in deep samples from MW-19D. 1,1,-DCE was not detected in any of the upgradient wells.

Radionuclides in 140 Property Monitoring Well Samples

Groundwater samples were collected from 10 monitoring wells (MW-17S, -18S, -18I, -19S, -19D, -20S, -20I, -20D, -41S, and -42I) on the 140 property and analyzed for radionuclides. Table 4.7-3 presents a summary of the radioanalytical results. Twelve radionuclides were detected in the monitoring well samples, in-

cluding isotopes of naturally occurring uranium, thorium, and radium, and their short-lived daughter products, which are present with the parent products and are not discussed separately in this section. Uranium and thorium were detected in one or more samples at concentrations greater than three times their respective BTV. Ra-226 was detected at concentrations above its BTV, but not greater than three times its BTV. Total uranium, total gross alpha (for screening purposes), and gross beta (for screening purposes), also were measured. Most of the radionuclides did not exhibit specific lateral or vertical trends in distribution or concentration. Radionuclides that did exhibit a trend are noted below.

- **Uranium.** U-238 was detected in six of the 10 monitoring well samples, and in five samples at greater than three times its BTV (0.205 pCi/L): 3,638 pCi/L in MW-18S (screened at 62 to 72 feet BGS); 768 pCi/L in MW-20S (screened at 70 to 80 feet BGS); 393 pCi/L in MW-41S (screened at 65 to 75 feet BGS); 54 pCi/L in MW-18I (screened at 118 to 128 feet BGS); and 2.5 pCi/L in MW-42I (screened at 140 to 150 feet BGS). The highest U-234 results tracked the U-238 concentrations, with concentrations of 4,009 pCi/L, 817 pCi/L, 381 pCi/L, 58 pCi/L, and 3.1 pCi/L in the above-mentioned wells. Similarly, the U-235 results tracked the U-238 and U-234 concentrations, with concentrations of 285 pCi/L, 67 pCi/L, 28 pCi/L, 3.5 pCi/L, and 0.34 pCi/L in the same wells. The total uranium results corresponding to these five wells were 10,830 µg/L, 2,289 µg/L, 1,168 µg/L, 159 µg/L, and 7.6 µg/L.

  The groundwater monitoring wells MW-18S, MW-20S, and MW-41S (depths from 62 up to 80 feet BGS) are located to the west-southwest of B140, beneath remedial cells 1 and 6. Slightly lower concentrations were detected in the sample from MW-18I at a depth of 118 to 128 feet BGS. MW-42I is located directly west of MW-20S, beneath remedial cell 2. The U-238 concentration in MW-43S, which is downgradient of this well grouping on the 100 property, was slightly elevated at 8.8 pCi/L.

- **Thorium.** Th-232 was detected in one of the 10 monitoring well samples at a concentration greater than three times its BTV (0.137 pCi/L): 10.83 pCi/L in MW-42I (screened at 140 to 150 feet BGS). The highest concentrations of Th-228 and Th-230 (6.73 pCi/L and 10.52 pCi/L, respectively) also were detected in this well.

- **Radium.** Ra-226 was detected in two of the 10 monitoring well samples at a concentration greater than its BTV (0.999 pCi/L): 1.91 pCi/L in MW-18I (screened at 118 to 128 feet BGS), and 1.50 pCi/L in MW-20D (screened at 300 to 310 feet BGS). Ra-228 was not detected above its BTV (1.64 pCi/L) in any of the samples.

- **Gross alpha total (screening)** was detected in three of the 10 monitoring well samples at a concentration greater than three times its BTV (5.31 pCi/L): 1,895 pCi/L in MW-20S (screened at 70 to 80 feet BGS), 956 pCi/L at MW-

41S (screened at 65 to 75 feet BGS), and 74.5 pCi/L at MW-18S (screened at 62 to 72 feet BGS).

- **Gross beta (screening)** was detected in two of the 10 monitoring well samples at a concentration greater than three times its BTV (14.6 pCi/L): 231 pCi/L in MW-20S (screened at 70 to 80 feet BGS), and 104 pCi/L in MW-41S (screened at 65 to 75 feet BGS).

Summary

- **Metals.** Fifteen metals were detected in the monitoring well samples: aluminum, barium, cadmium, calcium, chromium, cobalt, copper, iron, magnesium, manganese, nickel, potassium, sodium, thallium, and zinc. Of these metals, three (calcium, magnesium, and potassium) are considered naturally occurring essential nutrients in soils; therefore, their presence in the groundwater is not a concern. In addition, calcium, iron, magnesium, and potassium are not CERCLA hazardous substances.

  Based on the sample results, seven of the above-mentioned non-essential nutrient metals were detected above their respective BTVs (barium, cadmium, cobalt, iron, manganese, nickel, and sodium). Of these, only manganese was detected at more then three times its BTV. In addition, copper was detected in one of the 140 property wells samples, but copper was not detected in upgradient wells.

  Almost all of the metals that exceeded their BTVs did not exhibit any specific lateral or vertical trends in distribution or concentration. The only exception was sodium, the highest concentrations of which were detected in intermediate and deep wells. As mentioned in the upgradient property summary above, the likely source of the elevated sodium is the stockpiled salt on the NCDPW property. The presence of higher levels of sodium in intermediate and deep wells as opposed to shallow wells fits the current conceptual site model that groundwater has a southerly flow laterally and a downward flow vertically (see Section 3). Copper was detected in only one shallow well (MW-18S) at a concentration of only 2.3 µg/L, which is not of concern.

  In summary, sodium appears to be the only metal present at elevated concentrations due to upgradient anthropogenic activities.

- **VOCs.** Six VOCs were detected in the monitoring well samples: 1,1,1-TCA, 1,1-DCA, 1,1-DCE, chloroform, PCE, and TCE.

  Four of the VOCs (1,1-DCA, chloroform, PCE, and TCE) exceeded their respective BTVs, and chloroform exceeded three times its BTV. Three of the VOCs (1,1,1-TCA, 1,1-DCA, and 1,1-DCE) were detected at low levels in deep groundwater from MW-19. Although these compounds were detected in a UST removed from remedial cell 2 (see Section 4.6), it is unlikely that the

presence of these compounds in MW-19D is due to that tank; therefore, their source is unknown. Since they were detected at a depth of approximately 300 feet BGS and were not found in shallow samples from the property, the source is likely upgradient.

The highest concentrations of chloroform were detected in five shallow and intermediate wells in the eastern portion of the property. Chloroform was also detected upgradient. One of the likely sources of chloroform is from the discharge of swimming pool water in Cantiague Park. Every fall, the park drains their pools (located a few hundred feet to the north of the MW-16 well cluster), and several million gallons of water are pumped through a storm drain system that flows to the east then south to a recharge basin along West John Street (southeast of the Sylvania site). During the draining of the pools, water overflows into the parking lot to the east of the MW-16 well cluster. Chloroform is formed by the reaction of chlorine with various compounds. Based on groundwater contours (see Section 3), the discharged chlorinated water could be flowing from the park area to the site.

The PCE detected in shallow samples from MW-18S, -19S, -20S, and -41S could be from upgradient sources (as PCE at similar concentrations were detected in shallow upgradient wells), the former leach pool beneath the eastern portion of current B140, or the former recharge basin (recharge basin 3) that was located on the east side of current B140.

TCE was detected only in deep groundwater from MW-19D. TCE is a degradation product of PCE. Since PCE was also detected in MW-19D, the presence of TCE could be related to the degradation of PCE or an upgradient source of TCE (TCE was detected in upgradient wells MW-14DD and -16D).

In summary, the VOCs detected in deep samples (PCE, TCE, 1,1,1-TCA, 1,1-DCA, and 1,1-DCE) are likely the result of upgradient sources. The PCE detected in shallow samples is likely site related; however, some may be from an upgradient source. The chloroform is likely a byproduct of chlorine from the pools in Cantiague Park.

- **Radionuclides.** High concentrations of uranium were detected in samples from several monitoring wells on the eastern portion of the 140 property, beneath remedial cells 1 and 6. The highest concentrations (U-238 at 3,638 pCi/L, U-234 at 4,009 pCi/L, and U-235 at 285 pCi/L) were present in samples from MW-18S, which was screened at 62 to 72 feet BGS. The concentrations in MW-18I, which was screened at 118 to 128 feet BGS, decreased substantially but were still elevated (U-238 at 54 pCi/L, U-234 at 58 pCi/L, and U-235 at 3.5 pCi/L). The uranium concentrations in samples from MW-20S and MW-41S, which are downgradient of MW-18S, were also elevated, with U-238 detected at 768 pCi/L and 393 pCi/L, respectively. The sample from monitoring well MW-20I (screened at 150 to 160 feet BGS) had uranium concentrations near background levels. The original source of this area of con-

tamination could be the former recharge basin (recharge basin 3, Figure 1.2-2) that was located on the east side of current B140.

The highest concentrations of thorium (Th-232 at 10.83 pCi/L, Th-228 at 6.73 pCi/L, and Th-230 at 10.52 pCi/L) were detected in the sample from MW-42I, which is on the eastern border of the 140 property. Ra-226 was slightly elevated (1.91 pCi/L) above its BTV in MW-18I, and Ra-228 was not present above its BTV.

4.7.2.3 100 Property Groundwater Results

Four well clusters (MW-21S/I/D, MW-22S/I/D, MW-24S/DD, and MW-28S/I/D) and three individual wells (MW-43S, MW-44S, and MW-49S) were installed on the 100 property (see Figure 2.5-8).

All profile samples were tested for VOCs; MW-24DD, MW-44S, and MW-49S profile samples were tested for metals; and MW-22I, MW-24DD, MW-28I, MW-43S, and MW-44S profile samples were tested for radiological parameters. The results from the profile samples are presented in Appendix H.

All groundwater monitoring well samples were tested for VOCs, metals, and radiological parameters. The analytical results from the groundwater monitoring well samples are described below.

Metals in 100 Property Monitoring Well Samples

Groundwater samples were collected from 14 monitoring wells (MW-21S, -21I, -21D, -22S, -22I, -22D, -24S, -24DD, -28S, -28I, -28D, -43S, -44S, and -49S) on the 100 property and analyzed for metals. Table 4.7-4 presents a summary of the analytical results for metals. Nineteen metals were detected in the monitoring well samples: aluminum, antimony, arsenic, barium, beryllium, cadmium, calcium, chromium, cobalt, copper, iron, lead, magnesium, manganese, nickel, sodium, thallium, vanadium, and zinc. However, only six metals (arsenic, beryllium, cadmium, lead, manganese, and nickel) were detected in one or more samples at concentrations greater than three times their respective BTV. In addition, calcium, iron, and magnesium are not CERCLA hazardous substances. Most of the metals did not exhibit specific lateral or vertical trends in distribution or concentration. Metals that did exhibit a trend are noted below.

- **Arsenic** was detected in two of the 14 monitoring well samples, with concentrations ranging from 2.4 µg/L (MW-28D, screened 277 to 287 feet BGS) to 5.8 µg/L (MW-28I, screened at 149 to 159 feet BGS), the latter concentration being greater than three times the BTV (1.14 µg/L). Arsenic was not detected in 140 property monitoring well samples.

- **Beryllium** was detected in three of the 14 monitoring well samples, with concentrations ranging from 0.49 µg/L (MW-28I, screened at 149 to 159 feet BGS) to 2.8 µg/L (MW-21I, screened at 170 to 180), the latter concentration

being greater than three times the BTV (0.183 µg/L). Beryllium was not detected in 140 property monitoring well samples.

- **Cadmium** was detected in five of the 14 monitoring well samples, with concentrations ranging from 0.097 µg/L (MW-49S, screened at 100 to 110 feet BGS) to 1.5 µg/L (MW-22S, screened at 70 to 80 feet BGS), the latter concentration being greater than three times the BTV (0.416 µg/L). The range was similar to 140 property levels.

- **Lead** was detected in one of the 14 monitoring well samples at a concentration of 11.4 µg/L (MW-28D, screened at 277 to 287 feet BGS), which was greater than three times the BTV (2.63 µg/L). Lead was not detected in 140 property monitoring well samples.

- **Manganese** was detected in all 14 monitoring well samples, with concentrations ranging from 10.5 µg/L (MW-24DD, screened at 360 to 370 feet BGS) to 784 µg/L (MW-49S, screened at 100 to 110 feet BGS). Four of these samples contained concentrations greater than three times the BTV (107 µg/L): 380 µg/L in MW-44S (screened at 65 to 75 feet BGS, 535 µg/L in MW-21S (screened at 70 to 80 feet BGS), 620 µg/L in MW-22S (screened at 70 to 80 feet BGS), and 784 µg/L in MW-49S (screened at 100 to 110 feet BGS). The range was similar to upgradient and 140 property well levels.

- **Nickel** was detected in all 14 monitoring well samples, with concentrations ranging from 0.24 µg/L (MW-28I, screened at 149 to 159 feet BGS) to 1350 µg/L (MW-44S, screened at 65 to 75 feet BGS). Three of these samples had concentrations greater than three times the BTV (4.54 µg/L): 18.6 µg/L in MW-22S (screened at 70 to 80 feet BGS), 89.1 µg/L in MW-24S (screened at 70 to 80 feet BGS), and 1,350 µg/L in MW-44S (screened at 65 to 75 feet BGS). The range was much higher than upgradient and 140 property well levels.

The following is a summary of the metals detected on the 100 property at concentrations above their respective BTV but below three times the BTV (less those metals considered essential nutrients).

- **Aluminum** was detected in 10 of the 14 monitoring well samples, with concentrations ranging from 20.8 µg/L (MW-22S, screened at 70 to 80 feet BGS) to 5,030 µg/L (MW-28D, screened at 277 to 287 feet BGS). Only the sample from MW-28D had a concentration above the BTV (2,580 µg/L). Aluminum was not detected above the BTV on the 140 property.

- **Barium** was detected in all 14 monitoring well samples, with concentrations ranging from 8.2 µg/L (MW-28I, screened at 149 to 159 feet BGS) to 188 µg/L (MW-22I, screened at 140 to 150 feet BGS). Three of these samples had concentrations above the BTV (88.1 µg/L): 89 in MW-21I (screened at 170 to 180 feet BGS), 188 µg/L in MW-22I (screened at 140 to 150 feet BGS), and

148 µg/L in MW-21D (screened at 300 to 310 feet BGS). The range was similar to the 140 property well levels.

- **Chromium** was detected in three of the 14 monitoring well samples, with concentrations ranging from 1.2 µg/L (MW-28I, screened at 149 to 159 feet BGS; and MW-21I, screened at 170 to 180 feet BGS) to 7.3 µg/L (MW-28D, screened at 277 to 287 feet BGS). Only the sample from MW-28D had concentration above the BTV (6.31 µg/L). The range was higher than the 140 property well levels.

- **Cobalt** was detected in eight of the 14 monitoring well samples, with concentrations ranging from 0.07 µg/L (MW-22D, screened at 305 to 315 feet BGS) to 7.1 µg/L (MW-22S, screened at 70 to 80 feet BGS). Two of these samples had concentration above the BTV (2.96 µg/L): 3.6 µg/L in MW-49S (screened at 100 to 110 feet BGS) and 7.1 µg/L in MW-22S (screened at 70 to 80 feet BGS). The range was higher than the 140 property well levels.

- **Iron** was detected in all 14 monitoring well samples, with concentrations ranging from 14.9 µg/L (MW-43S, screened at 65 to 75 feet BGS) to 3,530 µg/L (MW-28D, screened at 277 to 287 feet BGS). Two of these samples had concentration above the BTV (2,680 µg/L): 3,480 µg/L in MW-21S (screened at 70 to 80 feet BGS) and 3,530 µg/L in MW-28D (screened at 277 to 287 feet BGS). The range was similar to the 140 property well levels.

- **Vanadium** was detected in two of the 14 monitoring well samples, with concentrations ranging from 5.1 µg/L (MW-28I, screened at 149 to 159 feet BGS) to 14.7 µg/L (MW-28D, screened at 277 to 287 feet BGS). Only the sample from MW-28D had concentration above the BTV (7.14 µg/L). Vanadium was not detected in the 140 property wells.

BTVs could not be developed for the following chemicals because they were not detected in the upgradient samples:

- **Antimony** was detected in one of the 14 monitoring well samples at a concentration of 0.19 µg/L (MW-28D, screened at 277 to 287 feet BGS). Antimony was not detected in any of the upgradient or 140 property wells.

- **Copper** was detected in one of the 14 monitoring well samples at a concentration of 8.8 µg/L (MW-28D, screened at 277 to 287 feet BGS). Copper was detected deeper and at a higher concentration on the 100 property than on the 140 property.

A comparison of monitoring well sample results and associated profile sample results collected from the same depths as the well screens is presented in Table 4.7-8.

VOCs in 100 Property Monitoring Well Samples

Groundwater samples were collected from 14 monitoring wells (MW-21S, -21I, -21D, -22S, -22I, -22D, -24S, -24DD, -28S, -28I, -28D, -43S, -44S, and -49S) on the 100 property and analyzed for VOCs. Table 4.7-4 presents a summary of the analytical results for VOCs. Eight VOCs were detected in the monitoring well samples: 1,1,1-TCA, 1,1-DCA, 1,1-DCE, acetone, chloroform, cis-1,2-DCE, PCE, and TCE. Three VOCs (chloroform, PCE, and TCE) were detected in one or more samples at concentrations greater than three times their respective BTV. Most of the metals did not exhibit specific lateral or vertical trends in distribution or concentration. Any VOC that did exhibit a trend is noted below:

- **Chloroform** was detected in six of the 14 monitoring well samples, with concentration ranging from 3 µg/L (MW-28S, screened at 90 to 100 feet BGS) to 20 µg/L (MW-22I, screened at 140 to 150 feet BGS). Two of these samples had concentrations greater than three times the BTV (3.0 µg/L): 15 µg/L in MW-28I (screened at 149 to 159 feet BGS) and 20 µg/L in MW-22I (screened at 140 to 150 feet BGS). The highest concentrations, which were in samples from the eastern portion of the property, were similar to the highest levels on the 140 property.

- **PCE** was detected in 12 of the 14 monitoring well samples, with concentrations ranging from 2 µg/L (MW-21S, screened at 70 to 80 feet BGS; MW-21I, screened at 170 to 180 feet BGS; and MW-21D, screened at 300 to 310 feet BGS) to 1,800 µg/L (MW-22S, screened at 70 to 80 feet BGS). Five of these samples had concentrations greater than three times the BTV (2.71 µg/L): 10 µg/L in MW-43S (screened at 65 to 75 feet BGS); 40 µg/L in MW-24S (screened at 70 to 80 feet BGS); 41 µg/L in MW-44S (screened at 65 to 75 feet BGS); 340 µg/L in MW-28S (screened at 90 to 100 feet BGS); and 1,800 µg/L in MW-22S (screened at 70 to 80 feet BGS). The highest concentrations were detected in samples from the eastern portion of the site, and these levels were much higher than those detected in upgradient and 140 property wells.

- **TCE** was detected in six of the 14 monitoring well samples, with concentration ranging from 0.6 µg/L in MW-44S and MW-21D (screened 65 to 75 feet BGS and 300 to 310 feet BGS, respectively) to 130 µg/L in MW-22S (screened at 70 to 80 feet BGS). Two samples had concentrations greater than three times the BTV (1.51 µg/L): 10 µg/L in MW-24DD (screened at 360 to 370 feet BGS) and 130 µg/L in MW-22S (screened at 70 to 80 feet BGS). TCE is a degradation product of PCE. The highest levels were generally detected in shallow profile samples beneath the central and eastern portions of the property, coinciding with the presence of PCE. The range was much higher than upgradient and 140 property profile levels.

The following is a summary of VOC detections on the 100 property above the respective BTV but below three times the BTV.

- **1,1-DCA** was detected in two of the 14 monitoring well samples, with concentrations ranging from 2 µg/L (MW-28S, screened at 90 to 100 feet BGS) to 3 µg/L (MW-24DD, screened at 360 to 370 feet BGS). 1,1-DCA was detected at similar concentrations in the upgradient well (MW-16D) and 140 property well (MW-19D) and at similar depths.

- **Acetone** was detected in two of the 14 monitoring well samples at concentrations of 3 µg/L (MW-22S, screened at 70 to 80 feet BGS) and 5 µg/L (MW-49S, screened at 100 to 110 feet BGS). Acetone was detected at similar concentrations in shallow upgradient wells and was not detected in 140 property wells.

Three compounds were not detected in upgradient monitoring wells but were detected on-site. The results for these compounds are discussed below.

- **1,1,1-TCA** was detected in one of the 14 monitoring well samples at a concentration of 3 µg/L (MW-24DD, screened at 360 to 370 feet BGS). 1,1,1-TCA and 1,1-DCE were both detected only in deep samples from MW-24DD. 1,1,1-TCA was not detected in any of the upgradient wells and was detected in 140 property wells at similar concentrations.

- **1,1-DCE** was detected in one of the 14 monitoring well samples at a concentration of 2 µg/L (MW-24DD, screened at 360 to 370 feet BGS). 1,1-DCE and 1,1,1-TCA were both detected only in deep samples from MW-24DD. 1,1-DCA was not detected in any of the upgradient wells and was detected in 140 property wells at similar concentrations.

- **cis-1,2-DCE** was detected in one of the 14 monitoring well samples at a concentration of 6 µg/L (MW-22S, screened at 70 to 80 feet BGS). cis-1,2-DCE is a degradation product of PCE/TCE and thus is present at the same location (shallow groundwater in MW-22) as elevated levels of PCE/TCE. It was not detected in the upgradient or 140 property samples.

Radionuclides in 100 Property Monitoring Well Samples

Groundwater samples were collected and analyzed for radionuclides from 14 monitoring wells (MW-21S, -21I, -21D, -22S, -22I, -22D, -24S, -24DD, -28S, -28I, -28D, -43S, -44S, and -49S) on the 100 property. Table 4.7-4 presents a summary of the radioanalytical results. Twelve radionuclides were detected in the monitoring well samples, including isotopes of naturally occurring uranium, thorium, and radium, and their short-lived daughter products, which are present with the parent products and are not discussed separately in this section. Uranium and thorium were detected in one or more samples at concentrations greater than three times their respective BTVs, and Ra-226 and Ra-228 were detected above their respective BTVs but not at concentrations greater than three times their BTVs. Total uranium, total gross alpha radiation (for screening purposes), and gross beta radiation (for screening purposes), also were measured. Most of the radionuclides

did not exhibit specific lateral or vertical trends in distribution or concentration. Radionuclides that did exhibit a trend are noted below.

- **Uranium.** U-238 was detected in eight of the10 monitoring well samples, and five samples had concentrations greater than three times the BTV (0.205 pCi/L): 8.86 pCi/L in MW-43S (screened at 65 to 75 feet BGS), 6.7 pCi/L in MW-44S (screened at 65 to 75 feet BGS), 6.27 pCi/L in MW-24S (screened at 70 to 80 feet BGS), 3.90 pCi/L in MW-28I (screened at 149 to 159 feet BGS), and 0.62 pCi/L in MW-28D (screened at 277 to 287 feet BGS). The highest U-234 results tracked the U-238 concentrations, with concentrations of 9.63 pCi/L, 7.71 pCi/L, 5.14 pCi/L, 3.23 pCi/L, and 0.83 pCi/L from the above-mentioned wells. The U-235 results tracked the U-238 and U-234 concentrations from high to low in four of these wells, with concentrations of 0.73 pCi/L, 0.68 pCi/L, 0.31 pCi/L, and 0.19 pCi/L. The total uranium results corresponding to the five wells were 26.4 µg/L, 19.7 µg/L, 18.8 µg/L, 11.6 µg/L, and 1.86 µg/L.

  Monitoring well MW-43 is downgradient of the 140 property wells MW-18S and MW-41S, which are contaminated with uranium at the same depths. Monitoring well MW-24S is south of B100 beneath remedial cell 9. Although the groundwater samples from MW-24S were elevated, the higher concentrations of uranium at a depth of 68 feet in vertical profile boring MW-24DD (U-238 at 183 pCi/L) were not reflected in the samples from MW-24S (screened 70 to 80 feet BGS).

- **Thorium.** Th-232 was detected in one of the 14 monitoring well samples at a concentration greater than three times its BTV (0.137 pCi/L): 0.508 pCi/L in MW-28D (screened at 277 to 287 feet BGS). The highest concentrations of Th-228 and Th-230 (0.495 pCi/L and 0.80 pCi/L, respectively) also were detected in this well.

- **Radium.** Ra-226 was detected in three of the 14 monitoring well samples at a concentration greater than its BTV (0.999 pCi/L): 2.14 pCi/L in MW-22D (screened at 305 to 315 feet BGS), 1.47 pCi/L in MW-21I (screened at 170 to 180 feet BGS), and 1.11 pCi/L in MW-22I (screened at 140 to 150 feet BGS). Ra-228 was detected above its BTV (1.64 pCi/L) in one well: 2.61 pCi/L at MW-22D.

- **Gross alpha total (screening)** was detected in two of the 14 monitoring well samples at a concentration greater than three times its BTV (5.31 pCi/L): 22.8 pCi/L in MW-43S (screened at 65 to 75 feet BGS), and 17.2 pCi/L at MW-44S (screened at 65 to 75 feet BGS).

- **Gross beta (screening)** was not detected above its BTV (14.6 pCi/L) in any of the samples on the 100 property.

Summary

- **Metals.** Nineteen metals were detected in the monitoring well samples: aluminum, antimony, arsenic, barium, beryllium, cadmium, calcium, chromium, cobalt, copper, iron, lead, magnesium, manganese, nickel, sodium, thallium, vanadium, and zinc. Of these metals, two (calcium and magnesium) are considered naturally occurring essential nutrients in soils; therefore, their presence in the groundwater is not of concern. In addition, calcium, iron, and magnesium are not CERCLA hazardous substances.

  Based on the sample results, all of the metals except antimony, copper, sodium, thallium, and zinc were detected at concentrations above their respective BTV. Of these, six (arsenic, beryllium, cadmium, lead, manganese, and nickel) were detected at concentrations greater than three times their BTV. BTVs for antimony and copper could not be developed because they were not detected in any of the upgradient wells.

  Almost all of the metals that exceeded their BTV did not exhibit any specific lateral or vertical trends in distribution or concentration. The exception was nickel, the highest concentrations of which (1,350 µg/L and 89.1 µg/L) were detected in shallow wells on the south side of B100, in the west-central/central portion of the property. Elevated concentrations of nickel were not detected in shallow groundwater in upgradient wells (NCDPW property or 140 property). Therefore, the source of the nickel is likely on the 100 property. Elevated levels of nickel were detected in soils collected in remedial cell 9 from 24 to 64 feet BGS.

  Low levels of antimony and copper were detected only in one deep well (MW-28D) at concentrations of 0.19 µg/L and 8.8 µg/L, respectively, which are not of concern.

  In summary, nickel appears to be the only metal that is elevated due to site activities.

- **VOCs.** Eight VOCs were detected in the monitoring well samples: 1,1,1-TCA, 1,1-DCA, 1,1-DCE, acetone, chloroform, cis-1,2-DCE, PCE, and TCE.

  Five of the VOCs (1,1-DCA, acetone, chloroform, PCE, and TCE) exceeded their respective BTV, and chloroform, PCE, and TCE were detected at concentrations greater than three times their BTVs. Chloroform was detected in intermediate and deep samples from two well clusters (MW-22 and -28) and a shallow well (MW-43S) in the eastern portion of the property. As described in the 140 property summary, the likely source of chloroform is the pool water discharged from Cantiague Park.

  The PCE was detected in shallow, intermediate, and deep samples from four well clusters (MW-21, -22, -24, and -28) and two shallow wells (MW-43S and

-44s) in the central and eastern portions of the property. The highest concentration of PCE was 1,800 µg/L in MW-22S. The likely source could be contaminated soils beneath the eastern portion of current B100, remedial cell 9, and remedial cell 4. These contaminated soils may be from former leach pools in these areas.

TCE was detected in the same locations as PCE (shallow and deep samples from four well clusters [MW-21, -22, -24 and -28] and one shallow well [MW-44S]). The highest concentration of TCE was 130 µg/L, also in MW-22S. The presence of the TCE is likely related to the degradation of PCE.

In summary, the likely source of the chloroform is the pool water discharged from Cantiague Park, and the PCE/TCE is likely from several source areas (former leach pools and other potential sources) on the 100 property.

- **Radionuclides.** Elevated concentrations of uranium were detected in samples from monitoring wells MW-43S (screened at 65 to 75 feet BGS), MW-44S (screened at 65 to 75 feet BGS), MW-24S (screened at 70 to 80 feet BGS), and MW-28I (screened at 150 to 160 feet), which are located in different areas of the 100 property. Monitoring well MW-43S is downgradient of the 140 property wells MW-18S and MW-41S, which are contaminated with uranium at the same depths. Uranium concentrations in MW-43S were 8.86 pCi/L (U-238), 9.63 pCi/L (U-234), and 0.73 pCi/L (U-235).

  MW-44S, which is south of B100 and southwest of remedial cell 9, and MW-24S, which is beneath remedial cell 9, had U-238 concentrations of 6.6 pCi/L and 6.27 pCi/L. Although the groundwater samples from MW-24S were elevated, the higher concentrations of uranium at a depth of 68 feet in vertical profile boring MW-24DD (U-238 at 183 pCi/L) were not reflected in the samples from MW-24S.

  MW-28I, which is in the southeast corner of the 100 property in the vicinity of former recharge basins 1 and 2, had a U-238 concentration of 3.9 pCi/L.

  The concentrations of thorium and radium in the 100 property wells were low, with the highest concentrations (0.508 pCi/L [Th-232], and 2.71 pCi/L [Ra-228]) at depths below 277 feet. These levels at such a depth would likely be due to the clay layer that exists above the monitoring well screens.

4.7.2.4 70 Property Groundwater Results

Eight well clusters on the 70 property (MW-23S/I/D, MW-25S/I/D, MW-26S/D, MW-27S/D/DD, MW-30S/I/D, MW-3/MW-31I/D, MW-11/MW-12/MW-32D, and MW-4/MW51I), five individual wells (MW-8, -9, -10, -39S, and -50I), and three profile borings (RI-P-47I, -48I, and -54I) were installed on the 70 property (see Figure 2.5-8).

All profile samples were tested for VOCs; profile samples from MW-23D, -25D, -26D,-27DD, -30D, -31D-32D, RI-P-47, -48, -50I, and -51I were tested for metals; and profile samples from MW-27DD, -30D (to a depth of 150 feet), -31D (to a depth of 150 feet), RI-P-47, -48, and MW-51I (to a depth of 150 feet) were tested for radiological parameters. The results from the profile samples are presented in Appendix H.

All groundwater monitoring well samples were tested for VOCs, metals, and radiological parameters. The analytical results from the groundwater monitoring well samples are described below.

Metals in 70 Property Monitoring Well Samples

Groundwater samples were collected from 28 monitoring wells (MW-3, -4, -8, -9, -10, -11, -12, -23S/I/D, -25S/I/D, -26S/D, -27S/D/DD, -29S, -30S/I/D, -31I/D, -32D, -39S, -50II, and -51I) on the 70 property and analyzed for metals. Table 4.7-5 presents a summary of the analytical results for metals. Twenty metals were detected in the monitoring well samples: aluminum, antimony, arsenic, barium, beryllium, cadmium, calcium, chromium, cobalt, copper, iron, lead, magnesium, manganese, nickel, potassium, sodium, thallium, vanadium, and zinc. Five of these metals (beryllium, cobalt, manganese, nickel, and zinc) were detected in one or more samples at concentrations greater than three times their respective BTVs. In addition, calcium, iron, magnesium, and potassium are not CERCLA hazardous substances. Most of the metals did not exhibit specific lateral or vertical trends in distribution or concentration. Metals that did exhibit a trend are noted below.

- **Beryllium** was detected in 16 of the 28 monitoring well samples, with concentrations ranging from 0.049 µg/L (MW-50I, screened at 120 to 130 feet BGS) to 0.56 µg/L (MW-30S, screened at 90 to 100 feet BGS), and the highest concentration was greater than three times the BTV (0.183 µg/L). Beryllium was detected at similar levels in upgradient, 140 property, and 100 property wells.

- **Cobalt** was detected in 19 of the 28 monitoring well samples, with concentrations ranging from 0.37 µg/L (MW-25D, screened at 340 to 350 feet BGS) to 57.8 µg/L (MW-31D, screened at 320 to 330 feet BGS). Six of the samples had a concentration greater than three times the BTV (2.96 µg/L): 8.9 µg/L in MW-11 (screened at 71 to 81 feet BGS); 10 µg/L in MW-27S (screened at 80 to 90 feet BGS); 11.9 µg/L in MW-3 (screened at 58 to 78 feet BGS); 16.3 µg/L in MW-4 (screened at 58 to 78 feet BGS); 18.2 µg/L in MW-10 (screened at 120 to 130 feet BGS); and 57.8 µg/L in MW-31D (screened at 320 to 330 feet BGS). The range was higher than the upgradient, 140, and 100 property well levels.

- **Manganese** was detected in all 28 monitoring well samples, with concentrations ranging from 5.2 µg/L (MW-8, screened at 120-130 feet BGS) to 1710 µg/L (MW-31D, screened at 320 to 330 feet BGS). Four of the samples had a concentration greater than three times the BTV (107 µg/L): 510 µg/L in MW-

50I (screened at 120 to 130 feet BGS); 626 µg/L in MW-27S (screened at 80 to 90 feet BGS); 632 µg/L in MW-26S (screened at 110 to 120 feet BGS); and 1,710 µg/L in MW-31D (screened at 320 to 330 feet BGS). The range was the higher than the upgradient, 140 property, and 100 property well levels.

- **Nickel** was detected in 26 of the 28 monitoring well samples, with concentrations ranging from 0.47 µg/L (MW-30I, screened at 230 to 240 feet BGS) to 2240 µg/L (MW-23S, screened at 90 to 100 feet BGS). Twelve of the samples had a concentration greater than three times the BTV (4.54 µg/L): 14.9 µg/L in MW-11 (screened at 71 to 81 feet BGS); 15.6 µg/L in MW-51I (screened at 130 to 140 feet BGS); 36.3 µg/L in MW-10 (screened at 120 to 130 feet BGS); 40.6 µg/L in MW-29S (screened at 66 to 76 feet BGS); 62.9 µg/L in MW-25S (screened at 105 to 115 feet BGS); 75.4 µg/L in MW-27D (screened at 280 to 290 feet BGS); 108 µg/L in MW-27S (screened at 80 to 90 feet BGS); 152 µg/L in MW-50I (screened at 120 to 130 feet BGS); 189 µg/L in MW-8 (screened at 120 to 130 feet BGS); 193 µg/L in MW-26S (screened at 110 to 120 feet BGS); 472 µg/L in MW-31D (screened at 320 to 330 feet BGS) and 2,240 µg/L in MW-23S (screened at 90 to 100 feet BGS). The range was higher than in the upgradient, 140 property, and 100 property wells.

- **Zinc** was detected in 19 of the 28 monitoring well samples, with concentrations ranging from 3.5 µg/L (MW-30I, screened at 230 to 240 feet BGS) to 135 µg/L (MW-29S, screened at 66 to 76 feet BGS). One of the samples had a concentration greater than three times the BTV of (39.7 µg/L): 135 µg/L in MW-29S. The range was higher than in the upgradient, 140 property, and 100 property wells.

The following is a summary of metals detected on the 70 property (less those considered essential nutrients) at concentrations above their respective BTVs but below three times their BTV.

- **Aluminum** was detected in 19 of the 28 monitoring well samples, with concentrations ranging from 25.3 µg/L (MW-25I, screened at 230 to 240 feet BGS) to 1,940 µg/L (MW-27D, screened at 280 to 290 feet BGS). Aluminum did not exhibit specific lateral or vertical trends in distribution or concentration. The range was lower than the upgradient and 100 property well levels but above the 140 property well levels.

- **Antimony** was detected in two of the 28 monitoring well samples at concentrations ranging from 0.11 µg/L (MW-23D, screened at 330 to 340 feet BGS) to 0.18 µg/L (MW-50I, screened at 120 to 130 feet BGS). Similar levels of antimony were detected in 100 property samples. Antimony was not detected in upgradient or 140 property wells.

- **Arsenic** was detected in nine of the 28 monitoring well samples, with concentrations ranging from 0.13 µg/L (MW-27D, screened at 280 to 290 feet BGS) to 2.1 µg/L (MW-3, screened at 58 to 78 feet BGS). Arsenic was detected at

levels similar to those in upgradient wells and slightly lower than in 100 property wells. Arsenic was not detected in 140 property well samples.

- **Barium** was detected in all 28 monitoring well samples, with concentrations ranging from 4.3 µg/L (MW-12, screened at 120 to 130 feet BGS) to 196 µg/L (MW-25I, screened at 230 to 240 feet BGS). The levels were similar to those in upgradient, 140, and 100 property well samples.

- **Cadmium** was detected in 10 of the 28 monitoring well samples, with concentrations ranging from 0.083 µg/L (MW-39S, screened at 76 to 86 feet BGS) to 1.2 µg/L (MW-10, screened at 120 to 130 feet BGS). The range was similar to upgradient, 140, and 100 property well levels.

- **Chromium** was detected in 16 of the 28 monitoring well samples, with concentrations ranging from 0.36 µg/L (MW-31D, screened at 320 to 330 feet BGS) to 15 µg/L (MW-10, screened at 120 to 130 feet BGS). The range was slightly higher than in upgradient, 140, and 100 property well samples.

- **Copper** was detected in three of the 28 monitoring well samples, concentrations ranging from 0.8 µg/L (MW-23I, screened at 170 to 180 feet BGS) to 25 µg/L (MW-27DD, screened at 365 to 375 feet BGS). Copper was not detected in upgradient wells, and the levels of copper in 70 property wells were higher than in 140 and 100 property wells.

- **Iron** was detected in 23 of the 28 monitoring well samples, with concentrations ranging from 19.4 µg/L (MW-25I, screened at 230 to 240 feet BGS) to 3,090 µg/L (MW-29S, screened at 66 to 76 feet BGS). Nine of the samples had concentrations of iron >500 µg/L. The range was similar to upgradient, 140, and 100 property well sample levels.

- **Lead** was detected in four of the 28 monitoring well samples, with concentrations ranging from 1.2 µg/L (MW-10, screened at 120 to 130 feet BGS) to 2.3 µg/L (MW-32D, screened at 295 to 305 feet BGS). The highest lead levels were from deep samples, and the range was similar to upgradient well sample levels and less than 100 property well sample levels. Lead was not detected in the 140 property well samples.

- **Sodium** was detected in 26 of the 28 monitoring well samples, with concentrations ranging from 5,270 µg/L (MW-11, screened at 71 to 81 feet BGS) to 627,000 µg/L (MW-27D, screened at 280 to 290 feet BGS). The higher concentrations were predominantly in deeper samples. Most of the concentrations were higher than 20,000 µg/L, but the sodium levels were lower than in the upgradient, 140, and 100 property well samples.

- **Thallium** was detected in 26 of the 28 monitoring well samples, with concentrations ranging from 0.031 µg/L (MW-30S, screened at 90 to 100 feet BGS) to 0.37 µg/L (MW-3, screened at 58 to 78 feet BGS).

- **Vanadium** was detected in six of the 28 monitoring well samples, with concentrations ranging from 1.3 µg/L (MW-4, screened at 58 to 78 feet BGS) to 4 µg/L (MW-27DD, screened at 365 to 375 feet BGS). The levels were lower than in the upgradient and 100 property well samples. Vanadium was not detected in the 140 property well samples.

BTVs could not be developed for the following metals because they were not detected in the upgradient wells:

- **Antimony** was detected in two of the 28 monitoring well samples, with concentrations ranging from 0.11 µg/L (MW-23D, screened at 330 to 340 feet BGS) to 0.18 µg/L (MW-50I, screened at 120 to 130 feet BGS). The levels were similar to those in 100 property well samples. Antimony was not detected in any of the upgradient or 140 property well samples.

- **Copper** was detected in three of the 28 monitoring well samples, with concentrations ranging from 0.8 µg/L (MW-23I, screened at 170 to 180 feet BGS) to 25 µg/L (MW-27DD, screened at 365 to 375 feet BGS). On the 70 property, copper was detected deeper and at a higher concentration than on the 140 property, and it was detected shallower and at a higher concentration and than on the 100 property. Copper was not detected in upgradient well samples.

VOCs in 70 Property Monitoring Well Samples

Groundwater samples were collected from 14 monitoring wells (MW-21S, -21I, -21D, -22S, -22I, -22D, -24S, -24DD, -28S, -28I, -28D, -43S, -44S, and -49S) on the 70 property and analyzed for VOCs. Table 4.7-5 presents a summary of the analytical results for VOCs. Fourteen VOCs were detected in the monitoring well samples: 1,1,1-TCA, 1,1,2-TCA, 1,1-DCA, 1,1-DCE, 1,2-DCA, 4-methyl-2-pentanone, acetone, bromochloromethane, carbon disulfide, chloroform, cis-1,2-DCE, MTBE, PCE, and TCE. Two of these VOCs (PCE and TCE) were detected at concentrations greater than three times their respective BTVs. Most of the VOCs did not exhibit specific lateral or vertical trends in distribution or concentration. VOCs that did exhibit a trend are noted below.

- **PCE** was detected in 22 of the 28 monitoring well samples, with concentrations ranging from 2 µg/L (MW-31I, screened 180 to190 feet BGS; MW-26D, screened at 266 to 276 feet BGS; MW-23S, screened at 90 to100 feet BGS; MW-23I, screened at 170 to 180 feet BGS; and MW-25D, screened at 340 to 350 feet BGS) to 1,400 µg/L (MW-10, screened at 120 to 130 feet BGS). Eleven of these samples had concentrations greater than three times the BTV (2.71 µg/L): 15 µg/L in MW-27D (screened at 280 to 290 feet BGS); 34 µg/L in MW-32D (screened at 295 to 305 feet BGS); 38 µg/L in MW-3 (screened at 58 to 78 feet BGS); 44 µg/L in MW-31D (screened at 320 to 330 feet BGS); 280 µg/L in MW-4 (screened at 58 to 78 feet BGS); 360 µg/L in MW-29S (screened at 66 to 76 feet BGS); 450 µg/L in MW-11 (screened at 71 to 81 feet BGS); 470 µg/L in MW-9 (screened at 72 to 78 feet BGS); 1,000 µg/L

in MW-12 (screened at 120 to 130 feet BGS); 1,200 µg/L in MW-39S (screened at 76 to 86 feet BGS); and 1,400 µg/L in MW-10 (screened at 120 to 130 feet BGS). The second-highest levels of PCE were detected on the 70 property, and the highest levels were detected immediately upgradient on the 100 property. Most of the higher concentrations of PCE were detected in shallow and intermediate samples collected along the southern border of the property.

- **TCE** was detected in 20 of the 28 monitoring well samples, with concentrations ranging from 0.5 µg/L (MW-39S, screened at 76 to 86 feet BGS, and MW-23I, screened at 170 to 180 feet BGS) to 44 µg/L (MW-30I, screened at 230 to 240 feet BGS). Five of these samples had concentrations greater than three times the BTV (1.51 µg/L): 7 µg/L in MW-10 (screened at 120 to 130 feet BGS); 8 µg/L in MW-31D (screened at 320 to 330 feet BGS); 10 µg/L in MW-27DD (screened at 365 to 375 feet BGS); 26 µg/L in MW-12 (screened at 120 to 130 feet BGS); and 44 µg/L in MW-30I (screened at 230 to 240 feet BGS). The second-highest levels of TCE were detected on the 70 property, and the highest levels were detected immediately upgradient on the 100 property. TCE generally occurred along with PCE on the eastern part of the property and without significant PCE levels on the western part of the property.

The following is a summary of VOCs detected on the 70 property above their respective BTVs but below three times the BTVs.

- **1,1-DCA** was detected in four of the 28 monitoring well samples, all of which exceeded the BTV (1.0 µg/L): 2 µg/L in MW-26D (screened at 266 to 276 feet BGS) and MW-23D (screened at 330 to 340 feet BGS), and 3 µg/L in MW-30I (screened at 230 to 240 feet BGS) and MW-27DD (screened at 365 to 375 feet BGS). 1,1-DCA levels on the 70 property were slightly lower than upgradient levels but similar to the 140 and 100 properties levels.

- **Acetone** was detected in four of the 28 monitoring well samples, three of which exceeded the BTV (4.46 µg/L): 6 µg/L in MW-23I (screened at 170 to 180 feet BGS), 5 µg/L in MW-23D (screened at 330 to 340 feet BGS), and 5 µg/L in MW-30S (screened at 90 to 100 feet BGS). Acetone levels on the 70 property were approximately the same as the levels in the upgradient and 100 property well samples. Acetone was not detected in 140 property wells.

- **Chloroform** was detected in four of the 28 monitoring well samples, three of which exceeded the BTV (3.0 µg/L): 7 µg/L in MW-12 (screened at 120 to 130 feet BGS) and MW-27D (screened at 280 to 290 feet BGS), and 9 µg/L in MW-31D (screened at 320 to 330 feet BGS). Chloroform occurred in intermediate and deep samples from the central and southern portions of the property. The chloroform levels on the 70 property were higher than in upgradient samples but lower than in the 140 and 100 property well samples.

Eight compounds were not detected in upgradient monitoring wells but were detected on-site. The results for these compounds are discussed below.

- **1,1,1-TCA** was detected in seven of the 28 monitoring well samples, with concentrations ranging from 1 µg/L (MW-25I, screened at 230 to 240 feet BGS; MW-25S, screened at 105 to 115 feet BGS; and MW-26D, screened at 266 to 276 feet BGS) to 84 µg/L (MW-30I, screened at 230 to 240 feet BGS). 1,1,1,-TCA, 1,1,2-TCA, 1,1-DCE, and 1,2-DCA were all detected in intermediate and deep samples from the central and southwest portions of the property. Other than the two high samples in MW-30I/D, the levels of 1,1,1-TCA detected on the 70 property were similar to the 140 and 100 property well levels. 1,1,1-TCA was not detected in upgradient wells.

- **1,1,2-TCA** was detected in one of the 28 monitoring well samples at a concentration of 3 µg/L (MW-30I, screened at 230 to 240 feet BGS). 1,1,2,-TCA, 1,1,1-TCA, 1,1-DCE, and 1,2-DCA were all detected in intermediate and deep samples from the central and southwest portions of the property. 1,1,2-TCA was not detected in wells on any of the other properties.

- **1,1-DCE** was detected in seven of the 28 monitoring well samples, with concentrations ranging from 1 µg/L (MW-31I, screened at 180 to 190 feet BGS; MW-26D, screened at 266 to 276 feet BGS; MW-25S, screened at 105 to 115 feet BGS; and MW-23D, screened at 330 to 340 feet BGS) to 53 µg/L (MW-30I, screened at 230 to 240 feet BGS). 1,1-DCE, 1,1,1,-TCA, 1,1,2-TCA, and 1,2-DCA were all detected in intermediate and deep samples from the central and southwest portions of the property. Other than the highest concentration in sample in MW-30I, the levels of 1,1-DCE on the 70 property were similar to the 140 and 100 property well levels. 1,1-DCA was not detected in upgradient wells.

- **1,2-DCA** was detected in one of the 28 monitoring well samples at a concentration of 1 µg/L (MW-30I, screened at 230 to 240 feet BGS). 1,2-DCA, 1,1,1,-TCA, 1,1,2-TCA, and 1,1-DCE were all detected in intermediate and deep samples from the central and southwest portions of the property. 1,2-DCA was not detected in wells from any of the other properties.

- **Bromochloromethane** was detected in five of the 28 monitoring well samples, with concentrations ranging from 0.4 µg/L (MW-12, screened at 120 to 130 feet BGS, MW-11, screened at 71 to 81 feet BGS, MW-9, screened at 72 to 82 feet BGS, and MW-8, screened at 120 to 130 feet BGS) to 0.5 µg/L (MW-10, screened at 120 to 130 feet BGS). Bromochloromethane was not detected in wells from any of the other properties.

- **Carbon disulfide** was detected in one of the 28 monitoring well samples at a concentration of 1 µg/L (MW-23D, screened at 330 to 340 feet BGS). Carbon disulfide was not detected in wells from any of the other properties.

- **cis-1,2-DCE** was detected in four of the 28 monitoring well samples, with concentrations ranging from 2 µg/L (MW-4, screened at 58 to 78 feet BGS) to 7 µg/L (MW-12, screened at 120 to 130 feet BGS). cis-1,2-DCE is a degradation product of PCE/TCE and thus is present at the same locations as elevated levels of PCE/TCE. It was not detected in the upgradient or 140 property samples, but it was detected at a similar level in the 100 property wells.

- **MTBE** was detected in one of the 28 monitoring well samples at a concentration of 2 µg/L (MW-30I, screened at 230 to 240 feet BGS). MTBE was not detected in wells from any of the other properties.

A comparison of monitoring well results and associated profile sample results collected from the same depths as the well screens is presented in Table 4.7-8.

Radionuclides in 70 Property Monitoring Well Samples

Groundwater samples were collected from 28 monitoring wells (MW-3, -4, -8, -9, -10, -11, -12, -23S/I/D, -25S/I/D, -26S/D, -27S/D/DD, -29S, -30S/I/D, -31I/D, -32D, -39S, -50I, and -51I) on the 70 property and analyzed for radionuclides. Table 4.7-5 presents a summary of the radioanalytical results. Sixteen radionuclides were detected in the monitoring well samples, including isotopes of naturally occurring uranium, thorium, and radium and their short-lived daughter products, which are present with the parent products and are not discussed separately in this section. Uranium, thorium, and radium were detected in one or more samples at concentrations greater than three times their respective BTVs. Total uranium, total gross alpha (for screening purposes), and gross beta (for screening purposes) are reported as a comparison to typical screening values used for groundwater. Most of the radionuclides did not exhibit specific lateral or vertical trends in distribution or concentration. Radionuclides that did exhibit a trend are noted below.

- **Uranium.** U-238 was detected in 12 of the 28 monitoring well samples, and eight samples had concentrations greater than three times the BTV (0.205 pCi/L): 3.74 pCi/L in MW-27D (screened at 280 to 290 feet BGS); 3.65 pCi/L in MW-23S (screened at 90 to 100 feet BGS); 2.47 pCi/L in MW-25S (screened at 105 to 115 feet BGS); 2.21 pCi/L in MW-50I (screened at 120 to 130 feet BGS); 1.61 pCi/L in MW-12 (screened at 120 to 130 feet BGS); 1.42 pCi/L in MW-23I (screened at 170 to 180 feet BGS); 1.37 pCi/L in MW-26S (screened at 110 to 120 feet BGS); and 0.777 pCi/L in MW-4 (screened 58 to 78 feet BGS). The highest U-234 results tracked the U-238 concentrations in the first four wells, with concentrations of 3.88 pCi/L, 3.73 pCi/L, 2.60 pCi/L, and 2.51 pCi/L. The highest U-235 concentrations were 0.803 pCi/L in MW-4 (screened at 58 to 78 feet BGS), 0.647 pCi/L in MW-23S (screened 90 to 100 feet BGS), and 0.202 pCi/L in MW-25S (screened at 105 to 115 feet BGS). Corresponding concentrations of U-234 and U-238 in MW-4 were 0.849 pCi/L and 0.777 pCi/L.

The total uranium results corresponding to the eight U-238 wells specified above were 11.1 µg/L, 11.0 µg/L, 7.37 µg/L, 6.54µg/L, 4.79 µg/L. 4.25 µg/L, 4.11 µg/L, and 2.65 µg/L, respectively.

The uranium concentrations are all relatively low. The samples with concentrations above three times the BTV are from various depths in wells spread east to west across the north parking lot. Monitoring well MW-4, which is downgradient from the B70 former recharge basin, had low but comparable concentrations of U-234, U-235, and U-238 (0.849 pCi/L, 0.803 pCi/L, and 0.777 pCi/L, respectively).

- **Thorium.** Th-232 was detected in three of the 28 monitoring well samples, and two samples had concentrations greater than three times the BTV (0.137 pCi/L): 3.10 pCi/L in MW-31D (screened at 320 to 330 feet BGS); and 1.48 pCi/L in MW-51I (screened at 130 to 140 feet BGS). The highest concentrations of Th-228 and Th-230 also were detected in MW-31D at 2.83 pCi/L and 3.0 pCi/L, respectively.

- **Radium.** Ra-226 was detected in 22 of the 28 monitoring well samples, and one sample had a concentration greater than three times the BTV (0.999 pCi/L): 3.71 pCi/L in MW-27D (screened at 280 to 290 feet BGS). Ra-228 was not detected above three times its BTV in any of the wells. The Ra-228 concentrations ranged from 0.420 pCi/L in MW-12 (screened at 120 to 130 feet BGS) to 4.84 pCi/L in MW-27D.

- **Gross alpha total (screening)** was detected in 22 of the 28 monitoring well samples, and two samples had concentrations greater than three times the BTV (5.31 pCi/L): 16.9 pCi/L in MW-31D (screened at 320 to 330 feet BGS); and 16.4 pCi/L at MW-27D (screened at 280 to 290 feet BGS).

- **Gross beta (screening)** was detected in 26 of the 28 monitoring well samples, and one sample had a concentration greater than the BTV (14.6 pCi/L): 20.1 pCi/L in MW-27D (screened at 280 to 290 feet BGS).

Summary

- **Metals.** Twenty metals were detected in the monitoring well samples: aluminum, antimony, arsenic, barium, beryllium, cadmium, calcium, chromium, cobalt, copper, iron, lead, magnesium, manganese, nickel, potassium, sodium, thallium, vanadium, and zinc. Of these metals, three (calcium, magnesium and magnesium) are considered naturally occurring essential nutrients in soils; therefore, their presence in the groundwater is not of concern. In addition, calcium, iron, magnesium, and potassium are not CERCLA hazardous substances.

  Based on the sample results, all of the metals except aluminum, antimony, copper, lead, potassium, and vanadium were detected above their respective

BTV. Of the metals that exceeded their BTV, five (beryllium, cobalt, manganese, nickel, and zinc) were detected at concentrations greater than three times their BTV. BTVs for antimony and copper could not be developed because they were not detected in any of the upgradient wells.

Almost all of the metals that exceeded their BTV did not exhibit any specific lateral or vertical trends in distribution or concentration. The exception was nickel, the highest concentrations of which (>100 µg/L) were detected in shallow and intermediate wells in the west-central/central and southern portions of the property. Elevated levels of nickel in shallow groundwater were detected in the same general area (west-central/central) as on the 100 property. Therefore, the source of the nickel is likely on the 100 property in soils associated with remedial cell 9 from 24 to 64 feet BGS. Other possible sources may exist on the 70 property.

Antimony and copper were detected only in intermediate and deep wells at very low concentrations.

In summary, nickel appears to be the only metal that is elevated due to site activities.

- **VOCs.** Fourteen VOCs were detected in the monitoring well samples: 1,1,1-TCA, 1,1,2-TCA, 1,1-DCA, 1,1-DCE, 1,2-DCA, 4-methyl-2-pentanone, acetone, bromochloromethane, carbon disulfide, chloroform, cis-1,2-DCE, MTBE, PCE, and TCE.

  Five of the VOCs (1,1-DCA, acetone, chloroform, PCE, and TCE) exceeded their respective BTV, and PCE and TCE were detected at concentrations greater than three times their BTVs. The PCE was detected predominantly in shallow and intermediate wells, but also in a few deep wells from the MW-27 well cluster on the north side of B70 and in almost all the wells on the south side of B70. The highest concentration of PCE was 1,400 µg/L in MW-10 (intermediate). The likely source could be contaminated soils on the north side of B70, as well as contaminated soils beneath B70.

  TCE was detected in the same locations as PCE (intermediate and deep samples from wells just north of B70 and along the south side of B70. The highest concentration of TCE was 44 µg/L in MW-30I. The presence of the TCE is likely related to the degradation of PCE.

  In summary, the source of the PCE/TCE is likely from several source areas on the 70 property.

- **Radionuclides.** The concentrations of uranium in the monitoring well samples on the 70 property are all relatively low. The samples with concentrations greater than three times the BTV ranged from 0.777 pCi/L to 3.7 pCi/L

(MW-27D screened at 280 to 290 feet BGS). The samples were collected from various depths in wells spread east to west across the north parking lot.

The concentrations of thorium and radium were of the same magnitude as uranium. The highest concentration of thorium (3.10 pCi/L) was detected in MW-31D screened at 320 to 330 feet BGS. The highest concentrations of Ra-226 and Ra-228 were detected in samples from MW-27D, which also had the highest concentrations of uranium. These levels at such depths could most likely be due to natural radioactive materials in the clay layer that exists above the monitoring well screens.

4.7.2.5 Driving Range Results

Two well clusters (MW-33S/D and MW-34S/D), three individual wells (MW-52D, -53S, and -55S), and five profile borings (RI-P-35S, -36S, -37S, -38S, and -56I) were installed on the Driving Range property (see Figure 2.5-8).

All profile samples were tested for VOCs; MW-33D and RI-P-37S profile samples were tested for metals; and MW-33D, -52D and MW-53S, MW-55S, and RI-P-56I profile samples were tested for radiological parameters. The results from the profile samples are presented in Appendix H.

All groundwater monitoring well samples were tested for VOCs, metals, and radiological parameters. The results from the groundwater monitoring well samples are described below.

Metals in Driving Range Monitoring Well Samples

Groundwater samples were collected from seven monitoring wells (MW-33S, -33D, -34S, -34D, -52D, -53S, and -55S) on the driving range property and analyzed for metals. Table 4.7-6 presents a summary of the analytical results for metals. Twenty metals were detected in the groundwater monitoring well samples: aluminum, arsenic, barium, beryllium, cadmium, calcium, chromium, cobalt, copper, iron, lead, magnesium, manganese, nickel, potassium, selenium, sodium, thallium, vanadium, and zinc. Ten of these metals (aluminum, arsenic, beryllium, chromium, cobalt, iron, lead, manganese, nickel, and vanadium) were detected at concentrations greater than three times their respective BTVs. In addition, calcium, iron, magnesium, and potassium are not CERCLA hazardous substances. Most of the metals did not exhibit specific lateral or vertical trends in distribution or concentration. Metals that did exhibit a trend are noted below.

- **Aluminum** was detected in five of the seven monitoring well samples, one of which had a concentration greater than three times its BTV (2,580 µg/L): 9,140 µg/L in MW-34D (screened at 270 to 280 feet BGS). The level of aluminum in MW-34D is also significantly higher than in any of the other property samples collected. This was an unfiltered sample with high turbidity.

- **Arsenic** was detected in six of the seven monitoring well samples, with concentrations ranging from 0.1 µg/L (MW-34S, screened at 65 to 75 feet BGS)

to 9.1 µg/L (MW-34D, screened at 270 to 280 feet BGS), the latter of which was more than three times the BTV (1.14 µg/L). The level of arsenic in MW-34D is also significantly higher than in any of the other property samples collected. This was an unfiltered sample with high turbidity.

- **Beryllium** was detected in three of the seven monitoring well samples, with concentrations ranging from 0.16 µg/L (MW-53S, screened at 70 to 80 feet BGS) to 0.9 µg/L (MW-33S, screened at 65 to 75 feet BGS), the latter of which was more than three times the BTV (0.183 µg/L). The level of beryllium in MW-33S was higher than in any of the other property samples collected.

- **Chromium** was detected in all seven monitoring well samples, with concentrations ranging from 0.31 µg/L (MW-53S, screened at 70 to 80 feet BGS) to 23.5 µg/L (MW-34D, screened at 270 to 280 feet BGS). The concentration in the sample from MW-34D was more than three times the BTV (6.31 µg/L). This was an unfiltered sample with high turbidity. The level of chromium in MW-34D was significantly higher than the 140 property maximum concentration, and 1.5 to 3 times higher than in the other property samples collected.

- **Cobalt** was detected in all seven monitoring well samples, with concentrations ranging from 0.44 µg/L (MW-34D, screened at 270 to 280 feet BGS) to 17.4 µg/L (MW-55S, screened at 85 to 95 feet BGS). Two samples had concentrations more than three times the BTV (2.96 µg/L): 11.3 µg/L in MW-53S (screened at 70 to 80 feet BGS) and 17.4 µg/L in MW-55S (screened at 85 to 95 feet BGS). The level of cobalt was also higher than the maximum 140 property and 100 property levels, but significantly less than the maximum 70 property level.

- **Iron** was detected in all seven monitoring well samples, with concentrations ranging from 109 µg/L (MW-33S, screened at 65 to 75 feet BGS) to 32,400 µg/L (MW-34D, screened at 270 to 280 feet BGS). The concentration in the sample from MW-34D was more than three times the BTV (2,680 µg/L). This was an unfiltered sample with high turbidity. Four of the seven samples had concentrations >500 µg/L. The range was similar to upgradient, 140 property, and 100 property well sample levels.

- **Lead** was detected in two of the seven monitoring well samples at concentrations of 2.4 µg/L in MW-33D (screened at 290 to 300 feet BGS) and 31.1 µg/L in MW-34D (screened 270 to 280 feet BGS). The concentration in the sample from MW-34D was more than three times the BTV (2.63 µg/L). This was an unfiltered sample with high turbidity.

- **Manganese** was detected in all seven monitoring well samples, with concentrations ranging from 14.3 µg/L (MW-34D, screened at 270 to 280 feet BGS) to 1,450 µg/L (MW-55S, screened at 85 to 95 feet BGS). Samples from three of these wells had a manganese concentration greater than three times the

BTV (107 µg/L): 567 µg/L in MW-53S (screened at 70 to 80 feet BGS); 661 µg/L in MW-34S (screened at 65 to 75 feet BGS); and 1,450 µg/L in MW-55S (screened 85 to 95 feet BGS). Three of the seven samples had notable concentrations (>500 µg/L), and the levels were similar to 70 property well levels but higher than upgradient, 140 property, and 100 property well levels.

- **Nickel** was detected in all seven monitoring well samples, with concentrations ranging from 2 µg/L (MW-34S, screened at 65 to 75 feet BGS) to 16.8 µg/L (MW-53S, screened at 70 to 80 feet BGS). Two of these samples had concentrations greater than three times the BTV (4.54 µg/L): 16.4 µg/L in MW-55S (screened at 85 to 95 feet BGS) and 16.8 µg/L in MW-53S (screened at 70 to 80 feet BGS). The levels of nickel were similar to 140 property well levels and much lower than 100 property and 70 property well levels.

- **Vanadium** was detected in three of the seven monitoring well samples, with concentrations ranging from 2 µg/L (MW-33D, screened at 290 to 300 feet BGS) to 83.6 µg/L (MW-34D, screened at 270 to 280 feet BGS). The concentration in the sample from MW-34D was more than three times the BTV (7.14 µg/L). This was an unfiltered sample with high turbidity. The level of vanadium in MW-34D was also significantly higher than in any of the other property samples collected.

The following is a summary of metals detected on the Driving Range property at concentrations above their BTVs but below three times the BTV (less those considered essential nutrients).

- **Barium** was detected in all seven monitoring well samples, with concentrations ranging from 14.4 µg/L (MW-52D, screened at 275 to 285 feet BGS) to 106 µg/L (MW-55S, screened at 85 to 95 feet BGS). The levels of barium were similar to the upgradient levels and lower than 140 property, 100 property, and 70 property levels.

- **Thallium** was detected in all seven monitoring well samples, with concentrations ranging from 0.059 µg/L (MW-34S at 65 to 75 feet BGS) to 0.18 µg/L (MW-55S at 85 to 95 feet BGS). The levels of thallium were similar to the upgradient, 140 property, 100 property, and 70 property levels

BTVs could not be developed for the following metals because they were not detected in the upgradient wells:

- **Copper** was detected in one of the seven monitoring well samples at a concentration of 45.6 µg/L (MW-34D, screened at 270 to 280 feet BGS). This was an unfiltered sample with high turbidity.

- **Selenium** was detected in one of the seven monitoring well samples at a concentration of 7.6 µg/L in MW-34D (screened at 270 to 280 feet BGS). This was an unfiltered sample with high turbidity.

VOCs in Driving Range Monitoring Well Samples

Groundwater samples were collected from seven monitoring wells (MW-33S, -33D, -34S, -34D, -52D, -53S, and -55S) on the Driving Range property and analyzed for VOCs. Table 4.7-6 presents a summary of the analytical results for VOCs. Four VOCs were detected in Driving Range well samples: acetone, chloroform, PCE, and TCE. Chloroform and PCE were detected at concentrations greater than three times their respective BTVs. Most of the VOCs did not exhibit specific lateral or vertical trends in distribution or concentration. VOCs that did exhibit a trend are noted below.

- **Chloroform** was detected in one of the seven monitoring well samples at a concentration of 23 µg/L (MW-55S, screened at 85 to 95 feet BGS), which was more than three times the BTV (3 µg/L). This level of chloroform was similar to the 140 property and 100 property well levels, and much higher than the 70 property well levels.

- **PCE** was detected in five of the seven monitoring well samples, with concentrations ranging from 2 µg/L (MW-55S, screened at 85 to 95 feet BGS) to 910 µg/L (MW-53S, screened at 70 to 80 feet BGS). Four of these samples had concentrations more than three times the BTV (2.71 µg/L): 88 µg/L in MW-33D (screened 290 to 300 feet BGS), 100 µg/L in MW-52D (screened 275 to 285 feet BGS), 130 µg/L in MW-33S (screened 65 to 75 feet BGS) and 910 µg/L in MW-53S (screened 70 to 80 feet BGS). The higher concentrations of PCE were detected in samples from the southwestern portion of the Driving Range property. The levels were significantly higher than upgradient and 140 property well levels, and less then 100 property and 70 property well levels.

One VOC (TCE) was detected above its BTV but at less than three times its BTV:

- **TCE** was detected in three of the seven monitoring well samples, with concentrations ranging from 0.9 µg/L (MW-52D, screened at 275 to 285 feet BGS) to 2.0 µg/L (MW-53S, screened at 70 to 80 feet BGS), the latter of which was above the BTV (1.51 µg/L). TCE is a degradation product of PCE. TCE was also detected in shallow well samples from the southwestern portion of the Driving Range property in association with high levels of PCE. The levels of TCE were similar to upgradient and 140 property well levels, and much lower than 100 property and 70 property well levels.

Radionuclides in Driving Range Monitoring Well Samples

Groundwater samples were collected from seven monitoring wells (MW-33S, -33D, -34S, -34D, -52D, -53S, and -55S) on the Driving Range property and analyzed for radionuclides. Table 4.7-6 presents a summary of the radioanalytical results. Twelve radionuclides were detected in the monitoring well samples, including isotopes of naturally occurring uranium, thorium, and radium, and their short-lived daughter products, which are present with the parent products and are not discussed separately in this section. Uranium and thorium were detected in

one or more samples at concentrations greater than three times their BTVs, and radium was detected in one sample above its BTV. Total uranium, total gross alpha radiation (for screening purposes), and gross beta radiation (for screening purposes) also were measured. Most of the radionuclides did not exhibit specific lateral or vertical trends in distribution or concentration. Radionuclides that did exhibit a trend are noted below.

- **Uranium.** U-238 was detected in four of the seven monitoring well samples, and three samples had concentrations greater than three times the BTV (0.205 pCi/L): 26.0 pCi/L in MW-33S (screened at 65 to 75 feet BGS); 2.75 pCi/L in MW-53S (screened at 70 to 80 feet BGS); and 1.85 pCi/L in MW-34D (screened at 270 to 280 feet BGS). The highest U-234 results tracked the U-238 concentrations in these three wells with concentrations of 25.9 pCi/L, 2.76 pCi/L, and 1.59 pCi/L. The highest U-235 results also tracked the U-238 concentrations in the first two wells with concentrations of 2.75 pCi/L and 0.257 pCi/L.

  The total uranium results corresponding to the three wells mentioned above were 77.8 µg/L, 8.22 µg/L, and 5.61 µg/L. The highest total uranium concentration in the remaining wells was 8.2 µg/L in MW-53S (screened at 70 to 80 feet BGS).

- **Thorium.** Th-232 was detected in one of the seven monitoring well samples, and the concentration was greater than three times the BTV (0.137 pCi/L): 0.828 pCi/L in MW-34D (screened at 270 to 280 feet BGS). The highest concentrations of Th-228 and Th-230 (1.02 pCi/L and 1.03 pCi/L, respectively) also were detected in this well.

- **Radium.** Ra-226 was detected in three of the seven monitoring well samples, and one sample had a concentration greater than the BTV (0.999 pCi/L): 1.19 pCi/L in MW-34D (screened at 270 to 280 feet BGS). Ra-228 was not detected above its BTV in any of the wells.

- **Gross alpha total** (screening) was detected in five of the seven monitoring well samples, and two samples had a concentration greater than three times the BTV (5.31 pCi/L): 59.0 pCi/L in MW-33S (screened at 65 to 75 feet BGS); and 32.4 pCi/L at MW-34D (screened at 270 to 280 feet BGS).

- **Gross beta** (screening) was detected in all seven monitoring well samples, and one sample had a concentration greater than the BTV (14.6 pCi/L): 48.2 pCi/L in MW-34D (screened at 270 to 280 feet BGS).

Summary

- **Metals.** Twenty metals were detected in the monitoring well samples: aluminum, arsenic, barium, beryllium, cadmium, calcium, chromium, cobalt, copper, iron, lead, magnesium, manganese, nickel, potassium, selenium, sodium, thallium, vanadium, and zinc. Of these metals, three (calcium, magnesium, and potassium) are considered naturally occurring essential nutrients in soil; therefore, their presence in the groundwater is not of concern. In addition, calcium, iron, magnesium, and potassium are not CERCLA hazardous substances.

  Based on the sample results, 13 metals were detected above their respective BTVs, and 10 of these (aluminum, arsenic, beryllium, calcium, chromium, iron, lead, manganese, nickel, and vanadium) were detected at concentrations greater than three times their BTV. BTVs for copper and selenium could not be developed because they were not detected in any of the upgradient wells.

  Almost all of the metals that exceeded their BTVs did not exhibit any specific lateral or vertical trends in distribution or concentration. The exception was lead, which was detected in MW-34D at an elevated concentration of 31.1 µg/L. This detection was in an unfiltered sample with very high turbidity. Since no other elevated levels of lead were detected on the property, any other Sylvania parcels, or upgradient, it is likely that the elevated level is due to the turbidity. Copper and selenium were also detected in the turbid sample from MW-34D.

  In summary, no metals on the Driving Range property appear to be elevated due to Sylvania site activities.

- **VOCs.** Four VOCs were detected in the monitoring well samples, including: acetone, chloroform, PCE, and TCE.

  Three of the VOCs (chloroform, PCE, and TCE) exceeded their respective BTVs, and chloroform and PCE were detected at concentrations greater than three times their BTVs. Chloroform was detected only in one shallow well (MW-55S) from the location on the Driving Range property that is closest to the pool area in Cantiague Park. As previously discussed, the likely source of the chloroform is the pool water that is discharged from Cantiague Park. The higher levels of PCE were detected in shallow wells, but PCE was also detected in deep wells in the western and southern portions of the Driving Range property. Four wells (MW-33S, -33D, -52D, and -53S) contained elevated levels of PCE, with the highest concentration (910 µg/L) was detected in MW-53S. The likely source of the PCE could be the contaminated soils beneath remedial cell 4.

In summary, only PCE levels on the Driving Range property are of concern, and the source of the PCE is likely from contaminated soils remaining beneath remedial cell 4.

- **Radionuclides.** On the Driving Range property, elevated levels of uranium (U-238 at 26.0 pCi/L, U-234 at 25.9 pCi/L, and U-235 at 2.75 pCi/L) were found in MW-33S (screened at 65 to 75 feet BGS), which is to the east of the southern portion of the 100 property and remedial cell 14. Monitoring well MW-53S, which is downgradient of MW-33S, had much lower concentrations (U-238 at 2.75 pCi/L).

  Thorium and radium concentrations above their respective BTVs were detected in deep samples screened at 270 to 280 feet BGS (MW-33D), which is most likely due to a clay layer above the monitoring well screens.

4.8 Miscellaneous Samples

A total of six samples of various materials were collected by the USACE, including: a piece of "slag" discovered during a test trench investigation (sample GPR-F); a soil-like material sample collected from inside a historic drain pipe discovered during a test trench investigation (EM-3-SO-02); a water sample collected from a drain inside B70 (RI-DR-E-W-01); a sediment sample from the bottom of a drywell (RI-SD-01); and two concrete core samples collected from the B70 slab (samples D8-01 and F6-02). The analytical results for these samples are presented in the interactive database presented in Appendix H. The concrete core samples are included in the miscellaneous samples tab of the interactive database.

4.8.1 GPR-F

Sample GPR-F (subcell W74) was a piece slag (approximately 2 inches by 2 inches) discovered during the installation of the test trench of the same name. This is beneath historical Building 10, and a concrete foundation was located here. Radiological analysis only was performed on this sample. It had the highest concentrations of uranium detected on the 70 property. Uranium concentrations in the slag nugget were 1,450 pCi/g U-238, 450 pCi/g U-234, and 11 pCi/g U-235, which is an indication of depleted uranium.

4.8.2 EM-3-SO-02

The highest concentrations of nickel, uranium, and thorium in any sample collected by the USACE were detected in a sample collected from inside a historic drain pipe, which was found 2 feet BGS in subcell K10 (located in the eastern portion of the area between B140 and B100) during the excavation of a test trench (sample EM-03-SO-02). The nickel concentration was 16,900 mg/kg; the uranium concentrations were 1,900 pCi/g U-234, 104 pCi/g U-235, and 1,920 pCi/g U-238; and the thorium concentrations were 129 pCi/g Th-232, 114 pCi/g Th-228, and 23.6 pCi/g Th-230. The highest concentrations of the following uranium and thorium daughter products also were detected in the historic drain pipe in subcell K10: Ac-228, Bi-212, Bi-214, Pa-234m, Pb-212, Ra-224, Ra-226, Ra-

228, Th-234, and Tl-208. PCE and TCE were detected at a concentration of 550 µg/kg and 3.1 µg/kg respectively.

A sample collected from 8 feet BGS in the test trench exhibited concentrations of nickel, uranium, and thorium below their respective BTVs, a radiation survey of the soil yielded background levels, and neither PCE or TCE were detected, which indicates that the elevated concentrations may be limited to within the pipe. The portion of the pipe that was sampled was removed, but a similar pipe was found in the northeast portion of the test trench and appeared to extend east-northeastward from the trench. The extent of the remaining historic drain pipe was not determined.

4.8.3 RI-DR-E-W-01

Sample RI-DR-E-W-01 was collected from inside a drain in the middle warehouse of B70. Based on a downhole video camera survey, it was determined that the drain contained water. The drain was found to travel 80 feet or more eastward beneath the easternmost warehouse portion of the building. It appeared that the pipe opened into a tank (possible septic), box, or junction culvert, but the camera could not be installed further. Water contained in the pipe appeared stagnant, and the source of it could not be determined. Radionuclides in this sample were not detected in concentrations greater than reporting limits. Six VOCs were detected in this sample: 2-butanone at 0.653 µg/L; methylene chloride at 0.655 µg/L; acetone at 3.21 µg/L; 1,2-dichloroethane at 20 µg/L; bromofluorobenzene at 20.5 µg/L; and toluene at 21.3 µg/L. The VOCs present in this sample are not naturally found in the environment. However, the concentrations of the compounds are low and do not appear to be indicative of having been used for waste disposal. In addition, the 10 metals do not indicate that wastes were disposed of in this drain. Radionuclides were all qualified as non-detect (see interactive database included in Appendix H).

4.8.4 RI-SD-01

Sample RI-SD-01 was a sediment sample collected at approximately 10 feet BGS from the bottom of a drywell located on the south side of B70 in subcell F34. While surveying drains within the middle warehouse of B70, it was determined that DR-F contained flowing water. Presumably, this drain is either part of the roof drain system or the water is from a leaking pipe. The water was determined to empty into the drywell sampled in subcell F34, and a sediment sample was collected to determine whether wastes were potentially disposed of through this drain. The analytical results for the metals, VOCs, and radionuclides indicate that waste was not disposed of in this drain (see interactive database included in Appendix H).

4.8.5 Concrete Core Samples

Two concrete core samples were collected from the B70 slab to verify elevated radiological instrument readings detected during the radiation survey (see Section 4.4.6). Concrete core D8-02 had uranium concentrations of 354 pCi/g (U-238), 114 pCi/g (U-234), and 12.0 pCi/g (U-235). Concrete core F6-02 had uranium

concentrations of 273 pCi/g (U-238), 217 pCi/g (U-234), and 13.5 pCi/g (U-235). Thorium and radium concentrations in the cores were below 0.5 pCi/g.

4.9 Identification of Contaminants of Potential Concern (COPC) For Soils

COPCs for soil were identified based on their presence in samples collected from the site, comparison to background and risk-based screening levels, detection frequency, and nutrient status. Only analytical results for samples collected by the USACE or GTEOSI and analyzed in off-site National Environmental Laboratory Accreditation Program (NELAP) -certified laboratories were included in the identification process. For the purposes of the RI, the COPC screening process was applied on a site-wide basis. The baseline risk assessment (see Section 6) was then done on a property-by-property basis, so COPCs were developed for each property.

Screening of Metals, Organics and Radionuclides

The screening process is used to eliminate from the list of COPCs those contaminants that are unlikely to contribute significantly to any risks or hazards that may be posed by site contamination and, therefore, need no further consideration in the risk assessment process (see Section 6). The following filters were used to identify COPCs:

1. Was the substance detected in site samples? Only substances detected in at least one sample were considered potential COPCs.

2. Is the analyte an essential nutrient? Calcium, magnesium, potassium, and sodium are essential nutrients and were excluded on that basis as potential COPCs.

3. The larger of the maximum detected concentration or the maximum non-detected concentration of a substance was selected as a substance's comparison concentration for the initial automated screening process.

4. A substance's comparison concentration was compared with relevant risk-based criteria. Soil contaminants were screened using risk-based screening levels for direct contact and external exposure of potential receptors with the soil as well as for protection of groundwater. Specifically, the following screening levels were used:

   - The EPA's Regional Screening Levels (RSLs) (EPA 2009a) for chemicals;

   - NYSDEC's Soil Cleanup Objectives (SCOs) (NYSDEC/DOH 2006) for chemicals;

   - The EPA's Preliminary Remediation Goals (PRGs) for Radionuclides (EPA 2010) for radionuclides;

- The EPA's PRGs for Radionuclides for Groundwater Protection using dilution attenuation factors (DAF) of one and 20; and

- NYSDEC's SCO for Groundwater Protection (NYSDEC/DOH 2006) using a DAF of 100.

Groundwater contaminants were screened using risk-based screening levels for direct contact and ingestion. Specifically, the following were used:

- The EPA's RSLs for Tapwater (EPA 2009b) for chemical contaminants; and

- The EPA's PRGs for Radionuclides in Tapwater (EPA 2007a) for radiological contaminants.

Substances whose concentrations did not exceeding any of the relevant risk-based criteria were excluded as potential COPCs.

5. For metals and radionuclides in soils, the substance's comparison concentration was compared to its BTV. All substance's comparison concentrations were used when comparing groundwater to its BTV. BTVs are discussed in Sections 4.5.1 and 4.7.1 for soils and groundwater, respectively. Substances whose concentrations did not exceed their BTV were excluded as potential COPCs.

6. Substances that were not detected in at least 5% of the samples analyzed for the substance were excluded as potential COPCs based on infrequent detection.

7. If no risk-based screening values or BTV were available for a substance, it was retained as a potential COPC in that step of the screening process.

A flow chart of the initial automated screening process and the resulting COPC selection decision and rationale is shown on Figure 4.9-1.

The results of the initial automated COPC identification process were reviewed and modified as needed to take into account any special circumstances. For example, the detection limit for a substance may be substantially elevated due to the presence of a high concentration of a different substance in the sample, and the elevated detection limit may cause the substance's comparison concentration to exceed risk-based and/or background criteria values, leading to its initial identification as a COPC. If, upon review, it was noted that the substance's maximum detected concentration was well below all of the relevant screening criteria, the substance was deselected as a COPC. Conversely, if a substance, initially excluded as a COPC based on infrequent detection, is a known degradation or decay product of another COPC, is a COPC in another environmental medium, or if, when detected, its con-

centration substantially exceeded screening criteria (e.g., as in a hot spot), it may have been retained as a COPC.

The results of this screening process are presented in Tables 4.9-1 through 4.9-5.

5 Contaminant Fate and Transport

5.1 Introduction

This section presents a conceptual model describing possible chemical sources and migration pathways at the site followed by a discussion of the fate and transport characteristics of selected contaminants, with an emphasis on their environmental persistence and mobility.

Several metals, organic compounds, and radionuclides were detected in the various sample media (indoor air, soil vapor, site soils, and groundwater) tested at the site. However, based on the human health risk assessment (HHRA), only a few were identified as COPCs (see Section 4.9). Some of these COPCs did not result from activities associated with the early atomic energy program; thus, they are not considered FUSRAP wastes. Therefore, only the following potential FUSRAP waste COPCs are included in this assessment:

- **Metals:** nickel
- **Organic chemicals:** PCE and TCE
- **Radionuclides:** U-234, -235, -238; Th-228, -230, -232; and Ra-228

5.2 Conceptual Fate and Transport Model

During past site operations, contamination of site soils may have resulted from discharges to on-site recharge basins/sumps, surface spills, leaking underground storage tanks, leaking underground pipes used to transport liquids throughout the site, drum burial and leakage, discharges to leach pools/drywells, poor waste handling and disposal practices common for the time period. Chemicals may have further been distributed in site soils during demolition of historic Buildings 1 and 2 and construction of B140, B100, and the addition of the easternmost portion of B70. Affected media include air, soil, and groundwater. Chemicals released to site soils may have migrated through the air in the form of fugitive dust, evaporated through burning of wastes, and/or volatilization; migration to groundwater; and/or remained in the soil profile. Surface waters are not present at the site, and all stormwater is collected into drywells and infiltrated through subsurface soils at the site.

The key question in the fate and transport of contaminants at the Sylvania site is whether they may be expected to migrate to the air, remain in the soil profile, or migrate to groundwater, where further transport will occur. The answer varies by chemical, depending on the chemical's intrinsic properties (e.g., water solubility, vapor pressure, soil-water partition coefficient, adsorption properties, etc.) and site-specific circumstances (pH conditions, oxidizing/reducing environments, soil permeability, release mechanism, etc.). For example, VOCs typically evaporate to the air and/or transported to groundwater as a result of their high volatility and water solubility. However, VOCs may persist depending upon the availability of gas exchange between the atmosphere and site soils.

No operations are currently ongoing at the site; therefore, chemicals are no longer being used or stored on the property (besides typical building maintenance products, including heating oil). The three main mechanisms affecting further transport of contaminants detected at the site (presuming conditions remain stable) are volatilization of organic compounds detected in soils (contaminated soils or groundwater under buildings may create a potential vapor intrusion pathway), leaching of contaminants to the underlying aquifer through stormwater infiltration, and through the movement of groundwater carrying dissolved contaminants.

5.3 Contaminant Persistence and Behavioral Characteristics

The information on chemical fate and transport characteristics presented in this section was taken from toxicological profiles prepared by the Agency for Toxic Substance and Disease Registry (ATSDR) and other reputable sources, as cited below. The following discussion is organized under three main subheadings: (1) metals (2) organic contaminants, and (3) radionuclides.

5.3.1 Metals

This subsection discusses the fate and transport characteristics of nickel, which was detected in site soils and groundwater.

5.3.1.1 Nickel

Nickel occurs naturally in Earth's crust at an average concentration of 90 mg/kg (Ontario 2001). The concentrations of nickel in most soils in North America and elsewhere typically range from 4 to 80 mg/kg.

Nickel is a transition metal that exhibits a mixture of ferrous and nonferrous metal properties. It is both a siderophile (i.e., associates with iron) and chalcophile (i.e., associates with sulfur) and occurs primarily as oxides or sulfides in nature. Various nickel compounds have markedly different physicochemical characteristics and availability to biota; therefore, their solubility and mobility in the environment will vary greatly. Metallic nickel is not very soluble in water; nickel in most natural waters occurs at concentrations of less than 10 µg/L (ATSDR 2005). Nickel in soils is thought to be strongly associated with iron and manganese oxides and organic matter (Kabata-Pendias and Pendias 1984). Nickel is most mobile in organic-rich soils because it forms soluble complexes with humic and

fulvic acids. When not completely chelated, other nickel species may occur in soil solution, including Ni^{2+}, $NiOH^{+}$, and $HNiO_2^{-}$. Ni^{2+} is relatively stable in solution and capable of migrating (Kabata-Pendias and Pendias 1984). Based on this information, nickel is likely to persist in soils at the site and have a limited capacity to migrate to groundwater. In groundwater at the site, low levels of inorganic nickel species are present and will be transported with groundwater flow.

5.3.2 Organic Chemicals

This subsection discusses the fate and transport characteristics of PCE and TCE, which were detected in site soil gas, indoor air, soil, and groundwater samples.

5.3.2.1 PCE

Perchloroethylene (PCE or PERC), also known as tetrachloroethylene or tetrachloroethene, is a colorless, nonflammable, chlorinated organic compound. It is a liquid at room temperature, evaporates easily into the air, is an excellent solvent for organic compounds, is highly stable, and has a sharp, sweet odor. PCE is soluble in water and is denser than water (specific gravity of 1.62). PCE volatilizes rapidly to the atmosphere from water and soil, as predicted by the Henry's law constant. Once in the atmosphere, this chemical is expected to degrade photochemically in 5 to 7 days. Sorption and release from soils is dependent upon organic matter content, temperature, saturation, and salinity. PCE can leach rapidly through sandy soil and, therefore, can reach groundwater (ATSDR 1997a). In soils, it can reside in a liquid phase in pore spaces where the capillary pressure is strong enough to prevent it from flowing.

PCE is likely to have multiple fate and transport mechanisms at the Sylvania site, including volatilizing to the atmosphere and degrading, volatilizing to air contained within spaces between soil grains (soil gas), leaching to groundwater, and persistence in soil. Persistence in soils occurs in areas where gaseous exchange with the atmosphere is limited (e.g., at greater depths; beneath concrete/asphalt surfaces, etc.). Also, the potential for leaching of PCE from soils to groundwater is greatly reduced beneath concrete pads or asphalt surfaces where infiltration of stormwater is prevented. Thus, the presence of concrete pads and asphalt surfaces may increase the persistence of PCE in site soils. PCE in soils at the site likely exist as a gas in soil pore spaces and/or liquid adsorbed to soil particles. Concentrations of PCE in the gaseous phase can build up beneath concrete surfaces, migrate through cracks and pore spaces, and concentrate in indoor air environments. PCE has a relatively high water solubility (400 mg/L; Smith et al. 1988); therefore, transport with groundwater in dissolved form can be significant. PCE that reaches groundwater beneath the site likely exists in both dissolved phase and/or liquid form bound to sand, gravel, and other solids in contact with groundwater. Once dissolved in groundwater, PCE is expected to persist and generally be transported with groundwater in the direction of flow. Some loss to volatilization from groundwater is expected. Microbial degradation (e.g., by *dehalobacter multivorans*) through reductive dechlorination is a process that naturally degrades PCE through a series of steps to an end product of ethylene in soil and groundwater. These steps are as follows: PCE degrades into TCE, which degrades into cis-

1,2-DCE, and further into trans-1,2,-DCE, then vinyl chloride, and finally ethylene after all chlorine atoms have been removed . The mostly aerobic conditions in site soils and groundwater are not expected to promote this process. The presence of high concentrations of TCE indicates that some degradation of PCE may be occurring at the site, but a lack of further degradation compounds (e.g., vinyl chloride) indicates this process is not widespread across the site.

5.3.2.2 TCE

Trichloroethylene (TCE) is a nonflammable, colorless, VOC with a somewhat sweet odor. It is soluble in water and is denser than water (specific gravity of 1.46). When released to the air, TCE has a 5- to 7-day residence time and degrades photochemically. Releases to soil result in volatilization to air or leaching and percolation into the subsurface. TCE has lower adsorption capacity than PCE and therefore migrates more readily. In soils it can reside in a liquid phase in pore spaces where the capillary pressure is strong enough to prevent it from flowing.

Similar to PCE, TCE is likely to have the same multiple fate and transport mechanisms at the site, including volatilizing to the air and degrading, volatilizing to air contained within spaces between soil grains (soil gas), leaching to groundwater, and, in some areas, persistence in soil. Persistence in soils occurs in areas where gaseous exchange with the atmosphere is limited (e.g., at greater depths, beneath concrete/asphalt surfaces, etc.). The potential for leaching of TCE from soils to groundwater is reduced beneath concrete pads or asphalt surfaces where infiltration of storm water is prevented. This may increase the persistence of TCE in site soils. In soils, TCE likely exists as a gas in soil pore spaces and/or adsorbed to soil particles. Concentrations of TCE in the gaseous phase can build up beneath concrete surfaces, migrate through cracks and pore spaces, and concentrate in indoor air environments. TCE has a relatively high water solubility (1,100 mg/L); therefore, transport with groundwater in dissolved form can be significant. Similar to PCE, TCE that reaches groundwater beneath the site likely exists in both dissolved and liquid form, bound to solids in contact with groundwater. Once dissolved in groundwater, TCE is expected to persist and generally be transported with groundwater in the direction of flow. Some loss to volatilization from groundwater is expected. Microbial degradation (e.g., by *dehalobacter multivorans*) through reductive dechlorination is a process that naturally degrades TCE to ethene in soil and groundwater. However, the mostly aerobic conditions in site soils and groundwater do not promote this process. In addition, degradation products such as cis-1,2-DCE and vinyl chloride were not prevalent in site samples (soil or groundwater), indicating that this process is not widespread across the site.

5.3.3 Radionuclides

This subsection discusses the fate and transport characteristics of uranium, thorium, and Ra-228. All of these radionuclides occur naturally in the environment, and their concentrations depend upon soil types and geologic formations. Historical documents have indicated that uranium and possibly thorium were both used on this site (see Section 1). Ra-228 is the daughter product of thorium.

5.3.3.1 Uranium

Uranium is a naturally occurring radioactive element that is present in nearly all rocks and soils. In United States soils, natural uranium is found at an average concentration of 3 mg/kg (2 pCi/g). Uranium may undergo oxidation-reduction reactions or microbial reactions to alter its chemical form, but radioactive decay is the only mechanism that reduces its radioactivity. All three of the natural uranium isotopes, U-234, U-235, and U-238, have very long half-lives (240 thousand years, 700 million years, and 4.5 billion years, respectively) (ATSDR 1999). Thus, except for processes involving migration from one medium to another, uranium may be considered very persistent. Uranium may be present on the site due to the handling of natural, enriched, and depleted uranium for the production of many different kinds of fuel elements for various reactors, and the use of non-worked uranium natural metal for the construction of and/or research related to nuclear elements (USACE 2005). During historical site investigations, residual liquids found in USTs and residual material in underground pipes were found to be contaminated with uranium (GTEOSI 2006a).

The redox state of uranium is an important determinant of its mobility. Uranium(VI) is soluble in oxidizing environments and may leach to groundwater, while uranium(IV) is relatively insoluble. Other factors affecting uranium migration include soil porosity and particle size, pH, ligand (carbonate, fluoride, sulfate, phosphate, and dissolved organic carbon) concentrations, the concentrations of minerals containing oxides of aluminum and iron, and the uranium concentration (EPA 1999). Reduction of uranium(VI) to uranium(IV) can occur as a result of microbial action. Certain microbes (e.g., *Thiobacillus ferrooxidans,* which is ubiquitous in the environment) can facilitate the oxidation of Fe^{2+} to Fe^{3+}, which can, in turn, facilitate the conversion of insoluble uranium dioxide (UO_2[s]) to soluble UO_2^{2+} ions. This reaction has been shown to enhance the leaching of uranium from waste streams (Anderson and Lovley 2002).

The retention of uranium by soils may be due to adsorption on mineral surfaces (especially clay and iron oxide), complexation, precipitation, and partitioning into organic matter (EPA 1999). In general, uranium adsorption by soils and single-mineral phases in carbonate-containing aqueous solutions reaches a maximum in the pH range of 5 to 8. At pH below 5 or above 8, uranium adsorption is lower (EPA 1999).

Given that soils at the site are sandy, usually dry, and well oxidized, uranium would be expected to occur in the oxidized form, which is soluble and therefore potentially leachable to groundwater. Hence, uranium would be considered persistent in site soils and have a capacity to migrate to groundwater. Once dissolved in groundwater, uranium can remain dissolved or form solid precipitates, depending on the pH; redox potential; concentrations of anions, oxide minerals, and organic materials; and the presence of specific types of bacteria (EPA 1999). The available monitoring well data indicates that groundwater beneath the site in

many areas is aerobic; therefore, uranium in groundwater would be expected to occur in the oxidized form, which is soluble and therefore potentially mobile.

5.3.3.2 Thorium

Thorium is a metallic element that occurs naturally in soil at an average concentration of 6 mg/kg (7 pCi/g) in combination with other minerals, such as silica. Thorium exists in four naturally occurring isotopic forms: Th-228, Th-230, Th-232, and Th-234. Th-228 is the natural decay product of Th-232, while Th-230 and Th-234 are decay products of U-238. Of these isotopes, Th-234 is the least significant in terms of environmental persistence due to its relatively short half-life of 24.1 days. Th-228, Th-230, and Th-232 have half-lives of 1.91 years; 75,400 years; and 14 billion years, respectively (ATSDR 1990a). These isotopes are not destroyed by chemical or biological processes and are considered to be persistent in the environment.

Dissolved thorium occurs in very low concentrations in natural waters. Thorium-containing minerals do not dissolve readily in low-temperature surface water or groundwater. Most dissolved thorium in natural waters occurs as carbonate or hydroxyl carbonate complexes at pH values greater than 7.5. At lower pH, ionic thorium (Th^{4+}) occurs in solution. Humic substances are considered particularly important in the complexation of dissolved thorium in water and soil solution. When thorium becomes dissolved in groundwater or soil solution, it is often removed by adsorption onto humic substances and/or forms solid oxide precipitates. Available water partition coefficients indicate retention of thorium by most soil types (EPA 1999). Based on this information, thorium would be considered persistent and have a highly limited capacity to be transported to and migrate with groundwater.

5.3.3.3 Radium-228

Ra-228 is a metallic substance that is the decay product of Th-232. It is ubiquitous at low levels, mainly as salts or oxides, and is considered to be persistent in the environment. The half-life of Ra-228 is 5.77 years (Weast 1985; USDHHS 2005).

In the absence of other significant processes, adsorption to soils is predictive of migration to groundwater, with higher adsorption translating into slower migration. Ra-228 preferentially adheres to soil particles, with concentrations in sandy soils generally on the order of 500 times higher than in interstitial water (water in the pore spaces between soil particles); Ra-228 is less mobile in clayey soils, with concentration ratios over 9,000 (ANL 2005). Site soils are generally sandy with some gravel. Based on this information, Ra-228 would be considered persistent in site soils and have the capacity to migrate to groundwater. Ra-228 in groundwater at the site would be expected to be only minimally mobile given its tendency to adhere to particulate matter rather than remain in solution.

6 Summary of Baseline Risk Assessment

This section provides a summary of the Baseline Risk Assessment (BLRA) that was performed for the Sylvania Corning FUSRAP site (USACE 2010). The BLRA included a Human Health Risk Assessment (HHRA) and an Ecological Risk Assessment (ERA). The purpose of the HHRA was to consider the information available about the site, its history, physical setting, current and likely future land uses, receptor groups potentially affected by the site, and the nature and extent of environmental contamination present, and then assess the potential impacts that site contamination could have on the environment and health and welfare of the populations potentially affected by the site. A qualitative assessment of the ecological risk was performed and is summarized in Section 6.8. Sections 6.1 through 6.7 provide a summary of the HHRA.

6.1 Contaminants of Potential Concern

For the HHRA, the background concentrations of site-related chemical and radiological substances in soil in the vicinity of the site and in groundwater upgradient from the site were determined by statistical analysis of the analytical results for samples collected from these media. The COPCs were identified by comparing concentrations of substances measured in soil, groundwater, and indoor air from the site with the site-specific background concentrations and risk-based concentrations (RBCs) for these media. RBCs are concentrations, which, if not exceeded, would not be expected to result in any adverse health effects on individuals contacting the soil, using the groundwater as drinking water, or breathing the air in the buildings on site. RBCs developed by the EPA and NYSDEC were used to screen the chemicals and radionuclides found at the site. If a substance exceeded its local background concentration and one or more of the RBCs, it was selected as a COPC for the site (see Tables 4.9-1 through 4.9-5).

Several hazardous substances, pollutants, and contaminants present in groundwater and soils did not result from activities associated with the early atomic energy program; thus, they are not considered FUSRAP wastes. In addition, some of the constituents in groundwater are from upgradient sources, did not contribute to risk at the site due to their limited exceedances, or are the result of biodegradation of the organic constituents in groundwater. Nevertheless, for the purpose of completeness, these constituents were evaluated as part of the USACE RI effort, including their potential effects on site risks, as discussed in this section.

6.2 Conceptual Site Model

Once the characteristics of the site were known and the COPCs had been identified, the categories of people potentially affected by the site (receptors) and the pathways by which they might be exposed to site contaminants (e.g., incidental ingestion and dermal contact with soil, inhalation of contaminant vapors and particles released by the soil, use of site groundwater as drinking water, and external exposure to radiation from radioactive contaminants in the soil) could be determined.

The receptors and exposure pathways selected for evaluation were assembled into a series of scenarios portraying different current and potential future uses of the site. These scenarios are identified in the conceptual site model shown in Table 6.2-1. Because the site consists of three properties, which might be sold and/or redeveloped separately, the properties were assessed separately.

Three pieces of information are needed to perform a quantitative risk assessment:

1. Estimates of representative concentrations of the COPCs in the potential exposure media (i.e., soil, groundwater, and air); these are known as exposure point concentrations (EPCs);

2. Estimates of the degree of exposure receptors may have to contaminated soil, groundwater, or air, i.e., how much soil is accidentally ingested, groundwater drunk, and air breathed; and

3. The types of adverse health effects the COPCs can cause and the amount of exposure needed to cause the adverse effects.

Estimates of representative concentrations of the COPCs were obtained from the data generated from the collection of surface and subsurface soils throughout the site (including beneath the building slabs); sub-slab soil vapor and indoor air samples from the three buildings; and groundwater from several existing wells and a newly installed monitoring well network.

6.3 Exposure Point Concentrations

EPCs were derived using statistical analyses of the concentrations of COPCs measured in the soil, groundwater, and air. A computer program called ProUCL, developed by the EPA for this purpose (EPA 2009a), was used to calculate 95% UCLs on the arithmetic average concentrations of the COPCs in the soil. It is never possible to determine the true average concentration of a substance in an exposure area through sampling and analysis, even when large numbers of samples are collected and analyzed, because of uncertainties associated with sampling and analysis and the heterogeneity in the environmental concentrations themselves. The EPA uses the 95% UCL to compensate for these factors to avoid under estimating the true mean concentrations.

Unlike soil, groundwater and air are not static and receptors do not have an equal chance of contacting groundwater from anywhere on one of the properties. Groundwater, if used as a drinking water source, would be obtained from a well or wells installed at a particular location and depth. All of the groundwater a future resident or site worker might use as tapwater would probably come from the single location where their well is installed; however, there is no way of knowing where that might be or what mixture and concentrations of COPCs might be captured by that well. Therefore average concentrations of COPCs in the site groundwater are not representative estimates of the COPC concentrations to which a groundwater user might be exposed. In order to be reasonably, but not overly conservative, the 90th percentile concentration in groundwater from a property was used as the EPC. The 90th percentile concentrations also were calculated using ProUCL.

During the RI indoor air survey (see Section 2), three outdoor ambient air samples (one from each property) and nine indoor air samples (three from each building) were collected. The maximum contaminant concentration detected in any of the three outdoor ambient air samples was used as the background air concentration for each contaminant. The maximum detected concentrations in the indoor air in each building were used as the EPCs for that building.

6.4 Exposure Factors

The degree of exposure a receptor may experience was calculated using a series of exposure assumptions. The EPA has developed a series of standard exposure assumptions based on known physical and behavior characteristics of the population and various subgroups such as children, adolescents, and adults. These assumptions include factors such as body weight, life expectancy, and the amount of water consumed and air breathed. These assumptions were used to estimate the exposure.

6.5 Toxicity

The EPA and the scientific community have compiled information on the toxic effects of many substances and the doses of these substances needed to cause these effects. After careful scientific review, this information is compiled in data bases such as IRIS, the EPA's Integrated Risk Information System (EPA 2006a). A hierarchy of such information sources has been developed ranging from IRIS, considered to be the most authoritative source, through two more tiers of sources considered somewhat less authoritative. Information on the toxicological properties of the COPCs and the doses required to cause their effects were obtained from this hierarchy of sources. Two broad categories of adverse health effects are considered: carcinogenicity, the ability of a substance to cause or promote the development of cancer, and all other types of adverse effects, referred to collectively as noncarcinogenic effects. Carcinogens and noncarcinogens are assessed differently because historically it was assumed that no threshold dose existed for carcinogenic effects, while a threshold dose, below which adverse effects were not expected, was believed to exist for noncarcinogens. These assumptions require different mathematical models to assess the potential for adverse effects to occur.

Exposure to carcinogens is assessed in terms of the Risk, i.e., the likelihood of cancer resulting from a particular exposure. Exposure to noncarcinogens is assessed in terms of whether the exposure is likely to result in a dose greater or less than the threshold dose for adverse effects. This assessment is expressed as a ratio of the estimated dose to the threshold dose, termed a hazard quotient which are summed across pathways and chemicals to obtain a hazard index (HI). Generally acceptable exposures are those that result in a cancer risk estimates less than one in ten thousand (1E-04) to one in one million (1E-06), or an HI less than 1 (EPA 1994).

6.6 Risk Estimates

Summaries of the estimated cancer risks, noncancer hazards, and radiation doses for soil, groundwater, and indoor air for each property are provided in Tables 6.6-1 through 6.6-7. Risks were calculated for indoor air for existing conditions (scenario 1) but not for future scenarios due to the uncertainties involved with construction of future buildings (see Section 6 of the BLRA). The cancer risk estimates for chemicals and noncancer HIs shown in the tables for scenario 1 are due to inhalation of indoor air.

6.6.1 140 Property

A summary of the estimated cancer risks, noncancer hazards, and radiation doses for the 140 property is presented in Table 6.6-1.

6.6.1.1 Scenario 1 – Existing Commercial or Industrial Use

Under this scenario, the highest estimated total cancer risk and noncancer HI were to long-term site workers and were 6.68E-05 and 0.01, respectively. The maximum annual radiation dose to a site worker from contaminant concentrations on site was 3.03 mrem/yr; the corresponding dose from background concentrations was 1.88 mrem/yr.

6.6.1.2 Scenario 2 – Utility Maintenance or Construction Workers Excavating Site Soils

The estimated cancer risk to utility maintenance or construction workers was 1.30E-06 and the noncancer hazard index was 0.6. The radiation dose from contaminants in site soils was 1.58 mrem/yr; the corresponding dose from background concentrations was 1.30 mrem/yr.

6.6.1.3 Scenarios 3a and 3b – Future Commercial or Industrial Use – Site Redeveloped after Existing Structures and Paving are Removed

Under this scenario, the highest estimated cancer risk from exposure to contaminants in site soils were to long-term site workers. The estimated cancer risks from soils 0 to 2 and 0 to10 feet BGS were 6.35E-05 and 5.38E-05, respectively. The highest estimated noncancer hazards were to young children visiting the site. The HIs for these receptors were 0.1 and 0.47 for soils 0 to 2 and 0 to10 feet BGS, respectively.

Hypothetical future use of the property groundwater as tap water by future site workers poses an estimated cancer risk of 2.46E-03 with a noncancer HI of 22.3. Together, U-234 and U-238 account for about 94% of the groundwater cancer risk. Total uranium accounts for 98% of the groundwater noncancer hazard due to its kidney toxicity.

The maximum estimated radiation dose from exposure to soil was 3.46 mrem/yr; the corresponding dose from background concentrations was 2.16 mrem/yr.

6.6.1.4 Scenarios 4a and 4b – Future Residential Use – Site Redeveloped after Existing Structures and Paving are Removed

Under this scenario, the greatest estimated cancer risks were to future child-adult residents. The cancer risk from contaminants from soils 0 to 2 feet BGS and 0 to 10 feet BGS were 3.21E-04 and 2.51E-04, respectively. These risk estimates are about 25% to 60% higher than comparable background risks. The cancer risks are due primarily to Th-232 (64%), Ra-226 (24%) and arsenic (5%). Ra-226 and arsenic are not considered to be FUSRAP contaminants at this site. Noncancer hazard estimates were greatest for young child residents with HIs of 0.61 for soil 0 to 2 feet BGS and 2.68 for soils 0 to10 feet BGS. The latter estimate is about 12.6 times higher than the comparable hazard from background soil. The noncancer hazard from the soil is due mainly to cobalt, which is not considered to be a FUSRAP contaminant at this site. Table 6.6-2 provides a summary of the risks for 140 property COPCs for scenarios 4a and 4b, which are the scenarios that result in the maximum risk values.

Potential future use of groundwater from the 140 property as tap water would pose a cancer risk to future child and child-adult residents of 1.10E-03 and 6.63-03, respectively. These are 49 and 85 times the comparable background risks, respectively, and are due primarily to U-234 (44%) and U-238 (50%). The noncancer HIs for future child and child-adult residents are 181 and 233, about 370 times greater than comparable background hazards. These noncancer hazards are due to kidney toxicity from total uranium in the groundwater.

The maximum projected radiation dose from the 140 property soil was 14.5 mrem/yr, about 60% higher than the comparable dose (9.14 mrem/yr) from background soil.

6.6.1.5 Scenario 5 – Future Recreational Use after Existing Structures and Paving are Removed

Under this scenario, the highest estimated cancer risk (1.37E-05) was to a future child-adult recreational user. The highest estimated noncancer hazard (0.11) was to a future a young child recreational user. The highest estimated radiation dose was 0.54 mrem/yr; the corresponding dose from background concentrations was 0.34 mrem/yr.

6.6.2 100 Property

A summary of the estimated cancer risks, noncancer hazards, and radiation doses for the 100 property is presented in Table 6.6-3.

6.6.2.1 Scenario 1 – Existing Commercial or Industrial Use

Under this scenario, the highest estimated total cancer risk and noncancer HI were to long-term site workers and were 5.16E-05 and 0.007, respectively. The maximum annual radiation dose to a site worker from contaminant concentrations on site was 2.43 mrem/yr; the corresponding dose from background concentrations was 1.78 mrem/yr.

6.6.2.2 Scenario 2 – Utility Maintenance or Construction Workers Excavating Site Soils

The estimated cancer risk to utility maintenance or construction workers was 1.71E-06 and the noncancer hazard index was 0.078. The radiation dose from contaminants in site soils was 3.23 mrem/yr; the corresponding dose from background concentrations was 1.31 mrem/yr.

6.6.2.3 Scenarios 3a and 3b – Future Commercial or Industrial Use – Site Redeveloped after Existing Structures and Paving are Removed

Under this scenario, the highest estimated cancer risk from exposure to contaminants in site soils from was to long-term site workers. The estimated cancer risks from soils 0 to 2 and 0 to 10 feet BGS were 1.01E-04 and 6.02E-05, respectively. The highest estimated noncancer hazards were to young children visiting the site. The HIs for these receptors were 0.06 for soils 0 to 2 feet and 0 to 10 feet BGS.

Hypothetical future use of the property groundwater as tap water by future site workers poses an estimated cancer risk of 3.6E-04, about 11 times the corresponding risk at background levels. PCE accounted for about 67% of the groundwater cancer risk, arsenic contributed about 12%, the uranium and radium isotopes contributed about 13%, and TCE accounted for 7%. Arsenic and Ra-226 are not considered to be FUSRAP contaminants at this site. The estimated HI for future groundwater use is 0.81.

The maximum estimated radiation dose from exposure to soil was 5.24 mrem/yr; the corresponding dose from background concentrations was 2.13 mrem/yr.

6.6.2.4 Scenarios 4a and 4b – Future Residential Use – Site Redeveloped after Existing Structures and Paving are Removed

Under this scenario, the greatest estimated cancer risks were to future child-adult residents. The cancer risk from contaminants from soils 0 to 2 feet BGS was 5.13E-04 while that from soils 0 to 10 feet BGS was 3.34E-04. These risk estimates are about 2.5 and 1.7 times higher than comparable background risks. The cancer risks are due primarily to Th-232 (65%), Ra-226 (22%) and arsenic (6%). Ra-226 and arsenic are not considered to be FUSRAP contaminants at this site.

Noncancer hazard estimates were greatest for young child residents. The HIs were 0.34 for soil 0 to 2 feet BGS and 0.37 for soils 0 to10 feet BGS. Table 6.6-4 provides a summary of the risks for 100 property COPCs for scenarios 4a and 4b, which are the scenarios that result in the maximum risk values.

Potential future use of groundwater from the 100 property as tap water would pose a cancer risk to future child and child-adult residents of 4.75E-04 and 1.19E-03, respectively. These are 14 and 12 times higher than the corresponding background risks. The estimated cancer risks from groundwater were due mainly to PCE (69%), arsenic (16%), Ra-228 (5.5%), and TCE (4.5%). The estimated noncancer HIs for future child and child-adult residents are 5.6 and 7.4, about 15 times higher than the corresponding background hazards. The estimated noncancer HIs for groundwater usage were primarily due to nickel (66%) and arsenic (21%). Arsenic is not considered to be a FUSRAP contaminant at this site.

The maximum projected radiation dose from 100 property soil was 22.1 mrem/yr, about two times higher than the comparable dose (9.09 mrem/yr) from background soil.

6.6.2.5 Scenario 5 – Future Recreational Use after Existing Structures and Paving are Removed

Under this scenario, the highest estimated cancer risk (1.24E-05) was to a future child-adult recreational user. The highest estimated noncancer HI (0.06) was to a future a young child recreational user. The highest estimated radiation dose was 0.44 mrem/yr; the corresponding dose from background concentrations was 0.33 mrem/yr.

6.6.3 70 Property

A summary of the estimated cancer risks, noncancer hazards, and radiation doses for the 70 property is presented in Table 6.6-5.

6.6.3.1 Scenario 1 – Existing Commercial or Industrial Use

Under this scenario, the highest estimated total cancer risk and noncancer hazards were to long-term site workers and were 5.63E-05 and 0.003, respectively. The maximum annual radiation dose to a site worker from contaminant concentrations on site was 2.58 mrem/yr; the corresponding dose from background concentrations was 1.77 mrem/yr.

6.6.3.2 Scenario 2 – Utility Maintenance or Construction Workers Excavating Site Soils

The estimated cancer risk to utility maintenance or construction workers was 8.71E-07; the noncancer hazard index was 0.11; and the radiation dose from contaminants in site soils was 1.40 mrem/yr; the corresponding dose from background concentrations was 1.29 mrem/yr.

6.6.3.3 Scenarios 3a and 3b – Future Commercial or Industrial Use – Site Redeveloped after Existing Structures and Paving are Removed

Under this scenario, the highest estimated cancer risk from exposure to contaminants in site soils was to long-term site workers. The estimated cancer risks from soils 0 to 2 feet and 0 to10 feet BGS were 6.22E-05 and 4.87E-05, respectively. The highest estimated noncancer hazards were to young children visiting the site. The HIs for these receptors were 0.12 for soils 0 to 2 feet BGS and 0.086 for soils 0 to10 feet BGS.

Hypothetical future use of the property groundwater as tap water by future site workers poses an estimated cancer risk of 3.19E-03 with a noncancer HI of 3.48. PCE accounted for about 99% of the groundwater cancer risk. PCE (63%), cobalt (23%), manganese (8%), and nickel (3.5%) accounted for the noncancer hazard from use of groundwater as tap water. Cobalt and manganese are not considered to be FUSRAP contaminants at this site.

The maximum estimated radiation dose from exposure to soil was 3.17 mrem/yr; the corresponding dose from background soil was 2.13 mrem/yr.

6.6.3.4 Scenarios 4a and 4b – Future Residential Use – Site Redeveloped after Existing Structures and Paving are Removed

Under this scenario, the greatest estimated cancer risks were to future child-adult residents. The cancer risk from contaminants from soils 0 to 2 feet BGS was 3.16E-04 while that from soils 0 to 10 feet BGS was 2.74E-04. These risk estimates are about 56% and 36% higher than comparable background risks. This was due to marginally higher levels of a number of radionuclides in 70 property soils than in background soils. The cancer risks are due primarily to Th-232 (63%), Ra-226 (26%) and arsenic (6%). Ra-226 and arsenic are not considered to be FUSRAP contaminants at this site. Noncancer hazard estimates were greatest for young child residents. They were 0.845 for soil 0 to 2 feet BGS and 0.59 for soils 0 to 10 feet BGS. Table 6.6-6 provides a summary of the risks for 70 property COPCs for scenarios 4a and 4b, which are the scenarios that result in the maximum risk values.

Potential future use of groundwater from the 70 property as tap water would pose a cancer risk to future child and child-adult residents of 4.35E-03 and 1.06E-02, respectively. These are 64 and 104 times greater than comparable background risks. The noncancer hazard indices for future child and child-adult residents for groundwater use are 20 and 27 respectively, about 14 times higher than comparable background hazards. PCE accounted for about 99% of the groundwater cancer risk. PCE (60%), cobalt (26%), manganese (9%), and nickel (4%) accounted for the noncancer hazard from use of groundwater as tap water. Cobalt and manganese are not considered to be FUSRAP contaminants at this site.

The maximum projected radiation dose from 70 property soil was 13.7 mrem/yr; the corresponding dose from background concentrations was 9.09 mrem/yr.

6.6.3.5 Scenario 5 – Future Recreational Use after Existing Structures and Paving are Removed

Under this scenario, the highest estimated cancer risk (1.43E-05) was to a future child-adult recreational user. The highest estimated noncancer hazard (0.15) was to a future a young child recreational user. The highest estimated radiation dose was 0.50 mrem/yr; the corresponding dose from background concentrations was 0.33 mrem/yr.

6.6.4 Driving Range

A summary of the estimated cancer risks, noncancer hazards, for the driving range is presented in Table 6.6-7. Only hypothetical future groundwater use as tap water was assessed for this exposure area. If groundwater beneath the driving range were to be used as tap water, the only hypothetical future receptors likely use it regularly for an appreciable period of time would be future permanent site workers or future residents. These are the same hypothetical receptor groups assumed to use groundwater beneath the 70, 100 and 140 properties for assessment purposes. For the other properties, future commercial or industrial use was designated scenario 3 and future residential use, scenario 4. Those scenario designations have been retained here for consistency.

6.6.4.1 Scenario 3 – Future Commercial or Industrial Use – Site Redeveloped after Existing Structures and Paving are Removed

Use of groundwater from beneath the Driving Range as tap water by future full time commercial – industrial workers would pose an estimated cancer risk of 2.7E-03 and noncancer hazard of 3.3. Ninety-eight percent of the estimated cancer risk is due to PCE, which is present in Driving Range groundwater at a concentration 225 times higher than the upgradient background level. Fifty-five percent of the noncancer hazard also is due to PCE; the remainder is due to manganese (18%), cobalt (17%), arsenic (6.5%), and chloroform (3%), which are not considered to be FUSRAP contaminants at this site. The estimated cancer risk is about 129 times higher, and the noncancer hazard about 17 times higher than the corresponding background risk and hazard.

6.6.4.2 Scenario 4 – Future Residential Use – Site Redeveloped after Existing Structures and Paving are Removed

Use of groundwater from beneath the Driving Range as tap water by future child-adult residents would pose an estimated cancer risk of 8.98E-03 with a noncancer hazard index of 27, while for a young child resident, the risk and hazards would be 3.7E-03 and 20, respectively. The risks and hazards are due to the same chemicals as discussed in scenario 3.

6.7 HHRA Summary

A number of radionuclides, metals, and organic chemicals were detected in indoor air, site soils, and groundwater at the Sylvania site. However, based on the results of the HHRA, only a subset of these chemicals might pose an unacceptable cancer risk and/or a noncancer hazard. From this subset, the following are considered to be FUSRAP contaminants and have been identified as COPCs for this site:

- **Radionuclides:** U-234, -235, and -238; Th-228, -230, and -232; and Ra-228
- **Metals:** Nickel
- **Organic chemicals:** PCE and TCE

6.7.1 Current Conditions

The contaminants in site soils and indoor air are not expected to pose cancer risks greater than 1E-04 or noncancer HIs greater than 1 under existing or similar future site conditions (scenario 1 - existing buildings and paving remain intact). Groundwater is not currently being used as a source of potable water at the site and was not assessed under scenario 1.

6.7.2 Future Conditions

Chemical and radiological contaminants in shallow and near-surface soil and groundwater at the Sylvania site could potentially pose cancer risks greater than 1E-04 and/or noncancer hazards greater than 1 to future site users. The greatest risks and hazards would be to long-term continuous users like future site workers and future residents. Short-term and intermittent users like construction or utility maintenance workers, site visitors, site trespassers, and future recreational users of the site are not expected to be exposed to cancer risks greater than 1E-04 or noncancer HIs greater than 1.

The greatest risks and hazards were associated with hypothetical future use of groundwater as tap water. The contaminants driving the risks and hazards were PCE and uranium, acting both as a radiological (U-234 and U-238) and a chemical (total uranium) contaminant. This is considered a very unlikely scenario because of the availability and required use of a public water supply system at the site. Nevertheless, the groundwater at the site is fresh and is classified GA, and the best potential use of GA class waters is as a drinking water source. Uranium is the dominant contaminant at the 140 property while PCE is the dominant contaminant at the 70 and 100 properties and at the Driving Range. Contamination in site soil also could pose risks greater than 1E-04 and/or hazards greater than 1 to future site workers and residents, although generally at lower levels than those from groundwater.

6.8 Summary of Ecological Risk Assessment

An ERA refers to a qualitative and/or quantitative appraisal of the actual or potential impacts of contaminants from a hazardous waste site on plants and animals other than humans and domesticated species. A quantitative ERA often is not

needed in highly industrialized areas where few if any ecological receptors and habitats are present. In its current condition, the site provides little or no wildlife habitat. There is a small landscaped area near the entrance of the 70 property and some saplings and bushes along existing fences in some places. However, overall the site does not provide adequate food or cover to attract wildlife. Also, human activity on-site deters wildlife from using the area. Consequently, only common wildlife species accustomed to human activity and disturbance, such as the house sparrow (*Passer domesticus*), are likely to visit the site.

Even if common wildlife species visit the site, no exposure to site-related chemicals is expected because the contamination is confined to subsurface soil and groundwater (there is no surface water) and because the site is covered with buildings, pavement, and gravel. In theory, site-related contaminants in groundwater beneath the site could migrate and discharge to downgradient wetlands, streams, or other habitats, but it is highly unlikely due to the depth of the groundwater.

In its current condition, the Sylvania site is an industrial area with little or no wildlife habitat. Future use of the site is not expected to be useful for ecological purposes. Therefore, a quantitative ERA was determined to be unnecessary, and the site was evaluated qualitatively as follows:

- The site is largely covered with buildings, gravel, and paved surfaces and, therefore, provides little or no wildlife habitat.

- Contamination at the site is restricted to subsurface soil and groundwater in isolated areas and these areas are covered by buildings, pavement, and/or gravel. Even if some wildlife common species visit the site, no exposure to the subsurface contamination is expected.

- Transport of site-related contaminants in groundwater to downgradient wetlands, streams, or other habitats is highly unlikely due to the depth of the groundwater.

For these reasons, no adverse impacts on ecological receptors and/or habitats on the site are expected.

7 Summary and Conclusions

7.1 Project Summary

USACE performed an RI of the properties located at 70, 100, and 140 Cantiague Rock Road in Hicksville, New York. Extensive environmental sampling and remediation work was performed by GTEOSI from 1992 through to the present. Investigations performed by USACE were used to fill in data gaps, confirm GTEOSI data, and build upon the work performed to date by GTEOSI, but not to duplicate their work. This RI document presents the results of the USACE's work and as appropriate information obtained from the GTEOSI reports.

The RI activities included an initial site walkover, development of phased field activities (Phases I, II, and III), and implementation of those activities. Each phase of work was conducted in a successive fashion, and the results of each phase of work were reviewed by USACE to supplement and adjust each future phase of work. Phase I included reconnaissance-type activities, including: a geophysical surveys (EM-61 and GPR); passive soil gas surveys; radiation walkover surveys; indoor/outdoor air surveys (including sub-slab sampling); and limited soil sampling associated with transformer pads. Phase II included soil sampling activities, and Phase III included groundwater sampling activities.

7.2 Nature and Extent of Contamination

7.2.1 Upgradient Properties

No soil or soil gas samples were collected from any of the upgradient properties. Therefore, the summaries below are based solely on the results for groundwater samples.

The analytical results for samples collected from three groundwater well clusters on the NCDPW property (upgradient of the 140 property, 100 property, and 70 property sites) and one well cluster on the Cantiague Park property (upgradient of the Driving Range property) were used to establish baseline upgradient conditions of groundwater quality. The summaries below describe the findings of upgradient well testing.

7.2.1.1 Metals

Eighteen metals were detected in the monitoring well samples: aluminum, arsenic, barium, beryllium, cadmium, calcium, chromium, cobalt, iron, lead, magnesium, manganese, nickel, potassium, sodium, thallium, vanadium, and zinc. Of these

metals, three (calcium, magnesium, and potassium) are considered naturally occurring essential nutrients in soil.

Based on the sample results, upgradient groundwater contained a broad range of concentrations of iron and manganese in wells, giving the appearance of elevated levels. However, iron and manganese are common constituents of groundwater and are often detected at broad concentration ranges due to the nature of the geologic formations. Most of the metals did not exhibit any specific lateral or vertical trends in distribution or concentration, except sodium, which was detected at high levels in three shallow wells (MW-13S, -14S, and -15S). The elevated levels of sodium in these well samples are likely due to the storage and use of road salt on the NCDPW property.

In summary, sodium appears to be the only metal present at elevated concentrations due to upgradient anthropogenic activities.

7.2.1.2 VOCs

Fifteen VOCs were detected in the monitoring well samples, including: 1,1 DCA, 1,2,3-trichlorobenzene, 1,2,4-trichlorobenzene, 1,2-dibromoethane, 2-hexanone, 4-methyl-2-pentanone, acetone, bromodichloromethane, bromoform, chloroform, dibromochloromethane, dichlorodifluoromethane, PCE, trans-1,3-dichloropropene, and TCE. VOCs do not typically exist naturally in groundwater; therefore, their presence in these wells would be due to other local sources of contamination (on the NCDPW property).

Most of the VOCs were detected at low concentrations in one sample from MW-15S. MW-15S contained 1,2-dibromoethane at 2 µg/L. PCE was detected at low levels in four well samples, both shallow and deep, and TCE was detected at low levels in two deep well samples, indicating potential sources further upgradient.

In summary, numerous VOCs are present at low levels, predominantly in shallow groundwater from MW-15S, suggesting an upgradient, low-level source.

7.2.1.3 Radionuclides

Naturally occurring radionuclides, including U-238, U-234, Th-232, Th-230, Ra-226, Ra-228, and several of their daughter products were detected in upgradient monitoring well samples at very low concentrations. The U-235 and Th-228 results were all qualified as nondetect.

7.2.1.4 Conclusions

It appears that upgradient groundwater contains low levels of several VOCs and metals, which are originating either on the NCDPW and Cantiague Park properties or are from other sources further upgradient. Some of these contaminants are impacting the site, generally in deep groundwater. Radiological parameters are all within naturally occurring levels.

7.2.2 140 Property

7.2.2.1 Geophysical Survey/Test Trenches

The EM and GPR surveys identified several areas of elevated response throughout the survey area. The majority of these areas were determined to be readily identifiable features; however, the sources of three anomalies were unknown and these were further investigated through test pit excavations.

During test trench excavations, historic pipes were discovered in all three of the test trenches. A sample of the material inside a pipe from EM-3/GPR-A contained the highest concentration of uranium and nickel in samples collected by USACE from any of the three properties. A sample of soil collected from below the pipe did not have elevated concentrations of either metal. This pipe and the material it contained were removed and disposed of, although more potential contaminated pipes remain on the 140 property.

7.2.2.2 Passive Soil Gas Surveys

Twenty-six passive soil gas samples were collected from the 140 property. PCE (34.6 ng) was the only notable VOC detected just south of the eastern portion of B140. The levels of PCE detected on all three properties ranged from non-detect (ND) to 94.3 ng. The source of the PCE on the 140 property is unknown.

7.2.2.3 Indoor Air Surveys

Three sub-slab, three indoor air, and one outdoor air samples were collected using summa canisters and tested for VOCs. PCE and TCE were the only notable compounds detected. The following is a summary of the findings.

- Sub-slab samples contained PCE at levels ranging from 600 $\mu g/m^3$ to 27,000 $\mu g/m^3$ and TCE at levels ranging from ND to 590 $\mu g/m^3$. The highest concentration of PCE was detected beneath the eastern portion of B140, and the highest concentrations of TCE were detected beneath the central and eastern portions of the building.

- Indoor air samples contained PCE at levels ranging from 4.4 $\mu g/m^3$ to 24 $\mu g/m^3$ and TCE at levels ranging from 0.46 $\mu g/m^3$ to 2.6 $\mu g/m^3$. The highest concentrations of PCE and TCE were detected in the eastern portion of B140.

- The outdoor air sample contained PCE at a concentration of 0.24 $\mu g/m^3$ and TCE at a concentration of 0.064 $\mu g/m^3$.

7.2.2.4 Nature and Extent of Soil Contamination

Soils were excavated from the easternmost portion of the property in remedial cells 1, 2, 5, and 6 during GTEOSI's Phase I Soil Remediation. Soil sampling was conducted throughout the entire property, including beneath B140, beneath the remedial cells, and throughout parking and paved areas surrounding the building.

- **Metals.** Several metals were detected in the 140 property soils. The metal concentrations were higher in samples collected from 0 to 2 feet BGS than in deeper samples. Nickel was detected at elevated concentrations on the 140 property, mostly at depths less than 4 feet BGS, and elevated levels were detected beneath the eastern portion of the Building 140 slab, especially in soils surrounding one of the historic leach pools (LPH-21).

- **VOCs.** The VOC contamination in soils on the 140 property appears to be limited to depths less than 24 feet. The highest VOC concentrations detected on the property were from a single boring completed inside historic leach pool LPH-21. Eight VOCs were detected at concentrations greater than 1,000 µg/kg in the sample collected at a depth of 16 feet BGS, which, according to the borehole log, appears to be the bottom of the leach pool. The VOC with the highest concentration was PCE (40,000,000 µg/kg). Further sample results indicate that these contaminants have not migrated vertically more than 24 feet BGS at this location and that horizontal migration has been minimal. This is likely because the former drywell is beneath the concrete slab and there is no infiltration of surface water, and roof drain water is directed away from the building to a series of cisterns between B140 and B100. In another impacted area, subcell K07, a single sample collected from 0 to 2 feet BGS revealed the presence of PCE, TCE , cis-1,2-dichloroethene, and 1,2,3-trichlorobenzene, with PCE exhibiting the highest concentration. No other samples have been collected for VOC analysis in this subcell to determine the extent of these of contaminants.

- **Radionuclides.** Elevated concentrations of uranium (U-234 at 612 pCi/g) and thorium (Th-232 at 20.5 pCi/g) were detected at a depth of 16 feet BGS in the boring at historic leach pool LPH-21. The uranium results indicate the potential presence of enriched uranium at this location. Isolated areas of uranium contamination occurred in shallow soils (0 to 8 feet BGS) at approximately three locations beneath the west-central portion of B140, and elevated concentrations of uranium were detected below remedial cells 1 and 6 in the northeastern portion of the site at depths ranging from 16 to 64 feet BGS. The highest detected concentration of U-238 in this area was 210 pCi/g (subcell S05, at 40 to 48 feet BGS). Elevated concentrations of uranium were detected at several other locations in B140, with concentrations up to 44.7 pCi/g U-238 and 53.8 pCi/g U-234 in subcell E04. The Ra-226 and Ra-228 soil concentrations on the 140 property did not exceed three times their BTVs.

7.2.2.5 Nature and Extent of Groundwater Contamination

Groundwater samples were collected from a network of 10 monitoring wells. The following is a summary of the results.

- **Metals.** Several metals were detected in the groundwater samples. Based on the sample results, seven non-essential nutrient metals were detected above their respective BTVs (barium, cadmium, cobalt, iron, manganese, nickel, and sodium). Of these, only manganese was detected at more than three times its

BTV. In addition, copper was detected in one of the 140 property wells samples, but copper was not detected in upgradient wells.

Almost all of the metals that exceeded their BTVs did not exhibit any specific lateral or vertical trends in distribution or concentration. The only exception was sodium, the highest concentrations of which were detected in intermediate and deep wells. As mentioned above in the upgradient property summary, the likely source of the elevated sodium is the stockpiled road salt on the NCDPW property. The presence of higher levels of sodium in intermediate and deep wells as opposed to shallow wells fits the conceptual site model that groundwater has a southerly flow laterally and a downward flow vertically (see Section 3). Copper was detected in only one shallow well (MW-18S) at a concentration of only 2.3 µg/L.

In summary, sodium appears to be the only metal present at elevated concentrations due to upgradient anthropogenic activities.

- **VOCs.** Four of the VOCs (1,1-DCA, chloroform, PCE, and TCE) exceeded their respective BTVs, and chloroform exceeded three times its BTV in the groundwater samples. Three of the VOCs (1,1,1-TCA, 1,1-DCA, and 1,1-DCE) were detected at low levels in deep groundwater from MW-19D. Although these compounds were detected in a UST removed from remedial cell 2 (see Section 4.6), it is unlikely that the presence of these compounds in MW-19D is due to that tank, because the well is side-gradient and approximately 400 feet to the west of the former tank. Therefore, the source of these contaminants in MW-19D is unknown. Since they were detected at a depth of approximately 300 feet BGS and were not found in shallow samples from the property, their source is likely upgradient.

  The highest concentration of chloroform (22 µg/L) was detected in the eastern portion of the 140 property. Chloroform was also detected upgradient. One of the potential sources of chloroform is the water discharged from the swimming pools in Cantiague Park. Chloroform can form by the reaction of chlorine with various compounds. Based on groundwater contours (see Section 3), the discharged chlorinated water could be flowing from the park area to the site.

  The PCE detected at up to 9 µg/L in shallow samples from MW-18S, -19S, -20S, and -41S could be from upgradient sources (as PCE at similar concentrations were detected in shallow upgradient wells), the former leach pool beneath the eastern portion of the current B140, or the former recharge basin (recharge basin 3) that was located on the east side of current B140.

  TCE was detected at up to 4 µg/L only in deep groundwater from MW-19D. TCE is a degradation product of PCE. Since PCE was also detected in MW-19D, the TCE could be due to the degradation of PCE, or it could be from up-

gradient source of TCE (TCE was detected in upgradient wells MW-14DD and -16D).

In summary, the low levels of VOCs detected in deep samples (PCE, TCE, 1,1,1-TCA, 1,1-DCA, and 1,1-DCE) are likely the result of upgradient sources. The PCE detected in shallow samples is likely site related; however, some may be from an upgradient source. The chloroform is likely a byproduct of chlorine (from the pools in Cantiague Park) reactions in the subsurface.

- **Radionuclides.** Uranium was detected at concentrations greater than three times the BTV in samples from several monitoring wells on the eastern portion of the 140 property, beneath remedial cells 1 and 6. The highest concentrations were present in groundwater well samples from MW-18S (U-238 at 3,638 pCi/L). The concentrations in MW-18I decreased substantially but were still elevated (U-238 at 54 pCi/L) The uranium concentrations in samples from MW-20S and MW-41S, which are downgradient of MW-18S, also were elevated, with U-238 detected at 768 pCi/L and 393 pCi/L, respectively. The sample from monitoring well MW-20I had uranium concentrations near background levels.

  All of the thorium isotopes were detected at a concentration greater than three times their BTVs in the sample from monitoring well MW-42I (the highest was Th-232 at 10.83 pCi/L), which is on the eastern border of the 140 property. Ra-226 and Ra-228 were not detected in any of the monitoring well samples above three times their BTVs.

- **Conclusions.** Although a remedial soil removal action addressing soil contamination was performed by GTEOSI, elevated soil contamination still remains beneath the property: radionuclides beneath remedial cells 1 and 6; and PCE, nickel, and radionuclides beneath the eastern portion of B140. Contamination beneath the building has resulted in contaminated soil vapors and represents potential indoor air vapor intrusion pathway.

  Most of the remaining contamination is in eastern portion of the property. Shallow groundwater is contaminated with elevated levels of PCE and radionuclides, and intermediate groundwater is contaminated with elevated levels of radionuclides and chloroform. Shallow groundwater flow was predominantly to the southwest, intermediate groundwater flow was to the southwest, and deep groundwater flow was predominantly to the south, with a southwestern component in the eastern portion of the site. A summary of groundwater flow, extent of groundwater contamination, and fate and transport is presented in section 7.3.

7.2.3 100 Property

7.2.3.1 Geophysical Survey/Test Trenches

The EM and GPR surveys identified several areas of elevated response throughout the survey area. The majority of these areas were determined to be readily

identifiable features; however, the sources of nine anomalies were unknown and these were further investigated through test trench excavations.

During test trench excavations, the only significant finding was green pebble-sized granules in test trench EM-15b (located on the south side of B100) at approximately 2 feet BGS. The soil sample from this area had elevated levels of natural uranium that exceeded three times the BTV.

7.2.3.2 Passive Soil Gas Survey

Twenty-one passive soil gas samples were collected from the 100 property. PCE, the only notable VOC, was detected in the southwest corner of the property at 7.9 ng. The levels of PCE detected on all three properties ranged from ND to 94.3 ng (in the northwest portion of the 70 property).

7.2.3.3 Indoor Air Surveys

Three sub-slab, three indoor air, and one outdoor air samples were collected using summa canisters and tested for VOCs. PCE and TCE were the only notable compounds detected. The following is a summary of the findings.

- Sub-slab samples contained PCE at levels ranging from 290 $\mu g/m^3$ to 7,500 $\mu g/m^3$. The highest concentration of PCE was detected beneath the eastern portion of the building.

- Indoor air samples contained PCE at levels ranging from 1.2 $\mu g/m^3$ to 15 $\mu g/m^3$ and TCE at levels ranging from 0.07 $\mu g/m^3$ to 0.34 $\mu g/m^3$. The highest concentrations of PCE and TCE were detected in the central portion of the building.

- The outdoor air sample contained PCE a concentration of 0.46 $\mu g/m^3$ and TCE at a concentration of 0.075 $\mu g/m^3$.

7.2.3.4 Nature and Extent of Soil Contamination

Soils were excavated from the eastern and southernmost portions of the property in remedial cells 7, 8, 9, 10, 11, and 12 during GTEOSI's Phase I Soil Remediation. Soil sampling was conducted throughout the entire property, including beneath B100, beneath the remedial cells, and throughout parking and paved areas surrounding the building.

Although GTEOSI performed remedial excavation activities, contamination remains on the 100 property below the eastern portion of B100 (subcells L15 and L16) in the vicinity of former leach pools and a UST (primarily PCE, uranium, and some nickel); below remedial cell 4, located to the east of B100 along the property line with the Driving Range (primarily PCE); and below remedial cell 9, located on the south side of the east-central portion of B100 (primarily nickel, PCE, and uranium).

- **Metals.** Several metals were detected in the 100 property soils. The highest concentrations of arsenic, selenium, and vanadium on the 100 property were detected in subcell P70 at 0 to 2 feet BGS. Lead was also detected in this sample at a concentration of 57 mg/kg, which is more than twice the BTV. Subcell P70 is located near the western boundary of the 100 property.

  Nickel was present at concentrations greater than three times its BTV at two locations on the 100 property: in N15 (located inside B100 along the eastern wall) at 24 feet BGS (bottom of a historic leach pool LPH-05); and beneath remedial cell 9 (and the adjacent subcell G18, located inside B100 along the southern wall adjacent to remedial cell 9). Nickel does not appear to have migrated below a depth of 24 feet BGS or the bottom of LPH-05. The nickel concentrations beneath remedial cell 9 appear widespread and are above an order of magnitude higher than the BTV to depths of 64 feet BGS, with the highest concentration (8,020 mg/kg) detected at a depth of 45 to 46 feet BGS.

- **VOCs.** VOCs (primarily PCE) were detected in site soils mainly in five distinct areas. The VOC soil contamination beneath remedial cell 4 consists primarily of PCE, which was detected in subcell W16 at concentrations up to 450,000 µg/kg at 57 feet BGS. Beneath the eastern half of B100 and just south of it (in remedial cell 9), PCE was detected at concentrations greater than 1,000 µg/kg in the following locations: near and above an abandoned UST (subcell L17), near the bottom of three historic leach pools (subcells L15, M14, and N15), and in a historic trench drain (subcell H19). PCE also was detected in subcell E20 at 16 feet BGS beneath remedial cell 9, but it does not appear to be widespread. With the exception of the PCE soil contamination detected beneath remedial cell 4, the PCE does not appear to have migrated to depths exceeding 25 feet BGS; the deepest occurrence of PCE at a concentration greater than 1,000 µg/kg was at 25 feet BGS in subcell N15.

  Petroleum-related compounds (TPH, m,p-xylenes, o-xylene, and toluene) were detected at concentrations greater than 1,000 µg/kg in two isolated areas beneath remedial cells 9 and 4. The presence of these compounds does not appear to be related to the former gas pumps that were located just south of the southeastern corner of B100. There does not appear to be a widespread occurrence of these compounds on the property.

- **Radionuclides.** The highest concentrations of uranium (U-238 at 1,300 pCi/g) above three times the BTVs were detected beneath remedial cell 9 in subcell E20 at 16 feet BGS. Areas beneath remedial cell 9 from 24 to 56 feet BGS (subcells E19, E20, F20, F21, G20, and G21) also had elevated concentrations of uranium, with the highest concentrations (U-238 at 354 pCi/g) occurring at 40 to 48 feet. To the west of remedial cell 9, in subcells C-19, C-20, D-19, D-20, and D-21, uranium concentrations were elevated from 45 to 62 feet BGS (U-238 up to 77 pCi/g). To the east of remedial cell 9, in subcell H19, the U-238 concentration was 220 pCi/g at 0 to 8 feet BGS.

In the southeast corner of the 100 property (subcells P23 and W22), south of a former recharge basin, uranium concentrations were elevated (U-238 up to 51.5 pCi/g) at depths of 9 and 11 feet BGS.

Concentrations of uranium greater than 100 pCi/g, which could be associated with a trench drain, were present in B100 north of remedial cell 9, in subcells F-18, G-18, and H-18. U-238 concentrations ranging from 50 to 80 pCi/g were associated with leach pools on the east side of B140, in subcells M14 and N15. Uranium concentrations also were elevated in test trenches EM-11, EM-13, EM-15b, and EM-21 (subcells C22, A21, Y70, and T70), with U-238 concentrations up to 95 pCi/g.

The highest concentrations of thorium were detected in subcell E20 at 16 feet BGS (Th-232 at 15 pCi/g) and subcell N13 at 4 feet BGS (Th-232 at 11 pCi/g). Ra-226 was not detected above three times its BTV, and Ra-228 was detected in two samples above three times its BTV (highest concentration of 5.02 pCi/g in test trench EM-15B).

7.2.3.5 Nature and Extent of Groundwater Contamination

Groundwater samples were collected from a network of 14 newly installed monitoring wells. The following is a summary of the results.

- **Metals.** Based on the sample results, all of the metals except antimony, copper, sodium, thallium, and zinc were detected at concentrations above their respective BTV. Of the metals detected at concentrations above their respective BTV, six (arsenic, beryllium, cadmium, lead, manganese, and nickel) were detected at concentrations greater than three times their BTV. BTVs for antimony and copper could not be developed because they were not detected in any of the upgradient wells. Low levels of antimony and copper were detected only in one deep well (MW-28D) at concentrations of 0.19 µg/L and 8.8 µg/L, respectively.

  Almost all of the metals that exceeded their BTV did not exhibit any specific lateral or vertical trends in distribution or concentration. The exception was nickel, the highest concentrations of which (1,350 µg/L and 89.1 µg/L) were detected in shallow wells on the south side of B100, in the west-central and central portion of the property. Elevated concentrations of nickel were not detected in shallow groundwater in upgradient wells on the NCDPW property and 140 property. Therefore, the source of the nickel is likely on the 100 property. Elevated levels of nickel were detected in soils collected in remedial cell 9 from 24 to 64 feet BGS.

  In summary, nickel appears to be the only metal that is present at elevated levels due to site activities.

- **VOCs.** Five of the VOCs (1,1-DCA, acetone, chloroform, PCE, and TCE) exceeded their respective BTVs, and chloroform, PCE, and TCE were de-

tected at concentrations greater than three times their BTVs. Chloroform (up to 22 µg/L) was detected in intermediate and deep samples from two well clusters (MW-22 and -28) and a shallow well (MW-43S) in the eastern portion of the property. As described in the 140 property summary, the potential source of chloroform is the pool water discharged from Cantiague Park.

The PCE was detected in shallow, intermediate, and deep samples from three well clusters (MW-22, -24, and -28) and two shallow wells (MW-43S and -44s) in the central and eastern portions of the property. The highest concentration of PCE was 1,800 µg/L in MW-22S. The likely source could be contaminated soils beneath the eastern portion of current B100, remedial cell 9, and remedial cell 4. These contaminated soils may be from former leach pools in these areas.

TCE was detected in the same locations as PCE (shallow and deep samples from three well clusters [MW-22,-24 and -28] and one shallow well [MW-44S]). The highest concentration of TCE was 130 µg/L, also in MW-22S. The presence of the TCE is likely related to the degradation of PCE.

In summary, the potential source of the chloroform is the pool water discharged from Cantiague Park, and the PCE/TCE is likely from several source areas (former leach pools and other potential sources) on the 100 property.

- **Radionuclides.** Uranium was detected at concentrations greater than three times the BTV in samples from monitoring wells MW-43S, MW-44S, and MW-24S. Monitoring well MW-43S (8.86 pCi/L U-238) is downgradient of the 140 property wells MW-18S and MW-41S, which are contaminated with uranium at higher concentrations.

  MW-44S, which is south of B100 and southwest of remedial cell 9, and MW-24S, which is beneath remedial cell 9, had U-238 concentrations of 6.7 pCi/L and 6.27 pCi/L, respectively.

  Most of the concentrations of thorium and radium in the 100 property wells were low, with some slightly greater than three times the BTV. The highest concentrations were detected at depths greater than 277 feet and likely associated with a clay layer above the well screen.

- **Conclusions.** Although a remedial soil removal action addressing soil contamination was performed by GTEOSI, elevated soil contamination still remains beneath the property: PCE and TCE are present beneath remedial cell 4 and extend onto the western portion of the Driving Range property; nickel and radionuclides are present beneath remedial cell 9; and PCE, nickel, and radionuclides are present beneath the eastern portion of B100. Contamination beneath B100 has resulted in contaminated soil vapors and represents a potential indoor air vapor intrusion pathway.

Most of the remaining contamination is in eastern and south-central portions of the property. Shallow groundwater is contaminated with elevated levels of PCE, TCE, nickel, and radionuclides; intermediate groundwater is contaminated with elevated levels PCE and chloroform; and deep groundwater is contaminated with elevated levels of TCE. Shallow groundwater flow was predominantly to the southwest, intermediate groundwater flow was to the southwest, and deep groundwater flow was predominantly to the south, with a southwestern component in the eastern portion of the site. A summary of groundwater flow, extent of groundwater contamination, and fate and transport is presented in Section 7.3.

7.2.4 70 Property

7.2.4.1 Geophysical Survey/Test Trenches

The EM and GPR surveys identified several areas of elevated response throughout the survey area. The majority of these areas were determined to be readily identifiable features; however, the sources of eight anomalies were unknown and these were further investigated through test pit excavations.

The test trench excavations revealed three significant findings:

- **Anomaly EM-28, located north of the central portion of B70.** This was a 7- x 12-foot concrete cylindrical drywell/cistern structure beneath the surface. Isolated and elevated radiation activity was noted in soils within the drywell. There were no perforations in the concrete sidewalls or bottom of the drywell, there was no lid, and it appeared to have a solid bottom.

- **Anomaly EM- 29a, located east of the northeast portion of B70.** This was a drum (approximately 15- to 25-gallon capacity) found among other metallic debris at no deeper than 3 feet BGS. Based on elevated field readings, the drum was removed and disposed of as radioactive waste.

- **Anomaly GPR-F, located north of the western portion of B70.** This was a small (2- x 2- inch) slag type of material that exhibited 80,000 cpm with a 2-inch gamma scintillation probe. Elevated gamma readings were also detected in soils surrounding the slag. The slag nugget was removed and disposed of as radioactive waste.

7.2.4.2 Passive Soil Gas Surveys

Forty-two passive soil gas samples were collected from the 70 property. PCE, the only notable VOC detected in the northwest corner of the property, was detected at 94.3 ng. This was the highest level of PCE detected on all three properties. The source of the PCE on the 70 property is unknown; however, the location of this high detection coincides with a square feature, possibly a small recharge basin, noted in one of the historic aerial photos (1962).

7.2.4.3 Indoor Air Surveys

Fifteen sub-slab, three indoor air, and one outdoor air samples were collected using summa canisters and tested for VOCs. Several VOCS were detected in each of the sampled media. PCE and TCE were the only notable VOCs detected. The following is a summary of the findings.

Sub-Slab samples contained PCE at levels ranging from 88 $\mu g/m^3$ to 120,000 $\mu g/m^3$ and TCE at levels ranging from ND to 26,000 $\mu g/m^3$. The highest concentrations of PCE and TCE were detected beneath the north-central portion of the building.

Indoor air samples contained PCE at levels ranging from 7.5 $\mu g/m^3$ to 8.1 $\mu g/m^3$ and TCE at levels concentrations ranging from 0.51 $\mu g/m^3$ to 0.97 $\mu g/m^3$. The highest concentrations of PCE and TCE were detected in the central portion of the building.

The single outdoor air sample contained PCE at a concentration of 0.24 $\mu g/m^3$ and TCE at a concentration of 0.064 $\mu g/m^3$.

7.2.4.4 Transformer Pad Survey (70 Property)

PCBs (Aroclor 1254 and Aroclor 1260) were detected in samples from the historic transformer pad, and Aroclor 1260 was detected in samples from the current transformer pad. Aroclor 1254 was detected at concentrations ranging from 43 µg/kg to 1,000 µg/kg, and Aroclor 1260 was detected at concentrations ranging from 20 µg/kg to 69 µg/kg.

Delineation samples (SU14-11 and SU14-14) and historic outside samples (SU14-12 and SU14-13) were analyzed only for Aroclor 1254. In three of the eight samples collected at the southwest corner of the transformer pad and submitted for PCB analysis, Aroclor 1254 was detected at concentrations ranging from 39 µg/kg to 140 µg/kg.

7.2.4.5 Exterior Walkover Gamma Radiation Survey

In 1997 and 1998, GTESOI performed walkover gamma radiation surveys across much of the exterior portions of the 140, 100 and 70 properties. Most of the measurements were between two and four times background levels. The radiation level measured at one very localized area on the northeast side of the 70 property was 50 times the background level. Further investigation of areas with radiation levels above background resulted in soil remediation in the affected areas during GTEOSI's Phase I Soil Remediation effort. In 2006, USACE performed a walkover gamma radiation survey on the 70 property. The survey measurements for most of the area surrounding B70 demonstrated little variability in radiation levels.

7.2.4.6 Radiation Surveys inside B70

In 2003, GTEOSI performed a radiological characterization survey in B70. This survey did not include the eastern warehouse. Based on a comparison of the

building survey results to acceptable removable surface contamination levels (Table 5 of 12 NYCRR Part 38.41), no locations had removable surface contamination levels that exceeded the criteria. However, beta radiation levels exceeded the criteria in some areas due to fixed contamination.

During the RI, the locations of all previously identified areas of surface contamination were reconfirmed. Only elevated levels of beta and gamma radiation were found (no alpha contamination), which confirmed the original survey findings that the contamination was contained underneath surface coatings or within the expansion joints of the concrete floors.

7.2.4.7 Concrete Cores

A total of seven concrete cores were collected by USACE at locations within B70 that exhibited elevated radiation levels. Two cores from the historical portion of B70 were submitted for radiological analysis. Concrete core D8-02 yielded uranium concentrations of 114 pCi/g (U-234), 12.0 pCi/g (U-235), and 354 pCi/g (U-238). Concrete core F6-02 yielded uranium concentrations of 217 pCi/g (U-234), 13.5 pCi/g (U-235), and 273 pCi/g (U-238). At concrete core location F6-01, field screening beneath the core identified radiation levels above background, and at concrete core location A3-01, the field screening beneath the core identified PID readings above background. Therefore, soil borings were completed at each location to depths of 7 and 8 feet, respectively. Elevated levels of uranium were detected only in soils beneath concrete core sample F6-01. The uranium concentrations included U-234 at 65 pCi/g, U-235 at 6.1 pCi/g, and U-238 at 194 pCi/g.

7.2.4.8 Nature and Extent of Soil Contamination

Soils were excavated from the northeastern portion of the property in remedial cells 7, 8, and 13 during GTEOSI's Phase I Soil Remediation. Soil sampling was conducted throughout the entire property, including beneath B70, beneath the remedial cells, and throughout parking and paved areas surrounding the building.

- **Metals.** Nickel was present on the 70 property at concentrations greater than the BTV to depths of 64 feet BGS. The highest concentrations of nickel detected appear to be associated with the source area below and around remedial cell 9 on the 100 property. All 32 samples that had a concentration greater than three times the BTV were collected from a small area along the north-central property boundary (subcells C22, D22, I22, H22, E23, F24, and R24). No specific trends were noted in the results for samples collected for TAL metals other than that concentrations of metals (not including nickel) appear to be higher in samples collected from 0 to 2 feet BGS.

- **VOCs.** Most of the VOC contamination in soils on the 70 property consists of PCE and appears to be limited to depths less than 16 feet. The highest PCE concentrations detected on the property were found in three subcell areas: A33 and A34 (5,300 µg/kg at 0 to 2 feet BGS), located in the southwest corner of the B70 central warehouse; T73 and U73 (8,900 µg/kg at 1 foot BGS), located in the northwestern portion of the parking lot north of B70; and I26

(4,600 µg/kg at 4 to 5 feet BGS), located within the footprint of the former recharge basin beneath the easternmost B70 warehouse. One or two samples from all three subcell areas had PCE concentrations over 1,000 µg/kg near the surface. The remaining sample results for each of the three subcell areas indicate a downward trend in PCE concentrations at these locations until the bottom of the borings.

- **Radionuclides.** The uranium concentrations detected in samples collected on the 70 property indicate the potential presence of natural, depleted, and enriched uranium. The highest uranium concentration detected on the 70 property (1,450 pCi/g U-238) was in a slag nugget discovered in test trench GPR-F in subcell W74, located in the central portion of the parking lot north of B70. The soil collected within 2 feet of the slag nugget in test trench GPR-F (subcell W74) had elevated levels of U-238 (94 pCi/g), indicative of depleted uranium. The highest U-238 concentration in the soil (194 pCi/g) was detected beneath a concrete core in B70 (subcell X78); the results were indicative of depleted uranium.

  Enriched uranium has a significantly greater concentration of U-234 than U-238 and an increased percentage of U-235. Locations of potentially enriched uranium included areas in the easternmost B70 warehouse, primarily under the former recharge basin (i.e., subcells E26, G29, H28, I 26, and J25) at depths of 6 to 34 feet BGS (U-234 concentrations up to 71.6 pCi/g). Other areas of potentially enriched uranium include drain DR-K in subcell I26 (133 pCi/g U-234) and test trench EM-28 in subcell B26 (95 pCi/g U-234).

  The remaining samples from the 70 property, including those from subcell C22 (located just west of remedial cell 8), which had elevated U-238 concentrations, indicated the presence of natural uranium.

  Thorium and radium were not detected above three times their BTVs in any of the soil samples collected on the 70 property.

7.2.4.9 Nature and Extent of Groundwater Contamination

Groundwater samples were collected from a network of 26 newly installed monitoring wells. The following is a summary of the results.

- **Metals.** Based on the sample results, all of the metals except aluminum, antimony, copper, lead, potassium, and vanadium were detected above their respective BTV. Of the metals that exceeded their BTV, five (beryllium, cobalt, manganese, nickel, and zinc) were detected at concentrations greater than three times their BTV. BTVs for antimony and copper could not be developed because they were not detected in any of the upgradient wells. Antimony and copper were detected only in intermediate and deep wells at very low concentrations.

Almost all of the metals that exceeded their BTV did not exhibit any specific lateral or vertical trends in distribution or concentration. The exception was nickel, the highest concentrations of which (>100 µg/L) were detected in shallow and intermediate wells in the west-central/central and southern portions of the property. Elevated levels of nickel in shallow groundwater were detected in the same general area (west-central/central) as on the 100 property. Therefore, the source of the nickel is likely on the 100 property in soils associated with remedial cell 9 from 24 to 64 feet BGS.

In summary, nickel appears to be the only metal that is present at elevated levels due to FUSRAP-related site activities.

- **VOCs.** Five of the VOCs (1,1-DCA, acetone, chloroform, PCE, and TCE) exceeded their respective BTV, and PCE and TCE were detected at concentrations greater than three times their BTVs. The PCE was detected predominantly in shallow and intermediate wells, but also in a few deep wells from the MW-27 well cluster on the north side of B70 and in almost all the wells on the south side of B70. The highest concentration of PCE was 1,400 µg/L in MW-10 (intermediate). The likely source could be contaminated soils on the north side of B70, as well as contaminated soils beneath B70.

  TCE was detected in the same locations as PCE (intermediate and deep samples from wells just north of B70 and along the south side of B70. The highest concentration of TCE was 44 µg/L in MW-30I. The presence of the TCE is likely related to the degradation of PCE.

  In summary, the source of the PCE/TCE is likely from several source areas on the 70 property.

- **Radionuclides.** The concentrations of uranium in the monitoring well samples on the 70 property were all relatively low. The samples with concentrations greater than three times the BTV ranged from 0.777 pCi/L to 3.74 pCi/L (MW-27D screened at 280 to 290 feet BGS). The samples were collected from various depths in wells spread east to west across the north parking lot.

  The concentrations of thorium and radium were of the same magnitude as uranium. The highest concentration of thorium (3.10 pCi/L) was detected in MW-31D, screened at 320 to 330 feet BGS. The highest concentrations of Ra-226 and Ra-228 were detected in samples from MW-27D, which also had the highest concentrations of uranium. These levels at such depths would most likely be due to the clay layer that exists above the monitoring well screens.

- **Conclusions.** The GTEOSI remedial soil removal action was performed only across a small portion of the property (cell 13 along the north border in the eastern portion of the 70 property). Therefore, elevated levels of soil contamination remain beneath several portions of the property: PCE in the north-

western portion of the property and beneath B70; nickel in the north-central portion of the property and beneath B70; and uranium beneath B70. Contamination beneath the building has resulted in contaminated soil vapors and a potential indoor air vapor intrusion pathway.

Contamination is present throughout most of the property. Shallow groundwater is contaminated with elevated levels of PCE and nickel; and intermediate and deep groundwater is contaminated with elevated levels PCE, TCE, nickel, and chloroform. Shallow groundwater flow was predominantly to the southwest, intermediate groundwater flow was to the southwest, and deep groundwater flow was predominantly to the south, with a southwestern component in the eastern portion of the site. A summary of groundwater flow, extent of groundwater contamination, and fate and transport is presented in Section 7.3.

7.2.5 Driving Range

7.2.5.1 Nature and Extent of Soil Contamination

USACE did not collect soil samples or samples of any other media (soil gas, etc.) on the adjacent and off-site Driving Range property; however, GTEOSI collected 1,960 soil samples on the Driving Range property.

- **Metals.** 1,002 of the soil samples collected were analyzed for nickel only, and 28 samples were analyzed for beryllium. Based on the sample results, only nickel was detected at concentrations above its BTV. Nickel was detected in three samples at concentrations greater than three times the BTV, with up to 75 mg/kg at 55 feet BGS in subcell Y14, about 50 feet east of remedial cell 3. The other two samples were in the same subcell and the adjacent subcell to the east. These sample results do not appear to exhibit any specific trends.

- **VOCs.** VOC contamination appears to be concentrated in one main area of the Driving Range property: 48 to 62 feet BGS, all beneath remedial cell 14, and beneath subcells X16, X17, Y16, Y17, Z16, and Z17. Based on the sample data and the boring logs, it appears that VOCs, primarily chlorinated compounds, traveled vertically downward in remedial cell 4, encountered a less hydraulically conductive layer, and moved eastward onto the Driving Range property.

- **Radionuclides.** Natural uranium was detected on the Driving Range property at concentrations above the BTVs. U-238 concentrations ranged from background to 20 pCi/g. The highest concentration was detected in soil from subcell 15A at 53 feet BGS, approximately 100 feet east of the southeast corner of remedial cell 3. U-238 concentrations exceeded 10 pCi/g in samples collected in eight subcells (12D, 15A, 15B, 18A, 27I, X21, Y15, and Z21) at depths ranging from 3 feet to 55 feet BGS. There did not appear to be a pattern related to the elevated concentrations. Thorium isotope concentrations were all below 2.5 pCi/g, and radium isotope concentrations were all below 1.72 pCi/g.

7.2.5.2 Nature and Extent of Groundwater Contamination

Groundwater samples were collected from a network of seven newly installed monitoring wells. The following is a summary of the results.

- **Metals.** Based on the sample results, 13 metals were detected above their respective BTVs, and 10 of these (aluminum, arsenic, beryllium, calcium, chromium, iron, lead, manganese, nickel, and vanadium) were detected at concentrations greater than three times their BTV. BTVs for copper and selenium could not be developed because they were not detected in any of the upgradient wells.

  Almost all of the metals that exceeded their BTVs did not exhibit any specific lateral or vertical trends in distribution or concentration. The exception was lead, which was detected in MW-34D at an elevated concentration of 31.1 µg/L. This detection was in an unfiltered sample with very high turbidity. Since no other elevated levels of lead were detected on the property, any other Sylvania parcels, or upgradient, and lead was not detected in the filtered sample, it is likely that the elevated level is due to the turbidity. Copper and selenium were also detected in the turbid sample from MW-34D.

  In summary, no metals on the Driving Range property appear to be present at elevated levels due to Sylvania site activities.

- **VOCs.** Several VOCs were detected in the groundwater samples. Three of the VOCs (chloroform, PCE, and TCE) exceeded their respective BTVs, and chloroform and PCE were detected at concentrations greater than three times their BTVs. Chloroform was detected only in one shallow well (MW-55S) from the location on the Driving Range property that is closest to the pool area in Cantiague Park. As previously discussed, the potential source of the chloroform is the pool water that is discharged from Cantiague Park. The higher levels of PCE were detected in shallow wells, but PCE was also detected in deep wells in the western and southern portions of the Driving Range property. Four wells (MW-33S, -33D, -52D, and -53S) contained elevated levels of PCE (>5 µg/L), and the highest concentration (910 µg/L) was detected in MW-53S. The likely source of the PCE is the contaminated soils beneath remedial cell 4.

  In summary, only PCE levels on the Driving Range property are of concern, and the source of the PCE is likely from contaminated soils remaining beneath remedial cell 4.

- **Radionuclides.** On the Driving Range property, elevated levels of uranium (U-238 at 26.0 pCi/L) were found in MW-33S, which is to the east of the southern portion of the 100 property and remedial cell 14. Monitoring well MW-53S, which is downgradient of MW-33S, had much lower concentrations (U-238 at 2.75 pCi/L).

Thorium and radium were detected at concentrations above their respective BTVs in deep samples screened at 270 to 280 feet BGS (MW-33D), which is most likely due to a clay layer above the monitoring well screens.

- **Conclusions.** The GTEOSI remedial soil removal action was performed only across a small portion of the Driving Range property (cell 14 along the driving range/Sylvania site border). Elevated soil contamination (nickel and PCE) remains beneath the driving range adjacent to remedial cell 4

  Groundwater contamination is likely the result of leaching from the 140, 100, and 70 property contaminated soils described above, and other upgradient properties not associated with the Sylvania site. Shallow groundwater is contaminated with elevated levels of PCE; intermediate groundwater is contaminated with elevated levels of PCE, TCE, and chloroform; and deep groundwater is contaminated with elevated levels of PCE. A summary of groundwater flow, the extent of groundwater contamination, and fate and transport is presented in Section 7.3.

7.3 Fate and Transport

During past site operations, contamination of site soils and groundwater may have resulted from various types of discharges to on-site recharge basins/sumps/leach pools, surface spills, leaking underground storage tanks, leaking underground pipes, and disposal practices common for the time period. Currently, the main mechanisms affecting further transport of contaminants are volatilization, leaching through storm water infiltration, and through the movement of groundwater carrying dissolved contaminants.

The majority of the site surface is paved, with the exception of areas that have been excavated as part of GTEOSI's remedial effort, which were backfilled with clean fill (predominantly sand) and have a gravel surface. Almost all storm water collected at the site is directed into numerous on-site dry wells (cisterns) that allow for infiltration of storm water into subsurface soils and the underlying aquifer. Contaminated soils do not appear to be located near current drywells. The areas covered by gravel have storm water conveyances to collect storm water and carry it to the on-site drywells, but a minor component of storm water would be expected to infiltrate directly through surface soils in these portions of the site (remedial cells/excavated areas), which could cause underlying contamination to migrate to the water table.

Groundwater occurs as an unconfined aquifer in the shallow portions of the Magothy Formation. Based on static groundwater level data collected by USACE in March 2009, groundwater at the site occurred at approximately 65 feet BGS, which is the depth near the contact between the Magothy and the Upper Glacial aquifers. In April 2010, the average groundwater levels were approximately 3 feet higher. Based on limited on-site water level information from 1999, it ap-

pears that over the past 10 years the groundwater elevations at the site have risen approximately 7 feet.

The horizontal hydraulic gradient is approximately 0.0011 feet per foot, and the vertical hydraulic gradient ranges from 0.0022 feet per foot to 0.0069 feet per foot. Based on static levels from April 2010, shallow groundwater flow was predominantly to the southwest, intermediate groundwater flow was to the southwest, and deep groundwater flow was predominantly to the south, with a southwestern component in the eastern portion of the site. Groundwater velocities can range from a low of 0.01 feet per day near the groundwater divide to more than a foot per day in shallow portions of the Magothy.

7.3.1 Contaminant Fate and Transport

Based on the RI sample results, it appears that nickel, PCE, TCE, and uranium are the only FUSRAP contaminants that have leached into the underlying site groundwater in significant concentrations. The following is a summary of the potential for each of these contaminants to migrate both on- and off-site and the areal extent of these contaminants beneath the site.

7.3.1.1 Nickel

Nickel is likely to persist in soils at the site and have a limited capacity to migrate to groundwater. In groundwater at the site, inorganic nickel species that are mobile are likely present and will be transported with groundwater flow.

In shallow groundwater, nickel occurs at elevated levels in the vicinity of remedial cell 9 (south-central portion of the 100 property) (MW-24S [89.1 µg/L]) and appears to have migrated to the southwest onto the northwest portion of the 70 property (MW-23S [2,240 µg/L] and MW-26 [193 µg/L]). This coincides well with the direction of shallow groundwater flow. Nickel in this area has migrated downward and is present at an elevated concentration in MW-50I (152 µg/L, and MW-26 (193 µg/L). Elevated levels of nickel are present in deep groundwater in MW-31D (472 µg/L). The source of this deep nickel is unknown.

7.3.1.2 PCE

PCE is likely to have multiple fate and transport mechanisms at the Sylvania site, including volatilizing to the atmosphere, volatilizing to air spaces contained between soil grains (soil gas), leaching to groundwater, and persistence in soil. Persistence in soils occurs in areas where gaseous exchange with the atmosphere is limited (e.g., at greater depths, beneath concrete/asphalt surfaces, etc.). Therefore, due to the presence of the building slab and asphalt surrounding the building, the potential for leaching of PCE from soils to groundwater is greatly reduced where infiltration of storm water is prevented. Thus, the presence of concrete pads and asphalt surfaces may increase the persistence of PCE in site soils, as methods of transport (infiltration) are significantly reduced. PCE in soils at the site likely exists as a gas in soil pore spaces and/or liquid adsorbed to soil particles. PCE has a relatively high water solubility; therefore, transport with groundwater in dissolved form can be significant.

Microbial degradation through reductive dechlorination is a process that naturally degrades PCE through a series of steps to an end product of ethylene. The mostly aerobic conditions in site soils and groundwater are not expected to promote this process. The presence of TCE colocated with PCE indicates that some degradation of PCE may be occurring at the site, but a lack of further degradation compounds (e.g., vinyl chloride) indicates this process is not widespread across the site.

PCE appears to originate in shallow groundwater in the eastern portion of the 140 property (9 µg/L) and extends down to the southeast corner of the 70 property (470 µg/L). PCE in intermediate groundwater ranges from 5 µg/L in the southeast corner of the 100 property to 1,400 µg/L in the southeast of the 70 property. PCE in deep groundwater ranges from 8 µg/L in the southeast corner of the 100 property to 100 µg/L in the southwest portion of the Driving Range property. The extent of off-site migration of PCE is currently unknown, and additional off-site characterization is warranted.

7.3.1.3 TCE

TCE is likely to have the same multiple fate and transport mechanisms at the site as PCE. TCE also has a relatively high water solubility (1,100 mg/L); therefore, transport with groundwater in dissolved form can be significant.

In shallow groundwater, TCE is typically comingled with PCE, indicating that it may be a degradation product of PCE; however, some of the deeper TCE may not be associated with degradation of site-related PCE. The levels of TCE in shallow groundwater ranges from 130 µg/L (MW-22S) in the eastern portion of the 100 property (below remedial cell 4) to 3 µg/L (MW-28S) 125 feet to the southwest. Elevated levels of TCE also occur along the southern Sylvania site boundary in the southwest and southeast corners of the 70 property. In deep groundwater, TCE is present at an elevated level beneath remedial cell 9 (10 µg/L) and extends to the southern border of the 70 property (10 µg/L). The extent of off-site migration of TCE is currently unknown and additional off-site characterization is warranted.

7.3.1.4 Uranium

Given that soils at the site are sandy, usually dry, and well oxidized, uranium would be expected to occur in the oxidized form, which is soluble and therefore potentially leachable to groundwater. Hence, uranium in site soils has the potential to migrate to groundwater. Once dissolved in groundwater, uranium can remain dissolved or form solid precipitates, depending on the pH; redox potential; concentrations of anions, oxide minerals, and organic materials; and the presence of specific types of bacteria.

Elevated levels of total uranium occur in shallow groundwater beneath the eastern portion of the 140 property (below remedial cell 1) at concentrations ranging up to 10,830 µg/L. These elevated levels appear to be confined to the 140 property;

however, an elevated concentration of total uranium (77.75 µg/L) was also detected beneath the adjacent and off site Driving Range property. The source of this uranium is likely from the area beneath remedial cell 1. Intermediate groundwater beneath remedial cell 1 also contained elevated levels of total uranium (up to 159 µg/L). Elevated levels of uranium were not detected in deep groundwater samples. The only other location with elevated levels of total uranium is beneath and southwest of remedial cell 9 (up to 19.73 µg/L).

7.4 BLRA

The BLRA included a Human Health Risk Assessment (HHRA) and an Ecological Risk Assessment (ERA). The purpose of the HHRA was to consider the information available about the site, its history, physical setting, current and likely future land uses, receptor groups potentially affected by the site, and the nature and extent of environmental contamination present, and then assess the potential impacts that site contamination could have on the environment and health and welfare of the populations potentially affected by the site. A qualitative assessment of the ecological risk was performed (see Section 6).

7.4.1 HHRA

The contamination in soil and/or groundwater at the Sylvania site poses potential cancer risks greater than 1E-04 and/or noncancer HIs greater than 1 for several current and potential future groups of receptors.

7.4.1.1 Current Conditions

The contaminants in site soils and indoor air are not expected to pose cancer risks greater than 1E-04 or noncancer HIs greater than 1 under existing or substantially similar future site conditions (scenario 1 - existing buildings and paving remain intact). Groundwater is not currently being used as a source of potable water at the site and was not assessed under scenario 1.

7.4.1.2 Future Conditions

Chemical and radiological contaminants in shallow and near-surface soil and groundwater at the Sylvania site could potentially pose cancer risks greater than 1E-04 and/or noncancer HIs greater than 1 to future site users. The greatest risks and hazards would be to long-term, continuous users such as future site workers and future residents. Short-term and intermittent users such as construction or utility maintenance workers, site visitors, site trespassers, and future recreational users of the site are not expected to be exposed to cancer risks greater than 1E-04 or noncancer HIs greater than 1.

The greatest risks and hazards were associated with hypothetical future use of groundwater as tap water. The contaminants driving the risks and hazards were PCE and uranium, with the latter acting both as a radiological (U-234 and U-238) and a chemical (total uranium) contaminant. This is considered a very unlikely scenario because of the availability and required use of a public water supply system at the site. Nevertheless, the groundwater at the site is fresh and is classified GA, and the best potential use of GA class waters is as a drinking water source.

Uranium is the dominant contaminant at the 140 property, while PCE is the dominant contaminant at the 70 and 100 properties and at the Driving Range property. Contamination in site soil also could pose risks greater than 1E-04 and/or HIs greater than 1 to future site workers and residents, although generally at lower levels than those from groundwater.

7.4.2 Ecological Risk Assessment

An Ecological Risk Assessment (ERA) was performed in accordance with the Ecological Risk Assessment Guidance for Superfund (ERAGS) process (EPA 1997). The ERA refers to a qualitative and/or quantitative appraisal of the actual or potential impacts of contaminants from a hazardous waste site on plants and animals other than humans and domesticated species. A quantitative ERA often is not needed in highly industrialized areas, where few if any ecological receptors and habitats are present.

In its current condition, the Sylvania site is an industrial area with little or no wildlife habitat. Future use of the site is not expected to be useful for ecological purposes. Therefore, a quantitative ERA was determined to be unnecessary, and the site was evaluated qualitatively as follows:

- The site is largely covered with buildings, gravel, and paved surfaces and thus provides little or no wildlife habitat.

- Contamination at the site is restricted to subsurface soil and groundwater in isolated areas, and these areas are covered by buildings, pavement, and/or gravel. Even if some common wildlife species visit the site, no exposure to the subsurface contamination is expected.

- Transport of site-related contaminants in groundwater to downgradient wetlands, streams, or other habitats is highly unlikely due to the depth of the groundwater.

For these reasons, no adverse impacts on ecological receptors and/or habitats on the site are expected.

7.5 Data Limitations and Recommendations for Future Work

The on-site remedial investigations are complete. However, there are several remaining data gaps, and recommendations are provided below.

7.5.1 Data Limitations/Gaps

- The source of the elevated level of TCE in the plume detected in intermediate and deep groundwater beneath the western portion of the 70 property;

  TCE was detected at elevated levels up to 18 µg/L from 100 to 166 feet BGS in groundwater profiles from MW-25D, and at levels up to 190 µg/L from 157

to 337 feet BGS in groundwater profiles from MW-30D. TCE was not detected in monitoring well samples from MW-25S/I/D, but it was detected at 44 µg/L in MW-30I (screened 230 to 240 feet BGS). A profile boring/well (MW-49S) was installed upgradient of the MW-25 well cluster; however, TCE was not detected in either the profile samples or the well samples. Therefore, the source of the TCE remains unknown.

- The source of the elevated level of nickel detected in intermediate groundwater beneath the western portion of the 70 property;

  Nickel was detected at elevated levels up to 386 µg/L from 100 to 125 feet BGS in groundwater profiles from MW-25D, and at 62.9 µg/L in monitoring well MW-25S. Lower levels of nickel (36.2 µg/L and 5.4 µg/L) were detected in a nearby profile sample and a well sample from MW-49S, respectively. The elevated level of nickel may be from the remedial cell 9 area or another source further north on the 70 or 100 property. Therefore, the source of the nickel remains unknown.

- The source of the elevated level of TCE detected in deep groundwater beneath the central portion of the 100 property;

  TCE was detected at elevated levels up to 8.8 µg/L in profile samples from 356 to 379 feet BGS from MW-24DD, and at levels up to 8.1 µg/L in profile samples from 367 to 377 feet BGS from MW-27DD. TCE was detected in MW-24DD and MW-27DD at 10 µg/L. An upgradient boring (RI-P-45D) was drilled; however, TCE was not detected in deep groundwater at this location. Therefore, the source of the deep TCE is unknown.

- The source of the elevated levels of PCE, nickel, and uranium detected beneath remedial cell 9;

  Elevated levels of PCE (260 µg/L in profile samples and 40 µg/L in the well sample), nickel (500 µg/L in profile samples and 89.1 µg/L in the well sample), and uranium (183 µg/L in profile samples and 18.76 µg/L in the well sample) from MW-24S are either from contaminated soils from the remedial cell 9 area or a source beneath B100, or both. A profile boring/well (MW-46S) was planned to be drilled inside B100; however, it was eliminated from the program due to rig access issues and other work scheduled to be performed by GTEOSI to stabilize the building foundation. Therefore, the source(s) remain unknown.

USACE plans to perform a hydrologic modeling of the site groundwaters in preparation for scoping off-site investigation activities. Upon completion of the model, the data gaps described above will be re-evaluated to determine whether any additional on-site investigations are necessary.

7.5.2 Recommendations

Based on the presence of soil and groundwater contamination on the Sylvania Corning FUSRAP site, the following additional studies are recommended:

- Hydrologic modeling of the site groundwater should be performed. This modeling effort is needed to evaluate the potential for off-site contamination to impact downgradient public supply wells and to aid in the design of the off-site investigation program.

- Off-site characterization of metals, VOCs, and radiological contaminants in groundwater. This characterization should include a hydrologic evaluation of groundwater movement and off-site migration of contaminants.

- Evaluation of remedial options through soil and groundwater feasibility studies consistent with CERCLA.

8 References

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Tables

Table 1.2-1 Summary of Site Ownership and Operations

Date	Owner	Activities
140 Property		
1942-1952	Press Wireless Manufacturing, Inc. Transferred to Jefferson Standard Life in 1948 Transferred to Jefferson Standard Broadcasting in 1951	Manufactured radio and electronic equipment and carried out a pilot plant operation in the field of physical metallurgy. Despite the property transfers, Press is the only known operator of the property between 1942 and 1952.
1952, Feb 28	Acquired by SEP. Ownership remained among various Sylvania entities.	Research, development, and production of nuclear fuel elements.
1966	Various SEP entities	New York State Department of Labor (NYSDOL) informed SEP that the Contract 1293 area was fit for use as other than a radiation installation.
1967	SEP	Building 2 demolished
1967, March 2	SEP conveyed property to Canway Co., Inc.	Distribution of canned beverages (involved the use degreasers)
1967-1982	Various conveyances of all or part of the 140 property, including Eaton Yale and Towne and Yale Industrial Trucks.	Refurbished forklift trucks (involved the use of TCE)
1982, June	Sold to Ventarama Skylight Co.	Manufacture of skylights (involved the use of TCE)
1991, Nov	Conveyed to Gilbert Displays Realty Co., which owned the property until at least 1997.	Manufacture of advertising displays for commercial clients. Spray paint operations generated chemical waste.
1999, Dec	GTEOSI currently owns the 140 property.	Vacant
100 Property		
1942-1952	Press Wireless Manufacturing, Inc. Transferred to Jefferson Standard Life in 1948 Transferred to Jefferson Standard Broadcasting in 1951	Manufactured radio and electronic equipment and carried out a pilot plant operation in the field of physical metallurgy. Despite the property transfers, Press is the only known operator of the property between 1942 and 1952.
1952, Feb 28	Acquired by SEP. Ownership remained among various SEP entities.	Research, development, and production of nuclear fuel elements.
1966	SEP	NYSDOL informed SEP that the Contract 1293 area was fit for use as other than a radiation installation.
1967	SEP	Building 1 demolished.
1967, Mar 2	SEP conveyed property to Canway Co., Inc.	Distribution of canned beverages (involved the use of degreasers).
1967-1978	Various conveyances of all or part of the 140 property, including Towne and Yale Industrial Trucks.	Refurbished forklift trucks (involved the use of TCE)
1978, Sept	Conveyed to Nathan Lagin Co.	Unknown
1979, Dec	Transferred to PSPM Realty Corp.	Unknown
1981, Sept	Conveyed to Nassau County Industrial Development Agency.	Unknown

Table 1.2-1 Summary of Site Ownership and Operations

Date	Owner	Activities
1996, June	Magazine Distributors, Inc., purchased property.	Operation and repair of a fleet of small trucks (involved the use of TCE).
Unknown	Harbor Distributing Corp. operated at the 100 property.	Operation and repair of fleet of small trucks (involved the use of TCE).
Current	Janet P. Spry	Property currently leased to GTEOSI.
70 Property		
1952, Feb 28	A portion of the property now known as the 70 property was acquired by SEP.	Unknown
1952-1957	Ownership remained among various SEP entities.	No apparent use by SEP
1957, June	Sylcor (a division of SEP) purchased another portion of the 70 property from George H. Hauser.	Research, development, and production of nuclear fuel elements, as well as high-temperature coatings and composite alloys.
1957-1959	Sylcor constructed historical Building 4 and the first addition to this building.	No activities noted.
1960	Property transferred to SEP upon dissolution of Sylcor.	No activities noted.
1967, Sept 19	SEP	Based on AEC surveys, Atcor survey, and its own investigation, the State of New York released the site for non-radiological use and cancelled New York State Radioactive Materials License No. 325-0083.
1968-1970	Polytechnic Research Development Electronics, Inc., (a subsidiary of Harris Intertype Corporation) leased part of historical Building 4.	Production of microwave and electronic test equipment.
1970	Hi Tempco Division of Dewiant Corp. leased part of Building 4 from Sylvania.	Application of metallurgical coatings (involved the use of PCE and TCE).
1972, Sept 11	GTE Sylvania, Inc. (SEP changed its name to GT&E Sylvania, Inc., in 1970 and to GTE Sylvania, Inc., in 1971) conveyed what was then the 70 property to Dewiant Corp.	No activities noted.
1974, April	Barson Composites Corp. acquired the Hi Tempco Division from Dewiant Corp.	From 1974 until 1982, Barson Composites Corp. continued to utilize the property for the application of metallurgical coatings (involved the use of PCE and TCE).
1978, Sept	Conveyed the 70 property to A-T Realty Corp.	Unknown.
1979-1997	Site operated by Air Techniques, Inc.	Manufacture of dental equipment (involved the use of PCE).
1986	Air Techniques, Inc., purchased the remaining portion of the current 70 property.	Air Techniques, Inc., began construction of 30,000-square-foot addition to the east side of the existing facility.
2004	GTEOSI becomes owner of the 70 property.	Vacant

Key:
NA = Not Applicable.
PCE = Tetrachloroethene.
SEP = Sylvania Electric Products, Inc.
TCE = Trichloroethene.

Table 2.3-1 Initial Records Search

Document Type	Number of Records
Agreements and contracts	124
Bids and cost estimates	12
Corporate records	28
Court documents	10
Drawings and maps	107
Fax cover sheets and transmittals	6
File folders and tabs	108
Handwritten notes	7
Letters	330
Lists and tables	120
Meeting notes and minutes	7
Memos	260
News articles	6
Permits and licenses	56
Products	2
Reports and plans	347
Telephone records	8
Transaction documents	25
Work orders and procedures	8
Total	**1,571**

Table 2.3-2 Chronology of Project Planning Documents, Meetings, and Field Activities

Title/Description	Date
Initial site walkover	May and July 2006
Site conceptual model presentation and initial scoping meeting	July 2006
Final Phase I RI Work Plan	August 2006
Phase I field work	September and November 2006
Phase I RI Sampling Results for Field Investigations	December 2006
Final RI Work Plan (Phase I [Updated] and II)	March 2007
Phase IIa field work	May and June 2007
Phase IIb field work	October and November 2007
Final Phase IIa Data Summary Report	February 2008
Final Phase IIb Data Summary Report	June 2008
Phase III groundwater investigation scoping meeting	June 2008
Final RI Work Plan (Phase III Groundwater)	October 2008
Phase IIIa field work	October 2008 through March 2009
Phase IIIb groundwater investigation scoping meeting	June 2009
Phase IIIb field work	November 2009 through April 2010

Table 2.5-1 Phase I Sampling and Chemical Analysis Detail Table, Sylvania Corning FUSRAP Site, Hicksville, New York

	Sample ID		Number of Locations	Number of Samples	Total Number of Samples
Soil Gas Survey					
Passive ESN Rocky Mountain (Modified 8260/8270)	SG-XXX	Modified SW8260B	89	89	89
Sub-slab	B70-SSA-XX	TO-15	12	12	12
Indoor Air Sampling					
Sub-slab	B70-SSA-XX	TO-15	3	3	9
	B100-SSA-XX	TO-15	3	3	
	B140-SSA-XX	TO-15	3	3	
Indoor Air	B70-IA-XX	TO-15	3	3	9
	B100-IA-XX	TO-15	3	3	
	B140-IA-XX	TO-15	3	3	
Outdoor Air	OA-XX	TO-15	3	3	3
Transformer Pad Investigation (Soil)					
TCL PCBs	SS-XX or NS-XX	SW8082	5	5	5
QA/QC Samples					
				Total Phase I Field Duplicates[2]	**15**
				Total Phase I Trip Blanks[3]	**3**
				Total Phase I MS/MSD[4]	**1**

Key:
[1] One trip blank was used for the sub-slab, indoor air and outdoor air samples (added to the indoor air sample total only).
[2] The duplicate samples were blind and were collected at a frequency of 1 per 10.
[3] A trip blank was included in each seprate shipment. The trip blanks were identified as listed above.
[4] The MS/MSD samples were collected at a frequency of 1 per 20 samples.

Key:
MS/MSD = Matrix spike/matrix spike duplicate.
PCB = Polychlorinated biphenyl.
QA/QC = Quality assurance/quality control.
TCL = Target Compound List.

Table 2.5-2 Phase II Sampling and Chemical Analysis Detail Table, Sylvania Corning FUSRAP Site, Hicksville, New York

			Number of Field Samples	QA/QC Samples Field Duplicates[1]	Total Number of Samples
Subsurface Soil Sampling of Leach Pools/Drains/Drywells/Sump					
TCL Volatiles	Leach pools: prefix LPH followed by location letter and depth suffix (i.e., LPH-A-Z1, Z2 …through LPH-Z-Z1, Z2…). Drains: prefix DR for existing drains (or DRH for historic drains), followed by location letter and depth suffix (i.e., DR-A-Z1, Z2…through DR-Z-Z1, Z2…). Drywells: prefix DRY for existing drywells (or DRYH for historic drywells) followed by location letter and depth suffix (i.e., DRY-A-Z1, Z2...through DRY-Z-Z1, Z2...). Sumps: prefix SMP followed by location number and depth suffix (i.e., SMP-01-Z1, Z2...through SMP-2-Z1, Z2...).	SW8260	93	Duplicate samples will be identified by the original sample ID and replacing the sample number suffix starting with 900 (e.g., DRY-A-900, etc).	93
Nickel		SW6010B			
Uranium		DOE-A-01-R			
Ra226/228		DOE-GA-01-1			
Th-232		DOE-A-01-R			
Confirmatory Soil Borings					
TCL Volatiles	Cell ID, followed by boring number, and depth suffix (i.e., C1-01-Z1, Z2, ... through C13-03-Z1, Z2, ...)	SW8260	42	Duplicate Sample Numbers will start at 900 (e.g., C1-900-Z1)	42
Nickel		SW6010B			
Uranium		DOE-A-01-R			
Ra226/228		DOE-GA-01-1			
Th-232		DOE-A-01-R			
Data Gap Soil Borings - Building 140					
TCL Volatiles	Prefix RI-SB, followed by Building number, followed by boring number, and depth suffix (i.e., RI-SB-140-01-Z1, Z2, ... through RI-SB-140-11-Z1, Z2, ...)	SW8260	28	Duplicate Sample Numbers will start at 900 (e.g., RI-SB-100-900-Z1)	28
Nickel		SW6010B			
Uranium		DOE-A-01-R			
Ra226/228		DOE-GA-01-1			
Th-232		DOE-A-01-R			
Data Gap Soil Borings - Building 100					
TCL Volatiles	Prefix RI-SB, followed by Building number, followed by boring number, and depth suffix (i.e., RI-SB-100-01-Z1, Z2, ... through SBRI-100-11-Z1, Z2, ...)	SW8260	28	Duplicate Sample Numbers will start at 900 (e.g., RI-SB-140-900-Z2)	28
Nickel		SW6010B			
Uranium		DOE-A-01-R			
Ra226/228		DOE-GA-01-1			
Th-232		DOE-A-01-R			

Table 2.5-2 Phase II Sampling and Chemical Analysis Detail Table, Sylvania Corning FUSRAP Site, Hicksville, New York

			Number of Field Samples	QA/QC Samples Field Duplicates[1]	Total Number of Samples
Data Gap Soil Borings - Survey Unit 08					
TCL Volatiles	Survey Unit Number, followed by boring number, and depth suffix (i.e., SU08-01-Z1, Z2, ... through SU08-15-Z1, Z2, ...)	SW8260	38	Duplicate Sample Numbers will start at 900 (e.g., SU08-900-Z1)	38
Nickel		SW6010B			
Uranium		DOE-A-01-R			
Ra226/228		DOE-GA-01-1			
Th-232		DOE-A-01-R			
Building 70 Soil Borings - Survey Units 9, 10, 13 and 14					
TCL Volatiles	Survey Unit Number, followed by boring number, and depth suffix (i.e., SU09-01-Z1, Z2, ... through SU14-20-Z1, Z2, ...)	SW8260	164	Duplicate Sample Numbers will start at 900 (e.g., SU10-900-Z1)	164
Nickel		SW6010B			
Uranium		DOE-A-01-R			
Ra226/228		DOE-GA-01-1			
Th-232		DOE-A-01-R			
PCBs		SW8082	0		
Building 70 Soil Borings - Survey Units 11 and 12					
TCL Volatiles	Survey Unit Number, followed by boring number, and depth suffix (i.e., SU11-01-Z1, Z2, ... through SU12-20-Z1, Z2, ...)	SW8260	136	Duplicate Sample Numbers will start at 900 (e.g., SU11-900-Z1)	136
Nickel		SW6010B			
Uranium		DOE-A-01-R			
Ra226/228		DOE-GA-01-1			
Th-232		DOE-A-01-R			
PCBs		SW8082	0		
Test Trench Soil Samples					
TCL Volatiles	Prefix EM followed by location number and number of samples collected at that location (i.e., EM-28-SO-01)	SW8260	38	Duplicate samples will be identified by the original sample ID up to SO followed by sample number suffix starting at 900 (e.g., EM-3-SO-900, etc)	38
Nickel		SW6010B			
Uranium		DOE-A-01-R			
Ra226/228		DOE-GA-01-1			
Th-232		DOE-A-01-R			
Concrete Samples					
Uranium	D8-02, F6-01, F6-02, G4-01, F3-01, A3-01 and D9-01	DOE-A-01-R	7	--	7
Ra226/228		DOE-GA-01-1			
Th-232		DOE-A-01-R			

Table 2.5-2 Phase II Sampling and Chemical Analysis Detail Table, Sylvania Corning FUSRAP Site, Hicksville, New York

			Number of Field Samples	QA/QC Samples Field Duplicates[1]	Total Number of Samples
Miscellaneous Samples					
TCL Volatiles	GPR-F, F601-Z1, F601-Z2, A301-Z1	SW8260	4	--	4
Nickel		SW6010B			
Uranium		DOE-A-01-R			
Ra226/228		DOE-GA-01-1			
Th-232		DOE-A-01-R			
Rinse Blanks[2]					
TCL Volatiles - Low Level	Consecutively numbered starting at RB-01	SW8260	20	--	20
Nickel		SW6010B			
Uranium		DOE-A-01-R			
Gross Alpha		9310			
Gross Beta		9310			
Ra226/228		9315/9320			
Th-232		DOE-A-01-R			
PCBs (only for equipment used to collect samples being tested for PCBs)		SW8082			
				Total for Phase II with all groundwater samples	
				Total for Phase II with only 10% of groundwater samples	
Optional Analyses Unit Rates					
Water					
TCL SVOCs	TBD	SW8270	-	-	-
TCL PCBs	TBD	SW8082	-	-	-
TAL Metals	TBD	SW6010B	-	-	-
Nickel & Beryllium only	TBD	SW6010B	-	-	-

Table 2.5-2 Phase II Sampling and Chemical Analysis Detail Table, Sylvania Corning FUSRAP Site, Hicksville, New York

			Number of Field Samples	QA/QC Samples Field Duplicates[1]	Total Number of Samples
Soil					
TCL SVOCs	TBD	SW8270	-	-	-
TCL PCBs	TBD	SW8082	-	-	-
TAL Metals	TBD	SW6010B	-	-	-
Nickel & Beryllium only	TBD	SW6010B	-	-	-
				Total Phase II Duplicate Samples	**57**
				Total Phase II MS/MSD Samples[3]	**63**

Notes:

[1] Duplicate samples were blind and were collected at a frequency of 1 per 10.

[2] Rinsate samples were collected at a frequency of 1 per 10 for samples collected with non-dedicated equipment.

[3] Additional volume was required for the MS/MSD samples collected at a frequency 1 per 20 original samples. See QAPP for details (worksheets 19, 20, and 28).

[5] If on-site laboratory established, only 10% of groundwater samples to be sent to off-site lab.

Note: In general, 1 sample was collected from each 8-foot depth interval (i.e., the most contaminated zone in each interval). Therefore, standard borings had 2-samples per boring, intermediate locations (drilled to 32 feet) had 2 additional samples and deep locations (drilled to 64 feet maximum) had 7 additional samples.

Key:

EM = Electromagnetic.
ID = Sample Identification.
MS/MSD = Matrix spike/matrix spike duplicate.
PCB = Polychlorinated biphenyl.
QAPP = Quality Assurance Project Plan.
QA/QC = Quality Assurance/Quality Control.
Ra = Radium.
RB = Rinsate blank.
RISB = Remedial Investigation soil boring.
SU = Survey unit.
TCL = Target Compound List (from the most current version of EPA Contract Laboratory Program [CLP] methods, SOM01.1).
Th = Thorium.

Table 2.5-3 Phase III RI Sampling and Chemical Analysis Detail Table, Sylvania Corning FUSRAP Site, Hicksville, New York

Analysis	Method	Sample ID/Sample Location	Number of Locations	Field Duplicates[4]	Total Number of Samples
Vertical Profile Groundwater Samples from Monitoring Well Boreholes (IIIa)					
		Well ID (MW-13 through MW-34 and MW-39S), followed by "-VP" and two digit number for depth interval (i.e., MW-13D-VP01, -VP02, ... through MW-34D-VP01, -VP02, ...).	23	Duplicate samples will be identified by the original sample ID and replacing the depth number suffix starting with 800 (e.g., MW-13S-VP800, MW-19D-VP801, etc).	
TCL Volatiles	SW8260	Wells MW-13 through MW-34 and MW-39S. All samples.			528
TAL Metals	SW6010B/7470	Wells MW-13 through MW-34 and MW-39S. All samples.			364
Uranium Isotopes	DOE-A-01-R	Wells MW-13 through MW-34 and MW-39S. All samples.			128
Ra 226 and 228	9315/9320				
Thorium Isotopes	DOE-A-01-R				
Vertical Profile Groundwater Samples from Profile Borings (IIIa)					
TCL Volatiles Quick TAT	SW8260	RI-P-35S-VP01 through RI-P-38S-VP01.	4	Duplicate samples will be identified by the original sample ID and replacing the depth	25
TAL Metals Quick TAT	SW6010B/7470		1		6
Newly Installed Phase IIIa Permanent Monitoring Well Groundwater Samples					
TCL Volatiles	SW8260	Well ID (MW-13D, MW-14D, MW-15D, MW-16D, MW-17S, MW-18S, MW-19D, MW-20D, MW-21D, MW-22D, MW-23D, MW-24D, MW-25D, MW-26D, MW-27D, MW-28D, MW-29S, MW-30D, MW-31D, MW-32D, MW-33D, MW-34 and MW-39S), followed by "-GW" (i.e., MW-13D-GW, ... through MW-34D-GW and MW-39S).	23	"MW-" Prefix followed by Duplicate Sample Number starting at 800, followed by "-GW" (e.g., MW-800-GW).	23
TAL Metals (total)	SW6010B/7470				
Gross Alpha and Beta	9310				
Uranium Isotopes	DOE-A-01-R				
Ra-226 and -228	9315/9320				
Gamma Emitters	901.1				
Thorium Isotopes	DOE-A-01-R				
TAL Metals (dissolved)[1]	SW6010B/7470		3		3
Data Gap Surface Soil Samples (IIIa)					
TCL Volatiles	SW8260	"RI-SB-" prefix- followed by boring number, followed by "-NS." (i.e., RI-SB-01-NS through RI-SB-30-NS).	30	Duplicate Sample Numbers will start at 800 (e.g., RI-SB-800-NS).	30
TAL Metals	SW6010B/7471				
Uranium Isotopes	DOE-A-01-R				
Ra-226 and -228	DOE-GA-01-1				
Thorium Isotopes	DOE-A-01-R				
Data Gap Subsurface Soil Samples (IIIa)					
TAL Metals	SW6010B/7471	"RI-SB-" prefix- followed by boring number, followed by "-SS." (i.e., RI-SB-01-SS through RI-SB-30-SS).	30	Duplicate Sample Numbers will start at 800 (e.g., RI-SB-800-SS).	30
Drilling Water Samples[2] - (IIIa)					
TCL Volatiles	SW8260	Consecutively numbered starting at DW-01.	3	-	3
TAL Metals	SW6010B/7471		3		3
Gross Alpha and Beta	9310		1		1
Uranium Isotopes	DOE-A-01-R		1		1
Ra-226 and -228	9315/9320		1		1
Thorium Isotopes	DOE-A-01-R		1		1
Rinsate Samples[3] - (IIIa)					
TCL Volatiles	SW8260	Consecutively numbered starting at RB-01.	25	-	25
TAL Metals	SW6010B/7470		15		15
Gross Alpha and Beta	9310		5		5
Uranium Isotopes	DOE-A-01-R		5		5
Ra-226 and -228	9315/9320		5		5
Thorium Isotopes	DOE-A-01-R		5		5
Vertical Profile Groundwater Samples from Monitoring Well Boreholes (IIIb)					
		Well ID(MW-14DD, MW-15DD, MW-18I, MW-22I, MW-23I, MW-28I, MW-30I, MW-31I, MW-41, MW-42, MW-43, MW-44, MW-49, MW-50, MW-51, MW-52, MW-53, MW-55I and MW-56I).	19	Duplicate samples will be identified by the original sample ID and replacing the depth number suffix starting with 900 (e.g., MW-14DD-VP900, etc).	
TCL Volatiles	SW8260		12		124
TAL Metals	SW6010B/7470		6		51
Radiation (total U)	KPA-LIQ		14		124
Uranium Isotopes	DOE-A-01-R		15		148
Ra 226 and 228	9315/9320				
Thorium Isotopes	DOE-A-01-R				
Vertical Profile Groundwater Samples from Profile Borings (IIIb)					
TCL Volatiles	SW8260	RI-P-40I, RI-P-45DD, RI-P-47I, RI-P-48I and RI-P-54I, RI-P-56I followed by "-VP" and two digit number for depth interval (i.e., RI-P-40I-VP01, -VP02, ... through RI-P-56I-VP01, -VP02, ...).	6	Duplicate samples will be identified by the original sample ID and replacing the depth number suffix starting with 900 (e.g., RI-P-40I-VP900).	81
TAL Metals	SW6010B/7470		3		45
Radiation (total U)	KPA-LIQ		2		27
Uranium Isotopes	DOE-A-01-R		3		20
Ra 226 and 228	9315/9320		3		20
Thorium Isotopes	DOE-A-01-R		3		20

Table 2.5-3 Phase III RI Sampling and Chemical Analysis Detail Table, Sylvania Corning FUSRAP Site, Hicksville, New York

Analysis	Method	Sample ID/Sample Location	Number of Locations	Field Duplicates[4]	Total Number of Samples
Existing Monitoring Well Groundwater Samples (IIIb)					
TCL Volatiles	SW8260	MW-3-GW, MW-4-GW, and MW-8-GW through MW-12-GW.	7	-	7
TAL Metals (total)	SW6010B/7470				
Gross Alpha and Beta	9310				
Uranium Isotopes	DOE-A-01-R				
Ra-226 and -228	9315/9320				
Gamma Emitters	901.1				
Thorium Isotopes	DOE-A-01-R				
TAL Metals (dissolved)[1]	SW6010B/7470		0		0
Drilling Water Samples (IIIb)					
TCL Volatiles	SW8260	Consecutively numbered starting at DW-21.	1	-	1
TAL Metals	SW6010B/7471		1		1
Gross Alpha and Beta	9310		1		1
Uranium Isotopes	DOE-A-01-R		1		1
Ra-226 and -228	9315/9320		1		1
Thorium Isotopes	DOE-A-01-R		1		1
Newly Installed Phase Permanent Monitoring Well Groundwater Samples (IIIb)					
TCL Volatiles	SW8260	Well ID (MW-13S, MW-14DD, MW-14S, MW-15DD, MW-15S, MW-16S, MW-18I, MW-19S, MW-20I, MW-20S, MW-21I, MW-21S, MW-22I, MW-22S, MW-23S, MW-23I, MW-24S, MW-25S, MW-25I, MW-26S, MW-27D, MW-27S, MW-28S, MW-28I, MW-30S, MW-30I, MW-31I, MW-33S, MW-34S, MW-41S, MW-42I, MW-43S, MW-44S, MW-49S, MW-50I, MW-51I, MW-52D, MW-53S and MW-55S) followed by "-GW" (i.e., MW-13S-GW, ... through MW-55S-GW).	39	"MW-" Prefix followed by Duplicate Sample Number starting at 901, followed by "-GW" (e.g., MW-901-GWR2).	39
TAL Metals (total)	SW6010B/7470				
Gross Alpha and Beta	9310				
Uranium Isotopes	DOE-A-01-R				
Ra-226 and -228	9315/9320				
Gamma Emitters	901.1				
Thorium Isotopes	DOE-A-01-R				
TAL Metals (dissolved)[1]	SW6010B/7470		1		1
				Total Phase III Duplicate Samples[4]	**90**
				Total Phase III Trip Blank Samples[5]	**12**
				Total Phase III MS/MSD Samples[6]	**52**

Notes:

[1] If water turbidity was greater than 50 NTUs during sample collection, a portion of the sample was filtered in the field and was submitted for dissolved metals analysis by Method 6010B/7470.

[2] Drilling water samples were collected for all parameters in the beginning of the field activities and once every 2 months. An additional metals and VOC sample were collected in the middle of the field activities. More quick TAT VOC drilling water samples may have been collected during the course of the vertical profiling.

[3] Rinsate samples were collected at a frequency of 1 per vertical profile boring. Additional rinsate samples were required if non-dedicate filtering equipment was used.

[4] Duplicate samples were blind and were collected at a frequency of 1 per 10.

[5] Trip blanks were submitted with every shipment of aqueous samples that were tested for VOCs except for the screening vertical profile groundwater samples that were not accompanied by trip blanks.

[6] Additional volume was required for the MS/MSD samples collected at a frequency 1 per 20 original samples.

Turnaround Times. The bottom five vertical profile groundwater samples collected from the deep wells, all the vertical profile groundwater samples collected from the shallow stand-alone wells and the five borings TAT were 12-72 hours up to 7 days from sample pick-up. For the remaining samples (monitoring well groundwater and soil samples) TAT was 28 days.

Profiling depths. Profiling of the deep wells was conducted continuously starting at 60 feet BGS. Profiling at the three stand-alone shallow wells and the five profile borings were conducted at select

Key:
DW = Drilling water.
GW = Monitoring well groundwater sample.
ID = Sample Identification.
MS/MSD = Matrix spike/matrix spike duplicate.
MW = Monitoring well.
NTU = Nephelometric turbidity units.
Ra = Radium.
RB = Rinsate sample.
RI = Remedial Investigation.
SB = Soil boring.
TAL = Target Analyte List.
TAT = Turnaround time.
TCL = Target Compound List (from the most current version of EPA Contract Laboratory Program [CLP] methods, SOM01.1).
VOC = Volatile organic compounds.
VP = Vertical profile groundwater sample.

Table 2.5-4 Summary of Subsurface Investigation Field Activities, Remedial Investigation, Phase II, Sylvania Corning FUSRAP Site, Hicksville, New York

Original Boring ID	Depth Drilled (ft)	Depth of Downhole Gamma Survey (ft)	No. of Samples Collected	Comments
B70 Property - Exterior Data Gap Borings (SU-09, SU-13, and SU-14)				
SU09-01	24	23	3	Additional 8-ft interval collected due to elevated PID readings in soil core.
SU09-02	16	16	2	VOC samples recollected at later date because of hold time violation.
SU09-03	16	16	2	VOC samples re-collected at later date because of hold time violation.
SU09-04	15	7	2	Early refusal at 15 ft.
SU09-05	16	16	2	Drilled using 10-ft instead of 8-ft sample intervals. Cores evaluated for sampling at 0 to 10-ft and 10- to 15-ft BGS intervals due to use of 5-ft core barrels.
SU09-06	21	20	3	Continued soil core collection to 21 ft BGS as a result of elevated PID readings at bottom of soil core (16 ft). PID readings at background levels at bottom of boring.
SU09-07	15	8	2	Drilled using 10-ft instead of 8-ft sample intervals. Cores evaluated for sampling at 0 to 10-ft and 10- to 15-ft BGS intervals due to use of 5-ft core barrels.
SU09-08/D	55	35	7	Planned deep boring, but refusal occurred at 55 ft. Did not continue during Phase IIb because of no significant detections.
SU09-09	16	7	2	VOC samples re-collected at later date due to hold time violation.
SU9-10/D	66	64	8	Elevated PID readings throughout borehole and therefore boring continued to 55 ft (refusal) during Phase IIa; completed during Phase IIb. One soil "matrix" sample collected from below water table (collected from 70-72 ft), but analysis was cancelled after discussion with USACE.
SU09-11	16	10	2	No comment.
SU09-12	16	16	2	No comment.
SU09-13	16	10	2	VOC samples re-collected due to hold time violation.
SU09-14	15	10	2	Drilled using 10-ft instead of 8-ft sample intervals. Cores evaluated for sampling at 0 to 10-ft and 10-to 15-ft BGS intervals due to use of 5-ft core barrels.
SU13-01	16	11	2	Elevated PID at 9 ft (200 ppm) but at background levels prior to total depth. Location moved 4 ft east because of jersey barrier blocking access.
SU13-02	16	16	2	No comment.
SU13-03	16	16	2	No comment.
SU13-04	16	16	2	Moved 4 ft east from orignial plot due to drainage structure obstruction.
SU13-05	16	16	2	No comment.
SU13-06	16	14	2	No comment.
SU13-07/D	66	0-64	8	Boring was originally drilled during Phase lla but was completed deeper to further delineate vertically. Saturated soils discovered at 64 ft BGS.
SU13-08	16	16	2	No comment.

Table 2.5-4 Summary of Subsurface Investigation Field Activities, Remedial Investigation, Phase II, Sylvania Corning FUSRAP Site, Hicksville, New York

Original Boring ID	Depth Drilled (ft)	Depth of Downhole Gamma Survey (ft)	No. of Samples Collected	Comments
SU13-09	16	16	2	Moved 5 ft northeast due to drainage structure obstruction.
SU13-10	16	15	2	No comment.
SU13-11	16	7	2	No comment.
SU13-12	16	16	2	No comment.
SU13-13	16	16	2	No comment.
SU13-14	16	7	2	No comment.
SU13-15	16	16	2	No comment.
SU14-01	16	15.5	2	Moved 9 ft SW due to utilities.
SU14-02	16	16	2	Moved 4 ft south and 10.5 ft east due to surficial backfill/debris.
SU14-03/D	64	0-65	8	No comment.
SU14-04	16	16	2	Moved 8 ft east due to utilities.
SU14-05	24	24	2	Drilled deeper due to PID readings (35 ppm) in Z2 interval.
SU14-06	16	16	2	Moved 16 ft NE due to utilities.
SU14-07	16	16	2	No comment.
SU14-08	16	14	2	No comment.
SU14-09	16	16	2	No comment.
SU14-10/D	66	0-66	8	Completed as shallow boring during Phase lla (16 ft) and completed as deep boring during Phase llb. Saturated soils discovered at approximately 64 ft BGS.
SU14-11	16	16	2	Collected PCB aliquot.
SU14-12	16	16	2	Collected PCB aliquot. VOC sample jars for SU14-Z2 were broken during shipment and re-collected at later date.
SU14-13	16	16	2	Collect PCB aliquots.
SU14-14	16	16	2	Collected PCB aliquots.
SU14-15	16	16	2	Moved 8 ft south due to anchored machinery.
SU14-16	16	16	2	Moved 7 ft northeast due to drainage structure.
SU14-17	16	16	2	Moved 4 ft north due to drainage structure.
SU14-18	16	16	2	No comment.
SU14-19	16	16	2	No comment.
SU14-20	16	16	2	No comment.
B70 Property - Interiror Data Gap Borings (SU-10, SU-11, and SU-12)				
SU10-01	8	6	1	Early refusal at 8 ft BGS.
SU10-02	11	9	2	Early refusal at 9 ft BGS. Elevated PID reading in soil core from bottom of boring (Z2 = 53.5 ppm).
SU10-03	8	6	1	Early refusal at 8 ft BGS. VOC samples re-collected due to hold time violation.

Table 2.5-4 Summary of Subsurface Investigation Field Activities, Remedial Investigation, Phase II, Sylvania Corning FUSRAP Site, Hicksville, New York

Original Boring ID	Depth Drilled (ft)	Depth of Downhole Gamma Survey (ft)	No. of Samples Collected	Comments
SU10-04	11.5	11	2	Early refusal at 11.5 ft BGS. PID readings suspicious - may be false positive due to moisture. Originally planned for deep boring but early refusal only allowed for shallow penetration as a result of limited rig access.
SU10-05	12	11	2	Refusal at 12 ft. Difficult macrocore removal. PID readings suspect - possible false positives due to moisture.
SU10-06	16	13	2	Refusal at 12 ft BGS. Difficult macrocore removal. PID readings suspect - possible false positives due to moisture. Converted to shallow boring due to limited rig access.
SU10-07	12	12	2	Early refusal at 12 ft BGS.
SU10-08	9	8	1	Early refusal at 9 ft BGS. Elevated PID readings in borehole and soil core. No PID readings from 7-9 ft.
SU10-09	6	4	1	Early refusal at 6 ft BGS. Slightly elevated PID reading (Z1 = 8.1 ppm) but background levels at bottom of boring.
SU10-10	20	16	3	Elevated PID readings at 16 ft (Z2 = 40.1 ppm); extra 4-ft soil core collected with elevated PID reading at bottom (Z3 = 17.8 ppm). Only 1.5 ft recovery; Early refusal at 20 ft BGS.
SU10-11	11	9	2	Early refusal at 11 ft BGS. VOC samples re-collected at later date due to hold time violation.
SU10-12	12	12	2	Early refusal at 12 ft BGS.
SU10-13	9	9	1	Planned deep boring but early refusal due to limited rig access. Early refusal at 9 ft BGS. Slightly elevated PID reading (2.8 ppm) in upper 4 ft, then background readings at bottom.
SU10-14	14	13	2	Early refusal at 14 ft BGS.
SU10-15	11	5	2	Early refusal at 11 ft BGS. VOC samples re-collected on later date due to hold time violation.
SU10-16	12	10	2	Early refusal at 12 ft BGS.
SU10-17	9	2	2	Early refusal at 9 ft BGS.
SU10-18	16	14	2	No comment.
SU10-19	11	9	2	Early refusal at 11 ft BGS. VOC samples re-collected due to hold time violation.
SU11-01	16	15	2	No comment.
SU11-02	12	10	2	Early refusal at 12 ft BGS.
SU11-03	8	8	1	Early refusal at 8 ft BGS. Slightly elevated PID reading (Z1 = 5.7 ppm) in soil cores, but background levels at bottom of boring.
SU11-04	20	20	2	Slightly elevated PID reading (<5 ppm) but background levels at 16 ft. Additional soil core collected because a 5-ft core barrel was being utilized; therefore, rather than driving the barrel only 1 ft to achieve 16 ft total depth and risk no recovery, the full 5-ft core was driven.
SU11-05/D	66	0-64	7	Boring was originally drilled during Phase lla to 12 ft but was completed deeper to delineate further vertically. Saturated soils discovered at 56 ft BGS.
SU11-06	9	7	2	Early refusal at 9 ft BGS.

Table 2.5-4 Summary of Subsurface Investigation Field Activities, Remedial Investigation, Phase II, Sylvania Corning FUSRAP Site, Hicksville, New York

Original Boring ID	Depth Drilled (ft)	Depth of Downhole Gamma Survey (ft)	No. of Samples Collected	Comments
SU11-07	16	12	2	Elevated PID (Z1 = 25 ppm) but reducing toward bottom (4.9 ppm at bottom of soil core); no extra cores collected.
SU11-08	16	6	2	No comment.
SU11-09	20	20	2	Elevated PID reading (<25 ppm) in Z2 (8-16 ft) but background levels at 16 ft. Additional soil core collected because a 5-ft core barrel was being utilized; therefore, rather than driving the barrel only 1 ft to achieve 16 ft. total depth and risk no recovery, the full 5-ft core was driven.
SU11-10	13	13	2	Early refusal at 13 ft BGS. Elevated PID reading (Z2 = 58.7 ppm) but background levels over last ft of core.
SU11-11	20	20	2	Elevated PID readings (<25 ppm) but background levels at 16 ft. Additional soil core collected because a 5-ft core barrel was being utilized; therefore, rather than driving the barrel only 1 ft to achieve 16 ft total depth and risk no recovery, the full 5-ft core was driven.
SU-11-12	20	20	2	Elevated PID readings at 15 ft (4.1 ppm) but clean at bottom.
SU11-13	49	49	6	Early refusal before establishing background PID levels but exhibited a downward trend (high = 395 ppm at 15 ft; 41.4 ppm at 49 ft).
SU11-14	34	16.5	4	Z1 collected on a different day than Z2 through Z4 because drill rig stalled after collection of Z1 and could not be restarted. Collected extra soil cores to 32 ft before establishing low level PID readings (2.9 ppm).
SU11-15	16	13	2	Elevated PID reading in Z2 (770 ppm). Early refusal at 16ft BGS did not allow for extra soil cores to be collected.
SU11-16	20	19	3	Elevated PID readings at 16 ft (117 ppm); extra 4-ft soil core collected that exhibited background levels throughout. Extra core sampled as Z3.
SU11-16/D	66	0-64	8	Boring was originally drilled during Phase lla to 20 ft but was drilled deeper for additional vertical delineation. Saturated soils discovered at 56 ft BGS.
SU11-17	20	20		Boring was performed as shallow boring to help determine which borings may be more appropriate deep borings during Phase IIb. Additional soil core collected because a 5-ft core barrel was being utilized; therefore, rather than driving the barrel only 1-ft to achieve 16-ft total depth and risk no recovery, the full 5-ft core was driven.
SU11-18	18	18	2	Drilled to 18 ft because 5-ft core barrels were being used and rather than drive one ft to achieve 16 ft total depth, the barrel was to be advanced to 20 ft. However, there was refusal at 18 ft BGS. Elevated PID reading at 8-10 ft (220 ppm high) but background levels at bottom.
SU11-19	16	15	2	
SU11-20	16	15	2	PID reading (5.1 ppm) at 8-10 ft, but background levels at bottom.
SU11-21	11	11	2	Elevated PID reading 98.6 ppm at 11 ft (Z2) but met refusal.
SU11-22	8	7	1	Early refusal at 8 ft BGS. Elevated PID reading at bottom of soil core (17.2 ppm).
SU12-01/D	0	0	0	Not drilled, scheduled for Phase IIb.

Table 2.5-4 Summary of Subsurface Investigation Field Activities, Remedial Investigation, Phase II, Sylvania Corning FUSRAP Site, Hicksville, New York

Original Boring ID	Depth Drilled (ft)	Depth of Downhole Gamma Survey (ft)	No. of Samples Collected	Comments
SU12-01/D	66	0-64	8	Saturated soils at 64 ft BGS.
SU12-02	20	11	3	Elevated PID reading (77.6 ppm); collected extra 4-ft soil core which exhibited background levels throughout.
SU12-03/I	32	0-32	4	Minimal recovery after 16 ft during Phase lla so only 2 samples collected during this phase (possible gravel stuck in shoe and blocking soils). Soils collected began showing PID readings below 16 ft. Soils collected to 16 ft were obvious fill. Downhole gamma survey indicated elevated readings to 17 ft with the high reading at 16 ft (5 to 6 times background; 9,600 cpm). Recharge basin bottom possibly at 14 ft. Boring completed during Phase llb.
SU12-04/I	32	0-32	4	Low PID readings (< 5 ppm).
SU12-05	16	11	2	No comment.
SU12-06	20	13	3	Elevated PID reading (Z2 = 122 ppm); collected extra 4-ft soil core which exhibited background levels toward bottom.
SU12-07/D	66	0-64	8	Saturated soils at 64 ft BGS.
SU12-08/I	32	0-32	4	No comment.
SU12-09	13	12	2	Early refusal at 12 ft BGS. Elevated PID readings (Z1 = 75 ppm; Z2 = 6.8) but no PID readings above background over last ft of core. Location was probed twice because no recovery was gained past 8 ft during first attempt. During second attempt a soil core was collected between 8-12 ft but then met refusal.
SU12-10	20	10	3	Elevated PID reading (230 ppm at 16 ft); collected extra 4-ft soil core which exhibited background levels toward bottom.
SU12-11/I	32	0-32	4	Low level PID readings (< 7 ppm).
SU12-12/I	32	0-32	4	Boring was originally drilled during Phase lla but only Z1 sample collected. Drilled to planned deoth during Phase llb. Low level PID readings (< 5 ppm).
SU12-13	16	12	2	No recovery in 12-16 ft core.
SU12-14	16	5	1	No recovery from 8-16 ft, therefore, only one sample collected (Z1).
SU12-15	16	12	2	No comment.
SU12-16	13	13	2	Early refusal at 13 ft BGS.
SU12-17/I	32	0-32	4	No comment.
SU12-18	12	8	2	Early refusal at 13 ft BGS.
SU12-19	15	11	2	Early refusal at 15 ft.
SU12-20	16	12	2	No comment.
SU12-21	12	8	2	Early refusal at 12 ft.
SU12-22/D	66	0-64	8	Saturated soils discovered at 64 ft BGS.

Table 2.5-4 Summary of Subsurface Investigation Field Activities, Remedial Investigation, Phase II, Sylvania Corning FUSRAP Site, Hicksville, New York

Original Boring ID	Depth Drilled (ft)	Depth of Downhole Gamma Survey (ft)	No. of Samples Collected	Comments
B140 Property - Exterior Data Gap Borings (SU-08)				
SU08-01	16	16	2	No comment.
SU08-02/D	61	0-61	7	Saturated soils encountered at 48 ft BGS. Borehole was advanced to 61 ft to determine if saturated soils were the result of a perched aquifer. Soils were saturated throughout - no samples collected below Z6 (40-48 ft BGS).
SU08-03	16	16	2	No comment.
SU08-04	12	12	2	Early refusal met at 12 ft BGS. Boring performed 3 ft SW of planned location because of presence of leach pool/drywell.
SU08-05	16	16	2	Boring performed 11 ft north of planned location because of presence of leach pool/drywell.
SU08-06	16	16	2	No comment.
SU08-07	16	16	2	VOC samples re-collected at later date due to hold time violation of original sample.
SU08-08	16	16	2	Elevated PID readings (Z1 = 115 ppm; Z2 = 41.3 ppm) but no readings above background at bottom. VOC samples recollected at later date due to hold time violation.
SU08-09	20	20	2	High PID reading (Z1 = 126 ppm) in upper portion of core but no readings above background at 16 ft. Additional soil core collected because a 5-ft core barrel was being utilized; therefore, rather than driving the barrel only 1-ft to achieve 16 ft total depth and risk no recovery, the full 5-ft core was driven.
SU08-10	20	20	2	Additional soil core collected because a 5-ft core barrel was being utilized; therefore, rather than driving the barrel only 1-ft to achieve 16 ft total depth and risk no recovery, the full 5-ft core was driven.
SU08-11/D	64	0-64	7	Water table at 56 ft BGS. No samples collected below Z7 (48-56 ft BGS).
SU08-12	16	15	2	VOC samples re-collected at later date due to hold time violation.
SU08-13	20	20	2	Additional soil core collected because a 5-ft core barrel was being utilized; therefore, rather than driving the barrel only 1-ft to achieve 16 ft total depth and risk no recovery, the full 5-ft core was driven.
SU08-14/ DRY B	16	16	2	Boring located within 2-ft of DRY-B boring and boring was then completed at DRY-B.
SU08-15	16	16	2	No comment.
B140 Property/Interior and Exterior - Data Gap Borings				
140-01	9	5	2	Early refusal at 9 ft BGS. Elevated PID readings in Z2/9ft (20.4 ppm) from bottom of borehole.
140-02	11	6	2	Early refusal at 11 ft BGS.
140-03	9	6	2	Early refusal at 9 ft BGS.
140-04	11	6	2	Early refusal at 9 ft BGS.
140-05	11	11	2	Early refusal at 11 ft BGS.

Table 2.5-4 Summary of Subsurface Investigation Field Activities, Remedial Investigation, Phase II, Sylvania Corning FUSRAP Site, Hicksville, New York

Original Boring ID	Depth Drilled (ft)	Depth of Downhole Gamma Survey (ft)	No. of Samples Collected	Comments
140-06	16	16	2	Slightly elevated PID readings (Z1 = 10.2 ppm and Z2 = 5.1 ppm). Rad reading close to twice background in soil core. Downhole gamma survey did not exhibit elevated readings. VOCs and rad collected from different intervals. Rad sample collected across silt layer.
140-07/D	66	0-64	8	Saturated soils encountered at 64 ft BGS and sampling discontinued.
140-08	16	16	2	Slightly elevated PID readings (Z1 = 2.0 ppm and Z2 = 13.9 ppm). Elevated rad readings noted in downhole gamma survey in shallow interval (less than 4 ft).
140-09	11.5	11	2	Early refusal at 11.5 ft. BGS. Elevated PID readings (11.6 ppm) in soil core at bottom of boring.
140-10	16	16	2	No comment.
140-11	16	16	2	No comment.
B100 Property/Interior and Exterior - Data Gap Borings				
100-01	11	9	2	Early refusal at 11 ft BGS. Elevated PID readings (Z1 = 87.8 ppm; Z2 = 16.2 ppm). Elevated PID readings in soil core from bottom of borehole.
100-02	11.75	11	2	Early refusal at 11.75 ft BGS. Elevated PID readings in soil core from bottom of borehole (Z2 = 82.7 ppm).
100-03	10	10	2	Early refusal at 10 ft BGS. Elevated PID readings in soil core from bottom of borehole (Z2 = 44.7 ppm).
100-04	9	8	2	Early refusal at 9 ft BGS. Elevated PID readings in Z1 (42.7 ppm) soil core from bottom of borehole.
100-05	12	12	2	Early refusal at 12 ft BGS.
100-06/D	58	0-56	7	Saturated soils encountered at 56 ft BGS and therefore sampling was discontinued after collecting Z7 (48 to 56 ft) interval. Low level PID hits (<11 ppm).
100-07	16	16	2	No comment.
100-08	16	16	2	No comment.
100-09	16	16	2	No comment.
100-10	16	15	2	VOC samples re-collected at later date due to hold time violation of orginal sample.
100-11	24	0-24	3	Boring was originally drilled to 16 ft during Phase lla but was completed during Phasellb. Elevated rad activity in upper 12 ft of borehole detected which corresponds to results from Phase IIa. No elevated activity noted sample interval Z3 (16-24 ft BGS).
Confirmatory Borings				
C1-01	32	0-32	1	No comment.
C1-02	23	0-23	1	Excavation boundary identified at 18 ft BGS.
C1-03	25	0-25	1	Excavation boundary identified at 20 ft BGS.
C2-01	34	0-34	1	No comment.
C2-02	36	25-36	1	Excavation boundary in the 32- to 34-ft split spoon.

Table 2.5-4 Summary of Subsurface Investigation Field Activities, Remedial Investigation, Phase II, Sylvania Corning FUSRAP Site, Hicksville, New York

Original Boring ID	Depth Drilled (ft)	Depth of Downhole Gamma Survey (ft)	No. of Samples Collected	Comments
C3-01	30	21-30	1	Excavation boundary identified at 23 ft BGS.
C3-02	32	0-32	1	No comment.
C4-01/D	58.5	25-58.5	4	Geoprobe had refusal at 58.5 ft BGS. Sample was collected at bottom. PID readings still elevated >1000 ppm (throughout boring).
C4-02	32	23-32	1	No comment.
C4-03	32	23-32	1	No comment.
C5-01	30	0-30	1	Excavation boundary identified at 25 ft BGS.
C5-02	33	0-33	1	Excavation boundary identified at 28 ft BGS.
C6-01	56	0-56	1	Clean fill still noted at planned 48-50 ft BGS sampling interval, therefore, boring was advanced deeper before sample was collected in native soils at 54 to 56 ft BGS.
C6-02/D	52	40-52	1	Geoprobe had refusal at 52 ft BGS. Sampling began at Z7 interval (48-52 ft) and only one sample collected but had planned two samples. Screening results did not indicate any contaminants.
C6-03	22	0-22	1	Excavation boundary identified at 15.5 ft BGS.
C7-01	40	23-40	2	Due to slightly elevated PID readings (<15 ppm); an extra soil core and sample was collected from the Z5 zone (32-40 BGS).
C7-02	32	23-32	1	Extra two ft soil core collected within planned Z4 target zone for screening only due to slightly elevated PID reading (5 ppm).
C8-01	30	23-30	1	No comment.
C8-02	30	23-30	1	No comment.
C9-01	50	41 - 50	1	No comment.
C9-02/D	69	0-64	2	Saturated soils discovered at 64 ft BGS.
C9-03/D	68	0-64	3	Sampling scheduled to begin at 48 ft but augers need to be set at 45 ft to be flush with ground surface for Geoprobe. Green tinged sands with elevated rad activity noted at 45-46 ft so extra sample was collected for analysis.
C9-04/D	64	0-64	2	No comment.
C10-01	30	21-30	1	No comment.
C10-02	30	21-30	1	No comment.
C11-01	56	56	1	Elevated PID reading at 52-ft target depth for sample collection (40 ppm). Completed collection of Z7 interval (to 56 ft) for field screening which indicated a significant downward trend (~10 ppm) at bottom of interval. No further samples were collected.
C11-02	56	33-56	2	Due to slightly elevated PID readings (58 ppm) - extra soil cores were collected and sampled from the Z7 zone (51 to 52 ft BGS).
C12-01	34	25-34	1	No comment.

Table 2.5-4 Summary of Subsurface Investigation Field Activities, Remedial Investigation, Phase II, Sylvania Corning FUSRAP Site, Hicksville, New York

Original Boring ID	Depth Drilled (ft)	Depth of Downhole Gamma Survey (ft)	No. of Samples Collected	Comments
C12-02	32	23-32	1	Sample was proposed for collection at 30-32 ft BGS. Geologist determined that soils from 30- to 31-ft interval were clean fill and so sample was collected from 32-34 ft BGS.
C13-01	16	7-16	1	No comment.
C13-02	16	7-16	1	No comment.
C13-03	24	7-24	2	Due to slightly elevated PID readings (<10 ppm) - extra soil cores collected and sample collected from zone (Z3; 26-24 ft BGS) below zone planned for sampling (Z2; 14-16 ft).
Leach Pool/Drain/Drywell/Sump Borings				
DRH-A	0	0	0	Not drilled due to inaccessibility (large steel storage container).
DRH-A1	32	0-32	4	Boring was originally drilled during Phase lla to 12 ft. Boring completed during Phase llb.
DRH-A2	24	0-24	3	Boring was originally drilled during Phase lla to 10 ft and two samples collected. Boring completed during Phase IIb. During Phase IIa the following was noted: Elevated downhole gamma readings (6,000 cpm) noted between 1 and 3 ft during downhole gamma survey. Average site background (approx. 700 to 3200 cpm) and Phase IIa B140 soil boring backgrounds (800 cpm). The Z1 sample was originally collected at 7-8 ft, but then discarded after the results of the downhole survey was obtained. Since little recovery from this interval during initial run, a new Z1 sample from 1-3 ft was recollected. Noted wood pieces and dark wet silt in this core; wet silt had sewage type odor. No PID readings above background noted in boring. but was drilled deeper for additional vertical delineation. Old bicycle tire rim and rubber tire came out of borehole with soil cuttings when removing auger flights.
DRH-B	16	15	2	Since background levels to 16-ft will move deep boring to LPH-A in general vicinity.
DR-C	20	18	3	Elevated PID readings in Z2 soil core (8-16 ft; 80 ppm); extra 4-ft soil core collected that exhibited elevated PID readings; early refusal did not allow for more soil cores to be collected.
DR-D	16	0	1	Elevated PID reading across Z1 soil core (0-8; 8.2 ppm); No recovery across Z2 (8-16; sample shake-out during difficult retrieval). Borehole collapsed and did not allow for installation of PVC for downhole gamma survey.
DR-D	16	0-16	1	Boring was originally drilled during Phase lla but only Z1 sample collected. Boring completed during Phase IIb.
DR-E	16	11	2	Elevated PID readings in Z1 (0-8 ft; 4.6 ppm) and Z2 (8-16 ft; 79.4 ppm). No recovery and refusal while attempting to collect 16-20 ft.
DR-F	20	20	2	Low PID readings (<10 ppm) but below background at 16 ft. Additional soil core collected because a 5-ft core barrel was being utilized, therefore, rather than driving the barrel only 1-ft to achieve 16 ft sample interval and risking no recovery, the full 5-ft core was driven.
DR-G	20	20	2	Elevated PID reading at 15 ft (16.7 ppm high) but at background levels over bottom ft of soil core.
DR-H	16	14	2	No elevated PID or gamma readings.

Table 2.5-4 Summary of Subsurface Investigation Field Activities, Remedial Investigation, Phase II, Sylvania Corning FUSRAP Site, Hicksville, New York

Original Boring ID	Depth Drilled (ft)	Depth of Downhole Gamma Survey (ft)	No. of Samples Collected	Comments
DR-I	20	16	3	Elevated PID readings in Z1 and Z2 (10 and 44.5 ppm, respectively); Extra 4-ft core collected that exhibited backgrounc levels throughout.
DR-J	24	0-24	1	Boring was originally drilled during Phase lla to 14 ft and two samples collected (Z1 and Z2). Boring completed during Phase llb. Low PID readings (< 5 ppm). A black oily layer was noted in the boring. Some of the oily material was captured in the sample. Oily material did not emit activity or detectable volatiles.
DR-K	32	0-32	4	Boring was originally drilled during Phase lla to 17 ft and three samples collected (Z1 through Z3). Boring completed during Phase llb.
DR-L	16	15	2	Elevated PID readings in isolated zone (12-13 ft), with background levels toward bottom of core; no extra cores
DR-M	12	0	2	Drill rods stuck in borehole while collecting 12-16 ft macro-core and could not be retrieved with Geoprobe. Geoprobe swing arm bent while attempting to retrieve.
DR-N	15	11	2	Soil sampling slightly shallower than planned due to refusal.
DR-O	20	20	3	Collected extra soil core before establishing background levels at bottom of borehole (24 ppm to 12.3 ppm from 2-17.5 ft BGS).
DR-P	20	20	2	Elevated PID readings (<15 ppm) but background levels by 16 ft. Additional soil core collected because a 5-ft core barrel was being utilized, therefore, rather than driving the barrel only 1 ft to achieve 16 ft total depth and risking no recovery, the full 5-ft core was driven.
DR-R1/R2	8	7	1	Early refusal - high PID reading at bottom of soil core (316 ppm).
DR-U	16	14	2	No comment.
DR-V	16	14	2	No comment.
DR-W	7	0-5	1	Early refusal at 7 ft.
DR-X	16	0-9	2	Early refusal at 9ft.
DR-Y	16	0-5	2	Early refusal at 5 ft.
DR-Z	2	0-2	2	Boring was drilled with jackhammer probe due to limited access. It was drilled twice due to early refusal on separate dates. One sample was collected both times; Z1 and Z1A. During the second attempt a low level PID reading was noted (<5 ppm). Early refusal caused by existence of a concrete structure (possible footer) at 2 ft.
DR-AA	16	0-13	2	Early refusal at 13 ft.
DR-BB1/2	16	0-9	2	Elevated radiation activity noted inside lead lined drains (up to 10 times background with GM pancake probe; high of 600 cpm inside BB-2 drain). Radiation was removable (high of 166 alpha/1074 beta dpm/100 cm2) but found only inside the drains. Swipes of the room did not indicate that the removable had spread outside of drains. Radiation readings from soils collected next to drains did not indicate any elevated activity.
DR-CC	16	0-10	2	Early refusal at 10 ft.

Table 2.5-4 Summary of Subsurface Investigation Field Activities, Remedial Investigation, Phase II, Sylvania Corning FUSRAP Site, Hicksville, New York

Original Boring ID	Depth Drilled (ft)	Depth of Downhole Gamma Survey (ft)	No. of Samples Collected	Comments
DRY-B	16	16	2	Drilled at same location as SU08-14; therefore SU08-14 boring eliminated.
DRY-D	32	32	4	Collected additional samples due to elevated PID readings in soil cores (high >500 ppm at 15-16 ft). Background PID readings established by 32 ft.
DRY-E	16	15	2	No comment.
DRYH-A	16	15	2	No comment.
DRYH-C	16	12.5	2	No comment.
DRYH-F	20	20	2	Elevated PID readings (<40 ppm) but background levels by bottom of borehole. Additional soil core collected because a 5-ft core barrel was being utilized; therefore, rather than driving the barrel only 1 ft to achieve 16 ft total depth and risk no recovery, the full 5-ft core was driven.
LPH-A/D	50	0-48	6	Saturated soils discovered at approximately 48 ft BGS.
LPH-B	16	16	2	No comment.
LPH-C/D	68	0-68	8	Saturated soils discovered at approximately 66 ft BGS.
SMP-1	20	20	2	Drilled on south side of potential sump located near NW corner of B70 central warehouse.
Test Trench Investigation				
EM-2	4	0	1	Discovered historic drain pipes. No elevated PID or rad activity noted.
EM-3/ GPR-A	8	0	2	Discovered old piping in ground; some removed and some left in place; piping that was removed may have been from a previous building drain; Soil material within piping exhibited elevated rad activity; sample collected for analysis from interior of piping; surrounding soils did not exhibit elevated rad readings. A sample was collected from the pit bottom soils as planned.
EM-5	4	0	2	Discovered metal piping in shallow subsurface; two separate piping lines; some slightly elevated rad activity noted in soils.
EM-7	4.5	NA	2	Discovered old piping.
EM-8	5	NA	2	Discovered reinforced concrete debris and other minor metallic objects.
EM-9	5	NA	2	Discovered reinforced concrete debris and other minor metallic objects.
EM-11	10	NA	2	Minor debris noted in boring. Some slightly elevated radiation activity in isolated soils.
EM-13	4	NA	2	A metal utility pipe was discovered at largest gradient portion of anomaly. Pipe was not damaged. Some slightly elevated radiation activity noted in isolated soils.
EM-15a	7	0	0	Noted cut metal bollard and smaller metallic debris in pit. No PID/rad readings above background, therefore, no samples.
EM-15b	7	0	2	Elevated rad readings in soil. Discovered green pebble size grains in soil that exhibited elevated rad readings. Most elevated rad readings were shallow (2 ft) above an asphalt layer that may have been a historic parking area.

Table 2.5-4 Summary of Subsurface Investigation Field Activities, Remedial Investigation, Phase II, Sylvania Corning FUSRAP Site, Hicksville, New York

Original Boring ID	Depth Drilled (ft)	Depth of Downhole Gamma Survey (ft)	No. of Samples Collected	Comments
EM-16	4.5	NA	2	Concrete and small debris noted in trench and what appeared to be possible utility contained within PVC at 4.5 ft was encountered. Utility was not damaged.
EM-21	7	0	2	Geophysical anomaly was due to buried concrete rubble with metal reinforcement. Concrete rad activity was elevated compared to soil but not above what is expected for concrete.
EM-26	4	0	1	Discovered concrete foundation and two 2-ft by 6-in diameter support beams. No evidence of contamination and therefore only one sample collected from bottom of borehole.
EM-28	2	NA	2	Discovered a 7 x 12 ft concrete cylindrical drywell/cistern structure beneath surface. Isolated elevated radiation activity noted soils within the dry well. Drywell had no perforations in concrete in sidewalls or at bottom; no lid and appeared to have a solid bottom.
EM-30	5	NA	2	Metallic pipe and concrete debris.
EM-31	5	NA	2	Discovered old piping, wood debris, and some plastic.
EM-34	4.5	NA	2	Wire cable and concrete debris.
EM-35	2	NA	2	Discovered a 2.5-ft fence post type pipe in test pit. No other significant debris in test pit.
EM-29a	6	0	2	Discovered lead drum (~15 to 25 gallon capacity) among other metallic debris no deeper than 3 ft BGS.
EM29b	4	0	0	Excavated at second strongest geophysical anomaly within the EM-29 area. Discovered metallic wires including a small nest of wires in test pit. No stained soils or other significant debris. No samples collected.
GPR-C	6	NA	2	Discovered large piece of rebar in subsurface and three former power lines for B100 running parallel to southern side of building.
GPR-F	4.5	0	3	Discovered small (2x2 inch) slag type of material that exhibited 80,000 cpm with 2x2 inch gamma probe. Soils surrounding it were slightly elevated. Geophysical anomaly was due to some metal support rods and concrete fting. Sample of slag sent to laboratory for analysis.
Concrete Core Sampling				
A3-01	8	8	1	Early refusal at 8 ft. Elevated PID readings in soil beneath slab, therefore, borehole added (no deviation, sampling performed according to WP).
D8-02	concrete core	Below concrete	1	Concrete core sample sent for analysis.
D9-01	concrete core	Below concrete	0	No comment.
F3-01	concrete core	Below concrete	0	No comment.

Table 2.5-4 Summary of Subsurface Investigation Field Activities, Remedial Investigation, Phase II, Sylvania Corning FUSRAP Site, Hicksville, New York

Original Boring ID	Depth Drilled (ft)	Depth of Downhole Gamma Survey (ft)	No. of Samples Collected	Comments
F6-01	7.5	7.5	2	Elevated rad activity noted beneath concrete slab, therefore, borehole drilled below slab. Background readings at bottom of borehole.
F6-02	concrete core	Below concrete	1	Concrete core sample sent for analysis.
G4-01	concrete core	Below concrete	0	No comment.

Key:
BGS = Below ground surface.
cpm = Counts per minute.
ft= feet or foot
PCB = Polychlorinated Biphenyls.
PID = Photoionziation detector.
ppm = Parts per million.
rad = Radiological
USACE = United States Army Corps of Engineering.
VOC = Volatile organic compound.

Table 2.5-5 Geoprobe Boring Summary, Phase IIIa, Sylvania Corning FUSRAP Site, Hicksville, New York

Original Boring ID	Depth Drilled (ft)	Depth of Downhole Gamma Survey (ft)	No. of Samples Collected	Comments
SB-01	8	7	2	No comment.
SB-02	8	5	2	No comment.
SB-03	8	7	2	No comment.
SB-04	8	6	2	No comment.
SB-05	8	6	2	Moved north 7' due to refusal at 2" during first attempt.
SB-06	8	7	2	No comment.
SB-07	8	5	2	No comment.
SB-08	8	7	2	No comment.
SB-09	8	7	2	Moved 5' west due to proximity to transformer.
SB-10	8	7	2	No comment.
SB-11	8	7	2	No comment.
SB-12	8	7	2	No comment.
SB-13	8	7	2	No comment.
SB-14	6	5	2	Early refusal.
SB-15	8	7	2	Moved 5' east due to refusal at planned location.
SB-16	8	7	2	No comment.
SB-17	8	7	2	No comment.
SB-18	8	7	2	No comment.
SB-19	8	7	2	Moved 1' west due to existing landscaping.
SB-20	12	12	2	No comment.
SB-21	8.5	8.5	2	No comment.
SB-22	8	7	2	No comment.
SB-23	7	6	2	Early refusal.
SB-24	8	7	2	No comment.
SB-25	8	5	2	No comment.
SB-26	8	7	2	No comment.
SB-27	8	8	2	No comment.
SB-28	7.5	7	2	Early refusal.
SB-29	8	7	2	No comment.
SB-30	8	8	2	Moved 10' west due to presence of dry well.

Key:
ft = feet
ID = Identification.

Table 2.5-6 Phase IIIa and IIIb Sonic Drilling Progress and Deviations Summary, Sylvania Corning FUSRAP Site, Hicksville, New York

Boring Name	Location Type	Profile Depth Range (feet BGS)	Proposed Number of GW Profile Samples	No. of GW Profile Samples Collected	Drilling Start Date	Drilling End Date	Screen Interval (feet BGS)	Sample IDs	Deviations	Comments
MW-13S	Well	NA	0	0	12/14/2009	12/16/2009	70 - 80	MW-13S-VPxx	No deviations.	No comment.
MW-13D	Well	60-326	24	25	11/18/2008	11/22/2008	290 - 300	MW-13D-VPxx	Collected one additional GW profile sample	At USACE request, collected additional sample VP27 (316') due to VOC hits in previous samples.
MW-14S	Well	NA	0	0	11/9/2009	11/10/2009	70 - 80	MW-14S-VPxx	No deviations.	No comment.
MW-14D	Well	60-306	24	23	11/5/2008	11/17/2008	294 - 304	MW-14D-VPxx	No deviations.	Sample VP17 was not collected due to multiple runs at same interval resulting in a non-representative sample for this interval (see note above).
MW-14DD	Well	315-394	9	9	11/10/2009	12/11/2009	365 - 375	MW-14DD-VPxx	No deviations.	No comment.
MW-15S	Well	NA	0	0	11/5/2009	11/6/2009	70 - 80	MW-15S-VPxx	No deviations.	No comment.
MW-15D	Well	60-310	24	23	11/3/2008	11/19/2008	300 - 310	MW-15D-VPxx	GW reacted with HCL preservative in sample VP07 therefore sample was collected into a unpreserved VOAs.	Numerous problems with leaky sampler. Used 7-inch override casing to 150 feet. Sample VP21 was not collected due to leaks in sampler system causing multiple attempts at same interval. The multiple runs resulted in mixing of groundwater from previous intervals into this interval, therefore, a representative sample could not be obtained. Core barrel was accidentally driven to 286 during run to 276 essentially disrupting the following GW sample interval. GW sample VP24 was collected at 289 to remain in zone but to push into virgin material.
MW-15DD	Well	65-394	14	14	1/4/2010	1/19/2010	360 - 370	MW-15DD-VPxx	No deviations.	Note: 15' clay layer containing pyrite lense from ~168 to 185 ft. BGS during installation of MW-15D during Phase IIIa not encountered in soil cores collected from this borehole. Only thin lenses of clay encountered at similar depths at this borehole. VP28 sample collected today of questionable quality. Outer casing was driven to 325 ft BGS and sample screen was collected from ~327-330 ft. BGS. High potential for sample to be impacted by drill water because of minimal distance ahead of outer casing. Reason for this was difficult drilling through clay layer from ~315 to 325 ft BGS.
MW-16S	Well	NA	0	0	3/16/2010	3/18/2010	70 - 80	MW-16S-VPxx	No deviations.	No comment.
MW-16D	Well	60-399	23	29	2/19/2009	3/2/2009	280 - 290	MW-16D-VPxx	No deviations.	No comment.
MW-17S	Well	60-110	5	5	2/20/2009	2/22/2009	65 - 75	MW-17S-VPxx	This well will be sampled for metals only in place of scheduled VOCs. This data will better fit purpose of well which is to determine impacts from elevated rad activity and nickel discovered in shallow soils during Phase II.	No comment.
MW-18S	Well	60-106	5	5	12/18/2008	12/20/2008	62 - 72	MW-18S-VPxx	Added rad analyses in place of rad at MW-31D.	No comment.
MW-18I	Well	113-158	5	4	11/17/2009	12/15/2009	118 - 128	MW-18I-VPxx	VP08 (120-129 ft) not collected due to the sampling tool not opening (2 attempts).	Well being drilled using 6-inch pipe as a result of drillers not having head attachment for rig onsite.
MW-19S	Well	NA	0	0	12/1/2009	12/3/2009	70 - 80	MW-19S-VPxx	No deviations.	No comment.

Table 2.5-6 Phase IIIa and IIIb Sonic Drilling Progress and Deviations Summary, Sylvania Corning FUSRAP Site, Hicksville, New York

Boring Name	Location Type	Profile Depth Range (feet BGS)	Proposed Number of GW Profile Samples	No. of GW Profile Samples Collected	Drilling Start Date	Drilling End Date	Screen Interval (feet BGS)	Sample IDs	Deviations	Comments
MW-19D	Well	60-326	24	23	11/23/2008	12/9/2008	296 - 306	MW-19D-VPxx	No deviations.	Could not get sample at two intervals (VP17 and VP19) after two attempts at both intervals due to drill water intrusion into sampler. Possible cause is newly arrived driller lacking site experience and possible worn down GW point sampler threads. Extra sample collected (VP27 @ 316') based on laboratory and Color-tec results.
MW-20S	Well	NA	0	0	11/12/2009	11/13/2009	70 - 80	MW-20S-VPxx	No deviations.	No comment.
MW-20D	Well	60-310	24	24	11/24/2008	12/8/2008	300 - 310	MW-20D-VPxx	No deviations.	No comment.
MW-20I	Well	NA	0	0	11/13/2009	11/17/2009	140 - 150	MW-20I-VPxx	No deviations.	Well drilled using 6-inch pipe. Lost 20 feet of drill casing as a result of breakage. Interval unknown. Will be determined whether or not to install new well after attempt at developing well.
MW-21S	Well	NA	0	0	11/11/2009	11/12/2009	64 - 74	MW-21S-VPxx	Drilled MW-21S using 6-inch drill casing as opposed to planned 7-inch.	Drillers add bentonite mix as drilling mud to reduce friction on drill rods because they lost rotation of rod at 80 feet and were no longer able to drive at 130 feet BGS. As a rule, drill mud will not be added after borehole is advanced to a depth of 30 ft. above a planned/potential screened interval.
MW-21D	Well	60-310	24	22	11/19/2008	11/23/2008	300 - 310	MW-21D-VPxx	Could not collect water sample at 126' and 156' because sampler did not open after 4 and 2 attempts, respectively, possibly due to over tightening or silt jamming it closed.	Due to turbidity issues interfering with radiological analyses, data from MW-14D is not usable. Therefore, will replace rad from MW-14D with rad samples from MW-16D. Samples need to be filtered in the field.
MW-21I	Well	NA	0	0	11/5/2009	11/11/2009	170 - 180	MW-21I-VPxx	Drilled MW-21I using 6-inch drill casing rather than planned 7-inch as a result of not having enough 7-inch casing onsite.	No comment.
MW-22S	Well	NA	0	0	2/10/2010	2/11/2010	70 - 80	MW-22S-VPxx	No deviations.	No comment.
MW-22D	Well	60-335	25	24	12/10/2008	12/18/2008	305 - 315	MW-22D-VPxx	Casing was inadvertently driven to 65 feet, so no sample was collected from 55 to 65 feet. If this interval is determined to be critical, a sample can be collected during the drilling of the intermediate well. No sample at VP14. Collected additional sample (VP-28 @325 ft). Attempted to collect sample at 335 feet; however, based on results from VP-28, attempt terminated.	Three attempts to collect GW at VP-19 (235 ft) do to leaks in the sampler. No sample collected. Intervals for this well are on 5' intervals instead of 6' intervals because the boring is located on a slope, reducing the clearance between the drill platform and the ground surface. Collected sample intervals VP03 to VP07. All samples to be submitted for standard turnaround VOCs only.
MW-22I	Well	65-159	10	10	1/7/2010	1/13/2010	140 - 150	MW-22I-VPxx	No deviations.	Note: Soils with heavy chemical odor and PID readings above range detected from cores from 47-67 ft. BGS. It was noted that clean fill/native soil horizon was around 27' BGS and PID readings in hundred range were detected in soils from 28.5' BGS to 47' BGS. Also, sand point sampler broke off in borehole at 65-70 ft. Sampler will be left in place with expectation that it will be moved out of the way during ensuing GW profiling drilling at location. Compromised stormwater pipe at this location and will require repairs.
MW-23S	Well	NA	0	0	12/3/2009	12/7/2009	90 - 100	MW-23S-VPxx	No deviations.	No comment.

Table 2.5-6 Phase IIIa and IIIb Sonic Drilling Progress and Deviations Summary, Sylvania Corning FUSRAP Site, Hicksville, New York

Boring Name	Location Type	Profile Depth Range (feet BGS)	Proposed Number of GW Profile Samples	No. of GW Profile Samples Collected	Drilling Start Date	Drilling End Date	Screen Interval (feet BGS)	Sample IDs	Deviations	Comments
MW-23I	Well	65-109	5	5	2/4/2010	2/9/2010	170 - 180	MW-23I-VPxx	No deviations.	No comment.
MW-23D	Well	60-386	24	32	1/12/2009	1/27/2009	330 - 340	MW-23D-VPxx	Continue to collect continuous GW samples to 386' and will follow with continuous soil sample collection for logging purposes. Lost soil samples 336' to 356' while attempting to retrieve drill rods.	VP17 was inadvertently skipped when driller added extra rod while attempting to collect sample at 216'. Since no drill water has been used with new drilling method, the formation/GW should be minimally disturbed and sample should be representative. Andy Gosnell agreed to let the drillers add bentonite into MW-23D to assist in retrieving the rods from the boring. Installed 7" casing to 100' to help hold water in boring while trying to flush rods out. Removed 6" casing to find where the thread was not connected (and water was leaking out into boring). Reinstalled 6" casing and added mud (bentonite) to boring to 200'.
MW-24S	Well	NA	0	0	11/16/2009	11/18/2009	70 - 80	MW-24S-VPxx	No deviations.	No comment.
MW-24DD	Well	60-396	24	32	1/5/2009	1/12/2009	360 - 370	MW-24DD-VPxx	Collected additional samples (VP-29 @ 336 ft, VP-30 @ 346 ft, and VP-31 @ 356 ft due to contamination in previous sample intervals). Rad portion of the samples beyond 306 ft will be put on hold pending results of previous samples. Collected additional samples (VP-32 @ 366 ft, VP-33 @ 376 ft, and VP-34 @ 386 ft due to contamination in previous sample intervals). Another sample (VP-35) was collected at 396 ft, however, the VP35 sample was analyzed for Color-tec analysis only to determine presence or lack of chlorinated solvents; no laboratory analysis for this sample.	No comment.
MW-25S	Well	NA	0	0	12/7/2009	12/11/2009	105 - 115	MW-25S-VPxx	No deviations.	No comment.
MW-25D	Well	60-350	29	28	12/9/2008	12/17/2008	340 - 350	MW-25D-VPxx	Sampler would not advance at VP24 sample interval. Collected 8 foot soil core to determine lithology and increase the water sample depth by 2 feet. Sand heaved into the casing and will have to blow it out. No sample collected at VP24.	No comment.
MW-25I	Well	NA	0	0	12/16/2009	1/4/2010	230 - 240	MW-25I-VPxx	No deviations.	No comment.
MW-26S	Well	NA	0	0	1/22/2010	1/28/2010	110 - 120	MW-26S-VPxx	No deviations.	No comment.
MW-26D	Well	60-310	25	25	12/17/2008	12/22/2008	266 - 276	MW-26D-VPxx	1.5 hour delay in morning due to frozen pump (could not fill water tank on MW-18S rig). Shut down at 1630 due to unsafe conditions caused by heavy sleet.	No comment.
MW-27S	Well	NA	0	0	3/9/2010	3/10/2010	80 - 90	MW-27S-VPxx	No deviations.	No comment.
MW-27D	Well	NA	0	0	3/3/2010	3/8/2010	280 - 290	MW-27D-VPxx	Used drilling mud to advance boring from approx 238 ft to 248 ft bgs.	No comment.

Table 2.5-6 Phase IIIa and IIIb Sonic Drilling Progress and Deviations Summary, Sylvania Corning FUSRAP Site, Hicksville, New York

Boring Name	Location Type	Profile Depth Range (feet BGS)	Proposed Number of GW Profile Samples	No. of GW Profile Samples Collected	Drilling Start Date	Drilling End Date	Screen Interval (feet BGS)	Sample IDs	Deviations	Comments
MW-27DD	Well	60-387	23	31	1/12/2009	1/27/2009	365 - 375	MW-27DD-VPxx	Could not obtain 307' GW sample (two attempts, no GW due to clay). Continue to drill at MW-27D to 387', may proceed deeper depending on analytical results. Attempted GW sample again at 309' after soil was drilled to 297', only two inches in boring after 20 minutes. Therefore, no sample collected. Continue collecting GW and soil samples for logging purposes to 387 ft. Rad portion of the samples will be put on hold pending results of previous samples.	Soil from boring kept caving in during attempt to obtain the 317' GW sample (caved in to 305'). Driller decided best to collect soil samples to 297' and would then start GW sampling again.
MW-28S	Well	NA	0	0	11/19/2009	12/1/2009	90 - 100	MW-27S-VPxx	No deviations.	No comment.
MW-28I	Well	65-109	5	5	1/14/2009	1/19/2009	149 - 159	MW-28I-VPxx	Well screen at MW-28I moved up approximately 1 foot when casing was being removed from borehole. Final well screen depth estimated to be 149 to 159 feet bgs.	No comment.
MW-28D	Well	60-317	24	24	1/5/2009	1/11/2009	277 - 287	MW-28D-VPxx	Could not collect VP25 @ 297 ft due to presence of clay, but collected an additional sample (VP27 @ 317 ft) due to contamination detected in VP-26.	No comment.
MW-29S	Well	60-110	5	5	2/17/2009	2/20/2009	66 - 76	MW-29S-VPxx	No deviations.	No comment.
MW-30S	Well	NA	0	0	2/21/2010	2/22/2010	90 - 100	MW-30S-VPxx	No deviations.	No comment.
MW-30I	Well	65-204	15	15	1/20/2010	1/29/2010	230 - 240	MW-30I-VPxx	No deviations.	No comment.
MW-30D	Well	60-399	25	33	2/19/2009	2/26/2009	330 - 340	MW-30D-VPxx	No deviations.	No comment.
MW-31I	Well	65-209	15	15	2/10/2010	2/20/2010	180 - 190	MW-31I-VPxx	No deviations.	No comment.
MW-31D	Well	60-397	25	32	2/9/2009	2/18/2009	320 - 330	MW-31D-VPxx	Could not collect sample VP24 due to presence of clay (no water). A. Ewy agreed with E & E recommendation to continue drilling/sampling at MW-31D to 397 ft although non-detect sample obtained atVP30 (347') depth. Purpose for continued sampling is to determine extent of deeper contamination detected up gradient (see MW-27D and MW-24D).	High detections in samples collected below clay layer (VP27 and VP28) resulting in additional GW sample collection. Could not collect a VP-32 sample due to presence of clay. Sample VP33 is of questionable quality because drillers needed to use 1,500 gallons of water clearing out heave into casing prior to collecting this sample. Water quality instruments show a large variation in results from previous GW samples. A. Ewy approved the use of bentonite to backfill boring at MW-31D to hydraulically "seal off" a clay layer encountered in boring below planned monitoring well screen depth.
MW-32D	Well	60-326	22	26	2/10/2009	2/18/2009	295 - 305	MW-32D-VPxx	No deviations.	Hit refusal at 286 (likely clay layer) with GW sampler and began collecting soils.
MW-33S	Well	NA	0	0	3/6/2010	3/7/2010	65 - 75	MW-33S-VPxx	No deviations.	No comment.
MW-33D	Well	60-310	26	26	1/30/2009	2/9/2009	290 - 300	MW-33D-VPxx	No deviations.	Original borehole was abandoned due to inability to retrieve soil core barrel (located at 156 to 176' bgs. Removed casing and moved drill rig 1 to 2 ft north and redrilled. Soil core barrel detached again from drilling rods at 220-240' BGS in new borehole. Core barrel was successfully recovered.
MW-34S	Well	NA	0	0	3/4/2010	3/5/2010	65 - 75	MW-34S-VPxx	No deviations.	No comment.
MW-34D	Well	60-307	26	26	1/30/2009	2/3/2009	270 - 280	MW-34D-VPxx	No deviations.	No comment.

Table 2.5-6 Phase IIIa and IIIb Sonic Drilling Progress and Deviations Summary, Sylvania Corning FUSRAP Site, Hicksville, New York

Boring Name	Location Type	Profile Depth Range (feet BGS)	Proposed Number of GW Profile Samples	No. of GW Profile Samples Collected	Drilling Start Date	Drilling End Date	Screen Interval (feet BGS)	Sample IDs	Deviations	Comments
RI-P-35S	Groundwater Profile Boring	60-110	5	5	1/28/2009	1/29/2009	NA	RI-P-35-VPxx	No deviations.	No comment.
RI-P-36S	Groundwater	60-110	5	5	1/28/2009	1/28/2009	NA	RI-P-36-VPxx	No deviations.	No comment.
RI-P-37S	Groundwater Profile Boring	60-116	5	6	1/29/2009	1/30/2009	NA	RI-P-37-VPxx	Collected an extra sample from RI-P-37S at 116'. Analyses pending results of VP01 thru VP06. Note, a VP01 sample (56') was collected from this borehole.	No comment.
RI-P-38S	Groundwater Profile Boring	60-140	5	9	1/29/2009	1/30/2009	NA	RI-P-38-VPxx	Collect an extra sample from RI-P-38S at 117' due to presence of MTBE at 96' and 106'. Note, a VP01 sample (56') was collected from this borehole. Collected two additional samples (VP08 @127' and VP09 @137' due to elevated Chloroform at 117'.	No comment.
MW-39S	Well	60-136	6	8	12/20/2008	12/22/2008	76 - 86	MW-39S-VPxx	Completed as a well instead of a boring. Collected additional samples (VP-27 @ 316 ft due to contamination detected in VP-26, and VP-28 @ 326 ft due to contamination detected in VP-27).	No comment.
RI-P-40I	Groundwater Profile Boring	65-159	10	9	1/15/2010	1/27/2010	NA	MW-40S-VPxx	VP09 (130-140 ft) not collected due to casing breaking, forcing removal of tool from zone.	Originally planned as well but based on laboratory results, no well was installed.
MW-41S	Well	60-160	10	10	12/8/2009	1/4/2010	65 - 75	MW-41S-VPxx	No deviations.	No comment.
MW-42I	Well	66-189	13	12	12/16/2009	1/14/2010	140 - 150	MW-42S-VPxx	Additional 3 samples collected at location as a result of elevated total Uranium hits.	VP08 (120-129 ft) not collected due to the sampling tool not opening (2 attempts). Additional samples (VP12, VP13 and VP14) approved by USACE to define extent of Total Uranium.
MW-43S	Well	66-159	10	10	12/15/2009	1/6/2010	65 - 75	MW-43S-VPxx	No deviations.	Well "hung up" on casing and had to be removed so that borehole could be flushed before placing well in borehole a second time. Well "hung up" a second time but only came up 2-feet. Well will be left at this depth.
MW-44S	Well	65-159	10	10	1/20/2010	1/26/2010	65 - 75	MW-44S-VPxx	No deviations.	No comment.
RI-P-45DD	Groundwater Profile Boring	65-394	34	29	3/4/2010	3/19/2010	NA	RI-P-45-VPxx	VP08 interval (120-124 ft bgs) would not produce water so no sample. VP11 profile sample (150-154 ft bgs) would not produce water so no VP 11 sample. RI-P-45: Unable to obtain water from VP23 and VP24 due to unproductive formation. Following attempt to sample VP23, advanced outer casing from 55 ft to 265 ft bgs before at-tempting VP24. Will make additional attempt to obtain water from VP24 on 3/9/10. Unable to obtain water from VP24 due to unproductive formation. Unable to obtain water from VP28 (320-325 ft bgs) due to unproductive formation (hard gray clay).	No comment.
MW-46	NA	NA	NA	NA	NA	NA	NA	NA	No deviations.	Boring not completed due to access issues.

Table 2.5-6 Phase IIIa and IIIb Sonic Drilling Progress and Deviations Summary, Sylvania Corning FUSRAP Site, Hicksville, New York

Boring Name	Location Type	Profile Depth Range (feet BGS)	Proposed Number of GW Profile Samples	No. of GW Profile Samples Collected	Drilling Start Date	Drilling End Date	Screen Interval (feet BGS)	Sample IDs	Deviations	Comments
RI-P-47I	Groundwater Profile Boring	65-139	10	8	2/17/2010	2/21/2010	NA	RI-P-47-VPxx	Unable to obtain sufficient volume for rad analysis from VP04. Did not collect VP 10 due to failure of 4 inch rod. Did not collect VP 11 due to substantial water in sampler prior to opening. Made 2 attempts.	No comment.
RI-P-48I	Groundwater Profile Boring	65-159	10	8	2/22/2010	3/2/2010	NA	RI-P-48-VPxx	While attempting to collect VP07 (115-119') tip of sampler came off and was lost downhole. No sample collected from this interval. While attempting to collect VP09 (135-139') 4 inch rod broke. Sampler was not at depth so will try again on 2 March to collect VP09. Recovered rods successfully. Unable to collect VP09 because rods were close to depth when they broke on 2/24/10 and zone was substantially disturbed during recovery.	No comment.
MW-49S	Well	65-139	8	8	2/22/2010	3/2/2010	100 - 110	MW-49-VPxx	Samples were not collected past 140 ft based on USACE decision. Boring was scoped to 200 ft.	No comment.
MW-50I	Well	64-159	10	10	2/4/2010	2/17/2010	120 - 130	MW-50-VPxx	No deviations.	No comment.
MW-51I	Well	60-210	15	15	2/1/2010	2/8/2010	130 - 140	MW-51-VPxx	No deviations.	No comment.
MW-52D	Well	60-310	25	24	2/16/2010	2/24/2010	275 - 285	MW-52-VPxx	VP 25 interval (295-299') would not produce water so no sample. Successfully collected VP26 (305-309').	No comment.
MW-53S	Well	60-120	6	6	3/2/2010	3/9/2010	70 - 80	MW-53-VPxx	No deviations.	No comment.
RI-P-54I	Groundwater Profile Boring	60-160	11	10	1/28/2010	2/3/2010	NA	MW-54-VPxx	VP02 (60-69 ft) not collected due to sampling tool not opening. VP03 collected from 72-77'bgs. VP04 and beyond collected from 85-89, 95-99, 105-109. Boring added based on NYSDEC comment.	No well installed.
MW-55S	Well	60-230	17	17	3/9/2010	4/1/2010	85 - 95	MW-55-VPxx	Boring added by USACE to delineate Total Uranium extent on golf range.	No comment.
RI-P-56I	Groundwater Profile Boring	60-249	19	18	3/19/2010	3/24/2010	NA	MW-56-VPxx	Boring added by USACE to delineate Total Uranium extent on golf range. VP09 (130-139 ft) not collected due to broken sampling tool.	No well installed.

Key:
BGS = Below gound surface.
GW = Groundwater.
HCL = Hydrochloric acid.
ID = Identification.
MTBE = Methyl tert-butyl ether.
Rad = Radiological.
USACE = United States Army Corps of Engineering.
VOC = Volatile organic compounds.

Table 2.8-1 Deviation Summary Table, Sylvania Corning FUSRAP Site, Hicksville, New York

Phase I Deviations
The alpha/beta scintillation detector was added to the list of equipment to be used for scanning the soil and concrete cuttings. This detector or the GM pancake detector was used for scanning, which is an appropriate use for both detectors.
The scope of the geophysical survey was expanded to include utility clearance for several critical Phase I drilling locations in which utilities have not been marked by One Call Utility Clearance. The location of utilities under Building 70 are not known or marked. E & E needed to drill through concrete slab for sub-slab active soil gas sampling. In addition, large-live electric lines exit Building 70 in historic transformer pad area where sample collection will be necessary.
Added monitoring of the concrete/soil dust and cuttings for radioactivity during installation of the active soil gas probes in Building 70, which would determine handling and disposal measures.
2-inch and 3-inch NaI detectors were used to perform the gamma radiation surveys because they are more sensitive than the 1-inch detector. The 3-inch detector was used to perform the walkover gamma radiation survey and the 2-inch detector was used to perform the survey of the drains and cracks in Building 70. In addition, during the floor drain survey, the drain covers were removed when possible and the measurement was taken inside the drainhole rather than just at the surface.
Passive soil gas samplers were installed 15 to 18 inches below asphalt/paved surfaces and a maximum of 6 inches in grassy, non-paved areas as per manufacturer's instructions. Also, requested that a 2-inch drill bit be used to install samplers which is within manufacturer's recommended borehole size.
Requested that the scope of the outdoor geophysical survey be expanded to include the whole area between Buildings 140 and 100. This is the location of a network of circular concrete cisterns approximately 4 feet in diameter. This network is used to collect rainwater from the roof of Building 100 and provides temporary storage until it diffuses into the ground. No as-built drawings of this network exist and therefore the exact location of these individual subsurface features is unknown. Expanding the geophysical survey to include this area will provide USACE and E & E the data necessary to avoid these features while drilling during the Phase II investigation.
Liquid crack sealer was used to back fill sub-slab sample boreholes rather than the proposed sand. This will provide an impermeable seal.
Requested that the indoor geophysical survey be removed from scope of work. After failing to locate the historic drain in Building 100 with a GPR instrument, Geoview revisited the known UST in Building 100. After re-examining data from that area, it was determined that a utility crosses the top of the UST. The utility was being detected by GPR and mistaken as the UST. The top of the UST is greater than 5 feet below the surface and the GPR is not able to detect it. Geoview determined that they are not getting good resolution past ~3 feet below the slab, effectively rendering the indoor survey useless.
Requested that the passive soil gas (PSG) network be expanded by 3 locations/samplers from the 86 proposed. During installation of a PSG network, it was noted that spacing in the pre-determined grid left an almost 50-foot area without coverage on the western side (front) of Building 100. E & E proposed to extend the three existing rows to include a new location in grassy areas located along Building 100. Ninety samples were proposed in the text of the work plan and 86 were proposed on the site map.
Phase II Deviations
A number of planned soil boring locations were moved greater than 3 feet. All borings moved from their planned locations because of physical obstructions such as surface obstructions or subsurface stormwater conveyances did not allow for sample collection at the exact proposed location.
The scope of the Phase II soil sampling program was expanded to include collecting archive samples from the top 2-feet of each borehole as per USACE and E & E discussion. This will be completed in order to have samples available for analysis (radionuclide only) to support a soil exposure risk assessment if deemed necessary. The top 2-feet of each soil core (building materials such as asphalt and concrete excluded) will be collected into a plastic bag in the event that this depth interval is not selected for analysis during field screening. These samples will be archived and placed under standard custody care.
Boreholes will be backfilled with grout as opposed to bentonite as per the work plan. This was suggested by Verizon representatives because of elevated radiation readings they noticed during previous investigations. Bentonite exhibits gamma readings of 2x background levels as measured by E & E in field.

Table 2.8-1 Deviation Summary Table, Sylvania Corning FUSRAP Site, Hicksville, New York

Phase II Deviations (continued)
Gamma spectrometry was added to sample analyses of concrete core samples A3-01 and F6-01. Radiological analyses were thoroughly discussed between E & E and USACE during work plan development. The decision was made to analyze for the historical site contaminants of concern for soil and concrete. However, after getting different ratios of beta and gamma readings on different contaminated concrete samples, E & E's HP thought it would be advantageous to perform gamma spectrometry, which would more definitively eliminate (or identify) any other contaminants in the concrete.
Collected 1 rinsate per 10 borings as opposed to 1 sample per 10 samples. This was a USACE directive. Rinsates were not anticipated because of the use of dedicated equipment. However, Geoprobe equipment required the re-use of the core barrel tip which provides only several square inches of contact with sample prior to entering dedicated acetate sleeve.
Drilling deep locations within SU10 were difficult because access in this office space area of Building 70 limits the size of drill rigs that can access boreholes locations. Moved the following planned deep borings to new locations and completed these SU10 borings to 16 ft (shallow borings): SU10-04/D to SU14-03; SU10-06/D to SU12-07I; and SU10-13/D to SU14-10.
Switched from using 2-inch PVC casing as borehole retainer for downhole gamma survey to 1.5-inch PVC. This is necessary because the most productive drilling method (quickest and able to achieve the greatest depths) to date has been the use of macro-core for soil sample collection. In order to install 2-inch PVC casing, a 3.25-inch hollow rod must be driven to depth after completion of macro-core sampling. Early refusal (prior to total borehole depth) is being encountered because of this large diameter rod. A 1.5-inch PVC retainer will allow us to just drop the retainer into open borehole which will allow us to archive greater depths for downhole gamma survey and dramatically increase our efficiency.
Additional drains and what appears to be an abandoned sump were identified in the old warehouse and new warehouse of Building 70. Need to add shallow borings to investigate drains that are not along what appear to be similar drainage lines. These drains will be termed DR-N, DR-O, DR-P, DR-R1/R2, DR-U, and SMP-1 (sump). Also, DRH-A in Building 100 is inaccessible due to a large metal roll-off type box; this boring cannot be drilled. Identified two similar historic drains just east of this area. Need to add shallow borings to investigate these historic drains (DRH-A1 and DRH-A2). Also identified one floor drain similar to drains in Building 70 which needs shallow boring added (DR-V).
Several borings were drilled thru the remediation cells to obtain soil samples beneath the previously excavated cells. Since these cells were previously backfilled with clean soils, the clean soils will be placed back in the borehole from which they originated at the completion of the boring. Prior to placement back in the borehole, the clean soil will be field screened to ensure that PID readings are less than or equal to 5 ppm, and radiation readings are at background levels. The boreholes will be topped-off with grout if necessary.
Based on elevated field screening results and early refusal in some borings drilled during the Phase IIa investigation, it was recommended that additional drilling to deeper depths be performed during Phase IIb using different Geoprobe or drilling methods. However, after evaluating Phase IIa sample analytical data, it was determined that some of the borings with elevated PID readings had little to no VOCs, therefore, additional drilling is not warranted. In addition, based on other Phase IIa results, additional changes to the Phase IIb scope of work have also been approved by USACE. A summary of all changes to the Phase IIb program included: – test pits at the following Phase I geophysical anomaly locations: EM-1, 8 and 9 combined, 11, 13, 16, 28, 30, 31, 34, 35, and GPR-B and -C; – carpet removal from areas in B70 where carpet was installed directly on top of the concrete slab. If potential drains or sumps are discovered, borings will be drilled at these locations; – elimination of additional drilling at SU10-02, SU-10-10, SU11-15, SU11-21, SU11-22, DR-C, DR-E, DR-R1/R2, 100-01, 100-02, 100-03, 140-01, and 140-09; – replace deep drilling at SU-13 (originally planned to replace deep drilling at SU11-17/D) with deep drilling at SU11-16; and – additional drilling at DR-J, DRH-A2, and 100-11.

Table 2.8-1 Deviation Summary Table, Sylvania Corning FUSRAP Site, Hicksville, New York

Phase II Deviations (continued)
Based on the change in drilling methods between Phase IIa and Phase IIb (geoprobe to auger) a combination of augering and geoprobe drilling was used to complete borings in confirmatory cells with known contamination (C4-01/D, C6-02/D, C9-02/D, C9-03/D, and C9-04/D). This was completed by augering to the bottom of the excavation cell and then using the geoprobe to collect soil samples through the hollow-stem auger flights. This was completed in an effort to reduce the potential for drawing contaminated soils up through the clean backfilled excavation soils with the auger flights. Soil collection will begin from the bottom of the auger flights.
Some excavation cell depths varied greatly within each cell (by as much as 24 feet). Based on a review of excavation cell depths, it was determined that six confirmatory borings (C1-01, C1-03, C3-01, C5-01, C5-02, and C6-03) were scheduled to be sampled well below the subcell excavation depth that these borings are to be completed in. After a discussion with USACE it was determined that these scheduled sampling depths are too conservative for these six borings and samples collected from closer to the clean fill/native soil boundary will be more beneficial to the investigation. It was determined to begin collecting continuous split spoon samples 4 feet above the maximum subcell depth that the boring is to be completed in order to identify the clean fill/native soil boundary. After the field geologist identifies this boundary, the confirmatory sample will then be collected 5 to 10 feet below that depth.
Test pits EM-1 and GPR-B will not be performed due to a 36-inch stormwater pipe and GPR-B is located within an area previously excavated. EM-7 will be added to the list on the Phase IIb Field Adjustment Form 2 to provide general area coverage.
After completing the carpet removal task added to the scope of work and described in the Phase IIb Field Adjustment Form 2, seven shallow borings will be completed next to the eight (one co-located pair) newly identified drains DR. These borings are termed DR-W through DR-CC. These borings will supplement the existing Leach Pool/Drain/Dry Well investigation described in Section 3.3.1 of the RI/FS Work Plan.
Access to drain DR-Z was limited (within a small office) and could only be accessed with a jackhammer to drive geoprobe rods. The initial attempt to complete this boring resulted in a refusal at 2-feet BGS on an apparent concrete footer. A second attempt to complete this boring deeper in an adjacent location could not be done because of time constraints. Therefore a sample was collected from 0-2 feet and sent for analysis (DR-Z-Z1). This boring was again attempted with refusal at 8 feet on natural soils. Low level PID hits were noted in this boring so an additional sample (DR-Z-Z1A) was collected for laboratory analysis. This resulted in two samples being collected from the first 8-foot interval or zone.
Phase III Deviations
RI-SB-20 was completed to 12 feet BGS because of an excessive amount of gravel and asphalt encountered to 4 feet BGS. An 8-foot section of soil was collected and screened beginning at 4 feet BGS and completed at 12 feet BGS (8-foot interval in native soils). Therefore, the first soil sample was collected at 4 to 6 feet BGS (instead of 0 to 2 feet) and the second sample was collected at 10 to 12 feet BGS. Future borings will only be completed to 8 feet BGS.
E & E requested the use of unpreserved 40-mL VOA bottles during groundwater profiling. The HCl used to preserve samples reacted with constituents in the groundwater being collected making it difficult to fill jars with zero headspace. Unpreserved VOAs have a hold time of 7 days for VOC analysis and the laboratory (American Analytical) stated that they could run the analyses within the shorter hold-time period at no additional cost.
E & E requested allowance of the laboratory (American Analytical) to perform filtering of groundwater profile samples for metals analysis to save time in the field and alleviate the problems associated with freezing water during filtering due to inclement conditions. Due to high turbidity of the groundwater profile samples (generally over 1,000 NTUs), samples need to be filtered prior to analysis (EPA6010B/7470). Laboratory will perform filtering at no additional cost. Samples will be collected into unpreserved 500-mL bottles and preserved at the laboratory after filtering is performed. Samples will be filtered using 0.45 micron filter.

Table 2.8-1 Deviation Summary Table, Sylvania Corning FUSRAP Site, Hicksville, New York

Phase III Deviations (continued)
E & E requested the use of bentonite chips in place of tremied bentonite slurry to provide monitoring well seal above screen sand pack. After discussions with Boart Longyear lead drillers, E & E agreed with Boart Longyear that the bentonite chips would provide a better seal given the weight of grout that will be placed on top of the slurry seal. This method is acceptable under the USACE manual. USACE wanted to ensure that chips are poured at a slow enough rate to prevent bridging and ensure that the seal extends entirely around the well casing. By using this method, fine sand seals above and below the slurry will not be necessary. Also, for wells greater than 150-foot in depth, Boart Longyear recommends schedule 80 instead of schedule 40 PVC casing and screen. USACE approved this recommendation, therefore, all intermediate and deep wells will be constructed with schedule 80 PVC casing and screen.
Due to difficulties in collecting the groundwater profile samples at 126 feet (VP08) and 156 feet (VP11) in MW-21D, these intervals were skipped (i.e., no samples were collected at these intervals). Difficulties were caused by either leakage (water seeped into the sampler at one of the threaded joints prior to opening the sample ports); or the sampler would not open at a particular sample interval due to technical reasons; or the sample interval was dry due to the presence of clay. E & E and USACE decided that only two attempts would be made at a given sample interval to allow for the sampler to open in undisturbed soils within a particular 10-foot interval, and to minimize potential cross contamination from the previous interval.
Due to high turbidity in groundwater profile samples collected from MW-14D, radiological analyses could not be performed by GEL. Therefore, radiological samples will be collected from MW-16D to replace the samples from MW-14D. Filtering of samples for radiological analyses will be performed in the field using a high capacity 0.45-micron in-line filter and subsequently preserved (within 5 days) prior to shipment.
Based on the smoke test of drain DR-F, it was determined that DR-F empties into a drywell (manhole) on the southern side of Building 70. The drain appeared to have some sort of water-filled chamber before it emptied into the drywell. The drywell was relatively dry (at the time of observations). E & E collected a water sample from the drain and a sediment sample from the drywell for VOCs, metals, and radiation.
E & E used bentonite pellets for the monitoring well filter pack seal in place of bentonite chips because the hydration time for the pellets is less than that required for the chips. The pellets will not compromise the quality of the monitoring well.
During drum disposal activities, all drums containing decon water were placed within a roped-off area in Building 70. The plan was to sample and dispose the liquid IDW at a later date. Since there was a 20,000 gallon tank on site to containerize Phase III liquid IDW (decon water, drill water, and well water), E & E requested permission to consolidate the liquid wastes by placing the water from the drums into the storage tank. USACE approved this request. The liquids were transferred, the drums were decontaminated, crushed and disposed.
As stated in the Site-specific Health and Safety Plan, Section 6.3.2 Radiological Hazard Control, Radiation Contamination Monitoring: "monitoring will be performed for items, equipment/materials, and personnel if sample monitoring has indicated that contaminated samples were collected and handled." During the groundwater investigation (vertical profiling and well installation), the drilling exclusion zone, drill rods, and soil cores were all monitored for radioactive contamination. If no contamination was detected, personnel monitoring was not required upon exiting the exclusion zone. However, the routes of entry and exit to the exclusion zone were maintained. If the Health Physics technician identifies radioactive contamination in the drilling exclusion zone or on the equipment or in the soil cores, personnel were monitored each time they would exit the exclusion zone. The monitoring was performed by the HP technician or his/her designee who has been trained in the use of the monitoring equipment.
Due to the presence of elevated radioactivity levels in the soils below the excavation cells in the area of MW-18S, E & E requested that samples for radiological analyses be collected during the profiling in addition to samples for VOC analyses. Samples collected for radiological analyses from this profile boring will be used to replace scheduled radiological samples at MW-31D.
Due to elevated concentrations of PCE detected in groundwater samples collected from RI-P-39S, E & E recommended the installation of a shallow monitoring well (screened from 76 to 86 feet BGS) at this location.

Table 2.8-1 Deviation Summary Table, Sylvania Corning FUSRAP Site, Hicksville, New York

Phase III Deviations (continued)
In an effort to reduce the trip time of the drill rods, E & E proposed to drill down to 10 feet above the water table as described above, then implement a modified groundwater sampling procedure. This procedure is as follows: At 56 feet, the profiler would be advanced to 66 feet and the first water sample would be collected. The rods/sampler would be removed and deconned, then placed back in the hole and driven to 76 feet. After the water sample is collected, the rods/sampler would be removed and deconned, and advanced again to 86 feet. This process would continue until refusal (approximately 150 to 200 feet [or possibly deeper] BGS. During this process, the drill casing will remain above the water table at 56 feet. By keeping the drill casing above the water table, there is no heave up inside the casing as the profiler is extracted, so the soils remain relatively in place as the borehole collapses. Once refusal of the profiler is achieved, a 20-foot core barrel will be advanced to retrieve the soils. If recovery is poor, 10-foot core barrels will be used. Each time the core barrel is advanced, the drill casing will be advanced to the bottom of the core interval.
As a result of deep contamination in borings MW-23D, 24D, and 27D, E & E and USACE decided to extend sampling to 396 ft at MW-31D, 30D, and 16D (upgradient) to provide further delineation.
Groundwater profiles from MW-17S were sampled for metals in place of scheduled VOCs, as approved by USACE. This data will better fit the purpose of this well, which was to determine the impacts from elevated nickel activity discovered in shallow soils during Phase II.
E & E and USACE discussed different development techniques, including surging/pumping (as per the work plan) and a modified water surge method (mechanically moving tubing with check valve and surge block up and down to pump out slugs of water) followed by an airlift method to remove the required water volume. USACE agreed to implement the modified water surge method followed by the airlift method, but requested using nitrogen instead of compressed air for the air lift method. Additionally, USACE requested that E & E collect a sample before the introduction of nitrogen and at the end of development for quick turn VOC analysis to determine if nitrogen lift may have any impacts on GW quality.
Turbidity readings remained above 50 NTUs after completing fine tune development in several monitoring wells that will likely necessitate the use of filters for metals analysis. E & E and USACE agreed to add a filtered analysis for radioactive constituents for comparison purposes. Note that all groundwater profile samples analyzed for radioactive constituents were filtered as a result of very elevated turbidity. The Work Plan originally planned for unfiltered analysis only.
Turbidity readings remained above 50 NTUs (>1000 NTUs) after all parameters stabilized during purging of MW-34D. The sample was filtered with 5-micron filters as per the Work Plan. However, this size filter did not reduce the turbidity of the sample below 1000 NTUs due to the size of particles in formation. E & E recommended using a 0.45-micron filter and USACE agreed. The 0.45-micron filter was also used on MW-28D and MW-16D groundwater samples where turbidity readings did not reduce below 50 NTUs after stabilization.
Due to inconsistencies found between the Work Plan and the QAPP, Work Plan tables were modified to reflect previously discussed changes in the sampling plan (post Work Plan/QAPP approval).
Elevated total Uranium concentrations were encountered in groundwater profile samples collected from MW-42I, which is located along the eastern boundary of the Sylvania-Corning property. One boring (MW-56) and one monitoring well (MW-55S) were added to the Phase IIIb scope of work in order to help delineate VOC and Uranium contamination along the eastern edge of the site.
The groundwater profile samples collected at MW-42 had elevated total Uranium in the groundwater along the eastern edge of the property. The deepest sample to be collected in the original scope was MW-42S-VP11 from 154 to 159 feet BGS. This sample did not show elevated total Uranium, however the odd pattern of detections and elevated results at 145 to 149 feet BGS suggested that it would be advantageous to sample deeper to delineate the extent of the total Uranium with depth. Three additional groundwater profile samples were collected at the MW-42S location to aid in the delineation of total Uranium contamination with depth.
The upper eight groundwater profile samples (VP02 to VP09) for MW-49 did not encounter elevated levels of VOCs and Nickel, that were expected. The purpose of the boring was to delineate the Nickel/VOC plume in the area. MW-53 was originally scoped to be samples to 300 feet BGS if VOCs were not encountered at MW-52D. VOCs were not encountered at MW-52D, however, due to additional sampling at MW-55 and MW-56, it was determined to scale back the scope of this boring in order to meet budgetary constraints. Groundwater profile samples were not collected to the original scoped depths at the MW-49 and MW-53 locations. Changes were made following review of screening data by USACE, CDM and E & E.

Table 2.8-1 Deviation Summary Table, Sylvania Corning FUSRAP Site, Hicksville, New York

Phase III Deviations (continued)
Groundwater profiling at MW-40 from the water table to 159 feet BGS did not reveal any elevated concentrations of VOCs or total Uranium. The well was purposed to provide a shallow monitoring point at the northeast corner of the site. MW-54 was added to the original scope to meet NYSDEC comments. The boring was only intended to be converted to a monitoring well if elevated VOCs were encountered. No elevated VOCs were encountered during groundwater profile sampling. MW-46 was located in the interior of Building 100. Due to numerous issues with conflicting schedules (Helical Pile removal) and clearing and accessing a location to drill within the building, the installation of MW-46 was not feasible as part of this mobilization. Monitoring wells were not installed at three groundwater profile locations (MW-40, MW-46 and MW-54) as they were originally detailed in the Phase III RI QAPP. Wells were not installed at MW-40 and MW-54 following review of screening data by USACE, CDM and E & E. A well was not installed at MW-46 due to access restraints.

Key:

BGS = Below ground surface.
CDM = Camp, Dresser & McKee, Inc.
E & E = Ecology and Environment, Inc.
GEL = General Engineering Laboratories, LLC
GM = Geiger-Mueller
GPR = Ground penetrating radar.
HCl = Hydrochloric acid.
HP = Health physicist.
IDW = Investigative derived waste.
ml = Milliliter.
NaI = Sodium Iodide.
NTU = Nephelometric turbidity units.
PCE = Tetrachloroethene.
PID = Photoionization detector.
PVC = Polyvinyl chloride.
QAPP = Quality Assurance Project Plan.
RI/FS = Remedial Investigation/Feasibility Study.
USACE = United States Corps of Engineering.
UST = Underground storage tank.
VOC = Volatile organic compound.

Table 3.3-1 Groundwater Elevations, Sylvania Corning FUSRAP Site, Hicksville, New York

Well ID	Total Depth Drilled	Installed	Screened Interval (ft bgs)	Elevation Top of Inner Casing (ft amsl)[1]	Phase IIIa Groundwater Level 3/25/09 (ft below TOC)	Phase IIIa Groundwater Elevation 3/25/09 (ft below TOC)	Phase IIIb Groundwater Level 4/6/10 (ft below TOC)	Phase IIIb Groundwater Elevation 4/6/10 (ft amsl)
MW-13D	326	Phase IIIA	290-300	145.39	66.45	78.94	64.30	81.09
MW-13S	80.42	Phase IIIB	70-80	145.12	NI	NI	62.18	82.94
MW-14D	306	Phase IIIA	294-304	144.27	65.31	78.96	63.19	81.08
MW-14DD	375	Phase IIIB	365-375	143.91	NI	NI	63.11	80.80
MW-14S	79.5	Phase IIIB	70-80	144.50	NI	NI	63.26	81.24
MW-15D	310	Phase IIIA	300-310	144.11	65.1	79.01	62.82	81.29
MW-15DD	370	Phase IIIB	360-370	144.16	NI	NI	63.35	80.81
MW-15S	79.19	Phase IIIB	70-80	144.11	NI	NI	62.95	81.16
MW-16D	399	Phase IIIA	280-290	144.69	65.4	79.29	63.13	81.56
MW-16S	80	Phase IIIB	69.7-79.7	145.47	NI	NI	64.00	81.47
MW-17S	75	Phase IIIA	65-75	144.44	65.6	78.84	63.33	81.11
MW-18I	129	Phase IIIB	118-128	144.04	NI	NI	62.96	81.08
MW-18S	106	Phase IIIA	62-72	143.99	65.15	78.84	62.79	81.20
MW-19D	326	Phase IIIA	296-306	143.16	64.33	78.83	62.10	81.06
MW-19S	79	Phase IIIB	70-80	142.94	NI	NI	62.20	80.74
MW-20D	310	Phase IIIA	300-310	143.98	65.17	78.81	62.81	81.17
MW-20I	152.33	Phase IIIB	140-150	144.01	NI	NI	62.97	81.04
MW-20S	78.35	Phase IIIB	70-80	143.76	NI	NI	62.74	81.02
MW-21D	310	Phase IIIA	300-310	143.14	64.37	78.77	62.11	81.03
MW-21I	179.12	Phase IIIB	170-180	143.12	NI	NI	62.22	80.90
MW-21S	80	Phase IIIB	70-80	143.11	NI	NI	62.19	80.92
MW-22D	335	Phase IIIA	305-315	144.14	65.95	78.19	63.61	80.53
MW-22I	152.85	Phase IIIB	140-150	144.14	NI	NI	63.11	81.03
MW-22S	80	Phase IIIB	70-80	144.07	NI	NI	63.05	81.02
MW-23D	386	Phase IIIA	330-340	141.63	63.32	78.31	61.04	80.59
MW-23I	180	Phase IIIB	170-180	141.66	NI	NI	60.75	80.91
MW-23S	98.61	Phase IIIB	90-100	141.76	NI	NI	60.92	80.84
MW-24DD	396	Phase IIIA	360-370	145.61	67.3	78.31	64.95	80.66
MW-24S	79.73	Phase IIIB	70-80	142.29	NI	NI	61.35	80.94
MW-25D	350	Phase IIIA	340-350	142.13	63.8	78.33	61.51	80.62
MW-25I	239.21	Phase IIIB	230-240	141.86	NI	NI	61.13	80.73
MW-25S	115.3	Phase IIIB	105-115	142.03	NI	NI	61.19	80.84
MW-26D	310	Phase IIIA	266-276	142.08	64.49	77.59	61.15	80.93
MW-26S	120	Phase IIIB	110-120	142.23	NI	NI	61.43	80.80
MW-27DD	387	Phase IIIA	365-375	141.5	63.35	78.15	60.95	80.55
MW-27D	290	Phase IIIB	280-290	141.49	NI	NI	60.57	80.92
MW-27S	88	Phase IIIB	78-88	141.59	NI	NI	60.63	80.96
MW-28D	317	Phase IIIA	277-287	147.26	68.64	78.62	66.16	81.10
MW-28I	160.2	Phase IIIB	149-159	147.10	NI	NI	66.14	80.96
MW-28S	100.18	Phase IIIB	90-100	144.44	NI	NI	63.49	80.95
MW-29S	110	Phase IIIA	66-76	142.35	63.9	78.45	61.37	80.98
MW-30D	399	Phase IIIA	330-340	140.86	63.05	77.81	60.65	80.21
MW-30I	240	Phase IIIB	230-240	140.84	NI	NI	60.20	80.64
MW-30S	100	Phase IIIB	90-100	140.84	NI	NI	60.20	80.64
MW-31D	397	Phase IIIA	320-330	140.89	63.05	77.84	60.63	80.26
MW-31I	190	Phase IIIB	180-190	140.88	NI	NI	60.14	80.74
MW-32D	326	Phase IIIA	295-305	141.21	63.31	77.9	60.90	80.31
MW-33D	310	Phase IIIA	290-300	135.51	57.38	78.13	54.96	80.55
MW-33S	75	Phase IIIB	65-75	135.71	NI	NI	54.65	81.06
MW-34D	307	Phase IIIA	270-280	136.53	58.25	78.28	55.32	81.21
MW-34S	75	Phase IIIB	65-75	136.63	NI	NI	55.44	81.19
MW-39S	136	Phase IIIA	76-86	140.98	62.65	78.33	60.31	80.67
MW-41S	76.61	Phase IIIB	66-76	143.64	NI	NI	62.48	81.16
MW-42I	150.55	Phase IIIB	140-150	143.68	NI	NI	62.59	81.09
MW-43S	73	Phase IIIB	63-73	143.90	NI	NI	62.91	80.99

Table 3.3-1 Groundwater Elevations, Sylvania Corning FUSRAP Site, Hicksville, New York

Well ID	Total Depth Drilled	Installed	Screened Interval (ft bgs)	Elevation Top of Inner Casing (ft amsl)[1]	Phase IIIa Groundwater Level 3/25/09 (ft below TOC)	Phase IIIa Groundwater Elevation 3/25/09 (ft below TOC)	Phase IIIb Groundwater Level 4/6/10 (ft below TOC)	Phase IIIb Groundwater Elevation 4/6/10 (ft amsl)
MW-44S	75.5	Phase IIIB	65-75	142.69	NI	NI	61.81	80.88
MW-49S	110	Phase IIIB	100-110	143.80	NI	NI	62.95	80.85
MW-50I	129.4	Phase IIIB	120-130	141.62	NI	NI	60.75	80.87
MW-51I	140	Phase IIIB	130-140	140.38	NI	NI	59.65	80.73
MW-52D	285	Phase IIIB	275-285	136.95	NI	NI	56.62	80.33
MW-53S	80	Phase IIIB	70-80	137.15	NI	NI	56.04	81.11
MW-55S	229	Phase IIIB	85.5-95.5	136.50	NI	NI	55.35	81.15
MW-3	78	GTEOSI	58-78	141.09	NM	NM	60.30	80.79
MW-4	78	GTEOSI	58-78	140.91	NM	NM	59.85	81.06
MW-8	130	GTEOSI	120-130	140.72	NM	NM	60.06	80.66
MW-9	82	GTEOSI	72-82	141.57	NM	NM	60.62	80.95
MW-10	130	GTEOSI	120-130	141.47	NM	NM	60.52	80.95
MW-11	81	GTEOSI	71-81	141.74	NM	NM	60.72	81.02
MW-12	130	GTEOSI	120-130	142.27	NM	NM	61.27	81.00

Notes:

[1] Horizontal Datum: NAD83 (NYLI Zone 3104); Vertical Datum: NAVD 88; Units: U.S. Survey Feet

Key:
amsl= Above mean sea level.
BGS= Below ground surface.
ft= feet.
GTEOSI= General Telephone and Electronics Operation and Support.
ID= Identification.
NI= Not installed.
NM = Not measured.
TOC= Top of casing.

Table 4.4-1 Summary of Positive Results for Passive Soil Gas Samples, Sylvania Corning FUSRAP Site, Hicksville, New York

Analyte	SG-001 8" 09/25/06	SG-002 18" 09/25/06	SG-003 8" 09/25/06	SG-004 16" 09/25/06	SG-005 7" 09/25/06	SG-006 17" 09/25/06	SG-007 16" 09/25/06	SG-008 18" 09/25/06	SG-009 18" 09/25/06	SG-010 17.5" 09/25/06	SG-011 16.5" 09/25/06	SG-012 16" 09/25/06	SG-013 18" 09/25/06	SG-014 18" 09/25/06	SG-015 18.5" 09/25/06	SG-900 18.5" 09/25/06	SG-016 7" 09/25/06
VOCs (ng)																	
1,1-Dichloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethene	ND	ND	ND	ND	ND	ND	ND	ND	**4.341 J**	**8.73**	**5.431**	**1.732 J**	ND	ND	ND	ND	ND
1,2,3-Trichlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2,4-Trichlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,4-Dichlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Acetone	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Benzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chloromethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
cis-1,2-Dichloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**2.524 J**	ND	**2.363 J**	**1.219 J**	ND
Dibromochloromethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**0.5900 J**
Ethylbenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
m,p-Xylene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Methylene chloride	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
o-Xylene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Styrene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Tetrachloroethene	ND	**116.8**	ND	**454.2 J**	ND	ND	ND	**578.6**	**360.5 J**	**441.1**	**353.1**	**2587**	**10950**	**10260**	**34590**	**26290**	**241**
Toluene	ND	ND	ND	ND	ND	ND	ND	ND	ND	**11.59**	ND	ND	ND	ND	ND	**13.37**	ND
trans-1,2-Dichloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**3.153 J**	**1.234 J**	**5.076**	ND	**1.611 J**	ND	ND
Trichloroethene	ND	ND	ND	**2.703 J**	ND	ND	ND	**1.427 J**	**1.097 J**	**1.500 J**	**3.316 J**	**47.22**	**442.8**	**24.88**	**145.2 J**	**76.8 J**	ND
Vinyl chloride	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

Table 4.4-1 Summary of Positive Results for Passive Soil Gas Samples, Sylvania Corning FUSRAP Site, Hicksville, New York

Analyte	SG-017 19" 09/25/06	SG-018 18.5" 09/25/06	SG-019 16" 09/25/06	SG-020 17" 09/25/06	SG-021 16.5" 09/25/06	SG-022 16.6" 09/25/06	SG-023 16" 09/25/06	SG-024 16.5" 09/25/06	SG-025 17.5" 09/25/06	SG-026 18" 09/25/06	SG-901 18" 09/25/06	SG-027 7" 09/25/06	SG-028 18" 09/25/06	SG-902 18" 09/25/06	SG-029 7.5" 09/25/06	SG-030 18" 09/25/06	SG-031 6.5" 09/25/06
VOCs (ng)																	
1,1-Dichloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethene	ND	ND	ND	ND	**2.714 J**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2,3-Trichlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2,4-Trichlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,4-Dichlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Acetone	ND	ND	**236.5 J**	ND	ND	ND	ND	ND	ND	ND	ND	**227.8 J**	**183.2 J**	ND	ND	ND	ND
Benzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chloromethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
cis-1,2-Dichloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Dibromochloromethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Ethylbenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
m,p-Xylene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Methylene chloride	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
o-Xylene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Styrene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Tetrachloroethene	ND	ND	ND	**112.1**	**121.7**	**208**	ND	**814.6**	**451.8**	**3597 J**	**1653 J**	ND	ND	**111.5 J**	ND	ND	ND
Toluene	ND	ND	**12.19**	ND	**13.04**	**25.51**	ND	**15.77**	ND	ND	ND	ND	ND	**16.81 J**	**18.45 J**	ND	ND
trans-1,2-Dichloroethene	ND	ND	ND	ND	ND	ND	ND	ND	**2.040 J**	ND	ND	ND	ND	ND	ND	ND	ND
Trichloroethene	ND	ND	ND	ND	ND	ND	ND	**1.175 J**	**3.567 J**	**6.679 J**	**2.176 J**	ND	ND	ND	ND	ND	ND
Vinyl chloride	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

Table 4.4-1 Summary of Positive Results for Passive Soil Gas Samples, Sylvania Corning FUSRAP Site, Hicksville, New York

Analyte	SG-032 18" 09/25/06	SG-033 7" 09/25/06	SG-034 18" 09/25/06	SG-035 17.5" 09/25/06	SG-036 18" 09/25/06	SG-037 18" 09/25/06	SG-038 17.5" 09/25/06	SG-039 18" 09/25/06	SG-040 18" 09/25/06	SG-041 18" 09/25/06	SG-042 18" 09/25/06	SG-043 6" 09/25/06	SG-044 18.5" 09/25/06	SG-903 18.5" 09/25/06	SG-045 6.5" 09/25/06	SG-046 7" 09/25/06	SG-047 18" 09/25/06
VOCs (ng)																	
1,1-Dichloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**23.1**
1,2,3-Trichlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2,4-Trichlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,4-Dichlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Acetone	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Benzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chloromethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
cis-1,2-Dichloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**24.36**
Dibromochloromethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Ethylbenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
m,p-Xylene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**2.140 J**
Methylene chloride	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**1.335 J**
o-Xylene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**1.197 J**
Styrene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Tetrachloroethene	ND	ND	**243.7**	ND	ND	**130.6**	**1103**	ND	**310.2 J**	**419.9**	**7911**	ND	**3708 J**	**2102 J**	ND	ND	**94290**
Toluene	ND	ND	ND	ND	ND	ND	ND	**21.92**	**18.52 J**	**26.02**	**22.22**	ND	**12.1**	ND	**24.76**	ND	**79.09**
trans-1,2-Dichloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**5.994**
Trichloroethene	ND	ND	**1.088 J**	ND	ND	**14.03**	**2.716 J**	ND	**4.112 J**	**1.156 J**	**10.36**	ND	**13.47 J**	**6.023 J**	ND	ND	**384.8**
Vinyl chloride	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

Table 4.4-1 Summary of Positive Results for Passive Soil Gas Samples, Sylvania Corning FUSRAP Site, Hicksville, New York

Analyte	SG-048 18" 09/25/06	SG-049 18" 09/25/06	SG-050 17" 09/25/06	SG-051 18" 09/25/06	SG-052 7" 09/25/06	SG-053 7" 09/25/06	SG-054 18" 09/25/06	SG-055 17.5" 09/25/06	SG-056 18" 09/25/06	SG-057 18" 09/25/06	SG-058 17" 09/25/06	SG-059 18" 09/25/06	SG-060 18.5" 09/25/06	SG-061 17" 09/25/06	SG-062 7" 09/25/06	SG-904 7" 09/25/06	SG-063 7.5" 09/25/06
VOCs (ng)																	
1,1-Dichloroethane	**2.328 J**	ND	ND	ND	ND	ND	**3.073 J**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethene	**26.37**	ND	ND	ND	ND	ND	**95.64**	**7.935**	ND	**13.51**	ND	ND	ND	ND	ND	ND	ND
1,2,3-Trichlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2,4-Trichlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,4-Dichlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Acetone	ND	**371.1**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**300.1**	ND	ND	**4206**
Benzene	ND	**25.7**	ND	ND	ND	ND	**20.63**	ND	**25.15**	ND	ND	ND	ND	ND	ND	ND	ND
Chloromethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
cis-1,2-Dichloroethene	**14.46**	**4.855 J**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Dibromochloromethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Ethylbenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**0.6460 J**	ND
m,p-Xylene	ND	**2.392 J**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**0.3910 J**	**2.540 J**
Methylene chloride	**1.281 J**	ND	ND	ND	ND	ND	ND	ND	**1.228 J**	ND	ND	ND	ND	ND	ND	**0.4650 J**	ND
o-Xylene	**0.8070 J**	**1.146 J**	**0.8500 J**	ND	ND	ND	**0.9050 J**	ND	ND	ND	ND	ND	ND	ND	ND	**0.1040 J**	**1.184 J**
Styrene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Tetrachloroethene	**64120**	**41820**	**6525**	**362**	ND	ND	**18750**	**1108**	**32420**	**7587**	**2187**	**8177**	**201.2**	**434.5**	ND	ND	ND
Toluene	**63.3**	**82.82**	**39.11**	**35.1**	**12.27**	**15.85**	**80.69**	ND	**100.9**	**18.67**	**31.61**	**40.66**	**21.67**	**34.09**	**20.19**	**24.59**	**53.47**
trans-1,2-Dichloroethene	**6.27**	**15.37**	ND	ND	ND	ND	ND	ND	**1.656 J**	ND	ND	ND	ND	ND	ND	ND	ND
Trichloroethene	**184**	**332.1**	**12.64**	ND	ND	ND	**57.02**	**1.297 J**	**50.92**	**39.51**	**3.623 J**	**12.49**	ND	ND	ND	ND	ND
Vinyl chloride	ND	ND	ND	ND	ND	ND	**5.923**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

Table 4.4-1 Summary of Positive Results for Passive Soil Gas Samples, Sylvania Corning FUSRAP Site, Hicksville, New York

Analyte	SG-064 18" 09/25/06	SG-065 18" 09/25/06	SG-066 7" 09/25/06	SG-067 7" 09/25/06	SG-905 7" 09/25/06	SG-068 17.5" 09/25/06	SG-906 17.5" 09/25/06	SG-069 7.5" 09/25/06	SG-070 7" 09/25/06	SG-907 7" 09/25/06	SG-071 7" 09/25/06	SG-072 17.5" 09/25/06	SG-073 18" 09/25/06	SG-074 18" 09/25/06	SG-075 6.5" 09/25/06	SG-076 7" 09/25/06	SG-077 7.5" 09/25/06
VOCs (ng)																	
1,1-Dichloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**12.24**	ND	ND
1,2,3-Trichlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2,4-Trichlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,4-Dichlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Acetone	ND	ND	ND	ND	ND	**285.9**	ND	ND	**1444**	ND	**278.4**	ND	ND	ND	ND	ND	ND
Benzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chloromethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
cis-1,2-Dichloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Dibromochloromethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Ethylbenzene	ND	ND	ND	ND	ND	ND	ND	ND	**4.797 J**	ND	ND	ND	ND	ND	ND	ND	ND
m,p-Xylene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Methylene chloride	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
o-Xylene	ND	ND	ND	ND	ND	ND	ND	ND	ND	**0.7770 J**	ND	ND	ND	ND	ND	ND	ND
Styrene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Tetrachloroethene	**373.4**	**363.2**	ND	ND	ND	**806.1**	**767.1**	ND	ND	ND	ND	ND	**430.1**	**125.7**	**188.1**	ND	ND
Toluene	**26.86**	**30.72**	ND	**12.87**	**14.24**	ND	ND	**13.12**	**90.66**	**68.42**	**32.48**	ND	ND	ND	ND	**12.16**	ND
trans-1,2-Dichloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Trichloroethene	**2.925 J**	**1.632 J**	ND	ND	ND	**2.258 J**	ND	ND	ND	ND	ND	ND	**2.260 J**	ND	ND	ND	ND
Vinyl chloride	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

Table 4.4-1 Summary of Positive Results for Passive Soil Gas Samples, Sylvania Corning FUSRAP Site, Hicksville, New York

Analyte	SG-908 7.5" 09/25/06	SG-078 18" 09/26/06	SG-079 18" 09/26/06	SG-080 18" 09/26/06	SG-081 18" 09/26/06	SG-082 18" 09/26/06	SG-083 17.5" 09/26/06	SG-084 18" 09/26/06	SG-085 18.5" 09/26/06	SG-086 18" 09/26/06	SG-087 7" 09/26/06	SG-088 6.5" 09/26/06	SG-089 7" 09/26/06	SG-TB-01 09/26/06
VOCs (ng)														
1,1-Dichloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2,3-Trichlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**13.32 J**
1,2,4-Trichlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**12.39 J**
1,4-Dichlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**1.685 J**
Acetone	ND	**297.2**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**35.71 J**
Benzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**3.795 J**
Chloromethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**8.647**
cis-1,2-Dichloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Dibromochloromethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Ethylbenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
m,p-Xylene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Methylene chloride	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
o-Xylene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Styrene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**0.9460 J**
Tetrachloroethene	ND	ND	ND	ND	**260.5**	**1265**	ND	**295.9**	**135.3**	ND	ND	ND	ND	**18.71**
Toluene	**25.98**	ND	ND	ND	**12.14**	**14.8**	**16.56**	ND	ND	ND	**21.42**	**21.21**	**19.87**	**2.110 J**
trans-1,2-Dichloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Trichloroethene	ND	ND	ND	ND	ND	**16.01**	ND	ND	ND	ND	ND	ND	ND	ND
Vinyl chloride	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

Note:
Samples SG-900 to SG-908 are duplicates (their results are presented immediately after the corresponding original sample results).
Bolded values denote positive results

Key:
J = Estimated.
ND = Parameter not detected.
ng = Nanograms.
SG = Soil gas sample.
TB = Trip blank.
VOC = Volatile Organic Compound.

Table 4.4-2 Summary of Positive Results for Sub-Slab Soil Vapor Samples, Sylvania Corning FUSRAP Site, Hicksville, New York

Analyte	B70-SSA-01 09/13/06	B70-SSA-02 09/13/06	B70-SSA-03 09/13/06	B70-SSA-04 09/13/06	B70-SSA-05 09/13/06	B70-SSA-06 09/13/06	B70-SSA-07 09/13/06	B70-SSA-08 09/13/06	B70-SSA-09 09/13/06	B70-SSA-010 09/13/06	B70-SSA-011 09/13/06	B70-SSA-012 09/13/06
Volatiles TO-15 (µg/m^3)												
1,1,1-Trichloroethane	**71**	11 U	44 U	**27**	16 U	16 U	4.4 U	8.7 U	22 U	330 U	870 U	53 U
1,1-Dichloroethane	16 U	8.1 U	32 U	16 U	12 U	12 U	3.2 U	6.5 U	16 U	240 U	650 U	40 U
1,1-Dichloroethene	16 U	7.9 U	32 U	16 U	12 U	12 U	3.2 U	6.3 U	16 U	240 U	630 U	39 U
1,2,4-Trimethylbenzene	20 U	9.8 U	39 U	20 U	15 U	15 U	3.9 U	7.9 U	20 U	290 U	790 U	48 U
1,3,5-Trimethylbenzene	20 U	9.8 U	39 U	20 U	15 U	15 U	3.9 U	7.9 U	20 U	290 U	790 U	48 U
2-Hexanone	41 U	**30**	82 U	**41**	31 U	31 U	8.2 U	16 U	41 U	610 U	1600 U	100 U
4-Ethyltoluene	20 U	9.8 U	39 U	20 U	15 U	15 U	3.9 U	7.9 U	20 U	290 U	790 U	48 U
Acetone	240 U	**240**	480 U	240 U	**200**	**310**	**160**	**290**	**310**	3600 U	9500 U	590 U
Benzene	13 U	6.4 U	26 U	13 U	9.6 U	9.6 U	2.6 U	5.1 U	13 U	190 U	510 U	31 U
Bromoform	41 U	**65**	83 U	41 U	31 U	31 U	8.3 U	17 U	41 U	620 U	1700 U	100 U
Chloroform	20 U	9.8 U	39 U	20 U	15 U	15 U	3.9 U	7.8 U	20 U	290 U	780 U	48 U
Chloromethane	21 U	10 U	41 U	21 U	15 U	15 U	4.1 U	8.3 U	21 U	310 U	830 U	52 U
cis-1,2-Dichloroethene	16 U	7.9 U	32 U	**36**	12 U	12 U	3.2 U	6.3 U	16 U	240 U	**1100**	39 U
cis-1,3-Dichloropropene	18 U	9.1 U	36 U	18 U	14 U	14 U	3.6 U	7.3 U	18 U	270 U	730 U	44 U
Cyclohexane	14 U	6.9 U	28 U	14 U	10 U	10 U	2.8 U	5.5 U	14 U	210 U	550 U	34 U
Dichlorodifluoromethane	49 U	25 U	99 U	49 U	37 U	**130**	**310**	**480**	49 U	740 U	2000 U	120 U
Ethylbenzene	17 U	8.7 U	35 U	17 U	13 U	13 U	3.5 U	6.9 U	17 U	260 U	690 U	43 U
Heptane	16 U	8.2 U	33 U	16 U	12 U	12 U	3.3 U	6.6 U	16 U	250 U	660 U	40 U
Hexane	35 U	18 U	70 U	35 U	26 U	26 U	7.0 U	14 U	35 U	530 U	1400 U	88 U
Isopropyl alcohol	250 U	120 U	490 U	**290**	**1200**	**1200**	**210**	**120**	**1600**	3700 U	9800 U	610 U
Methyl ethyl ketone	29 U	**290**	**190**	**170**	**130**	**35**	**9.4**	**17**	**86**	440 U	1200 U	74 U
Methyl isobutyl ketone	41 U	**86**	82 U	**49**	**33**	31 U	8.2 U	16 U	41 U	610 U	1600 U	100 U
Methylene chloride	35 U	17 U	69 U	35 U	26 U	26 U	6.9 U	14 U	35 U	520 U	1400 U	87 U
o-Xylene	17 U	8.7 U	35 U	17 U	13 U	13 U	3.5 U	6.9 U	17 U	260 U	690 U	43 U
Tetrachloroethene	**2800 J**	**1500 J**	**6500 J**	**3200 J**	**150 J**	**88 J**	**160 J**	**1400 J**	**310 J**	**66000 J**	**120000 J**	**8800 J**
Toluene	15 U	**16**	30 U	**15**	**14**	**12**	**5.3**	**9.8**	15 U	230 U	600 U	**41**
Trichloroethene	21 UJ	11 UJ	**860 J**	**530 J**	16 UJ	16 UJ	4.3 UJ	**27 J**	21 UJ	**590 J**	**26000 J**	**190 J**
Trichlorofluoromethane	**84**	**96**	**84**	**79**	**50**	**110**	**90**	**84**	**79**	340 U	900 U	**180**

Table 4.4-2 Summary of Positive Results for Sub-Slab Soil Vapor Samples, Sylvania Corning FUSRAP Site, Hicksville, New York

Analyte	B70-SSA-13 11/14/06	B70-SSA-14 11/14/06	B70-SSA-15 11/14/06	B100-SSA-01 11/14/06	B100-SSA-02 11/14/06	B100-SSA-03 11/14/06	B140-SSA-01 11/14/06	B140-SSA-02 11/14/06	B140-SSA-03 11/14/06
Volatiles TO-15 (µg/m^3)									
1,1,1-Trichloroethane	**150**	130 U	**7.6**	**10**	**270**	**100**	**9.8**	44 U	140 U
1,1-Dichloroethane	**23**	93 U	4.0 U	4.0 U	10 U	32 U	2.0 U	33 U	110 U
1,1-Dichloroethene	**52**	91 U	4.0 U	4.0 U	9.9 U	31 U	2.0 U	32 U	100 U
1,2,4-Trimethylbenzene	4.9 U	110 U	4.9 U	4.9 U	**25**	38 U	**22**	40 U	130 U
1,3,5-Trimethylbenzene	4.9 U	110 U	4.9 U	4.9 U	12 U	38 U	**5.9**	40 U	130 U
2-Hexanone	10 U	230 U	10 U	10 U	26 U	78 U	**6.6**	82 U	260 U
4-Ethyltoluene	4.9 U	110 U	4.9 U	4.9 U	12 U	38 U	**21**	40 U	130 U
Acetone	59 U	1400 U	93 U	**380**	**330**	450 U	170 U	480 U	1500 U
Benzene	3.2 U	73 U	3.2 U	3.2 U	8.0 U	25 U	1.6 U	26 U	83 U
Bromoform	10 U	240 U	10 U	10 U	26 U	81 U	5.2 U	84 U	270 U
Chloroform	**23**	110 U	4.9 U	4.9 U	12 U	38 U	2.4 U	40 U	130 U
Chloromethane	5.2 U	120 U	5.2 U	5.2 U	13 U	39 U	2.7 U	41 U	130 U
cis-1,2-Dichloroethene	4.0 U	91 U	**4.0**	4.0 U	9.9 U	31 U	2.0 U	32 U	100 U
cis-1,3-Dichloropropene	4.5 U	100 U	4.5 U	4.5 U	11 U	35 U	2.3 U	37 U	120 U
Cyclohexane	**5.9**	79 U	3.4 U	3.4 U	**11**	27 U	1.7 U	28 U	89 U
Dichlorodifluoromethane	12 U	280 U	17 U	**490**	**1700**	**330**	6.4 U	99 U	320 U
Ethylbenzene	4.3 U	100 U	4.3 U	4.3 U	11 U	34 U	**13**	35 U	110 U
Heptane	4.1 U	94 U	**4.1**	4.1 U	10 U	32 U	2.0 U	33 U	110 U
Hexane	8.8 U	200 U	8.8 U	8.8 U	22 U	67 U	4.6 U	70 U	230 U
Isopropyl alcohol	61 U	1400 U	**130**	61 U	150 U	470 U	32 U	490 U	1600 U
Methyl ethyl ketone	7.4 U	170 U	**41**	**16**	**53**	56 U	**27**	**170**	**260**
Methyl isobutyl ketone	10 U	230 U	**12**	10 U	**29**	78 U	**9.0**	**86**	260 U
Methylene chloride	8.7 U	200 U	8.7 U	8.7 U	22 U	66 U	4.5 U	69 U	220 U
o-Xylene	4.3 U	100 U	4.3 U	4.3 U	11 U	34 U	**4.8**	35 U	110 U
Tetrachloroethene	**880**	**20000**	**880**	**640**	**290**	**7500**	**600**	**9500**	**27000**
Toluene	3.8 U	87 U	**57**	3.8 U	**75**	**75**	**9.8**	31 U	98 U
Trichloroethene	**160**	**4200**	**28**	5.4 U	13 U	42 U	2.7 U	**590**	**350**
Trichlorofluoromethane	**90**	130 U	**33**	**160**	**190**	**280**	2.9 U	46 U	150 U

Notes:

[1] Sample B70-SSA-090 is the field duplicate of sample B70-SSA-012

[2] Sample B70-SSA-092 is the field duplicate of sample B70-SSA-015

Bolded values denote positive results

Key:

J = Estimated.
µg/m^3 = Micrograms per cubic meter.
SSA = Sub-slab air sample.
TB = Trip blank.
U = Not detected.
UJ = Estimated/Not detected.

Table 4.4-3 Summary of Positive Results for Ambient Air (Indoor and Outdoor Air) Samples, Sylvania Corning FUSRAP Site, Hicksville, New York

Analyte	B70-IA-01 11/14/2006	B70-IA-02 11/14/2006	B70-IA-03 11/14/2006	B100-IA-01 11/14/2006	B100-IA-02 11/14/2006	B100-IA-03 11/14/2006	B140-IA-01 11/14/2006	B140-IA-02 11/14/2006	B140-IA-03 11/14/2006	OA-01 11/14/2006	OA-02 11/14/2006	OA-03 11/14/2006
Volatiles TO-15 (µg/m^3)												
1,1,1-Trichloroethane	**0.24**	**0.16**	**0.12**	**0.23**	0.16 U	0.055 UR	**0.27**	0.22 U	0.27 U	**0.11**	**0.10**	**0.11**
1,2-Dichlorotetrafluoroethane	**0.15**	0.14 U	**0.15**	**0.15**	0.21 U	0.070 UR	**0.14**	0.28 U	0.35 U	**0.15**	**0.14**	**0.16**
1,3,5-Trimethylbenzene	**0.38 J-**	**0.49 J-**	**0.29**	**0.17**	**0.42 J-**	0.049 UR	**0.40**	**0.38 J-**	**0.26 J-**	**0.12**	**0.11**	**0.093**
1,3-Butadiene	0.088 UJ	0.088 UJ	0.044 U	0.044 U	0.13 UJ	0.044 UR	0.044 U	0.18 UJ	0.22 UJ	0.044 U	**0.080**	**0.077**
2,2,4-Trimethylpentane	**0.15**	**0.14**	**0.14**	**0.16**	**0.30**	0.047 UR	**0.28**	**0.45**	0.23 U	**0.19**	**0.24**	**0.24**
4-Ethyltoluene	**0.59**	**0.88**	**0.54**	**0.46**	**1.3**	0.049 UR	**0.74**	**0.93**	**0.79**	**0.25**	**0.33**	**0.27**
Benzene	**0.45**	**0.42**	**0.38**	**0.45**	**0.61**	0.032 UR	**0.67**	**1.2**	**0.89**	**0.42**	**0.51**	**0.51**
Carbon tetrachloride	**0.75**	**0.75**	**0.75**	**0.69**	**0.75**	0.063 UR	**0.69**	**0.75**	**0.88**	**0.69**	**0.69**	**0.69**
Chloroform	**0.11**	**0.10**	**0.11**	**0.093**	0.15 U	0.049 UR	**0.13**	0.20 U	0.24 U	**0.11**	**0.098**	**0.15**
cis-1,2-Dichloroethene	0.079 U	0.079 U	0.040 U	0.040 U	0.12 U	0.040 UR	**0.087**	**0.52**	**0.48**	0.040 U	0.040 U	0.040 U
Cyclohexane	**0.10**	**0.079 J**	**0.096**	**0.11**	**0.22**	0.034 UR	**0.89**	**0.65**	**0.45**	**0.23**	**0.14**	**0.15**
Dichlorodifluoromethane	**3.4**	**6.4**	**9.9 J**	**4.9 J**	**6.9**	0.059 UR	**3.4**	**3.3**	**3.2**	**3.2**	**3.2**	**3.2**
Ethylbenzene	**0.78**	**0.87**	**0.56**	**0.26**	**0.42**	0.043 UR	**0.69**	**1.7**	**1.2**	**0.28**	**0.23**	**0.26**
Heptane	**0.22 J-**	**0.15 J**	**0.20 J-**	**0.20 J-**	**0.39 J-**	0.041 UR	**1.1 J-**	**0.78 J-**	**0.57 J-**	**0.25 J-**	**0.24 J-**	**0.25 J-**
Hexane	**0.39 J-**	**0.30 J**	**0.32**	**0.53**	**0.92 J-**	0.070 UR	**1.1**	**1.8 J-**	**1.2 J-**	**3.5 J**	**0.85**	**0.49**
Methyl tert-butyl ether	0.072 U	0.072 U	0.036 U	**0.036**	0.11 U	0.036 UR	**0.069**	0.14 U	0.18 U	0.036 U	**0.040**	0.036 U
o-Xylene	**2.1**	**2.5**	**1.4**	**0.33**	**0.52**	0.043 UR	**0.87**	**1.7**	**1.2**	**0.37**	**0.30**	**0.30**
Tetrachloroethene	**7.5**	**8.8**	**5.4**	**1.2**	**15**	0.068 UR	**4.4**	**19**	**24**	**0.24**	**0.46**	**0.39**
Toluene	**1.4**	**0.87**	**2.3**	**1.1**	**2.0**	0.038 UR	**3.1**	**4.1**	**3.0**	**1.3**	**1.4**	**2.3**
Trichloroethene	**0.51**	**0.97**	**0.40**	**0.070**	**0.34**	0.054 UR	**0.46**	**2.5**	**2.6**	**0.064**	**0.075**	**0.091**
Trichlorofluoromethane	**28 J**	**19 J**	**12 J**	**52 J**	**56 J**	0.056 UR	**2.4**	**2.5**	**4.0**	**1.9**	**1.9**	**1.7**

Note:

[1] Sample B70-IA-090 is the field duplicate of sample B70-IA-02.

Key:

IA = Indoor air sample.
J = Estimated.
J- = Estimated low.
µg/m^3 = Micrograms per cubic meter.
OA = Outdoor air sample.
U = Not detected.
UJ = Estimated/Not detected.
UR = Rejected values.

Table 4.4-4 Summary of Positive Results for Transformer Pad Soil Samples, Sylvania Corning FUSRAP Site, Hicksville, New York

Analyte	SS-01 09/15/06 0-2 in	NS-01 09/15/06 2-12 in	NS-02 09/15/06 2-12 in	NS-03 09/15/06 2-12 in	NS-04 09/15/06 2-12 in	SU14-11-Z1 05/23/2007 6-8 ft	SU14-11-Z2 05/23/2007 13-15 ft	SU14-12-Z1 05/23/2007 6-8 ft	SU14-12-Z2 06/01/2007 13-15 ft	SU14-13-Z1 05/22/2007 5-7 ft	SU14-13-Z2 05/22/2007 13-15 ft	SU14-14-Z1 05/22/2007 4-6 ft	SU14-14-Z2 05/22/2007 8-10 ft
PCBs (µg/Kg)													
AROCLOR 1254	21 U	19 U	**1000**	**170**	**43**	**39**	34 U	35 U	34 U	**88**	**140**	36 U	34 U
AROCLOR 1260	**32**	**51**	200 U	**69**	**20**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**

Note:

Bolded values denote positive results

Key:

ft= feet.
in= inches.
µg/Kg= Micrograms per kilogram.
na= Not analyzed.
NS= Near surface soil sample point (2 inches to 1 foot below ground surface).
PCB= Polychlorinated biphenyl.
SS= Surface soil sample point (0 to 2 inches below ground surface).
U= Not detected.

Table 4.4-5 Summary of Radiological Results for Concrete Core Samples, Remedial Investigation Report, Sylvania Corning FUSRAP Site, Hicksville, New York

Sample ID	Sample Depth	Analyte: Units: Sample Date	Uranium-233/234 pCi/g					Uranium-235/236 pCi/g					Uranium-238 pCi/g					Thorium-228 pCi/g					Thorium-230 pCi/g					Thorium-232 pCi/g					Radium-226 pCi/g					Radium-228 pCi/g				
			Result			Qual	MDC	Result			Qual	MDC	Result			Qual	MDC	Result			Qual	MDC	Result			Qual	MDC	Result			Qual	MDC	Result			Qual	MDC	Result			Qual	MDC
D8-02	0-0.34 ft	05/16/07	114	±	17		2	12.0	±	4.1		1.8	354	±	46		1	0.289	±	0.082		0.023	0.71	±	0.15		0.03	0.301	±	0.084		0.019	0.30	±	0.15		0.30	0.24	±	0.28	UJ	0.45
F6-02	0-0.25 ft	05/16/07	217	±	29		1	13.5	±	4.1		0.7	273	±	35		0.9	0.278	±	0.076		0.027	0.392	±	0.094		0.022	0.290	±	0.077		0.023	0.18	±	0.23		0.18	0.15	±	0.27	UJ	0.21

Table 4.4-5 Summary of Radiological Results for Concrete Core Samples, Remedial Investigation Report, Sylvania Corning FUSRAP Site, Hicksville, New York

Sample ID	Sample Depth	Analyte: Units: Sample Date	Bismuth-212 pCi/g				Potassium-40 pCi/g				Protactinium-234m pCi/g				Lead-212 pCi/g				Lead-214 pCi/g				Thallium-208 pCi/g				Thorium-234 pCi/g			
			Result		Qual	MDC	Result		Qual	MDC	Result		Qual	MDC	Result		Qual	MDC	Result		Qual	MDC	Result		Qual	MDC	Result		Qual	MDC
D8-02	0-0.34 ft	05/16/07		--			5.2	±	1.3	1.1	374	±	36	7	0.30	±	0.14	0.21		--				--			253	±	20	14
F6-02	0-0.25 ft	05/16/07	1.9	±	1.1	0.6	4.0	±	1.1	0.2	403	±	41	2	0.67	±	0.36	0.17		--			0.20	±	0.11	0.07	271	±	21	4

Notes:

Alpha Spectroscopy

Uranium 233/234, 235/236, 238- DOE-A-01-R

Thorium 228, 230, 232- DOE-A-01-R

Gamma Spectroscopy

All other Radionuclides- DOE-GA-01-R

Radium-226 was identified and quantified using the Bismuth-214 peak.

Radium-228 was identified and quantified using the Actinium-228 peak.

Table 4.5-1 List of GTEOSI Tables Used for Sample Inclusion, Sylvania Corning FUSRAP Site, Hicksville, New York

Systematic Subsurface Soil Sampling and Analysis Report Investigation Beneath the 100 Building (Survey Units 03, 04 and 05) (URS and Envirocon 2005a)	Table 1 - SU03, 04 and 05 Soil Boring Sample Results
	Table 3 - 100 Building Focused Sampling Sample Results
	Table 6 - SU04 009 Delineation Soil Boring Sample Results
	Table 7 - NYSDEC Additional Borings Sample Results
Systematic Subsurface Soil Sampling and Analysis Report Investigation Beneath the 140 Building (Survey Unit 06 and Survey Unit 07) (URS and Envirocon 2005c)	SU06 and SU07 Soil Boring Sample Results
Phase I Soil Remediation Report (URS and Envirocon 2006b)	Cell 1 - Table 3 - Summary of Verification Floor Sample Results, Severn Trent Laboratories, Inc.
	Cell 1 - Table 5 - Focused Soil Boring Sample Results
	Cell 2 - Table 3 - Summary of Verification Floor Sample Results, Severn Trent Laboratories, Inc.
	Cell 2 - Table 5 - Summary of Verification Wall Sample Results, Severn Trent Laboratories, Inc.
	Cell 3 - Table 3 - Summary of Verification Floor Sample Results, Severn Trent Laboratories, Inc.
	Cell 4 - Table 3 - Summary of Verification Floor Sample Results, Severn Trent Laboratories, Inc.
	Cell 4 - Table 5 - Summary of Verification Wall Sample Results, Severn Trent Laboratories, Inc.
	Cell 5 - Table 3 - Summary of Verification Floor Sample Results, Severn Trent Laboratories, Inc.
	Cell 5 - Table 5 - Focused Soil Boring Sample Results
	Cell 6 - Table 3 - Summary of Verification Floor Sample Results, Severn Trent Laboratories, Inc.
	Cell 6 - Table 5 - Focused Soil Boring Sample Results
	Cell 7 - Table 3 - Summary of Verification Floor Sample Results, Severn Trent Laboratories, Inc.
	Cell 7 - Table 5 - Summary of Verification Wall Sample Results, Severn Trent Laboratories, Inc.
	Cell 7 - Table 6 - Focused Soil Boring Sample Results
	Cell 8 - Table 3 - Summary of Verification Floor Sample Results, Severn Trent Laboratories, Inc.
	Cell 8 - Table 5 - Summary of Verification Wall Sample Results, Severn Trent Laboratories, Inc.
	Cell 9 - Table 3 - Summary of Verification Floor Sample Results, Severn Trent Laboratories, Inc.
	Cell 9 - Table 5 - Focused Soil Boring Sample Results
	Cell 9 - Table 6 - Systematic Soil Boring Sample Results
	Cell 9 - Table 7 - Focused Nickel Sample Results, Severn Trent Laboratories, Inc.
	Cell 10 - Table 3 - Summary of Verification Floor Sample Results, Severn Trent Laboratories, Inc.
	Cell 10 - Table 5 - Systematic Soil Boring Sample Results
	Cell 11 - Table 3 - Summary of Verification Floor Sample Results, Severn Trent Laboratories, Inc.
	Cell 11 - Table 5 - Focused Soil Boring Sample Results
	Cell 11 - Table 6 - Systematic Soil Boring Sample Results
	Cell 12 - Table 3 - Summary of Verification Floor Sample Results
	Cell 12 - Table 5 - Focused Soil Boring Sample Results
	Cell 13 - Table 3 - Summary of Verification Floor Sample Results, Severn Trent Laboratories, Inc.
	Cell 13 - Table 5 - Summary of Verification Wall Sample Results, Severn Trent Laboratories, Inc.
	Cell 14 - Table 3 - Summary of Verification Floor Sample Results, Severn Trent Laboratories, Inc.
	Cell 14 - Table 5 - Summary of Verification Wall Sample Results, Severn Trent Laboratories, Inc.
	Cell 14 - Table 6 - Systematic Soil Boring Sample Results, Severn Trent Laboratories, Inc.
Systematic Subsurface Soil Sampling and Analysis Report Cell 9 Subsurface Soil Delineation (URS and Envirocon 2005f)	Table 1- Cell 9 Soil Boring Sample Results
Systematic Subsurface Soil Sampling and Analysis Report Cells 3, 4, 12, 14 and Golf Course Driving Range Subsurface	Table 1 - Cells 3, 4, 12, 14 and Golf Course Driving Range Soil Boring Sample Results
	Table 2 - Golf Course Driving Range Additional Investigation Soil Boring Sample Results
Systematic Subsurface Soil Sampling and Analysis Report Historic Leach Pools (URS and Envirocon 2006c)	Table 2 - LPH Investigation, LPH01 and LPH02 Soil Boring Sample Results
	Table 3 - LPH Investigation, LPH03, LPH04 and LPH05 Soil Boring Sample Results
	Table 4 - LPH Investigation, LPH12 and LPH13 Soil Boring Sample Results
	Table 5 - LPH Investigation, LPH14 Soil Boring Sample Results
	Table 6 - LPH Investigation, LPH15, LPH16 and LPH17 Soil Boring Sample Results
	Table 7 - LPH Investigation, LPH20 and LPH21 Soil Boring Sample Results
	Table 8 - LPH Investigation, LPH34 Soil Boring Sample Results
Systematic Subsurface Soil Sampling and Analysis Report Investigation and Remediation of Soils North of the 140 Building (URS and Envirocon 2005d)	Table 2 - North of the 140 Building Summary of Verification Floor Sample Results, Severn Trent Laboratories, Inc.
	Table 3 - North of the 140 Building Summary of Verification Wall Sample Results, Severn Trent Laboratories, Inc.
Systematic Subsurface Soil Sampling and Analysis Report West of the 140 and 100 Buildings Southwest of the 100 Building (Survey Unit 01 and Survey Unit 02) (URS and Envirocon 2005b)	Table 1 - SU01 and SU02 Soil Boring Sample Results

Key:
LPH=Historic leach pool.
NYSDEC=New York State Department of Environmental Conservation.
SU=Survey unit.

Table 4.5-2 Statistical Summary of Analytical Data for 140 Property Soil Samples, Remedial Investigation, Sylvania FUSRAP Site

Analyte	# of Times Analyte Detected	# of Samples Collected	% Analyte Detected	Minimum Detected Value	Maximum Detected Value	Average Detected Value	Background Threshold Value (BTV)	Number of Samples Above BTV	Number of Samples Above 3x BTV
Metals (mg/kg)									
Aluminum	18	18	100	1100	9040	3570	5950	5	0
Antimony	12	18	66.7	0.376	4.4	1.15	0.639	8	1
Arsenic	18	18	100	1	15.3	4.72	2.42	13	3
Barium	18	18	100	3.8	28.9	11.7	24.7	1	0
Beryllium	182	209	87.1	0.039	1.2	0.183	0.35	13	1
Cadmium	4	18	22.2	0.1	0.41	0.213	NAV	NAV	NAV
Calcium	18	18	100	54.1	33100	4150	NAV	NAV	NAV
Chromium	18	18	100	1.5	17.9	6.67	7.56	3	0
Cobalt	18	18	100	0.62	156	12.1	4.6	4	3
Copper	18	18	100	1.7	60.7	8.22	9.19	3	1
Iron	18	18	100	1910	17200	6350	10800	2	0
Lead	18	18	100	0.75	23.8	5.6	10.4	2	0
Magnesium	18	18	100	221	20100	2660	NAV	NAV	NAV
Manganese	18	18	100	28.9	246	89.1	224	1	0
Mercury	10	18	55.6	0.004	0.172	0.0393	0.171	1	0
Nickel	517	1354	38.2	0.13	1100	13.7	16.1	56	22
Potassium	18	18	100	152	960	275	NAV	NAV	NAV
Selenium	18	18	100	0.73	6.4	2.96	0.376	18	17
Silver	6	18	33.3	0.15	2.7	1.28	0.137	6	4
Sodium	17	18	94.4	28.6	1590	172	NAV	NAV	NAV
Vanadium	18	18	100	2.2	53	9.88	14.7	3	1
Zinc	18	18	100	3	38.4	13.3	25.1	2	0
Radionuclides (pCi/g)									
Actinium-228*	3038	3398	89.4	0.097	3.4	0.405	0.878	155	5
Bismuth-212*	2636	3357	78.5	0.02	2.6	0.25	NAV	NAV	NAV
Bismuth-214*	3268	3417	95.6	0.068	0.98	0.216	0.51	99	0
Cesium-137	1243	3217	38.6	0.002	0.14	0.011	NAV	NAV	NAV
Lead-210	6	17	35.3	1.5	4.8	2.52	NAV	NAV	NAV
Lead-212*	3419	3449	99.1	0.052	2.4	0.252	0.854	59	0
Lead-214*	3339	3433	97.3	0.068	1.34	0.224	0.576	72	0
Potassium-40	3379	3450	97.9	0.11	15	4	12.9	6	0
Protactinium-231	606	1491	40.6	0.09	1.2	0.375	NAV	NAV	NAV
Protactinium-234*	535	3210	16.7	0.055	0.57	0.216	NAV	NAV	NAV
Protactinium-234m*	2158	3349	64.4	0.41	250	15.9	NAV	NAV	NAV
Radium-223*	456	1491	30.6	0.028	0.29	0.104	NAV	NAV	NAV
Radium-224*	1922	3210	59.9	0.092	2.8	0.391	NAV	NAV	NAV
Radium-226	90	1500	6	0.098	0.98	0.351	0.504	17	0
Radium-228	51	243	21	0.143	1.2	0.493	0.733	10	0
Thallium-208*	3210	3404	94.3	0.0092	0.91	0.0944	0.261	75	2
Thorium-227*	720	1491	48.3	0.018	0.28	0.0838	NAV	NAV	NAV
Thorium-228	533	595	89.6	0.042	23.2	0.408	1.2	8	1
Thorium-230	588	595	98.8	0.041	3.18	0.412	1.02	28	1
Thorium-231*	1533	3209	47.8	0.1	18	1.34	NAV	NAV	NAV
Thorium-232	3560	3805	93.6	0.064	20.5	0.396	1.18	70	1
Thorium-234*	2723	3378	80.6	0.24	210	12.1	0.625	2604	1817
Uranium-234	579	595	97.3	0.062	612	5.4	0.81	299	213
Uranium-235	3069	3805	80.7	0.013	23.6	0.707	0.091	2941	2054
Uranium-238	3207	3805	84.3	0.013	210	10.9	0.901	2606	1800
VOCs (µg/kg)									
1,1,1-Trichloroethane	1	508	0.197	0.54	0.54	0.54	NAV	NAV	NAV
1,1,2,2-Tetrachloroethane	1	518	0.193	0.82	0.82	0.82	NAV	NAV	NAV
1,1-Dichloroethene	1	518	0.193	15000	15000	15000	NAV	NAV	NAV
1,2,3-Trichlorobenzene	2	106	1.89	1.1	34	17.6	NAV	NAV	NAV
1,2-Dichlorobenzene	2	513	0.39	0.93	1.1	1.02	NAV	NAV	NAV
1,3-Dichlorobenzene	1	518	0.193	0.95	0.95	0.95	NAV	NAV	NAV
1,4-Dichlorobenzene	9	517	1.74	0.42	83000	9220	NAV	NAV	NAV

Table 4.5-2 Statistical Summary of Analytical Data for 140 Property Soil Samples, Remedial Investigation, Sylvania FUSRAP Site

Analyte	# of Times Analyte Detected	# of Samples Collected	% Analyte Detected	Minimum Detected Value	Maximum Detected Value	Average Detected Value	Background Threshold Value (BTV)	Number of Samples Above BTV	Number of Samples Above 3x BTV
2-Butanone	2	374	0.535	1.5	24	12.8	NAV	NAV	NAV
2-Hexanone	2	518	0.386	1.8	3.4	2.6	NAV	NAV	NAV
Acetone	82	391	21	2.4	140	8.85	NAV	NAV	NAV
Benzene	1	545	0.183	3.5	3.5	3.5	NAV	NAV	NAV
Bromomethane	2	518	0.386	1.1	1.4	1.25	NAV	NAV	NAV
Carbon disulfide	3	499	0.601	0.71	2.6	1.47	NAV	NAV	NAV
Carbon tetrachloride	3	508	0.591	24	34	29.7	NAV	NAV	NAV
Chloroform	1	518	0.193	0.25	0.25	0.25	NAV	NAV	NAV
Chloromethane	1	518	0.193	1.5	1.5	1.5	NAV	NAV	NAV
cis-1,2-Dichloroethene	6	545	1.1	0.34	210000	36100	NAV	NAV	NAV
Ethylbenzene	2	531	0.377	0.49	0.82	0.655	NAV	NAV	NAV
m,p-Xylenes	2	172	1.16	1.3	190	95.6	NAV	NAV	NAV
Methyl acetate	1	106	0.943	6.4	6.4	6.4	NAV	NAV	NAV
Methylene chloride	88	518	17	2.8	150	9.48	NAV	NAV	NAV
o-Xylene	1	171	0.585	0.37	0.37	0.37	NAV	NAV	NAV
Styrene	1	510	0.196	2	2	2	NAV	NAV	NAV
Tetrachloroethene	100	544	18.4	0.21	40000000	413000	NAV	NAV	NAV
Toluene	21	546	3.85	0.38	20000	1080	NAV	NAV	NAV
trans-1,2-Dichloroethene	3	545	0.55	0.74	6900	2370	NAV	NAV	NAV
Trichloroethene	32	537	5.96	0.17	1600000	51000	NAV	NAV	NAV
Trichlorofluoromethane	8	106	7.55	0.25	6.1	1.57	NAV	NAV	NAV
Vinyl chloride	2	545	0.367	700	3700	2200	NAV	NAV	NAV
Xylenes (total)	1	404	0.248	850	850	850	NAV	NAV	NAV

Notes:

* Short-lived daughter products of uranium and thorium.

Potassium-40 is a beta/gamma emitter that is ubiquitous in the environment and not a site contaminant; results are presented for informational purposes only and are not discussed in the report.

Key:

BTV = Background Threshold Value.

µg/kg = Micrograms per kilogram.

mg/kg = Milligrams per kilogram.

NAV = Not available.

pCi/g = Picocuries per gram.

VOCs = Volatile organic compounds.

Table 4.5-3 Statistical Summary of Analytical Data for 100 Property Soil Samples, Remedial Investigation, Sylvania FUSRAP Site, Hicksville, New York

Analyte	# of Times Analyte Detected	# of Samples Collected	% Analyte Detected	Minimum Detected Value	Maximum Detected Value	Average Detected Value	Background Threshold Value (BTV)	Number of Samples Above BTV	Number of Samples Above 3x BTV
Metals (mg/kg)									
Aluminum	19	19	100	806	17200	5040	5950	6	0
Antimony	14	19	73.7	0.415	2.4	1.28	0.639	12	2
Arsenic	19	19	100	0.28	15.7	6.26	2.42	12	8
Barium	19	19	100	3.4	37.2	16	24.7	5	0
Beryllium	429	539	79.6	0.039	1.4	0.171	0.35	30	1
Cadmium	10	19	52.6	0.11	0.33	0.209	NAV	NAV	NAV
Calcium	19	19	100	49.3	10200	1490	NAV	NAV	NAV
Chromium	19	19	100	2.2	34.4	9.69	7.56	8	1
Cobalt	18	19	94.7	0.55	8.5	2.67	4.6	2	0
Copper	19	19	100	1.4	168	15.9	9.19	7	1
Iron	19	19	100	1790	15700	7500	10800	4	0
Lead	19	19	100	1.3	180	21.2	10.4	6	3
Magnesium	19	19	100	50.9	5390	1120	NAV	NAV	NAV
Manganese	19	19	100	27.3	200	101	224	0	0
Mercury	12	19	63.2	0.0073	0.183	0.0546	0.171	1	0
Nickel	1462	5050	29	0.18	8020	134	16.1	595	464
Potassium	18	19	94.7	67.1	454	277	NAV	NAV	NAV
Selenium	18	19	94.7	0.9	7.3	3.35	0.376	18	16
Silver	4	19	21.1	0.11	0.78	0.347	0.137	3	1
Sodium	17	19	89.5	25.2	254	77.5	NAV	NAV	NAV
Vanadium	19	19	100	2.3	51.9	14.5	14.7	8	1
Zinc	19	19	100	2.6	72.8	21.4	25.1	6	0
Radionuclides (pCi/g)									
Actinium-227	36	109	33	5	27	10.2	NAV	NAV	NAV
Actinium-228*	9003	10168	88.5	0.048	15	0.484	0.878	1139	22
Bismuth-212*	7869	10137	77.6	0.011	7.6	0.291	NAV	NAV	NAV
Bismuth-214*	9676	10193	94.9	0.021	1.6	0.222	0.51	497	1
Cobalt-60	1	1	100	0.149	0.149	0.149	NAV	NAV	NAV
Cesium-137	4371	9626	45.4	0.00084	0.4	0.0133	NAV	NAV	NAV
Lead-210	2	11	18.2	1.7	3	2.35	NAV	NAV	NAV
Lead-212*	10144	10212	99.3	0.023	11	0.299	0.854	436	8
Lead-214*	9861	10204	96.6	0.016	1.69	0.228	0.576	347	0
Potassium-40	10091	10195	99	0.17	24	4.39	12.9	35	0
Protactinium-231	3101	7784	39.8	0.033	2	0.372	NAV	NAV	NAV
Protactinium-234*	1463	9616	15.2	0.032	0.7	0.209	NAV	NAV	NAV
Protactinium-234m*	5775	10129	57	0.25	1500	7.91	NAV	NAV	NAV
Radium-223*	2209	7784	28.4	0.02	0.39	0.103	NAV	NAV	NAV
Radium-224*	6689	9616	69.6	0.032	12	0.434	NAV	NAV	NAV
Radium-226	136	7444	1.83	0.106	1.47	0.411	0.504	36	0
Radium-228	115	598	19.2	0.17	5.02	0.742	0.733	43	2
Thallium-208*	9576	10167	94.2	0.011	3.7	0.11	0.261	615	9
Thorium-227*	3915	7784	50.3	0.0079	0.39	0.0844	NAV	NAV	NAV
Thorium-228	1045	1168	89.5	0.067	9.8	0.429	1.2	43	2
Thorium-230	1158	1169	99.1	0.057	2.32	0.396	1.02	30	0
Thorium-231*	2585	9616	26.9	0.045	62	2.28	NAV	NAV	NAV
Thorium-232	9982	10785	92.6	0.048	15	0.469	1.18	565	7
Thorium-234*	8232	10179	80.9	0.22	1300	5.26	0.625	7762	4402
Uranium-234	1162	1169	99.4	0.061	417	3.67	0.81	666	397
Uranium-235	8435	10785	78.2	0.012	77	0.439	0.091	8023	4664
Uranium-238	9040	10785	83.8	0.05	1300	5.06	0.901	7226	3489
VOCs (µg/kg)									
1,1,1-Trichloroethane	12	1130	1.06	0.2	2.5	0.562	NAV	NAV	NAV
1,1,2-Trichloroethane	1	1135	0.0881	9.5	9.5	9.5	NAV	NAV	NAV
1,2-Dichlorobenzene	24	1122	2.14	0.89	150	21.1	NAV	NAV	NAV
1,2-Dichloroethane	1	1133	0.0883	0.24	0.24	0.24	NAV	NAV	NAV
1,3-Dichlorobenzene	1	1132	0.0883	1.5	1.5	1.5	NAV	NAV	NAV
1,4-Dichlorobenzene	13	1123	1.16	0.4	4.9	0.949	NAV	NAV	NAV

Table 4.5-3 Statistical Summary of Analytical Data for 100 Property Soil Samples, Remedial Investigation, Sylvania FUSRAP Site, Hicksville, New York

Analyte	# of Times Analyte Detected	# of Samples Collected	% Analyte Detected	Minimum Detected Value	Maximum Detected Value	Average Detected Value	Background Threshold Value (BTV)	Number of Samples Above BTV	Number of Samples Above 3x BTV
2-Butanone	7	878	0.797	1.9	37	15	NAV	NAV	NAV
2-Hexanone	2	1135	0.176	2	5.4	3.7	NAV	NAV	NAV
Acetone	176	810	21.7	1.5	46000	350	NAV	NAV	NAV
Benzene	2	1640	0.122	0.19	0.41	0.3	NAV	NAV	NAV
Bromomethane	20	1132	1.77	0.98	31	2.64	NAV	NAV	NAV
Carbon disulfide	3	1123	0.267	0.76	2.4	1.49	NAV	NAV	NAV
Carbon tetrachloride	9	1128	0.798	0.4	1.8	1.05	NAV	NAV	NAV
Chlorobenzene	8	1116	0.717	0.38	5.8	2.07	NAV	NAV	NAV
Chloroform	4	1132	0.353	0.25	0.92	0.555	NAV	NAV	NAV
Chloromethane	25	1135	2.2	0.36	1.9	0.764	NAV	NAV	NAV
cis-1,2-Dichloroethene	12	1633	0.735	0.57	890	152	NAV	NAV	NAV
Cyclohexane	2	93	2.15	0.31	0.41	0.36	NAV	NAV	NAV
Ethylbenzene	1	1634	0.0612	8.6	8.6	8.6	NAV	NAV	NAV
m,p-Xylenes	6	791	0.759	0.38	2100	470	NAV	NAV	NAV
Methylene chloride	179	1135	15.8	0.47	40000	229	NAV	NAV	NAV
o-Xylene	6	792	0.758	3.6	8600	1740	NAV	NAV	NAV
Styrene	3	1116	0.269	0.32	1.4	0.893	NAV	NAV	NAV
Tetrachloroethene	392	1594	24.6	0.21	7000000	88600	NAV	NAV	NAV
Toluene	27	1641	1.65	0.32	6900	256	NAV	NAV	NAV
Total Petroleum Hydrocarbons	1	37	2.7	95000	95000	95000	NAV	NAV	NAV
trans-1,2-Dichloroethene	15	1640	0.915	0.39	950	64	NAV	NAV	NAV
Trichloroethene	139	1636	8.5	0.11	12000	353	NAV	NAV	NAV
Trichlorofluoromethane	22	93	23.7	0.29	1.3	0.497	NAV	NAV	NAV
Xylenes (total)	4	1026	0.39	1.9	92	26.8	NAV	NAV	NAV

Notes:

* Short-lived daughter products of uranium and thorium.

Potassium-40 is a beta/gamma emitter that is ubiquitous in the environment and not a site contaminant; results are presented for informational purposes only and are not discussed in the report.

Key:

BTV= Background Threshold Value.

µg/kg= Micrograms per kilograms.

mg/kg= Milligrams per kilogram.

NAV= Not available.

pCi/g= Picocuries per gram.

VOCs= Volatile organic compounds.

Table 4.5-4 Statistical Summary of Analytical Data for 70 Property Soil Samples, Remedial Investigation, Sylvania FUSRAP Site, Hicksville, New York

Analyte	# of Times Analyte Detected	# of Samples Collected	% Analyte Detected	Minimum Detected Value	Maximum Detected Value	Average Detected Value	Background Threshold Value (BTV)	Number of Samples Above BTV	Number of Samples Above 3x BTV
Metals (mg/kg)									
Aluminum	24	24	100	969	16100	4750	5950	6	0
Antimony	18	24	75	0.395	2.26	0.989	0.639	12	2
Arsenic	24	24	100	1.4	13.6	5.15	2.42	17	6
Barium	24	24	100	5.6	27.2	13.4	24.7	1	0
Beryllium	2	28	7.14	0.05	0.1	0.075	0.35	0	0
Cadmium	4	24	16.7	0.12	0.16	0.14	NAV	NAV	NAV
Calcium	24	24	100	47	5700	1170	NAV	NAV	NAV
Chromium	24	24	100	3.1	37.8	7.71	7.56	7	1
Cobalt	24	24	100	0.63	4.6	2.28	4.6	0	0
Copper	24	24	100	2.2	44.5	6.82	9.19	3	1
Iron	24	24	100	2090	20300	7040	10800	5	0
Lead	24	24	100	1.2	19.9	5.31	10.4	3	0
Magnesium	24	24	100	258	3570	1090	NAV	NAV	NAV
Manganese	24	24	100	42.6	406	112	224	1	0
Mercury	14	24	58.3	0.0044	0.0937	0.0285	0.171	0	0
Nickel	590	711	83	0.36	1020	20.1	16.1	71	32
Potassium	24	24	100	166	610	292	NAV	NAV	NAV
Selenium	24	24	100	0.73	11	3.43	0.376	24	23
Silver	5	24	20.8	0.22	12.6	3.45	0.137	5	4
Sodium	22	24	91.7	29.9	151	60.8	NAV	NAV	NAV
Vanadium	24	24	100	2.6	30.3	10	14.7	6	0
Zinc	24	24	100	4.2	40	13	25.1	3	0
PCBs (µg/kg)									
AROCLOR 1254	6	13	46.2	39	1000	247	NAV	NAV	NAV
AROCLOR 1260	4	13	30.8	20	69	43	NAV	NAV	NAV
Radionuclides (pCi/g)									
Actinium-228*	426	670	63.6	0.099	2.7	0.48	0.878	35	1
Bismuth-212*	181	521	34.7	0.033	1.8	0.258	NAV	NAV	NAV
Bismuth-214*	619	793	78.1	0.073	1.51	0.301	0.51	74	0
Cesium-137	94	230	40.9	0.0031	0.144	0.012	NAV	NAV	NAV
Lead-210	10	26	38.5	1.19	4.3	2.36	NAV	NAV	NAV
Lead-212*	862	883	97.6	0.056	2.2	0.335	0.854	49	0
Lead-214*	746	842	88.6	0.079	1.75	0.287	0.576	63	1
Potassium-40	871	880	99	0.16	15.6	5.27	12.9	8	0
Protactinium-231	88	217	40.6	0.13	0.84	0.373	NAV	NAV	NAV
Protactinium-234*	21	218	9.63	0.088	0.49	0.215	NAV	NAV	NAV
Protactinium-234m*	119	501	23.8	0.54	157	9.98	NAV	NAV	NAV
Radium-223*	51	217	23.5	0.026	0.27	0.105	NAV	NAV	NAV
Radium-224*	155	220	70.5	0.12	2.5	0.388	NAV	NAV	NAV
Radium-226	372	854	43.6	0.073	1.51	0.375	0.504	76	0
Radium-228	218	674	32.3	0.05	1.62	0.511	0.733	41	0
Thallium-208*	556	730	76.2	0.021	0.73	0.143	0.261	66	0
Thorium-227*	100	217	46.1	0.024	0.2	0.0799	NAV	NAV	NAV
Thorium-228	640	678	94.4	0.091	1.78	0.486	1.2	20	0
Thorium-230	671	678	99	0.091	2.53	0.527	1.02	62	0
Thorium-231*	38	217	17.5	1.5	6.7	3.21	NAV	NAV	NAV
Thorium-232	852	896	95.1	0.051	2.7	0.434	1.18	34	0
Thorium-234*	437	591	73.9	0.23	103	3.56	0.625	411	194
Uranium-234	678	678	100	0.063	133	3.04	0.81	323	177
Uranium-235	504	896	56.3	0.013	6.2	0.331	0.091	366	178
Uranium-238	872	896	97.3	0.062	194	2.68	0.901	436	195
VOCs (µg/kg)									
1,1,1-Trichloroethane	8	581	1.38	0.22	43	8.9	NAV	NAV	NAV
1,1,2-Trichloroethane	2	583	0.343	2	8	5	NAV	NAV	NAV
1,1-Dichloroethane	2	583	0.343	1.2	2.2	1.7	NAV	NAV	NAV
1,2,4-Trichlorobenzene	1	391	0.256	0.81	0.81	0.81	NAV	NAV	NAV
1,2-Dichlorobenzene	9	583	1.54	0.16	5	0.998	NAV	NAV	NAV

Table 4.5-4 Statistical Summary of Analytical Data for 70 Property Soil Samples, Remedial Investigation, Sylvania FUSRAP Site, Hicksville, New York

Analyte	# of Times Analyte Detected	# of Samples Collected	% Analyte Detected	Minimum Detected Value	Maximum Detected Value	Average Detected Value	Background Threshold Value (BTV)	Number of Samples Above BTV	Number of Samples Above 3x BTV
1,2-Dichloroethane	3	583	0.515	0.22	2.1	0.853	NAV	NAV	NAV
1,3-Dichlorobenzene	2	583	0.343	0.15	0.27	0.21	NAV	NAV	NAV
1,4-Dichlorobenzene	10	582	1.72	0.19	0.53	0.332	NAV	NAV	NAV
2-Butanone	14	537	2.61	1	46	9.87	NAV	NAV	NAV
Acetone	42	467	8.99	4.1	250	44.4	NAV	NAV	NAV
Benzene	8	583	1.37	0.2	0.49	0.306	NAV	NAV	NAV
Carbon disulfide	13	583	2.23	0.78	7.2	2.5	NAV	NAV	NAV
Chloroform	5	583	0.858	0.28	0.58	0.398	NAV	NAV	NAV
cis-1,2-Dichloroethene	19	583	3.26	0.27	61	8.17	NAV	NAV	NAV
Ethylbenzene	4	583	0.686	0.31	77	21.5	NAV	NAV	NAV
Isopropylbenzene	5	392	1.28	0.23	2.9	1.62	NAV	NAV	NAV
m,p-Xylenes	19	392	4.85	0.69	4.2	2.67	NAV	NAV	NAV
Methyl acetate	8	392	2.04	0.73	3.4	1.9	NAV	NAV	NAV
Methylene chloride	53	583	9.09	0.34	24	4.78	NAV	NAV	NAV
o-Xylene	8	393	2.04	0.8	5.2	2.43	NAV	NAV	NAV
Styrene	28	574	4.88	0.27	8.8	1.72	NAV	NAV	NAV
Tetrachloroethene	180	584	30.8	0.24	8900	170	NAV	NAV	NAV
Toluene	55	584	9.42	0.19	12	1.11	NAV	NAV	NAV
trans-1,2-Dichloroethene	5	583	0.858	0.33	2.4	0.952	NAV	NAV	NAV
Trichloroethene	53	583	9.09	0.23	1700	46	NAV	NAV	NAV
Trichlorofluoromethane	42	392	10.7	0.27	3.2	0.66	NAV	NAV	NAV
Vinyl chloride	2	581	0.344	4	4.3	4.15	NAV	NAV	NAV
Xylenes (total)	2	180	1.11	3	330	167	NAV	NAV	NAV

Notes:

*Short-lived daughter products of uranium and thorium.

Potassium-40 is a beta/gamma emitter that is ubiquitous in the environment and not a site contaminant; results are presented for informational purposes only and are not discussed in the report.

Key:

BTV= Background Threshold Value.
µg/kg= Micrograms per kilogram.
mg/kg= Milligrams per kilogram.
NAV= Not available.
PCBs= Polychlorinated biphenyls.
pCi/g= Picocuries per gram.
VOCs= Volatile organic compounds.

Table 4.5-5 Statistical Summary of Analytical Data for Driving Range Property Soil Samples, Remedial Investigation, Sylvania FUSRAP Site

Analyte	# of Times Analyte Detected	# of Samples Collected	% Analyte Detected	Minimum Detected Value	Maximum Detected Value	Average Detected Value	Background Threshold Value (BTV)	Number of Samples Above BTV	Number of Samples Above 3x BTV
Metals (mg/kg)									
Beryllium	19	28	67.9	0.039	0.15	0.0803	0.35	0	0
Nickel	127	1002	12.7	0.23	75	6.35	16.1	8	3
Radionuclides (pCi/g)									
Actinium-228*	1637	1930	84.8	0.028	1.94	0.396	0.878	101	0
Bismuth-212*	1328	1930	68.8	0.026	1.46	0.219	NAV	NAV	NAV
Bismuth-214*	1855	1930	96.1	0.012	1.27	0.224	0.51	105	0
Cesium-137	672	1700	39.5	0.0022	0.31	0.0183	NAV	NAV	NAV
Lead-212*	1929	1930	99.9	0.02	1.28	0.251	0.854	48	0
Lead-214*	1913	1930	99.1	0.018	1.15	0.23	0.576	83	0
Potassium-40	1892	1930	98	0.19	14	3.98	12.9	4	0
Protactinium-231	696	1673	41.6	0.078	1.1	0.335	NAV	NAV	NAV
Protactinium-234*	164	1675	9.79	0.079	0.52	0.181	NAV	NAV	NAV
Protactinium-234m*	693	1930	35.9	0.47	25	2.51	NAV	NAV	NAV
Radium-223*	455	1673	27.2	0.022	0.41	0.0931	NAV	NAV	NAV
Radium-224*	1082	1675	64.6	0.021	1.5	0.346	NAV	NAV	NAV
Radium-226	160	1660	9.64	0.182	1.31	0.513	0.504	64	0
Radium-228	89	255	34.9	0.3	1.72	0.722	0.733	45	0
Thallium-208*	1804	1930	93.5	0.0074	0.52	0.0939	0.261	76	0
Thorium-227*	847	1673	50.6	0.015	0.29	0.0762	NAV	NAV	NAV
Thorium-228	264	281	94	0.119	2.26	0.773	1.2	41	0
Thorium-230	285	285	100	0.109	2.26	0.856	1.02	81	0
Thoriium-231*	272	1675	16.2	0.34	8.6	2.78	NAV	NAV	NAV
Thorium-232	1786	1960	91.1	0.028	2.34	0.417	1.18	68	0
Thorium-234*	1539	1930	79.7	0.095	20	1.6	0.625	1387	387
Uraniium-234	285	285	100	0.082	12.8	1.66	0.81	150	53
Uranium-235	1286	1960	65.6	0.012	3.51	0.247	0.091	1193	406
Uranium-238	1725	1960	88	0.09	20	1.55	0.901	1143	178
VOCs (µg/kg)									
1,1,2,2-Tetrachloroethane	1	270	0.37	0.79	0.79	0.79	NAV	NAV	NAV
1,2-Dichlorobenzene	3	262	1.15	0.97	1.3	1.09	NAV	NAV	NAV
1,2-Dichloroethane	1	257	0.389	0.85	0.85	0.85	NAV	NAV	NAV
1,3-Dichlorobenzene	4	266	1.5	0.9	1.1	0.98	NAV	NAV	NAV
1,4-Dichlorobenzene	4	270	1.48	1	1.5	1.2	NAV	NAV	NAV
2-Butanone	2	138	1.45	1.3	1.5	1.4	NAV	NAV	NAV
2-Hexanone	3	270	1.11	1.7	2.2	2	NAV	NAV	NAV
Acetone	17	162	10.5	2.8	22	6.53	NAV	NAV	NAV
Benzene	6	964	0.622	0.32	0.36	0.335	NAV	NAV	NAV
Bromodichloromethane	2	267	0.749	0.21	0.22	0.215	NAV	NAV	NAV
Bromomethane	13	269	4.83	1.1	2.2	1.63	NAV	NAV	NAV
Carbon disulfide	12	270	4.44	0.29	0.82	0.418	NAV	NAV	NAV
Chloroform	1	244	0.41	0.13	0.13	0.13	NAV	NAV	NAV
Chloromethane	5	267	1.87	0.51	1.2	1	NAV	NAV	NAV
cis-1,2-Dichloroethene	3	934	0.321	0.36	110	36.9	NAV	NAV	NAV
Ethylbenzene	4	963	0.415	0.47	0.56	0.522	NAV	NAV	NAV
m,p-Xylenes	2	710	0.282	140	440	290	NAV	NAV	NAV
Methylene chloride	28	270	10.4	2.8	27	6.89	NAV	NAV	NAV
o-Xylene	3	718	0.418	290	7100	2720	NAV	NAV	NAV
Styrene	3	270	1.11	0.55	6.4	2.92	NAV	NAV	NAV
Tetrachloroethene	74	960	7.71	0.2	9900000	404000	NAV	NAV	NAV
Toluene	7	964	0.726	0.4	3100	443	NAV	NAV	NAV
trans-1,2-Dichloroethene	2	964	0.207	300	1700	1000	NAV	NAV	NAV
Trichloroethene	64	946	6.77	0.31	22000	684	NAV	NAV	NAV
Xylenes (total)	1	270	0.37	1.6	1.6	1.6	NAV	NAV	NAV

Notes:

*Short-lived daughter products of uranium and thorium.

Potassium-40 is a beta/gamma emitter that is ubiquitous in the environment and not a site contaminant; results are presented for informational purposes only and are not discussed in the report.

Key:

BTV= Background Threshold Value.
µg/kg= Micrograms per kilogram.
pCi/g= Picocuries per gram.
mg/kg= Milligrams per kilogram.
NAV= Not available.
VOCs= Volatile organic compounds.

Table 4.5-6 Summary of Background Threshold Values for Soils, Sylvania Corning FUSRAP Site, Hicksville, New York

Analyte	Number of Samples	Number of Detections	Outliers Excluded	Distribution	Mean	SD	Mean + 2SD	Maximum Detected Value	Background Threshold Value (BTV)	Statistic	New York State Rural Soil Bkgd. Conc. (RSBC) Table 9.1-9	NYS Rural Soil Source Distant 98%ile Conc. App. D Table 6a
Metals (mg/kg)												
Aluminum	45	45	0	Lognormal	2,061	1,741	5,542	8,590	5,950	95% UPL (t)	NA	17,000
Antimony	37	19	0	None	0.324	0.184	0.692	1.200	0.639	95% KM UPL (t)	NA	<2.7
Arsenic	45	43	0	Lognormal	1.229	0.599	2.428	2.900	2.42	95% UPL (t)	16	14
Barium	45	45	0	Lognormal	8.831	8.315	25.460	37.000	24.7	95% UPL (t)	350	312
Beryllium	45	45	0	Lognormal	0.157	0.091	0.340	0.410	0.350	95% UPL (t)	NA	1.1
Cadmium	45	0	0	None	NA	NA	NA	NA	NAV	None	2.5	2.7
Chromium	43	43	2	Lognormal	3.626	1.824	7.274	8.600	7.56	95% UPL (t)	30	22
Cobalt	44	43	1	Lognormal	1.438	1.313	4.063	6.700	4.60	95% UPL (t)	NA	14.8
Copper	45	45	0	Lognormal	3.482	2.941	9.364	14.400	9.19	95% UPL (t)	NA	61
Iron	45	45	0	Lognormal	4,021	3,173	10,366	15,400	10,800	95% UPL (t)	NA	27,600
Lead	44	44	1	Lognormal	3.725	4.705	13.135	27.700	10.4	95% UPL (t)	NA	75
Manganese	44	44	1	Lognormal	62.323	58.717	179.757	309.000	224	95% UPL (t)	2,000	1,760
Mercury	45	17	0	None	0.046	0.073	0.193	0.480	0.171	95% KM UPL (t)	0.3	0.27
Nickel	45	45	0	None	2.732	4.201	11.134	20.200	16.1	95% UPL	NA	26
Selenium	45	18	0	Lognormal	0.299	0.044	0.386	0.450	0.376	95% UPL (t)	4	5.7
Silver	45	2	0	None	0.096	0.025	0.145	0.120	0.137	95% KM UPL (t)	NA	1.3
Thallium	45	17	0	Lognormal	0.753	0.426	1.605	2.200	1.56	95% UPL (t)	NA	NA
Vanadium	45	45	0	Lognormal	6.511	4.519	15.549	24.400	14.7	95% UPL (t)	NA	38
Zinc	45	45	0	Lognormal	8.591	8.287	25.165	43.400	25.1	95% UPL (t)	NA	180
Radionuclides (pCi/g)												
Actinium-228	51	16	0	Lognormal	0.352	0.307	0.966	1.280	0.878	95% UPL (t)	NA	NA
Bismuth-212	51	1	0	None	NA	NA	NA	1.010	NAV	None	NA	NA
Bismuth-214	51	29	0	None	0.247	0.155	0.558	0.710	0.510	95% KM UPL (t)	NA	NA
Lead-212	51	45	0	Lognormal	0.298	0.263	0.824	1.000	0.854	95% UPL (t)	NA	NA
Lead-214	51	38	0	Lognormal	0.226	0.173	0.572	0.720	0.576	95% UPL (t)	NA	NA
Potassium-40	35	35	0	Gamma	4.161	3.757	11.676	12.200	12.9	95% Wilson Hilferty (WH) Approx. Gamma UPL	NA	NA
Radium-226	51	15	0	Lognormal	0.236	0.149	0.534	0.700	0.504	95% UPL (t)	NA	NA
Radium-228	47	10	4	Lognormal	0.336	0.249	0.834	1.220	0.733	95% UPL (t)	NA	NA
Thallium-208	51	24	0	None	0.130	0.077	0.284	0.360	0.261	95% KM UPL (t)	NA	NA
Thorium-228	51	41	0	Lognormal	0.462	0.357	1.176	1.480	1.20	95% UPL (t)	NA	NA
Thorium-230	47	47	4	Nonparametric	0.469	0.325	1.119	1.230	1.02	95% KM UPL (t)	NA	NA
Thorium-232	51	48	0	Lognormal	0.388	0.313	1.014	1.200	1.18	95% UPL (t)	NA	NA
Thorium-234	51	6	0	Lognormal	0.290	0.284	0.857	1.590	0.625	95% UPL (t)	NA	NA

Table 4.5-6 Summary of Background Threshold Values for Soils, Sylvania Corning FUSRAP Site, Hicksville, New York

Analyte	Number of Samples	Number of Detections	Outliers Excluded	Distribution	Mean	SD	Mean + 2SD	Maximum Detected Value	Background Threshold Value (BTV)	Statistic	New York State Rural Soil Bkgd. Conc. (RSBC) Table 9.1-9	NYS Rural Soil Source Distant 98%ile Conc. App. D Table 6a
Uranium-234	51	50	0	None	0.383	0.252	0.887	1.000	0.810	95% KM UPL (t)	NA	NA
Uranium-235	51	13	0	Normal	0.057	0.020	0.097	0.106	0.091	95% KM UPL (t)	NA	NA
Uranium-238	51	47	0	Gamma	0.350	0.251	0.853	1.030	0.901	95% Wilson Hilferty (WH) Approx. Gamma UPL	NA	NA

Note:
K-40 (potassium-40) is a beta/gamma emitter that is ubiquitous in the environment and not a site contaminant; results are presented for informational purposes only and are not discussed in the report.

Key:
BTV = Background threshold value.
pCi/g = Picocuries per gram.
mg/kg = Milligrams per kilogram.
NA = Not applicable.
NAV = Not available.
RSBC = Rural soil background concentration.
SD = Standard deviation.
UPL = Upper Prediction Limit.

Table 4.7-1 Summary of Background Threshold Values for Groundwater, Sylvania Corning FUSRAP Site, Hicksville, New York

Analyte	Number of Samples	Number of Detections	High Outliers Excluded	Distribution	Mean	Standard Deviation	Mean + 2SD	Maximum Detected Value	Background Threshold Value (BTV)	Statistic
Metals (µg/L)										
Aluminum	10	5	0	Normal	602	1,031	2,664	3,210	2,580	95% KM UPL (t)
Arsenic	10	2	0	Insuff. Data	0.304	0.432	1.168	1.6	1.14	95% KM UPL (t)
Barium	10	10	0	Gamma	32.01	25.07	82.15	89.4	88.1	95% WH Approx. Gamma UPL
Beryllium	10	5	0	Normal	0.082	0.052	0.187	0.19	0.183	95% KM UPL (t)
Cadmium	10	7	0	Gamma	0.178	0.124	0.426	0.52	0.416	95% KM UPL (t)
Calcium	10	10	0	Normal	14,886	8,498	31,882	31,600	31,200	95% UPL (t)
Chromium	10	6	0	Gamma	1.460	2.521	6.502	7.2	6.31	95% KM UPL (t)
Cobalt	10	7	0	Normal	1.234	0.897	3.028	2.7	2.96	95% KM UPL (t)
Iron	10	5	0	Gamma	617	1,071	2,759	3,790	2,680	95% KM UPL (t)
Lead	10	4	0	Normal	0.618	1.044	2.706	3.5	2.63	95% KM UPL (t)
Magnesium	10	10	0	Normal	3,777	1,596	6,969	6,610	6,850	95% UPL (t)
Manganese	9	9	1	Normal	42.06	33.09	108.24	117	107	95% UPL (t)
Nickel	10	4	0	Normal	1.964	1.341	4.646	3.9	4.54	95% KM UPL (t)
Potassium	10	2	0	Insuff. Data	5,673	1,809	9,291	11,100	9,150	95% KM UPL (t)
Sodium	10	10	0	Lognormal	85,525	151,843	389,211	491,000	432,000	95% UPL (t)
Thallium	10	9	0	Normal	0.087	0.036	0.1586	0.15	0.156	95% UPL (t)
Vanadium	10	2	0	Insuff. Data	2.930	2.190	7.31	9.5	7.14	95% KM UPL (t)
Zinc	10	9	0	Gamma	12.3	14.26	40.82	52.5	39.7	95% KM UPL (t)
Radionuclides (pCi/L)										
Gross Alpha	10	7	0	Normal	2.123	1.660	5.443	5.326	5.31	95% KM UPL (t)
Gross Beta	10	8	0	Normal	5.751	4.621	14.993	15.810	14.6	95% KM UPL (t)
Lead-212	8	2	0	Insuff. Data	5.465	0.059	5.583	5.621	5.58	95% KM UPL (t)
Lead-214	10	1	0	Insuff. Data	ID	ID	ID	5.002	5.00	Max Detect
Radium-226	10	8	0	Normal	0.537	0.240	1.017	1.00	0.999	95% KM UPL (t)
Radium-228	8	7	0	Normal	0.891	0.371	1.633	1.513	1.64	95% KM UPL (t)
Thallium-208	10	1	0	Insuff. Data	ID	ID	ID	12.85	12.9	Max Detect
Thorium-227	10	1	0	Insuff. Data	ID	ID	ID	0.151	0.151	Max Detect
Thorium-230	5	3	0	Normal	0.573	0.169	0.911	0.828	0.969	95% KM UPL (t)
Thorium-232	10	1	0	Insuff. Data	ID	ID	ID	0.1374	0.137	Max Detect
Thorium-234	7	1	0	Insuff. Data	ID	ID	ID	72.17	72.2	Max Detect
Total Uranium (µg/L)	10	3	0	Normal	0.469	0.102	0.673	0.773	0.665	95% KM UPL (t)
Uranium-234	10	2	0	Insuff. Data	0.380	0.026	0.4314	0.457	0.429	95% KM UPL (t)
Uranium-238	10	3	0	Normal	0.133	0.038	0.2082	0.243	0.205	95% KM UPL (t)
VOCs (µg/L)										
1,1-Dichloroethane	10	1	0	Insuff. Data	ID	ID	ID	1	1	Max Detect
1,2,3-Trichlorobenzene	10	1	0	Insuff. Data	ID	ID	ID	2	2	Max Detect
1,2,4-Trichlorobenzene	10	1	0	Insuff. Data	ID	ID	ID	2	2	Max Detect
2-Hexanone	10	1	0	Insuff. Data	ID	ID	ID	3	3	Max Detect
Acetone	10	2	0	Insuff. Data	3.500	0.500	4.5	4	4.46	95% KM UPL (t)
Bromoform	10	2	0	Insuff. Data	4.000	0.000	4.000	4	4	Max Detect
CFC-12	10	1	0	Insuff. Data	ID	ID	ID	1	1	Max Detect
Chloroform	10	1	0	Insuff. Data	ID	ID	ID	3	3	Max Detect
Dibromochloromethane	10	3	0	Indeterminate	ID	ID	ID	3	3	Max Detect
Dichlorobromomethane	10	1	0	Insuff. Data	ID	ID	ID	2	2	Max Detect
Ethylene dibromide	10	1	0	Insuff. Data	ID	ID	ID	2	2	Max Detect
Methyl isobutyl ketone	10	1	0	Insuff. Data	ID	ID	ID	2	2	Max Detect
Tetrachloroethene	10	4	0	Indeterminate	2.111	0.314	2.739	3	2.71	95% KM UPL (t)
Trans-1,3-Dichloropropene	10	1	0	Insuff. Data	ID	ID	ID	0.9	0.900	Max Detect
Trichloroethene	10	2	0	Insuff. Data	0.650	0.450	1.55	2	1.51	95% KM UPL (t)

Key:
ID= Insufficient data.
µg/L = Micrograms per liter.
pCi/L = Picocuries per liter.
UPL= Upper prediction limit.
VOCs = Volatile organic compounds.

Table 4.7-2 Statistical Summary of Phase IIIb Analytical Data for NCDPW Property (Upgradient) Monitoring Well Samples, Remedial Investigation, Sylvania FUSRAP Site, Hicksville, New York

Analyte	# of Times Analyte Detected	# of Samples Collected	% Analyte Detected	Minimum Detected Value	Maximum Detected Value	Average Detected Value
Metals (µg/L)						
Aluminum	5	10	50	51.8	3210	1150
Arsenic	2	10	20	0.16	1.6	0.88
Barium	10	10	100	9.5	89.4	32
Beryllium	5	10	50	0.05	0.19	0.114
Cadmium	7	10	70	0.11	0.52	0.207
Calcium	10	10	100	6750	31600	14900
Chromium	6	10	60	0.1	7.2	2.37
Cobalt	7	10	70	0.43	2.7	1.58
Iron	5	10	50	154	3790	1080
Lead	4	10	40	0.068	3.5	1.44
Magnesium	10	10	100	1860	6610	3780
Manganese	10	10	100	11.3	736	111
Nickel	4	10	40	0.66	3.9	2.29
Potassium	2	10	20	5070	11100	8090
Sodium	10	10	100	7640	491000	85500
Thallium	10	10	100	0.036	0.15	0.0868
Vanadium	2	10	20	2.2	9.5	5.85
Zinc	9	10	90	3	52.5	13.3
Radionuclides (pCi/L)						
Gross Alpha	7	10	70	0.819	5.33	2.68
Gross Beta	8	10	80	1.48	15.8	6.82
Lead-212*	2	10	20	5.44	5.62	5.53
Lead-214*	1	10	10	5	5	5
Radium-226	8	10	80	0.296	1	0.597
Radium-228	7	10	70	0.453	1.51	0.954
Thallium-208*	1	10	10	12.9	12.9	12.9
Thorium-227*	1	10	10	0.151	0.151	0.151
Thorium-230	3	10	30	0.437	0.828	0.663
Thorium-232	1	10	10	0.137	0.137	0.137
Thorium-234*	1	10	10	72.2	72.2	72.2
Total Uranium (µg/L)	3	10	30	0.427	0.773	0.553
Uranium-234	2	10	20	0.371	0.457	0.414
Uranium-238	3	10	30	0.117	0.243	0.168
VOCs (µg/L)						
1,1-Dichloroethane	1	10	10	1	1	1
1,2,3-Trichlorobenzene	1	10	10	2	2	2
1,2,4-Trichlorobenzene	1	10	10	2	2	2
1,2-Dibromoethane	1	10	10	2	2	2
2-Hexanone	1	10	10	3	3	3
4-Methyl-2-Pentanone	1	10	10	2	2	2

Table 4.7-2 Statistical Summary of Phase IIIb Analytical Data for NCDPW Property (Upgradient) Monitoring Well Samples, Remedial Investigation, Sylvania FUSRAP Site, Hicksville, New York

Analyte	# of Times Analyte Detected	# of Samples Collected	% Analyte Detected	Minimum Detected Value	Maximum Detected Value	Average Detected Value
Acetone	2	10	20	3	4	3.5
Bromodichloromethane	1	10	10	2	2	2
Bromoform	2	10	20	4	4	4
Chloroform	1	10	10	3	3	3
Dibromochloromethane	3	10	30	3	3	3
Dichlorodifluoromethane	1	10	10	1	1	1
Tetrachloroethene	4	10	40	2	3	2.25
trans-1,3-Dichloropropene	1	10	10	0.9	0.9	0.9
Trichloroethene	2	10	20	0.5	2	1.25

Note:

*Short-lived daughter products of uranium and thorium

Key:
BTV= Background threshold value.
µg/L = Micrograms per liter.
pCi/L = Picocuries per liter.
NAV= Not available.
VOCs = Volatile organic compounds.

Table 4.7-3 Statistical Summary of Phase IIIb Analytical Data for 140 Property Monitoring Well Samples
Remedial Investigation, Sylvania FUSRAP Site, Hicksville, New York

Analyte	# of Times Analyte Detected	# of Samples Collected	% Analyte Detected	Minimum Detected Value	Maximum Detected Value	Average Detected Value	Background Threshold Value (BTV)	Number of Samples Above BTV	Number of Samples Above 3x BTV
Metals (µg/L)									
Aluminum	4	10	40	36.9	260	103	2580	0	0
Barium	10	10	100	23.5	164	76.9	88.1	4	0
Cadmium	3	10	30	0.13	1.1	0.467	0.416	1	0
Calcium	9	10	90	7310	140000	42500	31200	3	2
Chromium	3	10	30	0.25	1.4	0.707	6.31	0	0
Cobalt	5	10	50	0.4	3	2.12	2.96	3	0
Copper	1	10	10	2.3	2.3	2.3	NAV	NAV	NAV
Iron	10	10	100	41.9	4000	680	2680	1	0
Magnesium	10	10	100	405	29800	8210	6850	3	2
Manganese	10	10	100	9	929	187	107	5	1
Nickel	9	10	90	0.35	9.9	3.87	4.54	4	0
Potassium	2	10	20	5760	6320	6040	9150	0	0
Sodium	10	10	100	5080	455000	118000	432000	1	0
Thallium	10	10	100	0.042	0.12	0.0635	0.156	0	0
Zinc	6	10	60	3.5	21.4	9.5	39.7	0	0
Radionuclides (pCi/L)									
Gross Alpha	6	10	60	2.62	1900	491	5.31	5	3
Gross Beta	10	10	100	3.55	231	38.7	14.6	2	2
Lead-212*	3	10	30	5.79	6.78	6.15	5.58	3	0
Potassium-40	1	10	10	80	80	80	NAV	NAV	NAV
Protactinium-234m*	3	10	30	361	2320	1030	NAV	NAV	NAV
Radium-226	8	10	80	0.278	1.91	0.924	0.999	2	0
Radium-228	8	10	80	0.56	1.57	1.03	1.64	0	0
Thallium-208*	1	10	10	7.64	7.64	7.64	12.9	0	0
Thorium-227*	2	10	20	0.27	0.822	0.546	0.151	2	1
Thorium-228	1	10	10	10.5	10.5	10.5	NAV	NAV	NAV
Thorium-230	3	10	30	0.241	6.73	2.47	0.969	1	1
Thorium-232	1	10	10	10.8	10.8	10.8	0.137	1	1
Thorium-234*	4	10	40	93	1790	571	72.2	4	2
Total Uranium (µg/L)	6	10	60	1.71	10800	2410	0.665	6	5
Uranium-234	7	10	70	0.205	4010	753	0.429	5	5
Uranium-235	5	10	50	0.34	285	76.6	NAV	NAV	NAV
Uranium-238	6	10	60	0.55	3640	809	0.205	6	5
VOCs (µg/L)									
1,1,1-Trichloroethane	1	10	10	2	2	2	NAV	NAV	NAV
1,1-Dichloroethane	1	10	10	2	2	2	1	1	
1,1-Dichloroethene	1	10	10	2	2	2	NAV	NAV	NAV
Chloroform	6	10	60	0.4	22	9.07	3	3	3
Tetrachloroethene	5	10	50	2	9	4.4	2.71	3	1
Trichloroethene	1	10	10	4	4	4	1.51	1	0

Notes:
*Short-lived daughter products of uranium and thorium.
Potassium-40 is a beta/gamma emitter that is ubiquitous in the environment and not a site contaminant; results are presented for informational purposes only and are not discussed in the report.

Key:
BTV= Background threshold value.
µg/L = Micrograms per liter.
pCi/L = Picocuries per liter.
NAV= Not available.
VOCs = Volatile organic compounds.

Table 4.7-4 Statistical Summary of Phase IIIb Analytical Data for 100 Property Monitoring Well Samples
Remedial Investigation, Sylvania FUSRAP Site, Hicksville, New York

Analyte	# of Times Analyte Detected	# of Samples Collected	% Analyte Detected	Minimum Detected Value	Maximum Detected Value	Average Detected Value	Background Threshold Value (BTV)	Number of Samples Above BTV	Number of Samples Above 3x BTV
Metals (µg/L)									
Aluminum	10	14	71.4	20.8	5030	663	2580	1	0
Antimony	1	14	7.14	0.19	0.19	0.19	NAV	NAV	NAV
Arsenic	2	14	14.3	2.4	5.8	4.1	1.14	2	1
Barium	14	14	100	8.2	188	58.2	88.1	3	0
Beryllium	3	14	21.4	0.049	2.8	1.04	0.183	2	1
Cadmium	5	14	35.7	0.097	1.5	0.477	0.416	2	1
Calcium	14	14	100	3940	73700	22500	31200	3	0
Chromium	3	14	21.4	1.2	7.3	3.23	6.31	1	0
Cobalt	8	14	57.1	0.07	7.1	1.78	2.96	2	0
Copper	1	14	7.14	8.8	8.8	8.8	NAV	NAV	NAV
Iron	14	14	100	14.9	3530	806	2680	2	0
Lead	1	14	7.14	11.4	11.4	11.4	2.63	1	1
Magnesium	14	14	100	1170	16800	4540	6850	1	0
Manganese	14	14	100	10.5	784	220	107	7	4
Nickel	14	14	100	0.24	1350	107	4.54	8	3
Sodium	13	14	92.9	6670	338000	101000	432000	0	0
Thallium	13	14	92.9	0.029	0.11	0.0688	0.156	0	0
Vanadium	2	14	14.3	5.1	14.7	9.9	7.14	1	0
Zinc	6	14	42.9	1.9	39.2	10.1	39.7	0	0
Radionuclides (pCi/L)									
Gross Alpha	10	14	71.4	2	22.8	8.89	5.31	7	2
Gross Beta	14	14	92.9	1.75	10.3	6.11	14.6	0	0
Bismuth-214*	2	14	14.3	8.93	14.7	11.8	NAV	NAV	NAV
Potassium-40	1	15	6.67	37.9	37.9	37.9	NAV	NAV	NAV
Protactinium-234m*	3	14	21.4	252	498	385	NAV	NAV	NAV
Radium-226	11	14	78.6	0.195	2.14	0.763	0.999	3	0
Radium-228	11	14	78.6	0.464	2.61	1.05	1.64	1	0
Thorium-227*	2	14	14.3	0.262	0.282	0.272	0.151	2	0
Thorium-228	1	14	7.14	0.495	0.495	0.495	NAV	NAV	NAV
Thorium-230	4	14	28.6	0.21	0.803	0.518	0.969	0	0
Thorium-232	1	14	7.14	0.508	0.508	0.508	0.137	1	1
Total Uranium (µg/L)	8	14	57.1	0.414	26.4	10	0.665	6	4
Uranium-234	8	14	57.1	0.174	9.63	3.47	0.429	6	4
Uranium-235	3	14	21.4	0.194	0.733	0.536	NAV	NAV	NAV
Uranium-238	8	14	57.1	0.13	8.86	3.37	0.205	6	5
VOCs (µg/L)									
1,1,1-Trichloroethane	1	14	7.14	3	3	3	NAV	NAV	NAV
1,1-Dichloroethane	2	14	14.3	2	3	2.5	1	2	0
1,1-Dichloroethene	1	14	7.14	2	2	2	NAV	NAV	NAV
Acetone	2	14	14.3	3	5	4	4.46	1	0
Chloroform	6	14	42.9	3	20	9	3	5	2
cis-1,2-Dichloroethene	1	14	7.14	6	6	6	NAV	NAV	NAV
Tetrachloroethene	12	14	85.7	2	1800	188	2.71	9	5
Trichloroethene	6	14	42.9	0.6	130	24.2	1.51	3	2

Notes:

*Short-lived daughter products of uranium and thorium

Potassium-40 is a beta/gamma emitter that is ubiquitous in the environment and not a site contaminant; results are presented for informational purposes only and are not discussed in the report.

Key:

BTV= Background threshold value.

µg/L = Micrograms per liter.

pCi/L = Picocuries per liter.

NAV= Not available.

VOCs = Volatile organic compounds.

Table 4.7-5 Statistical Summary of Phase IIIb Analytical Data for 70 Property Monitoring Well Samples
Remedial Investigation, Sylvania FUSRAP Site, Hicksville, New York

Analyte	# of Times Analyte Detected	# of Samples Collected	% Analyte Detected	Minimum Detected Value	Maximum Detected Value	Average Detected Value	Background Threshold Value (BTV)	Number of Samples Above BTV	Number of Samples Above 3x BTV
Metals (µg/L)									
Aluminum	19	28	67.9	25.3	1940	399	2580	0	0
Antimony	2	28	7.14	0.11	0.18	0.145	NAV	NAV	NAV
Arsenic	9	28	32.1	0.13	2.1	0.896	1.14	3	0
Barium	28	28	100	4.3	196	79.9	88.1	11	0
Beryllium	16	28	57.1	0.049	0.56	0.14	0.183	3	1
Cadmium	10	28	35.7	0.083	1.2	0.339	0.416	2	0
Calcium	28	28	100	6000	37400	15800	31200	1	0
Chromium	16	28	57.1	0.36	15	3.23	6.31	2	0
Cobalt	19	28	67.9	0.37	57.8	9.12	2.96	14	6
Copper	3	28	10.7	0.8	25	10	NAV	NAV	NAV
Iron	23	28	82.1	19.4	3090	682	2680	2	0
Lead	4	28	14.3	1.2	2.3	1.9	2.63	0	0
Magnesium	27	28	96.4	395	7540	3600	6850	4	0
Manganese	28	28	100	5.2	1710	191	107	10	4
Nickel	26	28	92.9	0.47	2240	141	4.54	20	12
Potassium	5	28	17.9	5840	7350	6450	9150	0	0
Sodium	26	28	92.9	5270	627000	96600	432000	1	0
Thallium	26	28	92.9	0.031	0.37	0.116	0.156	4	0
Vanadium	6	28	21.4	1.3	4	2.68	7.14	0	0
Zinc	19	28	67.9	3.5	135	38.7	39.7	7	1
Radionuclides (pCi/L)									
Gross Alpha	22	28	78.6	0.908	16.9	4.91	5.31	5	2
Gross Beta	26	28	92.9	1.79	20.1	5.32	14.6	1	0
Bismuth-214*	4	28	14.3	8.23	15	10.7	NAV	NAV	NAV
Lead-212*	1	28	3.57	5.97	5.97	5.97	5.58	1	0
Lead-214*	4	28	14.3	-2.54	12.8	6.7	5	3	0
Potassium-40	2	30	6.67	31.2	64.3	47.8	NAV	NAV	NAV
Protactinium-234m*	2	28	7.14	383	440	412	NAV	NAV	NAV
Radium-226	22	28	78.6	0.203	3.71	0.902	0.999	6	1
Radium-228	16	28	57.1	0.42	4.84	1.34	1.64	3	0
Thallium-208*	2	28	7.14	6.88	7.59	7.23	12.9	0	0
Thorium-227	5	28	17.9	0.234	0.466	0.305	0.151	5	1
Thorium-228	4	28	14.3	0.143	2.83	1.34	NAV	NAV	NAV
Thorium-230	6	28	21.4	0.132	3	1.12	0.969	2	1
Thorium-232	3	28	10.7	0.168	3.1	1.58	0.137	3	2
Thorium-234*	4	28	14.3	54.5	76.5	69.1	72.2	2	0
Total Uranium (µg/L)	12	28	42.9	0.54	11.1	4.56	0.665	10	8
Uranium-234	15	28	53.6	0.139	3.88	1.38	0.429	10	7
Uranium-235	6	28	21.4	0.149	0.803	0.351	NAV	NAV	NAV
Uranium-238	12	28	42.9	0.167	3.74	1.51	0.205	10	8
VOCs (µg/L)									
1,1,1-Trichloroethane	7	28	25	1	84	14	NAV	NAV	NAV
1,1,2-Trichloroethane	1	28	3.57	3	3	3	NAV	NAV	NAV
1,1-Dichloroethane	4	28	14.3	2	3	2.5	1	4	0
1,1-Dichloroethene	7	28	25	1	53	9.14	NAV	NAV	NAV
1,2-Dichloroethane	1	28	3.57	1	1	1	NAV	NAV	NAV
4-Methyl-2-Pentanone	1	28	3.57	2	2	2	2	0	0
Acetone	4	28	14.3	2	6	4.5	4.46	3	0
Bromochloromethane	5	28	17.9	0.4	0.5	0.42	NAV	NAV	NAV

Table 4.7-5 Statistical Summary of Phase IIIb Analytical Data for 70 Property Monitoring Well Samples
Remedial Investigation, Sylvania FUSRAP Site, Hicksville, New York

Analyte	# of Times Analyte Detected	# of Samples Collected	% Analyte Detected	Minimum Detected Value	Maximum Detected Value	Average Detected Value	Background Threshold Value (BTV)	Number of Samples Above BTV	Number of Samples Above 3x BTV
Carbon Disulfide	1	28	3.57	1	1	1	NAV	NAV	NAV
Chloroform	4	28	14.3	1	9	6	3	3	0
cis-1,2-Dichloroethene	4	28	14.3	2	7	5	NAV	NAV	NAV
Methyl tert-Butyl Ether	1	28	3.57	2	2	2	NAV	NAV	NAV
Tetrachloroethene	22	28	78.6	2	1400	242	2.71	17	11
Trichloroethene	20	28	71.4	0.5	44	5.9	1.51	9	5

Notes:

*Short-lived daughter products of uranium and thorium

Potassium-40 is a beta/gamma emitter that is ubiquitous in the environment and not a site contaminant; results are presented for informational purposes only and are not discussed in the report.

Key:

BTV= Background threshold value.

µg/L = Micrograms per liter.

pCi/L = Picocuries per liter.

NAV= Not available.

VOCs = Volatile organic compounds.

Table 4.7-6 Statistical Summary of Phase IIIb Analytical Data for Driving Range Property Monitoring Well Samples Remedial Investigation, Sylvania FUSRAP Site, Hicksville, New York

Analyte	# of Times Analyte Detected	# of Samples Collected	% Analyte Detected	Minimum Detected Value	Maximum Detected Value	Average Detected Value	Background Threshold Value (BTV)	Number of Samples Above BTV	Number of Samples Above 3x BTV
Metals (µg/L)									
Aluminum	5	7	71.4	63.6	9140	2060	2580	1	1
Arsenic	6	7	85.7	0.1	9.1	1.82	1.14	1	1
Barium	7	7	100	14.4	106	44.1	88.1	1	0
Beryllium	3	7	42.9	0.16	0.9	0.463	0.183	2	1
Cadmium	7	7	100	0.092	0.24	0.159	0.416	0	0
Calcium	6	7	85.7	5440	19500	12400	31200	0	0
Chromium	7	7	100	0.31	23.5	4.55	6.31	1	1
Cobalt	7	7	100	0.44	17.4	6.79	2.96	5	2
Copper	1	7	14.3	45.6	45.6	45.6	NAV	NAV	NAV
Iron	7	7	100	109	32400	5100	2680	1	1
Lead	2	7	28.6	2.4	31.1	16.8	2.63	1	1
Magnesium	2	7	28.6	1820	2850	2340	6850	0	0
Manganese	7	7	100	14.3	1450	431	107	4	3
Nickel	7	7	100	2	16.8	8.96	4.54	4	2
Potassium	1	7	14.3	19400	19400	19400	9150	1	0
Selenium	1	7	14.3	7.6	7.6	7.6	NAV	NAV	NAV
Sodium	6	7	85.7	5900	152000	55100	432000	0	0
Thallium	7	7	100	0.059	0.18	0.103	0.156	2	0
Vanadium	3	7	42.9	2	83.6	29.6	7.14	1	1
Zinc	7	7	100	3.1	23.9	11.2	39.7	0	0
Radionuclides (pCi/L)									
Gross Alpha	5	7	71.4	1.65	59	20.4	5.31	3	2
Gross Beta	7	7	100	1.52	48.2	10.4	14.6	1	1
Bismuth-212*	1	7	14.3	35.8	35.8	35.8	NAV	NAV	NAV
Bismuth-214*	1	7	14.3	9.09	9.09	9.09	NAV	NAV	NAV
Potassium-40	1	8	12.5	32.8	32.8	32.8	NAV	NAV	NAV
Radium-226	3	7	42.9	0.661	1.19	0.863	0.999	1	0
Radium-228	2	7	28.6	0.742	1.13	0.938	1.64	0	0
Thorium-228	1	7	14.3	1.02	1.02	1.02	NAV	NAV	NAV
Thorium-230	4	7	57.1	0.134	1.03	0.506	0.969	1	0
Thorium-232	1	7	14.3	0.828	0.828	0.828	0.137	1	1
Thorium-234*	1	7	14.3	91.7	91.7	91.7	72.2	1	0
Total Uranium (µg/L)	4	7	57.1	0.534	77.8	23	0.665	3	3
Uranium-234	6	7	85.7	0.13	25.9	5.15	0.429	3	3
Uranium-235	2	7	28.6	0.257	2.75	1.5	NAV	NAV	NAV
Uranium-238	4	7	57.1	0.168	26	7.7	0.205	3	3
VOCs (µg/L)									
Acetone	1	7	14.3	3	3	3	4.46	0	0
Chloroform	1	7	14.3	23	23	23	3	1	1
Tetrachloroethene	5	7	71.4	2	910	246	2.71	4	4
Trichloroethene	3	7	42.9	0.9	2	1.3	1.51	1	0

Key:

*Short-lived daughter products of uranium and thorium

Potassium-40 is a beta/gamma emitter that is ubiquitous in the environment and not a site contaminant; results are presented for informational purposes only and are not discussed in the report.

Key:

BTV= Background threshold value.

µg/L = Micrograms per liter.

pCi/L = Picocuries per liter.

NAV= Not available.

VOCs = Volatile organic compounds.

Table 4.7-7 Monitor Well Sampling Parameters, Sylvania Corning FUSRAP Site, Hicksville, New York

Well ID	Installation Phase	Screened Interval (ft bgs)	Sample Collected (Date/Time)	Final Groundwater Quality Parameters						Samples			Notes
				pH	Temp (ºC)	Specific Conductance (µS/cm)	ORP (mV)	DO (mg/L)	Turb (NTU)	VOCs[1] (14 d)	Metals[2] (14d)	RAD +[3] (14 d)	
MW-13D	Phase IIIA	290-300	3/16/09 1805	4.27	13.50	302.000	111.5	0.84	2.02	1	1	1	No Note.
MW-14D	Phase IIIA	294-304	3/16/09 1505	4.08	12.79	627.100	0	87.10	20.3	1	1	1	No Note.
MW-15D	Phase IIIA	300-310	3/16/09 1110	4.03	13.55	548.500	195.9	0.03	2.10	1	1	1	No Note.
MW-16D	Phase IIIA	280-290	3/24/09 1415	7.98	14.11	0.374	-35.1	3.02	125.0	1	1	1	No Note.
MW-17S	Phase IIIA	66-76	3/20/09 1125	7.16	15.41	0.365	-369.4	0.51	5.82	3	3	3	MS/MSD sample
MW-18S	Phase IIIA	62-72	3/18/09 1625	6.77	13.98	1.211	137.8	2.83	44.30	1	1	1	No Note.
MW-19D	Phase IIIA	296-306	3/19/09 1350	5.67	13.43	1.298	185.8	4.20	31.30	1	1	1	No Note.
MW-20D	Phase IIIA	300-310	3/18/09 1045	5.94	13.76	3.338	225.8	7.23	8.53	1	1	1	No Note.
MW-21D	Phase IIIA	300-310	3/19/09 1025	5.55	13.80	1.093	122.6	4.13	4.16	1	1	1	No Note.
MW-22D	Phase IIIA	305-315	3/19/09 1830	6.35	12.99	1.509	-20	0.57	41.90	1	1	1	No Note.
MW-23D	Phase IIIA	330-340	3/19/09 1045	6.83	13.25	0.969	-237.1	0.75	9.41	1	1	1	No Note.
MW-24D	Phase IIIA	360-370	3/20/09 0935	5.44	12.57	0.400	113.7	3.93	8.08	2	2	2	dupe sample MW801-GW
MW-25D	Phase IIIA	340-350	3/18/09 1810	6.41	13.79	1.217	54.1	4.38	16.80	2	2	2	dupe sample MW800-GW
MW-26D	Phase IIIA	266-276	3/17/09 1020	4.55	14.34	818.300	161.2	0.00	2.33	3	3	3	MS/MSD sample
MW-27D	Phase IIIA	365-375	3/19/09 1550	6.25	13.46	0.506	4.3	3.34	40.00	1	1	1	No Note.
MW-28D	Phase IIIA	277-287	3/24/09 1350	6.67	13.10	2.055	-24.9	1.51	100.0	1	1	1	No Note.
MW-29S	Phase IIIA	66-76	3/23/09 1640	6.03	15.83	0.33	-41.1	2.97	1.2	1	1	1	No Note.
MW-30D	Phase IIIA	330-340	3/23/09 1435	6.69	14.35	1.107	-332.9	3.38	4.30	2	2	2	dupe sample MW802-GW
MW-31D	Phase IIIA	320-330	3/20/09 1120	6.20	14.62	1.884	-154.1	1.90	35.00	1	1	1	No Note.
MW-32D	Phase IIIA	295-305	3/23/09 1710	4.97	13.08	2.155	62	8.10	25.0	1	1	1	No Note.
MW-33D	Phase IIIA	290-300	3/18/09 1300	6.03	14.18	0.557	-147.2	1.26	2.40	1	1	1	No Note.
MW-34D	Phase IIIA	270-280	3/24/09 1120	6.83	12.94	0.208	154.8	4.41	>1000	1	1	1	submitted filtered and unfiltered samples
MW-39S	Phase IIIA	76-86	3/23/09 1410	5.70	14.65	0.105	122.3	8.20	14.00	1	1	1	No Note.
MW-13D	Phase IIIA	290-300	3/24/10 11:05	5.51	13.73	0.098	58	5.02	2.55	1	1	1	No Note.
MW-13S	Phase IIIB	70-80	3/24/10 9:50	4.90	14.16	1.278	42.2	9.82	0.61	1	1	1	No Note.
MW-14D	Phase IIIA	294-304	3/23/10 12:25	5.72	13.03	0.258	28.8	4.14	48.0	1	1	1	No Note.
MW-14DD	Phase IIIB	365-375	3/22/10 16:30	6.10	13.40	0.239	3.6	2.13	8.34	1	1	1	No Note.
MW-14S	Phase IIIB	70-80	3/22/10 14:20	5.09	13.81	0.438	44.4	9.21	2.35	1	1	1	No Note.
MW-15D	Phase IIIA	300-310	3/23/10 13:45	5.17	13.65	0.198	51.3	6.52	1.19	1	1	1	No Note.
MW-15DD	Phase IIIB	360-370	3/23/10 15:50	6.02	13.48	0.113	39.9	6.42	1.42	1	1	1	No Note.
MW-15S	Phase IIIB	70-80	3/23/10 10:50	6.18	12.96	2.588	29.7	9.55	0.88	1	1	1	No Note.
MW-16D	Phase IIIA	280-290	4/7/10 9:25	6.72	15.11	0.265	-22.5	7.09	350.0	1	2	2	filtered and unfiltered samples for metals and RAD+
MW-16S	Phase IIIB	69.7-79.7	4/7/10 11:25	5.89	15.86	0.182	24.4	0.82	1.63	1	1	1	No Note.
MW-17S	Phase IIIA	65-75	3/23/10 15:35	6.24	15.32	0.133	-56.1	1.47	5.72	1	1	1	No Note.
MW-18I	Phase IIIB	118-128	3/31/10 15:20	5.39	14.01	1.341	162.5	8.93	2.88	1	1	1	No Note.
MW-18S	Phase IIIA	62-72	4/1/10 7:55	6.58	13.80	1.172	105.9	6.99	1.07	1	1	1	No Note.
MW-19D	Phase IIIA	296-306	3/31/10 13:20	5.57	13.16	0.380	99.4	6.08	17.30	1	1	1	No Note.
MW-19S	Phase IIIB	70-80	3/24/10 16:15	5.77	14.26	0.091	162	3.73	0.03	1	1	1	No Note.
MW-20D	Phase IIIA	300-310	4/5/10 14:40	5.75	14.90	2.696	259.2	8.89	8.85	1	1	1	No Note.
MW-20I	Phase IIIB	140-150	4/1/10 12:25	5.83	14.52	1.384	136.9	6.16	9.92	1	1	1	No Note.
MW-20S	Phase IIIB	70-80	4/1/10 12:20	6.19	14.54	1.288	-5.1	6.53	2.00	1	1	1	No Note.
MW-21D	Phase IIIA	300-310	3/24/10 15:01	5.36	14.70	0.270	162.1	4.23	3.67	1	1	1	No Note.
MW-21I	Phase IIIB	170-180	3/24/10 14:20	4.32	14.65	1.084	341.5	8.09	47.10	1	1	1	No Note.
MW-21S	Phase IIIB	70-80	3/24/10 15:00	6.35	15.02	0.246	-49.6	1.35	4.32	1	1	1	No Note.
MW-22D	Phase IIIA	305-315	4/1/10 9:45	6.20	13.72	2.141	-28.1	0.26	43.30	1	1	1	No Note.
MW-22I	Phase IIIB	140-150	4/1/10 9:25	5.66	13.73	1.284	8.9	8.31	1.20	1	1	1	No Note.
MW-22S	Phase IIIB	70-80	3/31/10 16:05	6.17	13.87	0.422	-18.2	3.71	1.30	1	1	1	No Note.
MW-23D	Phase IIIA	330-340	3/31/10 9:00	6.73	13.76	0.638	-75.9	0.44	10.12	1	1	1	No Note.

Table 4.7-7 Monitor Well Sampling Parameters, Sylvania Corning FUSRAP Site, Hicksville, New York

Well ID	Installation Phase	Screened Interval (ft bgs)	Sample Collected (Date/Time)	Final Groundwater Quality Parameters						Samples			Notes
				pH	Temp (ºC)	Specific Conductance (µS/cm)	ORP (mV)	DO (mg/L)	Turb (NTU)	VOCs[1] (14 d)	Metals[2] (14d)	RAD +[3] (14 d)	
MW-23I	Phase IIIB	170-180	3/29/10 10:00	6.54	13.50	0.592	12	1.92	16.40	1	1	1	No Note.
MW-23S	Phase IIIB	90-100	3/29/10 8:50	6.19	13.76	0.128	175.5	7.76	2.02	2	2	2	duplicate MW-901-GWR2 and MS/MSD
MW-24DD	Phase IIIA	360-370	3/31/10 14:20	5.22	14.08	0.199	283.6	5.82	2.52	2	2	2	duplicate MW-903-GWR2
MW-24S	Phase IIIB	70-80	3/31/10 12:30	5.99	14.56	0.146	218.4	7.74	0.55	1	1	1	No Note.
MW-25D	Phase IIIA	340-350	3/31/10 9:10	5.44	13.79	1.165	116.8	3.20	3.69	1	1	1	No Note.
MW-25I	Phase IIIB	230-240	3/31/10 10:01	5.62	13.88	0.680	4.5	6.95	1.80	1	1	1	No Note.
MW-25S	Phase IIIB	105-115	3/31/10 10:45	5.16	14.02	0.400	172.7	6.80	1.35	1	1	1	No Note.
MW-26D	Phase IIIA	266-276	3/29/10 15:20	5.35	14.21	0.323	165.8	6.54	1.85	1	1	1	No Note.
MW-26S	Phase IIIB	110-120	3/31/10 8:30	5.63	14.29	0.504	159	2.22	1.13	1	1	1	No Note.
MW-27DD	Phase IIIA	365-375	4/2/10 9:40	5.19	13.95	0.177	249.9	6.87	45.60	1	1	1	No Note.
MW-27D	Phase IIIB	280-290	4/2/10 9:50	5.09	14.15	3.484	9.2	6.99	174.0	1	2	2	filtered and unfiltered samples for metals and RAD+
MW-27S	Phase IIIB	78-88	4/7/10 15:50	5.46	15.89	0.147	163.7	2.41	0.74	1	1	1	MS/MSD
MW-28D	Phase IIIA	277-287	3/31/10 12:40	6.46	13.55	1.921	-32.6	0.40	120.0	1	2	2	filtered and unfiltered samples for metals and RAD+
MW-28I	Phase IIIB	149-159	3/31/10 13:50	7.89	13.76	0.801	119.9	4.70	46.40	1	1	1	No Note.
MW-28S	Phase IIIB	90-100	3/31/10 15:00	6.04	13.91	0.452	116.9	6.00	6.27	1	1	1	No Note.
MW-29S	Phase IIIA	66-76	3/23/10 8:45	6.03	15.54	0.494	90.5	6.45	3.94	2	2	2	MS/MSD and duplicate MW-900-GWR2
MW-30D	Phase IIIA	330-340	4/1/10 16:00	5.80	15.41	0.920	25.5	2.63	4.50	1	1	1	No Note.
MW-30I	Phase IIIB	230-240	4/2/10 9:03	6.18	15.06	0.655	142	7.36	0.39	2	2	2	duplicate MW-905-GWR2
MW-30S	Phase IIIB	90-100	4/1/10 15:40	5.14	15.12	0.137	20.3	9.17	1.50	1	1	1	No Note.
MW-31D	Phase IIIA	320-330	4/1/10 14:20	5.30	15.45	2.623	101.2	4.41	29.90	1	1	1	No Note.
MW-31I	Phase IIIB	180-190	4/1/10 16:05	5.45	16.06	0.671	166.2	2.51	0.91	1	1	1	No Note.
MW-32D	Phase IIIA	295-305	3/23/10 13:00	5.04	12.98	2.046	72.7	1.69	218.0	1	2	2	filtered and unfiltered samples for metals and RAD+
MW-33D	Phase IIIA	290-300	4/2/10 8:45	5.85	13.02	1.047	-59.9	0.55	36.10	1	1	1	No Note.
MW-33S	Phase IIIB	65-75	4/2/10 10:15	5.06	13.33	0.076	199.5	12.02	4.01	1	1	1	No Note.
MW-34D	Phase IIIA	270-280	4/5/10 10:00	10.08	14.03	0.389	154.7	3.00	1394.0	1	2	2	filtered and unfiltered samples for metals and RAD+
MW-34S	Phase IIIB	65-75	4/5/10 12:25	5.70	13.97	0.087	163.7	6.81	2.22	2	2	2	duplicate MW-906-GWR2
MW-39S	Phase IIIA	76-86	3/24/10 12:10	5.45	15.07	0.199	29.7	9.32	5.34	1	1	1	No Note.
MW-41S	Phase IIIB	66-76	3/31/10 16:05	6.16	14.17	0.647	206.1	2.48	1.15	1	1	1	No Note.
MW-42I	Phase IIIB	140-150	4/1/10 9:50	6.06	13.74	0.724	98.7	7.07	10.27	1	1	1	No Note.
MW-43S	Phase IIIB	63-73	4/1/10 12:20	5.89	14.38	0.790	104	6.67	0.19	1	1	1	No Note.
MW-44S	Phase IIIB	65-75	4/1/10 11:00	6.42	14.71	0.596	141.8	2.69	0.16	2	2	2	duplicate MW-904-GWR2 and MS/MSD
MW-49S	Phase IIIB	100-110	3/31/10 10:15	5.71	14.22	0.090	171.1	6.96	1.28	2	2	2	duplicate MW-902-GWR2
MW-50I	Phase IIIB	120-130	3/31/10 11:00	5.58	14.03	0.538	94.7	4.39	4.42	1	1	1	No Note.
MW-51I	Phase IIIB	130-140	4/1/10 13:55	5.42	15.21	0.610	272.1	7.50	0.65	1	1	1	No Note.
MW-52D	Phase IIIB	275-285	4/5/10 14:50	6.35	14.14	0.250	117.3	1.63	27.10	1	1	1	No Note.
MW-53S	Phase IIIB	70-80	4/5/10 12:10	5.70	13.86	0.129	171.5	10.56	2.69	1	1	1	No Note.
MW-55S	Phase IIIB	85.5-95.5	4/7/10 12:10	5.82	15.49	0.810	-5	7.64	10.74	1	1	1	No Note.
MW-3	GTEOSI	58-78	3/21/10 8:55	5.35	19.24	0.195	111.4	8.73	14.80	1	1	1	No Note.
MW-4	GTEOSI	58-78	3/21/10 11:36	5.38	19.33	0.115	84.3	8.86	6.64	1	1	1	No Note.

Table 4.7-7 Monitor Well Sampling Parameters, Sylvania Corning FUSRAP Site, Hicksville, New York

				Final Groundwater Quality Parameters						Samples			
Well ID	Installation Phase	Screened Interval (ft bgs)	Sample Collected (Date/Time)	pH	Temp (ºC)	Specific Conductance (µS/cm)	ORP (mV)	DO (mg/L)	Turb (NTU)	VOCs[1] (14 d)	Metals[2] (14d)	RAD +[3] (14 d)	Notes
MW-8	GTEOSI	120-130	3/21/10 10:25	5.48	15.37	0.338	77.8	5.90	5.11	1	1	1	No Note.
MW-9	GTEOSI	72-82	3/21/10 13:10	5.12	18.43	0.056	35	8.66	1.74	1	1	1	No Note.
MW-10	GTEOSI	120-130	3/21/10 14:47	4.46	16.59	0.283	60.8	8.84	7.46	1	1	1	No Note.
MW-11	GTEOSI	71-81	3/22/10 9:20	5.87	17.74	0.130	21.6	9.30	2.98	1	1	1	No Note.
MW-12	GTEOSI	120-130	3/21/10 16:05	6.10	15.53	0.501	24.3	7.82	1.89	1	1	1	No Note.

Notes:

[1] VOC - TCL VOCs by method 8260b

[2] Metals - TAL Metals + Hg by methods 6010/6020 and 7470.

[3] Rad+ - Radium 226/228, gamma spectroscopy, gross alpha/beta, isotopic thorium and isotopic uranium

Key:

BGS = Below ground surface.
ºC = Degrees Celcius.
µS/cm = Microseimens per centimeter. Conductivity corrected to 25°C.
DO = Dissolved oxygen.
ft = feet
GTEOSI = General Telephone and Electronics Operation and Support.
ID = Identification
mg/L = Milligrams per liter.
mV = Millivolts
NTU = Nephelometric turbidity units.
ORP = Oxidation-reduction potential.
Temp = Temperature
Turb = Turbidity
VOCs = Volatile organic compounds.

Table 4.7-8 Comparison of Monitoring Well Data with Vertical Profile Data at Depth, Sylvania Corning FUSRAP Site, Hicksville, NY

Sample ID: / Sample Depth (feet BGS): / Analyte	MW-13D-GW 290-300	MW-13D-GWR2 290-300	MW-13D-VP25 296	MW-13S-GWR2 70-80	MW-13D-VP03 76	MW-14DD-GWR2 365-375	MW-14DD-VP33 370-374	MW-14D-GW 294-304	MW-14D-GWR2 294-304	MW-14D-VP25 296	MW-14S-GWR2 70-80	MW-14D-VP03 76	MW-15DD-GWR2 360-370	MW-15DD-VP32 360-364	MW-15D-GW 300-310	MW-15D-GWR2 300-310	MW-15D-VP26 306	MW-15S-GWR2 70-80	MW-15D-VP03 75	MW-16D-GW-F 280-290	MW-16D-GWR2-F 280-290	MW-16D-GWR2-U 280-290
Metals (µg/L)																						
Aluminum	68 U	19.6 U	457	61.4 J	150	521	17.7 UJ	213	1910	397	200 U	49.7	200 U	17.7 U	68 U	19.6 U	149	200 U	2570	114 J	200 U	3210
Antimony	3 U	0.1 U	25 U	0.1 U	25 U	0.1 U	0.4 J	3 U	2 U	25 U	0.1 U	25 U	0.1 U	0.53 J	3 U	0.1 U	25 U	0.1 U	19.8 J	3 U	0.1 U	2 U
Arsenic	5 U	1 U	25 U	0.075 U	25 U	1 U	0.42 U	5 U	1 U	25 U	1 U	25 U	0.075 U	0.075 U	5 U	1 U	25 U	0.075 U	25 U	5 U	1 U	1.6
Barium	20.4	18.5 J	33.7	89.4 J	528	20.5 J	13.3 J	17.1	24 J	45.3	9.5 J	130	10.7 J	4.2 J	14.9	15 J	28.2	39.1 J	154	15.5	40.5 J	57.9 J
Beryllium	1 U	0.048 U	20 U	0.19 J	20 U	0.11 J	0.058 U	1 U	0.05 J	20 U	0.052 J	20 U	0.048 U	0.048 U	1 U	0.048 U	20 U	0.048 U	20 U	1 U	0.048 U	0.17 J
Cadmium	1 U	0.083 U	10 U	0.52 J	10 U	0.14 J	0.097 U	1 U	0.18 J	10 U	0.083 U	10 U	0.12 J	0.083 U	1 U	0.083 U	10 U	0.27 J	10 U	1 U	0.083 U	0.11 J
Calcium	6270	6750	5960	31600	46400	14800	16300	16100	10800	14300	8330	14800	7080	6710	10700	11300	11700	25000	19600	16300	18600	22200
Chromium	2 U	0.097 U	20 U	0.1 J	20 U	7.2	0.9 J	2 U	0.097 U	20 U	0.097 U	20 U	0.31 J	4.8 J	2 U	0.097 U	20 U	0.51 J	19.3 J	2 U	0.5 J	5.7
Cobalt	1 U	0.029 U	20 U	2.4 J	146	1.5 J	8.3	3.3 J	2.4 J	20 U	0.29 UJ	20 U	0.43 J	0.06 J	2.9 J	2.7 J	20 U	0.29 UJ	42.2	1.9 J	0.87 J	1.1 J
Copper	3 U	25 U	20 U	25 U	14.5 J	25 U	3.4 J	3 U	25 U	8.04 J	0.75 U	20 U	25 U	1.4 J	3 U	25 U	20 U	0.75 U	19.3 J	3 U	25 U	25 U
Iron	108	154	2420	100 U	6020	381	1400	788	369	4880	100 U	3420	100 U	36.7 J	137	100 U	1220	100 U	8400	78 J	27.4 J	3790
Lead	2.5 U	1 U	15 U	1 U	15 U	1.2	0.051 U	2.5 U	1	15 U	1 U	15 U	1 U	0.17 J	2.5 U	1 U	15 U	0.068 J	15 U	2.5 U	1 U	3.5
Magnesium	1780	1860 J	1670	6610	5100	4010 J	5250	5180	3620 J	4500	4060 J	3740	2120 J	1900 J	3470	3700 J	3870	5960	5730	3340	5000 U	3930 J
Manganese	22.8	12.9 J	51.2	117 J	13100	63.7	156 J	76	32.3	324	11.3	1300	23.8	39.7 J	84.2	28.2	81.3	55.7	1610	54.6	21.1	33.6 J
Nickel	1 U	0.66 J	20 U	3.9 J	61.6	5 U	13	4 J	5 U	8.39 J	0.068 U	18.1 J	5 U	2 J	4.1 J	5 U	9.85 J	5 U	34.3	1 U	1.4 J	3.2 J
Potassium	611	5000 U	1100	5000 U	13900	5070	2470 J	1200	5000 U	4690	5000 U	8570	5000 U	1140 J	1030	5000 U	1790	11100	2580	1760	5000 U	5000 U
Selenium	5 U	4.2 U	25 U	4.2 U	25 U	4.2 U	2.5 U	5 U	4.2 U	25 U	4.2 U	25 U	4.2 U	2.5 J	5 U	4.2 U	25 U	4.2 U	25 U	5 U	4.2 UJ	4.2 U
Silver	1 U	0.069 U	20 U	0.069 U	20 U	0.069 U	0.1 J	1 U	0.069 U	20 U	0.069 U	20 U	0.069 U	0.67 J	1 U	0.069 U	20 U	0.069 U	20 U	1 U	0.069 U	0.069 U
Sodium	8710	7640	5130	179000	44800	19800	17500	11000	29500	6460	73600	27600	8510	22300	13900	15700	5310	491000	29700	51100	19000	17200
Thallium	5 U	0.036 J	15 U	0.15 J	15 U	0.12 J	0.14 J	5 U	0.085 J	15 U	0.043 J	15 U	0.1 J	0.029 J	5 U	0.068 J	15 U	0.12 J	15 U	5 U	0.036 J	0.075 J
Vanadium	1 U	1.2 U	20 U	1.2 U	20 U	1.2 U	1.4 U	2.2 J	2.2 J	20 U	1.2 U	20 U	1.2 U	1.4 U	1 U	1.2 U	20 U	1.2 U	20 U	1.2 J	1.2 U	9.5 J
Zinc	5.3 UJ	8.5 J	10.5 J	11.6 J	8.67 J	52.5 J	11.8 J	15.2 U	9.7 J	50.5	1.1 U	39.8	3 J	3.9 J	34	8.3 J	66.8	3 J	76.1	4.1 J	6.5 J	19.4 J
Radionuclides (pCi/L)																						
Actinium-228	-5.67 UJ	1.32 U	--	3.07 U	--	-3.49 U	--	-0.29 U	-0.379 U	--	5.35 U	--	-5.15 U	--	-1.24 U	3.07 U	--	-0.0721 U	--	1.63 UJ	7.31 U	-1.97 U
Bismuth-212	-11.3 UJ	-2.58 U	--	16.2 U	--	-0.343 U	--	11.8 U	-6.52 U	--	-2.52 U	--	1.11 U	--	8.77 U	7.66 U	--	7.25 U	--	-17.4 UJ	-10.7 UJ	-0.601 U
Bismuth-214	10.2 UJ	1.26 U	--	8.48 UJ	--	2.59 U	--	7.45 UJ	-3.21 UJ	--	-3.15 U	--	-1.04 U	--	8.78 UJ	-1.11 U	--	1.63 U	--	13.4 U	1.12 U	2.08 U
Gross Alpha	-0.427 U	1.84	--	4.36 J	--	1.26 J	--	3.21	4.04	--	-0.113 U	--	0.261 U	--	0.555 U	1.13 J	--	-0.599 U	--	3.09 J	1.33 J	5.33
Gross Beta	1.29 U	1.48 J	--	11 J	--	8.14	--	6.59	2.86 J	--	-1.36 U	--	3.27 J	--	2.77 UJ	3.79 J	--	15.8	--	3.45	3.51 J	8.17
Potassium-40	23.1 U	-9.8 U	--	-17.1 U	--	14.5 U	--	30.9 UJ	11.4 U	--	-8.26 U	--	23 U	--	-32.8 UJ	-14.3 U	--	22.3 UJ	--	-39.8 R	-4.245 U	21.62 U
Protactinium-234M	--	-52.4 U	--	149 U	--	49.2 U	--	--	125 U	--	-33.9 U	--	17.2 U	--	--	-46.3 U	--	-264 R	--	--	85.9 U	-13.5 U
Lead-212	6.65 U	5.62 J	--	2.19 U	--	-3.92 R	--	-4.42 UJ	1.37 UJ	--	0.669 UJ	--	-3.96 R	--	8.73 U	2.34 U	--	4.61 UJ	--	1.05 UJ	0.166 U	5.44 J
Lead-214	5.66 U	3.52 U	--	0.378 UJ	--	5 J	--	-2.67 UJ	-5.16 UJ	--	-0.931 U	--	3.54 U	--	10.2 UJ	0.846 U	--	2.92 U	--	16.5 U	0.301 U	1.01 U
Radium-226	-0.0844 U	0.296 J	--	1 J	--	0.44 J	--	0.23 U	0.707 J	--	0.0669 UJ	--	0.44 J	--	0.24 U	0.652 J	--	0.384 J	--	-0.045 U	0.515 J	0.86 J
Radium-228	0.25 U	0.453 J	--	1.35 J	--	0.914 J	--	1.06	1.07 J	--	0.692 J	--	0.187 UJ	--	0.558 U	1.51 J	--	0.679 J	--	0.284 U	0.899 R	1.5 R
Thorium-227	--	0.104 U	--	0.133 U	--	0.06 U	--	--	0.151 J	--	0.185 UJ	--	0.0538 U	--	--	0.0616 U	--	0.0709 U	--	--	0.00861 U	0.213 U
Thorium-228	-0.0463 U	0.0213 UJ	--	0.0722 UJ	--	0.0704 U	--	-0.00226 U	0.14 UJ	--	0.0585 U	--	-0.0274 U	--	-0.0735 U	0.0765 UJ	--	-0.0269 U	--	0.115 UJ	0.0526 U	0.24 UJ
Thorium-230	0.0727	0.828 J	--	0.131 UJ	--	0.211 R	--	0.162	0.091 R	--	0.149 R	--	0.437 J	--	0.235	0.147 R	--	0.0659 R	--	0.122	0.328 UJ	0.725 J
Thorium-232	0.00079 U	-0.0237 U	--	0.0193 U	--	0.112 UJ	--	0.00876 U	0.0388 U	--	0.0559 UJ	--	0.105 U	--	0.019 U	0.137 J	--	0.0202 U	--	0.0717 UJ	0.0293 U	0.188 U
Thorium-234	-272 R	72.2 J	--	-4.2 U	--	-15.2 U	--	-22.1 U	-41 R	--	-61.8 R	--	-1.04 U	--	-52.1 U	-48.1 R	--	-5.58 U	--	-85.1 UJ	-5.07 U	-5.25 U
Thallium-208	3.94 UJ	-2.01 U	--	6.52 U	--	2.31 U	--	1.82 U	-7.94 UJ	--	-0.457 U	--	12.9 J	--	0.797 U	1.24 U	--	2.54 U	--	1.7 UJ	0.285 U	1.75 U
Total Uranium	0.579 U	0.492 U	--	0.448 U	--	0.457 J	--	0.579 U	0.491 UJ	--	0.495 U	--	0.239 UJ	--	0.579 U	0.597 UJ	--	0.773 J	--	3.34	0.418 J	0.463 UJ
Uranium-234	0.00345 U	0.0437 UJ	--	0.0431 UJ	--	0.108 UJ	--	0.0798 U	0.371 J	--	0.113 UJ	--	0.0114 UJ	--	0.0385 U	0.0375 UJ	--	0.0199 UJ	--	1.1	0.263 J	0.457
Uranium-235	0.0295 U	0.0539 U	--	-0.0148 U	--	0.0537 UJ	--	-0.0209 U	0.0233 U	--	0.079 U	--	0.0318 UJ	--	0.11 UJ	0.0457 U	--	0.0517 UJ	--	0.121 UJ	0.132 UJ	0.135 UJ
Uranium-238	0.00119 U	0.0173 U	--	0.0155 U	--	0.144 J	--	0.0974 UJ	0.121 UJ	--	0.0077 U	--	0.0514 UJ	--	0.0449 U	0.0833 UJ	--	0.243 J	--	1.11	0.128 J	0.133 UJ
VOCs (µg/L)																						
1,1,1-Trichloroethane	1 U	1 U	0.5 U	1 U	0.5 U	1 U	1 U	0.25 J	1 U	0.5 U	1 U	0.5 U	1 U	1 U	1 U	1 U	0.5 U	1 U	0.5 U	--	--	1 U
1,1,2-Trichloroethane	1 U	1 U	0.5 U	1 U	0.5 U	1 U	1 U	1 U	1 U	0.5 U	1 U	0.5 U	1 U	1 U	1 U	1 U	0.5 U	1 U	0.5 U	--	--	1 U
1,1-Dichloroethane	1 U	1 U	0.5 U	1 U	0.5 U	1 U	1 U	0.3 J	1 U	0.5 U	1 U	0.5 U	1 U	1 U	1 U	1 U	0.5 U	1 U	0.5 U	--	--	1
1,1-Dichloroethene	0.5 U	1 U	0.5 U	1 U	0.5 U	1 U	1 U	0.17 J	1 U	0.5 U	1 U	0.5 U	1 U	1 U	0.5 U	1 U	0.5 U	1 U	0.5 U	--	--	1 U
1,2,3-Trichlorobenzene	0.5 U	1 UJ	0.5 U	1 UJ	0.5 U	1 UJ	1 U	0.5 U	1 UJ	0.5 U	1 UJ	0.5 U	1 UJ	1 U	0.5 U	1 UJ	0.5 U	2 J	0.5 U	--	--	1 U
1,2,4-Trichlorobenzene	1 U	1 U	0.5 U	1 U	0.5 U	1 U	1 U	1 U	1 U	0.5 U	1 U	0.5 U	1 U	1 U	1 U	1 U	0.5 U	2	0.5 U	--	--	1 U
1,2-Dibromoethane	1 U	1 U	0.5 U	1 U	0.5 U	1 U	1 U	1 U	1 U	0.5 U	1 U	0.5 U	1 U	1 U	1 U	1 U	0.5 U	2	0.5 U	--	--	1 U
1,2-Dichloroethane	1 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	1 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	1 U	0.5 U	0.5 U	0.5 U	0.5 U	--	--	0.5 U
2-Butanone	2 U	5 U	3 U	5 U	3 U	5 U	5 U	2 U	5 U	3 U	5 U	3 U	5 U	5 U	2 U	5 U	3 U	5 U	3 U	--	--	5 U
2-Hexanone	2 U	5 U	2 U	5 U	2 U	5 UJ	5 U	2 U	5 U	2 U	5 UJ	2 U	5 UJ	5 U	2 U	5 UJ	2 U	3 J	2 U	--	--	5 U
4-Methyl-2-pentanone	1 U	1 U	2 U	1 U	2 U	1 UJ	1 U	1 U	1 U	2 U	1 UJ	2 U	1 UJ	17	1 U	1 UJ	2 U	2 J	2 U	--	--	1 U
Acetone	2 U	5 UJ	2 U	5 UJ	2 U	4 J	5 U	2 U	5 UJ	2 U	5 U	2 U	5 U	2 J	2 U	5 U	2 U	5 U	2 U	--	--	5 U
Benzene	0.5 U	1 U	0.5 U	1 U	0.5 U	1 U	1 U	0.5 U	1 U	1.9	1 U	0.5 U	1 U	1 U	0.1 J	1 U	0.5 U	1 U	0.5 U	--	--	1 U
Bromochloromethane	1 U	1 U	0.5 U	1 U	0.5 U	1 U	1 U	1 U	1 U	0.5 U	1 U	0.5 U	1 U	1 U	1 U	1 U	0.5 U	1 U	0.5 U	--	--	1 U
Bromodichloromethane	1 U	1 U	0.5 U	1 U	0.5 U	1 U	1 U	1 U	1 U	0.5 U	1 U	0.5 U	1 U	1 U	1 U	1 U	0.5 U	2	0.5 U	--	--	1 U
Bromoform	1 U	1 U	0.5 U	1 U	0.5 U	4	1 U	1 U	1 U	0.5 U	1 U	0.5 U	1 U	1 U	1 U	1 U	0.5 U	4	0.5 U	--	--	1 U
Carbon disulfide	1 U	1 U	0.5 U	1 U	0.5 U	1 U	1 U	1 U	1 U	0.5 U	1 U	0.5 U	1 U	1 U	1 U	1 U	0.5 U	1 U	0.5 U	--	--	1 U
Chloroform	0.5 U	1 U	0.5 U	1 U	0.5 U	1 U	1 U	0.5 U	1 U	0.5 U	1 U	0.5 U	1 U	1 U	0.5 U	1 U	0.5 U	3	5.3	--	--	1 U
cis-1,2-Dichloroethene	0.5 U	1 U	0.5 U	1 U	0.5 U	1 U	1 U	0.5 U	1 U	0.5 U	1 U	0.5 U	1 U	1 U	0.5 U	1 U	0.5 U	1 U	0.5 U	--	--	1 U
Dibromochloromethane	1 U	1 U	0.5 U	1 U	0.5 U	3	1 U	1 U	3	0.5 U	1 U	0.5 U	1 U	1 U	1 U	1 U	0.5 U	3	0.5 U	--	--	1 U
Dichlorodifluoromethane	1 U	1 U	0.5 U	1 U	0.5 U	1 U	1 U	1 U	1 U	0.5 U	1 U	0.5 U	1 U	1 U	1 U	1 U	0.5 U	1	0.5 U	--	--	1 UJ
Isopropylbenzene	0.5 U	1 U	0.5 U	1 U	0.5 U	1 U	1 U	0.5 U	1 U	0.5 U	1 U	0.5 U	1 U	1 U	0.5 U	1 U	0.5 U	1 U	0.5 U	--	--	1 U
m,p-Xylene	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	--	--	1 U
Methyl tert-Butyl Ether	1 U	1 U	0.5 U	1 U	0.5 U	1 U	1 U	1 U	1 U	0.5 U	1 U	0.5 U	1 U	1 U	1 U	1 U	0.5 U	1 U	0.5 U	--	--	1 U
Tetrachloroethene	0.63 J	2 U	1.2	2	0.5 U	4 U	0.5 U	1 U	2 U	0.5 U	3 U	0.5 U	2 U	0.6	1 U	3 U	0.5 U	2	0.5 U	--	--	3
Toluene	0.11 J	1 U	0.5 U	1 U	0.5 U	1 U	1 U	0.5 U	1 U	0.5 U	1 U	0.5 U	1 U	1 U	0.5 U	1 U	0.5 U	1 U	0.5 U	--	--	1 U
trans-1,3-Dichloropropene	1 U	0.4 U	0.5 U	0.4 U	0.5 U	0.4 U	0.4 U	1 U	0.4 U	0.5 U	0.4 U	0.5 U	0.4 U	0.4 U	1 U	0.4 U	0.5 U	0.9	0.5 U	--	--	0.4 U
Trichloroethene	0.34 J	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.48 J	0.5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	--	--	2

Table 4.7-8 Comparison of Monitoring Well Data with Vertical Profile Data at Depth, Sylvania Corning FUSRAP Site, Hicksville, NY

Sample ID:	MW-16D-GW-U	MW-16D-VP24	MW-16S-GWR2	MW-16D-VP03	MW-17S-GW	MW-17S-GWR2	MW-17S-VP03	MW-18I-GWR2	MW-18I-VP09	MW-18S-GW	MW-18S-GWR2	MW-18S-VP02	MW-19D-GW	MW-19D-GWR2	MW-19D-VP25	MW-19S-GWR2	MW-19D-VP03	MW-20D-GW	MW-20D-GWR2	MW-20D-VP26	MW-20I-GWR2	MW-20D-VP10	MW-20S-GWR2
Sample Depth (feet BGS):	280-290	286	70-80	76	65-75	65-75	70	118-128	133-137	62-72	62-72	69	296-306	296-306	296	70-80	76	300-310	300-310	296	140-150	136	70-80
Analyte																							
Metals (µg/L)																							
Aluminum	1940	--	51.8 J	--	68 U	200 U	351	36.9 J	--	608	19.6 U	--	258	71.3 J	128	19.6 U	179	68 U	200 U	--	44.2 J	--	19.6 U
Antimony	3 U	--	0.1 U	--	3 U	0.1 U	21.4 J	0.1 U	--	3 U	0.1 U	--	3 U	0.1 U	25 U	0.1 U	25 U	3 U	2 U	--	1 U	--	0.1 U
Arsenic	5 U	--	0.16 J	--	5 U	1 U	25 U	1 U	--	5 U	1 U	--	5 U	1 U	25 U	1 U	25 U	5 U	0.075 U	--	1 U	--	1 U
Barium	23.2	--	35.5 J	--	44.3	40.5 J	95.3	164 J	--	94.5	59.1 J	--	334	118 J	67.8	23.5 J	42	130	75.8 J	--	90.3 J	--	48.2 J
Beryllium	1 U	--	0.048 U	--	1 U	0.048 U	20 U	0.048 U	--	1 U	0.048 U	--	1 U	0.048 U	20 U	0.048 U	20 U	1 U	0.048 U	--	0.048 U	--	0.048 U
Cadmium	1 U	--	0.11 J	--	1 U	0.083 U	10 U	0.13 J	--	1 U	0.083 U	--	1 U	0.083 U	10 U	0.17 J	10 U	1 U	0.083 U	--	0.083 U	--	0.083 U
Calcium	17600	--	11000	--	11600	5000 U	9310	14300	--	192000	140000	--	41600	12100	11000	7310	9010	36000	22200	--	10700	--	102000
Chromium	2.1 J	--	0.38 J	--	2 U	0.47 J	20 U	0.097 UJ	--	3.4 J	0.097 UJ	--	2 U	0.25 J	20 U	0.097 U	20 U	2 U	1.4 J	--	0.097 UJ	--	0.097 UJ
Cobalt	1 U	--	0.52 J	--	6.4	3 J	20 U	3 J	--	2.6 J	0.029 U	--	3.3 J	0.029 U	20 U	1.2 J	20 U	1.3 J	0.029 UJ	--	0.4 J	--	0.029 U
Copper	3 U	--	25 U	--	9.4 J	25 U	20 U	0.75 U	--	4.1 J	2.3 J	--	3 U	0.75 U	20 U	25 U	5 J	3 U	25 U	--	0.75 U	--	0.75 U
Iron	1520	--	701	--	2660	4000	3020	190	--	906	41.9 J	--	1010	1190	1530	208	496	62.5 J	87 J	--	367	--	66.5 J
Lead	3 J	--	1 U	--	2.5 U	1 U	15 U	1 UJ	--	2.5 U	1 UJ	--	2.5 U	1 U	15 U	1 U	15 U	2.5 U	1 U	--	1 UJ	--	1 UJ
Magnesium	3670	--	1900 J	--	963	405 J	824	3930 J	--	41600	29800	--	11500	3470 J	3320	1240 J	2610	9520	5930	--	2660 J	--	21400
Manganese	52	--	736 J	--	1400	929	1070	142 J	--	146	9 J	--	85.7	22.6 J	79.9	70.3 J	125	46.7	9.3 J	--	59.7 J	--	251 J
Nickel	1 U	--	1.4 J	--	4.9 J	5 U	12.6 J	9.9	--	10.4	4.7 J	--	2.6 J	2.8 J	13.8 J	5	19 J	2.6 J	0.35 J	--	2.3 J	--	1.2 J
Potassium	2110	--	5000 U	--	2480	5000 U	5930	5000 U	--	7270	6320	--	2500	5000 U	1190	5000 U	2390	2290	5000 U	--	5000 U	--	5760
Selenium	5 U	--	4.2 U	--	5 U	4.2 U	25 U	4.2 U	--	5 U	4.2 U	--	5 U	4.2 U	25 U	4.2 U	25 U	5 U	4.2 U	--	4.2 U	--	4.2 U
Silver	1 U	--	0.069 U	--	1 U	0.069 U	20 U	0.069 U	--	1 U	0.069 U	--	1 U	0.069 U	20 U	0.069 U	20 U	1 U	5 U	--	0.069 U	--	0.069 U
Sodium	50600	--	13300	--	19000	17800	16100	191000	--	26700	29700	--	162000	32400	10100	5080	10600	533000	455000	--	224000	--	87500
Thallium	5 U	--	0.071 J	--	5 U	0.045 J	15 U	0.12 J	--	5 U	0.061 J	--	5 U	0.045 J	15 U	0.042 J	15 U	5 U	0.086 J	--	0.051 J	--	0.066 J
Vanadium	6.3	--	1.2 U	--	1 U	1.2 U	20 U	1.2 U	--	2 J	1.2 U	--	1 U	1.2 U	20 U	1.2 U	20 U	1 U	1.2 U	--	1.2 U	--	1.2 U
Zinc	5.3 J	--	4 J	--	3.9 J	3.5 J	16 J	60 U	--	5.8 J	60 U	--	6.7 J	5.5 J	166	21.4 J	42	8.4 J	6.2 J	--	60 U	--	60 U
Radionuclides (pCi/L)																							
Actinium-228	10.7 UJ	--	-1.32 U	--	-3.59 UJ	3.18 U	--	1.78 U	--	-5.96 UJ	-2.53 U	--	6.83 U	1.34 U	--	0.686 U	--	10.6 U	2.66 U	--	1.55 U	--	-3.65 U
Bismuth-212	-0.666 U	--	0.552 U	--	1.38 U	-5.39 UJ	--	-8.35 U	--	15.4 U	-2.52 U	--	6.99 U	-9.1 U	--	9.36 U	--	-3.72 UJ	18.6 UJ	--	2.85 UJ	--	1.98 U
Bismuth-214	10.2 UJ	--	0.618 U	--	-0.601 UJ	-2.83 UJ	--	1.9 U	--	-8.22 R	0.598 U	--	0.607 UJ	0.143 U	--	0.0543 U	--	7.39 UJ	-2.53 U	--	1.72 UJ	--	0.0413 U
Gross Alpha	4.07 J	--	0.819 J	--	3.15	-0.6 U	--	2.62 J	--	6160	74.5	--	1.87 UJ	1.54 UJ	--	0.268 U	--	1.04 U	7.32 J	--	3.27 UJ	--	1900
Gross Beta	6.54	--	0.738 U	--	1.7 UJ	3.81 J	--	9.15	--	2050	13.9	--	7.6	4.36 J	--	3.55 J	--	0.7 U	7.46 J	--	5.24 J	--	231
Potassium-40	12 UJ	--	4.904 U	--	1.08 UJ	80	--	-3.08 U	--	-3.94 U	17 U	--	-16.3 U	-4.23 U	--	0.272 U	--	-2.61 U	3.59 U	--	-2.29 UJ	--	12.6 U
Protactinium-234M	--	--	190 U	--	--	171 U	--	73.7 U	--	--	2320	--	--	361 J	--	-16 U	--	--	180 UJ	--	-109 U	--	412 J
Lead-212	-2.43 UJ	--	-0.294 U	--	3.1 UJ	-0.876 UJ	--	-0.157 U	--	-0.374 UJ	-2.17 U	--	9.06 UJ	5.79 J	--	5.89 J	--	-0.222 U	0.809 U	--	-1.39 UJ	--	6.78 J
Lead-214	8 UJ	--	0.256 UJ	--	2.55 UJ	4.43 UJ	--	5.22 UJ	--	5.69 U	-1.35 UJ	--	1.92 U	0.907 U	--	2.48 U	--	3.76 U	0.582 U	--	-6.39 R	--	-0.345 UJ
Radium-226	-0.0901 U	0.189 U	0.0294 UJ	0.0912 U	0.699 UJ	0.278 J	--	1.91	--	0.255 J	0.484 UJ	1.34	0.961 J	0.951 J	--	0.105 UJ	--	-0.284 R	1.5	1.2	0.749 J	0.642	0.708 J
Radium-228	0.66 UJ	0.704	0.605 R	0.345 U	0.358 UJ	0.56 J	--	1.03 J	--	1.46	2.68 UJ	0.283 U	3.02	1.2 J	--	0.205 UJ	--	2.71	1.57 J	2.31	0.871 J	0.4 UJ	0.941 J
Thorium-227	--	--	0.0904 U	--	--	-0.13 R	--	-0.0303 U	--	--	1.38 UJ	--	--	0.069 U	--	0.0286 U	--	--	0.042 U	--	0.27 J	--	-0.0311 U
Thorium-228	0.271	0.00962 U	0.0511 UJ	-0.0363 U	0.0223 U	-0.00851 U	--	-0.025 U	--	-0.00136 U	0.0682 U	-0.0121 U	-0.018 U	-0.00465 U	--	-0.0426 R	--	0.00726 U	0.00552 U	0.0775 U	0.0842 U	0.133 UJ	0.0517 U
Thorium-230	0.17	-0.00158 U	0.0505 UJ	-0.0209 U	0.0236 U	0.439 J	--	0.241 J	--	-0.0366 U	0.949 UJ	0.0387 U	0.081	-0.0123 U	--	0.188 UJ	--	0.00392 U	0.0847 UJ	0.0575	0.084 UJ	0.0637 U	0.745 UJ
Thorium-232	0.15	-0.0174 U	0.0504 U	-0.01 U	-0.0216 U	0.153 UJ	--	-0.00482 U	--	-0.0152 U	0.348 U	0.023 U	-0.014 U	0.0441 UJ	--	0.129 UJ	--	-0.00785 U	-0.00289 U	-0.00543 U	0.00505 U	-0.0295 U	0.292 UJ
Thorium-234	45.4 UJ	--	-3.1 U	--	68.2 UJ	-35 UJ	--	26.8 U	--	2310	1790	--	-55.6 U	-11.7 U	--	-61.2 R	--	-29.8 UJ	93 J	--	-43.4 U	--	220
Thallium-208	1.99 U	--	0.836 U	--	-0.187 UJ	4.95 U	--	-2.08 U	--	-2.84 UJ	-2.98 U	--	3.05 U	4.94 U	--	-2.01 U	--	0.357 U	7.64 J	--	0.257 U	--	-4.28 U
Total Uranium	3.42	0.249 U	0.427 J	0.0651 U	0.341 UJ	0.413 U	--	159	25.1	13100	10800	15400	0.579 U	0.595 UJ	--	0.397 U	--	0.579 U	0.468 UJ	0.13 U	1.71	5.09	2290
Uranium-234	1.88	-0.0729 U	0.0608 U	-0.00621 U	0.0502 U	0.121 UJ	--	58.4	--	4490	4010	4740	0.0163 UJ	0.0635 U	--	0.205 J	--	0.0826 UJ	0.058 U	0.00238 U	0.35 J	1.97	817
Uranium-235	0.0916 UJ	0.0619 U	0.0148 U	-0.0069 U	-0.0216 U	0.0995 UJ	--	3.47	--	241	285	241	0.0213 U	0.0198 U	--	0.0173 U	--	-0.0148 U	0.0204 U	-0.00588 U	0.0496 U	0.138	66.6
Uranium-238	1.19	0.0751 U	0.117 J	0.0232 U	-0.0176 U	0.0201 U	--	53.5	--	4680	3640	5210	0.0521 U	0.0961 UJ	--	0.0351 U	--	0.0118 U	0.0663 UJ	0.0452 U	0.55	1.71	768
VOCs (µg/L)																							
1,1,1-Trichloroethane	1.2	1.8	1 U	0.5 U	1 U	1 U	--	1 U	1 U	1 U	1 U	0.5 U	1.3	2	1.7	1 U	0.5 U	1 U	1 U	0.5 U	1 U	0.5 U	1 U
1,1,2-Trichloroethane	1 U	0.5 U	1 U	0.5 U	1 U	1 U	--	1 U	1 U	1 U	1 U	0.5 U	1 U	1 U	0.5 U	1 U	0.5 U	1 U	1 U	0.5 U	1 U	0.5 U	1 U
1,1-Dichloroethane	1.9	2.8	1 U	0.5 U	1 U	1 U	--	1 U	1 U	1 U	1 U	0.5 U	1.1	2	1.6	1 U	0.5 U	1 U	1 U	0.5 U	1 U	0.5 U	1 U
1,1-Dichloroethene	0.91	1.8	1 U	0.5 U	0.5 U	1 U	--	1 U	1 U	0.5 U	1 U	0.5 U	0.9	2	1.4	1 U	0.5 U	0.5 U	1 U	0.5 U	1 U	0.5 U	1 U
1,2,3-Trichlorobenzene	0.5 U	0.5 U	1 U	0.5 U	0.5 U	1 UJ	--	1 U	1 U	0.5 U	1 U	0.5 U	0.5 U	1 U	0.5 U	1 UJ	0.5 U	0.5 U	1 U	0.5 U	1 U	0.5 U	1 U
1,2,4-Trichlorobenzene	1 U	0.5 U	1 U	0.5 U	1 U	1 U	--	1 UJ	1 U	1 U	1 UJ	0.5 U	1 U	1 U	0.5 U	1 U	0.5 U	1 U	1 U	0.5 U	1 UJ	0.5 U	1 UJ
1,2-Dibromoethane	1 U	0.5 U	1 U	0.5 U	1 U	1 U	--	1 U	1 U	1 U	1 U	0.5 U	1 U	1 U	0.5 U	1 U	0.5 U	1 U	1 U	0.5 U	1 U	0.5 U	1 U
1,2-Dichloroethane	1 U	0.5 U	0.5 U	0.5 U	1 U	0.5 U	--	0.5 U	0.5 U	1 U	0.5 U	0.5 U	1 U	0.5 U	0.5 U	0.5 U	0.5 U	1 U	0.5 UJ	0.5 U	0.5 U	0.5 U	0.5 U
2-Butanone	2 U	3 U	5 U	3 U	2 U	5 U	--	5 U	5 U	2 U	5 U	36	2 U	5 U	3 U	5 U	3 U	2 U	5 U	3 U	5 U	3 U	5 U
2-Hexanone	2 U	2 U	5 U	2 U	2 U	5 U	--	5 UJ	5 U	2 U	5 UJ	2 U	2 U	5 UJ	2 U	5 U	2 U	2 U	5 UJ	2 U	5 UJ	2 U	5 UJ
4-Methyl-2-pentanone	1 U	2 U	1 U	2 U	1 U	1 U	--	1 UJ	1 U	1 U	1 UJ	2 U	1 U	1 UJ	2 U	1 U	2 U	1 U	1 UJ	2 U	1 UJ	2 U	1 UJ
Acetone	2 U	2 U	3 J	2 U	5.1	5 UJ	--	5 U	2 J	2 U	5 U	230	2 U	5 U	2 U	5 UJ	2 U	2 U	5 U	2 U	5 U	2 U	5 U
Benzene	4.5	0.5 U	1 U	0.5 U	1.3	1 U	--	1 U	1 U	0.5 U	1 U	5.5	0.5 U	1 U	0.5 U	1 U	0.5 U	0.5 U	1 U	0.5 U	1 U	0.5 U	1 U
Bromochloromethane	1 U	0.5 U	1 U	0.5 U	1 U	1 U	--	1 U	1 U	1 U	1 U	0.5 U	1 U	1 U	0.5 U	1 U	0.5 U	1 U	1 U	0.5 U	1 U	0.5 U	1 U
Bromodichloromethane	1 U	0.5 U	1 U	0.5 U	1 U	1 U	--	1 U	1 U	1 U	1 U	0.5 U	1 U	1 U	0.5 U	1 U	0.5 U	1 U	1 U	0.5 U	1 U	0.5 U	1 U
Bromoform	1 U	0.5 U	1 U	0.5 U	1 U	1 U	--	1 U	1 U	1 U	1 U	0.5 U	1 U	1 U	0.5 U	1 U	0.5 U	1 U	1 U	0.5 U	1 U	0.5 U	1 U
Carbon disulfide	1 U	0.5 U	1 U	0.5 U	1 U	1 U	--	1 U	1 U	1 U	1 U	0.5 U	1 U	1 U	0.5 U	1 U	0.5 U	1 U	1 U	0.5 U	1 U	0.5 U	1 U
Chloroform	0.71	0.5 U	1 U	0.5 U	0.5 U	1 U	--	17	6	0.16 J	1	0.5 U	0.21 J	1 U	0.5 U	1 U	0.5 U	3.5	2	4.7	12	0.5 U	1 U
cis-1,2-Dichloroethene	0.5 U	0.5 U	1 U	0.5 U	0.5 U	1 U	--	1 U	1 U	0.5 U	1 U	0.5 U	0.15 J	1 U	0.5 U	1 U	0.5 U	0.5 U	1 U	0.5 U	1 U	0.5 U	1 U
Dibromochloromethane	1 U	0.5 U	1 U	0.5 U	1 U	1 U	--	1 U	1 U	1 U	1 U	0.5 U	1 U	1 U	0.5 U	1 U	0.5 U	1 U	1 U	0.5 U	1 U	0.5 U	1 U
Dichlorodifluoromethane	1 U	0.5 U	1 UJ	0.5 U	1 U	1 U	--	1 U	1 U	1 U	1 U	0.5 U	1 U	1 U	0.5 U	1 U	0.5 U	1 U	1 UJ	0.5 U	1 U	0.5 U	1 U
Isopropylbenzene	0.5 UJ	0.5 U	1 U	0.5 U	0.5 U	1 U	--	1 U	1 U	0.5 U	1 U	0.5 U	0.5 U	1 U	0.5 U	1 U	0.5 U	0.5 U	1 U	0.5 U	1 U	0.5 U	1 U
m,p-Xylene	1 U	1 U	1 U	1 U	1 U	1 U	--	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Methyl tert-Butyl Ether	1 U	0.5 U	1 U	0.5 U	1 U	1 U	--	1 U	1 U	1 U	1 U	0.5 U	1 U	1 U	0.5 U	1 U	0.5 U	0.36 J	1 U	1.4	1 U	0.5 U	1 U
Tetrachloroethene	0.2 J	0.5 U	2	0.5 U	1.4	3 U	--	0.5 U	0.5 U	2.7	3	1.5	0.76 J	2	1.1	2	0.5 U	0.34 J	2 U	0.5 U	0.5 U	0.5 U	6
Toluene	0.14 J	0.5 U	1 U	0.5 U	0.5 U	1 U	--	1 U	1 U	0.5 U	1 U	1.7	0.5 U	1 U	0.5 U	1 U	0.5 U	0.5 U	1 U	0.5 U	1 U	0.5 U	1 U
trans-1,3-Dichloropropene	1 U	0.5 U	0.4 U	0.5 U	1 U	0.4 U	--	0.4 U	0.4 U	1 U	0.4 U	0.5 U	1 U	0.4 U	0.5 U	0.4 U	0.5 U	1 U	0.4 U	0.5 U	0.4 U	0.5 U	0.4 U
Trichloroethene	2.6	3.3	0.5 U	0.5 U	0.21 J	0.5 U	--	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	1.6	4	4.2	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U

Table 4.7-8 Comparison of Monitoring Well Data with Vertical Profile Data at Depth, Sylvania Corning FUSRAP Site, Hicksville, NY

Sample ID: / Sample Depth (feet BGS): / Analyte	MW-20D-VP03 66	MW-21D-GW 300-310	MW-21D-GWR2 300-310	MW-21D-VP26 306	MW-21I-GWR2 170-180	MW-21D-VP13 176	MW-21S-GWR2 70-80	MW-21D-VP03 76	MW-22D-GW 305-315	MW-22D-GWR2 305-315	MW-22D-VP26 305	MW-22I-GWR2 140-150	MW-22I-VP16 145-149	MW-22S-GWR2 70-80	MW-22D-VP03 75	MW-23D-GW 330-340	MW-23D-GWR2 330-340	MW-23D-VP29 336	MW-23I-GWR2 170-180	MW-23D-VP13 176	MW-23S-GWR2 90-100	MW-23D-VP05 96	MW-24DD-GW 360-370
Metals (µg/L)																							
Aluminum	--	68 U	24.1 J	--	672	--	19.6 U	--	557	81.7 J	--	24.3 J	--	20.8 J	--	538	89.7 J	137	308	231	43.5 J	226	155 J
Antimony	--	3 U	0.1 U	--	0.1 U	--	0.1 U	--	3 U	0.1 U	--	0.1 U	--	0.1 U	--	3 U	0.11 J	17.9 J	1 U	25 U	0.1 U	25 U	3 U
Arsenic	--	5 U	1 U	--	1 U	--	1 U	--	5 U	1 U	--	0.075 U	--	1 U	--	5 U	1.1	25 U	0.82 J	25 U	0.075 U	25 U	5 U
Barium	--	227	148 J	--	89 J	--	31.5 J	--	21	15 J	--	188 J	--	52.8 J	--	29	35.7 J	365	109 J	357	27.3 J	34.9	25.8
Beryllium	--	1 U	0.048 U	--	2.8	--	0.048 U	--	1 U	0.048 U	--	0.048 U	--	0.048 U	--	1 U	0.048 U	20 U	0.051 J	20 U	0.048 U	20 U	1 U
Cadmium	--	1 U	0.083 U	--	0.47 J	--	0.083 U	--	1 U	0.083 U	--	0.15 J	--	1.5	--	1 U	0.083 U	10 U	0.083 U	10 U	0.083 U	10 U	1 U
Calcium	--	27400	18600	--	25100	--	18100	--	15100	16300	--	19000	--	32900	--	14100	16800	7050	20200	17300	7810	11000	8430
Chromium	--	2 U	0.097 U	--	1.2 J	--	0.097 U	--	2 U	0.097 UJ	--	1 UJ	--	0.097 UJ	--	2 U	0.96 J	20 U	2 J	20 U	0.097 U	20 U	2 U
Cobalt	--	2 J	0.029 U	--	1.9 J	--	0.21 J	--	2.1 J	0.07 J	--	0.26 J	--	7.1	--	2.3 J	2.1 J	20 U	1.6 J	20 U	0.029 U	20 U	5.5
Copper	--	3 U	25 U	--	25 U	--	25 U	--	3 U	0.75 U	--	0.75 U	--	0.75 U	--	4.1 J	4.2 J	6.16 J	0.8 J	20 U	0.75 U	20 U	3.7 J
Iron	--	570	233	--	1410	--	3480	--	2750	107	--	20.3 J	--	904	--	6190	1980	458	765	493	49.8 J	179	304
Lead	--	2.5 U	1 U	--	1 U	--	1 U	--	2.5 U	1 UJ	--	1 UJ	--	1 UJ	--	2.5 U	1 U	15 U	1 U	15 U	1 U	15 U	2.5 U
Magnesium	--	8260	5630	--	6490	--	2210 J	--	4440	5150	--	5460	--	4850 J	--	2320	2710 J	1620	3650 J	5800	1680 J	1690	2410
Manganese	--	126	11 J	--	225 J	--	535 J	--	126	27.5 J	--	248 J	--	620 J	--	263	171 J	61.8	191 J	84.8	35.7 J	46.7	103
Nickel	--	4.6 J	0.59 J	--	5 J	--	3.4 J	--	2.5 J	4.9 J	--	3.1 J	--	18.6	--	5.3	4.6 J	20 U	11.6	14.7 J	2240	3370	1.6 J
Potassium	--	2780	5000 U	--	5000 U	--	5000 U	--	3600	5000 U	--	5000 U	--	5000 U	--	2180	5960	3000	5000 U	3040	5000 U	1630	1420
Selenium	--	5 U	4.2 U	--	4.2 U	--	4.2 U	--	5 U	4.2 U	--	4.2 U	--	4.2 U	--	5 U	4.2 U	25 U	4.2 U	25 U	4.2 U	25 U	5 U
Silver	--	1 U	0.069 U	--	0.069 U	--	0.069 U	--	1 U	0.069 U	--	0.069 U	--	0.069 U	--	1 U	0.069 U	20 U	0.069 U	20 U	0.069 U	20 U	1 U
Sodium	--	50700	27400	--	144000	--	14300	--	335000	338000	--	160000	--	22900	--	195000	87700	52100	75400	53200	7630	6390	19900
Thallium	--	5 U	0.029 J	--	0.11 J	--	0.027 U	--	5 U	0.11 J	--	0.085 J	--	0.049 J	--	5 U	0.027 U	15 U	0.096 J	15 U	0.059 J	15 U	5 U
Vanadium	--	1 U	1.2 U	--	1.2 U	--	1.2 U	--	1 U	1.2 U	--	1.2 U	--	1.2 U	--	1 U	1.2 U	20 U	1.2 U	20 U	1.2 U	20 U	1 U
Zinc	--	5.3 J	6.1 J	--	39.2 J	--	1.9 J	--	5.1 J	60 U	--	60 U	--	60 U	--	5.9 J	60 U	375	69.2	16.8 J	60 U	32.9	4.3 J
Radionuclides (pCi/L)																							
Actinium-228	--	-3.08 UJ	-1.76 U	--	3.13 U	--	1.11 U	--	11 U	5.99 U	--	4.4 U	--	3.56 U	--	7.07 U	3.97 U	--	-0.111 U	--	2.34 U	--	-8.84 R
Bismuth-212	--	-21.6 R	2.58 U	--	-0.18 U	--	-0.637 U	--	-4.49 UJ	-12 UJ	--	7.89 U	--	-1.75 UJ	--	11.2 U	-2.72 U	--	11.7 U	--	12.7 U	--	13.7 U
Bismuth-214	--	8.71 UJ	0.611 U	--	2.43 U	--	-1.11 U	--	11.3 UJ	8.93 J	--	-0.821 U	--	1.13 UJ	--	-0.74 U	-2.64 U	--	-3.29 U	--	-1.46 U	--	0.566 UJ
Gross Alpha	--	2.29	0.446 U	--	6.19 J	--	2 J	--	3.66	9.26 UJ	--	1.15 U	--	2.83	--	0.84 U	2.35 J	--	4.62 J	--	7.02	--	1.02 U
Gross Beta	--	7.87	1.75 J	--	5.4 J	--	2.87 J	--	4.6	7.38 J	--	2.63 U	--	6.5	--	3.07 UJ	6.84	--	7.08	--	3.13 J	--	5.69
Potassium-40	--	25.1 UJ	25.2 UJ	--	3.32 U	--	-0.378 U	--	28.9 U	12.6 U	--	34.1 UJ	--	5.94 UJ	--	8.75 U	-10.9 U	--	14.2 UJ	--	-2.1 UJ	--	-0.508 U
Protactinium-234M	--	--	405 J	--	312 UJ	--	-79 U	--	--	-138 U	--	-135 U	--	252 J	--	--	-122 UJ	--	-60 U	--	342 UJ	--	--
Lead-212	--	1.59 U	-0.596 UJ	--	-0.495 UJ	--	1.44 U	--	5.15 U	-1.09 UJ	--	-2.7 UJ	--	2.56 U	--	0.498 U	-1.63 UJ	--	0.0513 U	--	1.64 U	--	0.436 U
Lead-214	--	5.65 U	7.51 UJ	--	-4.14 R	--	1.87 U	--	11.7 UJ	3.88 U	--	-2.56 U	--	0.788 U	--	1.62 UJ	-2.54 J	--	-1.61 UJ	--	-3.22 UJ	--	4.73 U
Radium-226	0.382 U	0.203 UJ	0.34 J	--	1.47 J	--	0.195 J	--	1.2 J	2.14	--	1.11 J	--	0.294 J	--	0.46 UJ	0.431 J	--	0.909 J	--	0.365 J	--	-0.0837 UJ
Radium-228	1.94	2.47	1.31 J	--	1.06 J	--	0.6 J	--	1.54	2.61 J	--	1.07 J	--	1.03 J	--	2.47	0.52 UJ	--	-0.217 U	--	0.697 J	--	0.593 UJ
Thorium-227	--	--	0.0825 U	--	0.109 U	--	0.0374 U	--	--	0.204 UJ	--	0.195 U	--	0.166 UJ	--	--	0.242 J	--	0.049 U	--	0.127 U	--	--
Thorium-228	0.0645 U	0.0142 U	-0.00524 U	--	0.0553 U	--	0.0969 UJ	--	-0.043 U	0.116 U	--	0.0587 U	--	0.0154 U	--	0.0188 U	0.0141 U	--	-0.0321 R	--	-0.0134 U	--	0.0563 U
Thorium-230	0.0369 U	-0.00892 U	0.0267 UJ	--	0.166 UJ	--	0.12 UJ	--	-0.00349 U	0.0947 UJ	--	0.0637 UJ	--	0.0868 UJ	--	0.0129 U	0.103 UJ	--	-0.0136 U	--	0.0372 U	--	0.0587 UJ
Thorium-232	-0.0472 U	0.00872 U	0.00407 U	--	-0.000476 U	--	0.0382 U	--	0.0593 UJ	-0.00536 U	--	-0.0151 U	--	0.0117 U	--	0.0352 U	0.0591 UJ	--	-0.00453 U	--	-0.00423 U	--	-0.0205 U
Thorium-234	--	72.4 UJ	2.57 U	--	58.2 UJ	--	-18.1 U	--	-145 UJ	-42.9 U	--	-42.5 U	--	-25.2 U	--	-90 UJ	-16.6 U	--	-42.4 U	--	69.2 J	--	161 U
Thallium-208	--	-0.813 UJ	1.52 U	--	3.41 U	--	7.19 UJ	--	-2.26 UJ	-5.24 U	--	-2.23 U	--	2.89 U	--	0.309 U	2.32 U	--	2.98 U	--	-1.85 U	--	1.74 U
Total Uranium	6470	0.249 UJ	0.541 U	--	0.671 UJ	--	0.36 UJ	--	0.0982 UJ	0.505 U	--	0.177 UJ	0.199 J	1.2 J	--	1.37	0.474 UJ	--	4.24	--	11	--	0.0851 UJ
Uranium-234	2230	-0.0539 U	0.0392 UJ	--	0.0849 UJ	--	0.0752 UJ	--	-0.0575 U	0.0035 U	--	0.162 J	--	0.182	--	0.387	0.366 J	--	1.8	--	3.73	--	-0.0178 U
Uranium-235	117	-0.000426 U	-0.0248 U	--	-0.0102 U	--	-0.0136 U	--	-0.000242 U	-0.0201 U	--	0.027 UJ	--	0.138 UJ	--	0.023 U	0.0393 UJ	--	0.149 J	--	0.641 J	--	0.0454 UJ
Uranium-238	2180	-0.000345 U	0.0546 U	--	0.157 UJ	--	0.0821 UJ	--	0.167	-0.0121 U	--	0.056 UJ	--	0.381 J	--	0.272	0.0581 UJ	--	1.42	--	3.65	--	0.00891 U
VOCs (µg/L)																							
1,1,1-Trichloroethane	0.5 U	1 U	1 U	0.5 U	1 U	0.5 U	1 U	0.5 U	1 U	1 U	0.5 U	1 U	--	1 U	0.5 U	0.4 J	1 U	0.81	1 U	0.5 U	1 U	0.5 U	2.3
1,1,2-Trichloroethane	0.5 U	1 U	1 U	0.5 U	1 U	0.5 U	1 U	0.5 U	1 U	1 U	0.5 U	1 U	--	1 U	0.5 U	1 U	1 U	0.5 U	1 U	0.5 U	1 U	0.5 U	1 U
1,1-Dichloroethane	0.5 U	1 U	1 U	0.5 U	1 U	0.5 U	1 U	0.5 U	1 U	1 U	0.5 U	1 U	--	1 U	0.5 U	0.9 J	2	0.93	1 U	0.5 U	1 U	0.5 U	2.6
1,1-Dichloroethene	0.5 U	0.5 U	1 U	0.5 U	1 U	0.5 U	1 U	0.5 U	0.5 U	1 U	0.5 U	1 U	--	1 U	0.5 U	0.26 J	1	0.5 U	1 U	0.5 U	1 U	0.5 U	1.4
1,2,3-Trichlorobenzene	0.5 U	0.5 U	1 UJ	0.5 U	1 UJ	0.5 U	1 UJ	0.5 U	0.5 U	1 U	0.5 U	1 U	--	1 U	0.5 U	0.5 U	1 U	0.5 U	1 U	0.5 U	1 U	0.5 U	0.5 U
1,2,4-Trichlorobenzene	0.5 U	1 U	1 U	0.5 U	1 U	0.5 U	1 U	0.5 U	1 U	1 UJ	0.5 U	1 UJ	--	1 UJ	0.5 U	1 U	1 U	0.5 U	1 U	0.5 U	1 U	0.5 U	1 U
1,2-Dibromoethane	0.5 U	1 U	1 U	0.5 U	1 U	0.5 U	1 U	0.5 U	1 U	1 U	0.5 U	1 U	--	1 U	0.5 U	1 U	1 U	0.5 U	1 U	0.5 U	1 U	0.5 U	1 U
1,2-Dichloroethane	0.5 U	1 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	1 U	0.5 U	0.5 U	0.5 U	--	0.5 U	0.5 U	1 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	1 U
2-Butanone	3 U	2 U	5 U	3 U	5 U	3 U	5 U	3 U	2 U	5 U	3 U	5 U	--	5 U	3 U	2 U	5 UJ	3 U	5 UJ	3 U	5 UJ	3 U	2 U
2-Hexanone	2 U	2 U	5 U	2 U	5 U	2 U	5 U	2 U	2 U	5 UJ	2 U	5 UJ	--	5 UJ	2 U	2 U	5 UJ	2 U	5 UJ	2 U	5 UJ	2 U	2 U
4-Methyl-2-pentanone	2 U	1 U	1 U	2 U	1 U	2 U	1 U	2 U	1 U	1 UJ	2 U	1 UJ	--	1 UJ	2 U	1 U	2 J	2 U	1 UJ	2 U	1 UJ	2 U	1 U
Acetone	2 U	2 U	5 U	2 U	5 UJ	2 U	5 UJ	2 U	2 U	5 U	97	5 U	--	3 J	2 U	2 U	5	2 U	6	2 U	5 U	2 U	2 U
Benzene	0.5 U	0.5 U	1 U	0.5 U	1 U	0.5 U	1 U	0.5 U	0.15 J	1 U	1	1 U	--	1 U	0.5 U	0.21 J	1 U	0.5 U	1 U	0.96	1 U	0.5 U	0.5 U
Bromochloromethane	0.5 U	1 U	1 U	0.5 U	1 U	0.5 U	1 U	0.5 U	1 U	1 U	0.5 U	1 U	--	1 U	0.5 U	1 U	1 U	0.5 U	1 U	0.5 U	1 U	0.5 U	1 U
Bromodichloromethane	0.5 U	1 U	1 U	0.5 U	1 U	0.5 U	1 U	0.5 U	1 U	1 U	0.5 U	1 U	--	1 U	0.5 U	1 U	1 U	0.5 U	1 U	0.5 U	1 U	0.5 U	1 U
Bromoform	0.5 U	1 U	1 U	0.5 U	1 U	0.5 U	1 U	0.5 U	1 U	1 U	0.5 U	1 U	--	1 U	0.5 U	1 U	1 U	0.5 U	1 U	0.5 U	1 U	0.5 U	1 U
Carbon disulfide	0.5 U	1 U	1 U	0.5 U	1 U	0.5 U	1 U	0.5 U	1 U	1 U	6.3	1 U	--	1 U	0.5 U	1 U	1	0.5 U	1 U	0.5 U	1 U	0.5 U	1 U
Chloroform	5.5	0.5 U	1 U	0.5 U	1 U	0.5 U	1 U	0.5 U	3.4	4	0.5 U	20	--	1 U	0.5 U	2.7	1 U	0.58	1 U	0.5 U	1 U	0.5 U	0.18 J
cis-1,2-Dichloroethene	0.5 U	0.5 U	1 U	0.5 U	1 U	0.5 U	1 U	0.5 U	0.5 U	1 U	0.5 U	1 U	--	6 J	5 J	0.5 U	1 U	0.5 U	1 U	0.5 U	1 U	0.5 U	0.17 J
Dibromochloromethane	0.5 U	1 U	1 U	0.5 U	1 U	0.5 U	1 U	0.5 U	1 U	1 U	0.5 U	1 U	--	1 U	0.5 U	1 U	1 U	0.5 U	1 U	0.5 U	1 U	0.5 U	1 U
Dichlorodifluoromethane	0.5 U	1 U	1 U	0.5 U	1 U	0.5 U	1 U	0.5 U	1 U	1 U	0.5 U	1 U	--	1 U	0.5 U	1 U	1 U	0.5 U	1 U	0.5 U	1 U	0.5 U	1 U
Isopropylbenzene	0.5 U	0.5 U	1 U	0.5 U	1 U	0.5 U	1 U	0.5 U	0.5 U	1 U	0.5 U	1 U	--	1 U	0.5 U	0.5 U	1 U	0.5 U	1 U	1.4	1 U	0.5 U	0.5 U
m,p-Xylene	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	0.14 J	1 U	1 U	1 U	--	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Methyl tert-Butyl Ether	0.5 U	1 U	1 U	0.5 U	1 U	0.5 U	1 U	0.5 U	0.45 J	1 U	0.5 U	1 U	--	1 U	0.5 U	1 U	1 U	0.5 U	1 U	0.5 U	1 U	0.5 U	1 U
Tetrachloroethene	6	1 U	2	0.5 U	2	0.5 U	2	0.5 U	2.2	5	0.5 U	0.5 U	--	1800 J	2200	3.4	3	3	2	0.5 U	2	1.7	1.8
Toluene	0.5 U	0.5 U	1 U	0.5 U	1 U	0.5 U	1 U	0.5 U	0.3 J	1 U	0.5 U	1 U	--	1 U	0.5 U	0.14 J	1 U	0.5 U	1 U	0.5 U	1 U	0.5 U	0.5 U
trans-1,3-Dichloropropene	0.5 U	1 U	0.4 U	0.5 U	0.4 U	0.5 U	0.4 U	0.5 U	1 U	0.4 U	0.5 U	0.4 U	--	0.4 U	0.5 U	1 U	0.4 U	0.5 U	0.4 U	0.5 U	0.4 U	0.5 U	1 U
Trichloroethene	0.5 U	0.5 U	0.6	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	--	130	38	0.59	1	1.8	0.5	0.5 U	0.5 U	0.5 U	8.2

Table 4.7-8 Comparison of Monitoring Well Data with Vertical Profile Data at Depth, Sylvania Corning FUSRAP Site, Hicksville, NY

Sample ID: / Sample Depth (feet BGS): / Analyte	MW-24DD-GWR2 360-370	MW-24DD-VP32 366	MW-24S-GWR2 70-80	MW-24DD-VP03 76	MW-25D-GW 340-350	MW-25D-GWR2 340-350	MW-25D-VP30 346	MW-25I-GWR2 230-240	MW-25D-VP19 236	MW-25S-GWR2 105-115	MW-25D-VP06 106	MW-26D-GW 266-276	MW-26D-GWR2 266-276	MW-26D-VP22 266	MW-26S-GWR2 110-120	MW-26D-VP07 116	MW-27DD-GW 365-375	MW-27DD-GWR2 365-375	MW-27DD-VP32 367	MW-27D-GWR2-F 280-290	MW-27D-GWR2-U 280-290
Metals (µg/L)																					
Aluminum	37.6 J	656	19.6 U	172	309	31.6 J	3790	25.3 J	23.2	25.4 J	1900	68 U	19.6 U	370	19.6 U	29.5	253	328	1120	204	1940
Antimony	0.1 U	25 U	0.1 U	25 U	3 U	0.1 U	25 U	0.1 U	25 U	0.1 U	25 U	3 U	0.1 U	38.1	0.1 U	25 U	3 U	0.1 U	25 U	2 U	2 U
Arsenic	1 U	25 U	1 U	25 U	5 U	1 U	25 U	1 U	25 U	1 U	25 U	5 U	1 U	25 U	1 U	25 U	5 U	0.9 J	25 U	0.075 U	0.13 J
Barium	21.8 J	51.9	42.7 J	43.9	113	155 J	307	196 J	321	144 J	238	149	142 J	201	133 J	195	16.6	13.8 J	76.8	147 J	162 J
Beryllium	0.048 U	20 U	0.048 U	20 U	1 U	0.048 U	20 U	0.06 J	20 U	0.081 J	20 U	1 U	0.054 J	20 U	0.048 U	20 U	1 U	0.051 J	20 U	0.24 J	0.28 J
Cadmium	0.083 U	10 U	0.083 U	10 U	1 U	0.083 U	10 U	0.083 U	10 U	0.083 U	10 U	1 U	0.083 U	10 U	0.083 U	10 U	1 U	0.083 U	10 U	0.33 J	0.31 J
Calcium	8590	10400	13100	18500	30000	22600	27000	17700	11200	15600	17000	15400	14600	13400	8630	9190	14100	8490	6330	21500	21200
Chromium	0.097 U	20 U	0.097 U	20 U	2 U	0.097 U	20 U	0.097 U	20 U	0.097 U	20 U	2 U	0.097 U	20 U	0.097 U	20 U	2 U	2.3 J	20 U	1.2 J	3.4 J
Cobalt	0.029 U	20 U	0.029 U	6.88 J	5.4	0.37 J	25.9	0.029 U	20 U	0.029 U	20 U	2.4 J	0.029 U	20 U	5.7	20 U	2.3 J	0.029 UJ	20 U	5.4	4.5 J
Copper	0.75 U	20 U	0.75 U	20 U	3.9 J	0.75 U	20 U	0.75 U	20 U	0.75 U	20 U	3 U	0.75 U	3.39 J	0.75 U	20 U	3 U	25 J	20 U	25 U	25 U
Iron	71.4 J	2820	23.3 J	2800	5350	471	16600	19.4 J	613	27.8 J	894	1330	33 J	250	107 U	46.3	1340	1460	777	503	1140
Lead	1 U	15 U	1 U	15 U	2.5 U	1 U	15 U	1 U	15 U	1 U	15 U	2.5 U	1 U	15 U	1 U	15 U	2.5 U	1 U	15 U	1 U	1.9
Magnesium	2420 J	2950	1800 J	2290	5860	7040	8630	6150	4270	3480 J	3770	4580	4260 J	4450	1880 J	2230	2300	5000 U	1760	5330	5410
Manganese	10.5 J	127	12.2 J	357	313	42 J	573	197 J	231	198 J	226	202	31.4 J	44.2	632 J	155	144	17 J	38	182	180 J
Nickel	0.64 J	20 U	89.1	60.4	8.8	3.7 J	33.6	4.1 J	6.26 J	62.9	152	8.4	5.2	20 U	193	249	2.4 J	1.2 J	20 U	75.9	75.4
Potassium	5000 U	2050	5000 U	3000	16700	6590	14300	6490	8750	5000 U	5290	1440	5000 U	2860	5000 U	3530	4780	5000 U	2020	5000 U	5000 U
Selenium	4.2 U	25 U	4.2 U	25 U	5 U	4.2 U	25 U	4.2 U	25 U	4.2 U	25 U	5 U	4.2 U	25 U	4.2 U	25 U	5 U	4.2 U	25 U	4.2 UJ	4.2 U
Silver	0.069 U	20 U	0.069 U	20 U	1 U	0.069 U	20 U	0.069 U	20 U	0.069 U	20 U	1 U	0.069 U	20 U	0.069 U	20 U	1 U	0.069 U	20 U	5 U	0.069 U
Sodium	17900	15700	6670	4860	161000	162000	37900	70500	29200	38600	19400	26300	26800	11700	64300	25100	22500	16700	11900	610000	627000
Thallium	0.038 J	15 U	0.041 J	15 U	5 U	0.096 J	15 U	0.13 J	15 U	0.094 J	15 U	5 U	0.051 J	15 U	0.19 J	15 U	5 U	0.066 J	15 U	0.12 J	0.13 J
Vanadium	1.2 U	20 U	1.2 U	20 U	1 U	1.2 U	20 U	1.2 U	20 U	1.2 U	20 U	1 U	1.2 U	20 U	1.2 U	20 U	4 J	4 J	20 U	1.2 U	2.7 J
Zinc	60 U	40.7	60 U	15.2 J	7.5 J	60 U	38.7	60 U	33.3	60 U	44.4	6.2 J	60 U	31.3	60 U	13.4 J	6 J	8.7 J	72.8	15.7 J	25.7 J
Radionuclides (pCi/L)																					
Actinium-228	-1.88 U	--	3.48 U	--	0.323 U	6.48 U	--	0.144 U	--	-2.12 U	--	4.08 U	-3.76 U	--	-0.131 U	--	-10 UJ	-5.31 U	--	9.86 J	2.44 U
Bismuth-212	-6.41 UJ	--	4.52 U	--	7.03 U	6.55 U	--	9.91 U	--	12.4 U	--	0.66 UJ	-5.53 U	--	-1.03 UJ	--	15.3 U	-20.9 R	--	-6.07 U	4.42 U
Bismuth-214	-2.46 UJ	--	3.11 U	--	13.1 U	3.91 U	--	0.492 U	--	-4.34 UJ	--	17.2 U	-0.0275 U	--	8.94 J	--	1.4 U	2.89 U	--	-1.84 U	2.57 U
Gross Alpha	1.17 UJ	--	11.7	--	2.57	3.08 J	--	5.04 J	--	13.3	--	0.362 U	1.73 U	--	4.75	--	0.472 U	1.6 J	--	11.7 J	16.4 J
Gross Beta	8.38 J	--	5.02	--	13.8	9.61	--	6.51	--	5.83	--	1.48 UJ	2.57 J	--	6.78	--	5.67	1.79 J	--	8.53 J	20.1
Potassium-40	37.9 J	--	4.16 U	--	0.207 UJ	29.2 UJ	--	-4.04 U	--	21.1 U	--	2.03 UJ	-9.74 U	--	-3.29 U	--	53.3 U	-2.47 U	--	-9.34 U	9.08 U
Protactinium-234M	-71.1 U	--	498 J	--	--	-81.4 U	--	-23.5 U	--	41.3 U	--	--	51.4 U	--	-121 U	--	--	-39.9 UJ	--	-155 UJ	37.3 UJ
Lead-212	-0.922 U	--	1.44 U	--	-0.844 U	-0.733 U	--	-1.85 UJ	--	-0.208 U	--	0.462 U	0.119 U	--	1.07 U	--	2.66 UJ	6.3 UJ	--	-4.22 R	-0.24 U
Lead-214	3.72 U	--	-0.904 U	--	5.42 U	0.427 U	--	-1.36 U	--	0.795 U	--	29.6 U	-1.38 U	--	-0.433 UJ	--	2.47 UJ	3.36 U	--	2 U	2.98 U
Radium-226	0.486 J	--	0.105 U	0.118 U	0.84 J	2.44	--	1.3 J	--	0.889 J	--	-0.126 UJ	0.328 J	--	0.903	--	0.655 J	0.797	--	3.12	3.71
Radium-228	1.05 J	--	0.363 U	0.422 U	2.69	2.07	--	0.772 J	--	0.255 U	--	0.016 U	0.465 U	--	0.26 U	--	-0.0481 U	0.468 UJ	--	3.86	4.84
Thorium-227	0.213 UJ	--	0.262 J	--	--	0.256 J	--	-0.0686 U	--	0.105 U	--	--	0.181 UJ	--	0.222 UJ	--	--	0.0568 U	--	0.09 UJ	0.0485 U
Thorium-228	0.13 UJ	--	0.0173 UJ	0.0617 U	-0.00828 U	0.0364 UJ	--	0.0252 U	--	0.0806 U	--	-0.0268 U	-0.0194 UJ	--	0.00486 UJ	--	0.0232 U	0.0448 UJ	--	0.0157 U	0.193
Thorium-230	0.0131 UJ	--	0.26 J	-0.0462 U	-0.0118 U	0.0926 UJ	--	0.108 UJ	--	0.0119 U	--	-0.00635 U	0.132 J	--	0.0529 UJ	--	0.0276 U	0.0464 UJ	--	0.13 UJ	0.296 J
Thorium-232	0.0221 U	--	0.0474 UJ	0.0244 U	0.0129 U	0.0966 UJ	--	-0.0133 U	--	-0.0123 U	--	-0.0133 U	-0.00464 U	--	-0.0054 U	--	0.015 U	0.0116 U	--	0.0024 U	0.168
Thorium-234	-5.53 U	--	-3.38 U	--	-23.7 U	-22.7 U	--	10.7 U	--	-23.9 U	--	52.9 UJ	-8.57 U	--	-7.42 U	--	-156 UJ	-17.5 U	--	-28.6 U	-8.47 U
Thallium-208	-4 U	--	2.03 U	--	0.753 UJ	-6.56 R	--	1.2 U	--	0.217 U	--	-2.32 U	-0.94 U	--	-0.674 U	--	3.37 U	7.59 J	--	-0.365 U	0.266 U
Total Uranium	0.462 U	--	18.8	24	43.7	0.592 J	--	0.505 U	--	7.37	--	0.143 UJ	0.54 J	--	4.11	--	0.579 U	0.402 UJ	--	5.77	11.1
Uranium-234	0.109 UJ	--	5.14 J	8.25	-0.00712 U	0.0386 UJ	--	0.107 UJ	--	2.6	--	0.137	0.268 J	--	1.83 J	--	0.0154 U	0.0653 UJ	--	1.45	3.88
Uranium-235	0.0147 U	--	0.682	0.553	0.0716	0.0811 UJ	--	0.109 UJ	--	0.202 J	--	0.0238 UJ	0.165 UJ	--	0.133 UJ	--	0.0105 U	0.111 UJ	--	0.0577 U	0.159 J
Uranium-238	0.0159 U	--	6.27	8.07	0.00955 U	0.181 J	--	0.0485 U	--	2.47	--	0.0384 UJ	0.167 J	--	1.37	--	0.0685 UJ	0.0447 UJ	--	1.93	3.74
VOCs (µg/L)																					
1,1,1-Trichloroethane	3	0.5 U	1 U	0.5 U	0.28 J	1 U	0.5 U	1	6.6	1	40	1.6	1	1.5	1 U	0.5 U	2.1	2	1.9	--	1 U
1,1,2-Trichloroethane	1 U	0.5 U	1 U	0.5 U	1 U	1 U	0.5 U	1 U	0.5 U	1 U	0.5 U	1 U	1 U	0.5 U	1 U	0.5 U	1 U	1 U	0.5 U	--	1 U
1,1-Dichloroethane	3	3	1 U	0.5 U	1 U	1 U	0.5 U	1 U	0.5 U	1 U	1.5	1.4	2	1.6	1 U	0.5 U	2.6	3	2	--	1 U
1,1-Dichloroethene	2	1.8	1 U	0.5 U	0.5 U	1 U	0.5 U	1 U	4.3	1	31	0.98	1	1.2	1 U	0.5 U	1.3	2	1.3	--	1 U
1,2,3-Trichlorobenzene	1 U	0.5 U	1 U	0.5 U	0.5 U	1 U	0.5 U	1 U	0.5 U	1 U	0.5 U	0.5 U	1 U	0.5 U	1 U	0.5 U	0.5 U	1 U	0.5 U	--	1 U
1,2,4-Trichlorobenzene	1 U	0.5 U	1 U	0.5 U	1 U	1 U	0.5 U	1 U	0.5 U	1 U	0.5 U	1 U	1 UJ	0.5 U	1 U	0.5 U	1 U	1 U	0.5 U	--	1 U
1,2-Dibromoethane	1 U	0.5 U	1 U	0.5 U	1 U	1 U	0.5 U	1 U	0.5 U	1 U	0.5 U	1 U	1 U	0.5 U	1 U	0.5 U	1 U	1 U	0.5 U	--	1 U
1,2-Dichloroethane	0.5 U	0.5 U	0.5 U	0.5 U	1 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	1 U	0.5 U	0.5 U	0.5 U	0.5 U	0.26 J	0.5 UJ	0.5 U	--	0.5 UJ
2-Butanone	5 UJ	3 U	5 UJ	3 U	2 U	5 UJ	3 U	5 UJ	3 U	5 UJ	3 U	2 U	5 U	3 U	5 UJ	3 U	2 U	5 U	3 U	--	5 U
2-Hexanone	5 UJ	2 U	5 UJ	2 U	2 U	5 UJ	2 U	5 UJ	2 U	5 UJ	2 U	2 U	5 UJ	2 U	5 UJ	2 U	2 U	5 UJ	2 U	--	5 UJ
4-Methyl-2-pentanone	1 UJ	2 U	1 UJ	2 U	1 U	1 UJ	2 U	1 UJ	2 U	1 UJ	2 U	1 U	1 UJ	2 U	1 UJ	2 U	1 U	1 UJ	2 U	--	1 UJ
Acetone	5 U	2 U	5 U	2 U	2 U	5 U	2 U	5 U	2 U	5 U	2 U	2 U	5 U	2 U	5 U	2 U	2 U	5 U	2 U	--	2 J
Benzene	1 U	0.5 U	1 U	0.7	0.5 U	1 U	0.5 U	1 U	0.5 U	1 U	0.5 U	0.5 U	1 U	0.5 U	1 U	0.5 U	0.84	1 U	0.5 U	--	1 U
Bromochloromethane	1 U	0.5 U	1 U	0.5 U	1 U	1 U	0.5 U	1 U	0.5 U	1 U	0.5 U	1 U	1 U	0.5 U	1 U	0.5 U	1 U	1 U	0.5 U	--	1 U
Bromodichloromethane	1 U	0.5 U	1 U	0.5 U	1 U	1 U	0.5 U	1 U	0.5 U	1 U	0.5 U	1 U	1 U	0.5 U	1 U	0.5 U	1 U	1 U	0.5 U	--	1 U
Bromoform	1 U	0.5 U	1 U	0.5 U	1 U	1 U	0.5 U	1 U	0.5 U	1 U	0.5 U	1 U	1 U	0.5 U	1 U	0.5 U	1 U	1 U	0.5 U	--	1 U
Carbon disulfide	1 U	0.5 U	1 U	0.5 U	1 U	1 U	0.5 U	1 U	0.5 U	1 U	0.5 U	1 U	1 U	0.5 U	1 U	0.5 U	1 U	1 U	0.5 U	--	1 U
Chloroform	1 U	0.5 U	1 U	0.5 U	0.13 J	1 U	0.5 U	1 U	0.5 U	1 U	0.5 U	0.17 J	1 U	0.5 U	1 U	0.5 U	0.18 J	1 U	0.5 U	--	7
cis-1,2-Dichloroethene	1 U	0.5 U	1 U	0.5 U	0.5 U	1 U	0.5 U	1 U	0.5 U	1 U	1.7	0.1 J	1 U	0.5 U	1 U	0.5 U	0.2 J	1 U	0.5 U	--	1 U
Dibromochloromethane	1 U	0.5 U	1 U	0.5 U	1 U	1 U	0.5 U	1 U	0.5 U	1 U	0.5 U	1 U	1 U	0.5 U	1 U	0.5 U	1 U	1 U	0.5 U	--	1 U
Dichlorodifluoromethane	1 U	0.5 U	1 U	0.5 U	1 U	1 U	0.5 U	1 U	0.5 U	1 U	0.5 U	1 U	1 U	0.5 U	1 U	0.5 U	1 U	1 UJ	0.5 U	--	1 UJ
Isopropylbenzene	1 U	0.5 U	1 U	0.5 U	0.5 U	1 U	0.5 U	1 U	0.5 U	1 U	0.5 U	0.5 U	1 U	0.5 U	1 U	0.5 U	0.5 U	1 U	0.5 U	--	1 U
m,p-Xylene	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	--	1 U
Methyl tert-Butyl Ether	1 U	0.5 U	1 U	0.5 U	1 U	1 U	0.5 U	1 U	0.5 U	1 U	0.5 U	1 U	1 U	0.5 U	1 U	0.5 U	1 U	1 U	0.5 U	--	1 U
Tetrachloroethene	3	0.91	40	43	1 U	2	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	1.7	2	1.4	0.5 U	0.5 U	1.1	2 U	1.6	--	15
Toluene	1 U	0.5 U	1 U	0.5 U	0.17 J	1 U	0.5 U	1 U	0.5 U	1 U	0.5 U	0.5 U	1 U	0.5 U	1 U	0.5 U	0.26 J	1 U	0.5 U	--	1 U
trans-1,3-Dichloropropene	0.4 U	0.5 U	0.4 U	0.5 U	1 U	0.4 U	0.5 U	0.4 U	0.5 U	0.4 U	0.5 U	1 U	0.4 U	0.5 U	0.4 U	0.5 U	1 U	0.4 U	0.5 U	--	0.4 U
Trichloroethene	10	8.4	0.5 U	0.83	0.23 J	0.5 U	0.5 U	0.5 U	0.99	0.5 U	7.2	2.8	3	3.9	0.5 U	0.5 U	8.8	10	8.1	--	1

Table 4.7-8 Comparison of Monitoring Well Data with Vertical Profile Data at Depth, Sylvania Corning FUSRAP Site, Hicksville, NY

Sample ID:	MW-27DD-VP24	MW-27S-GWR2	MW-27DD-VP04	MW-28D-GW-F	MW-28D-GWR2-F	MW-28D-GWR2-U	MW-28D-GW-U	MW-28D-VP23	MW-28I-GWR2	MW-28D-VP16	MW-28S-GWR2	MW-28D-VP05	MW-29S-GW	MW-29S-GWR2	MW-29S-VP03	MW-30D-GW	MW-30D-GWR2	MW-30D-VP29	MW-30I-GWR2	MW-30D-VP19	MW-30S-GWR2	MW-30D-VP05
Sample Depth (feet BGS):	287	80-90	87	277-287	277-287	277-287	277-287	277	149-159	149	90-100	97	66-76	66-76	66	330-340	330-340	337	230-240	237	90-100	98
Analyte																						
Metals (µg/L)																						
Aluminum	773	31.7 J	332	204	1940 R	5030	3590	--	664	--	50 J	--	68 U	19.6 U	--	306	38.5 J	181	200 U	575	455	826
Antimony	25 U	0.1 U	25 U	3 U	0.31 J	0.19 J	3 U	--	0.1 U	--	0.1 U	--	3 U	2 U	--	3 U	0.1 U	25 U	0.1 U	25 U	0.1 U	25 U
Arsenic	25 U	0.17 J	25 U	5 U	1	2.4	5 U	--	5.8	--	0.075 U	--	5 U	1 U	--	5 U	1 U	25 U	0.24 J	25 U	1 U	25 U
Barium	642	18.3 J	24.9	17.9	25.9 J	43.3 J	33.3	--	8.2 J	--	15.3 J	--	50	50.1 J	--	57.3 J	127 J	112	129 J	238	45 J	161
Beryllium	20 U	0.048 U	20 U	1 U	0.14 J	0.27 J	1 U	--	0.049 J	--	0.048 U	--	1 U	0.048 U	--	1 U	0.048 U	20 U	0.048 U	20 U	0.56 J	20 U
Cadmium	10 U	0.083 U	10 U	1 U	0.083 U	0.083 U	1 U	--	0.083 U	--	0.083 U	--	1 U	0.16 J	--	1 U	0.083 U	10 U	0.44 J	10 U	0.083 U	10 U
Calcium	15800	9160	9700	8010	5000 U	3940 J	8790	--	9160	--	25300	--	34300	37400	--	32100	24800	17300	27000	24400	11100	12000
Chromium	20 U	0.4 J	20 U	2 U	2.3 J	7.3	4.5 J	--	1.2 J	--	0.097 UJ	--	2 U	0.097 U	--	2 U	0.097 UJ	20 U	0.63 J	20 U	0.097 UJ	20 U
Cobalt	20 U	10 J	20 U	1.2 J	3.4 R	0.44 R	1.3 J	--	0.029 U	--	0.21 J	--	10.1	5.6 J	--	11.2 J	2.8 J	20 U	0.029 UJ	20 U	0.029 U	20 U
Copper	8.34 J	25 U	20 U	3 U	5.6 J	8.8 J	4.8 J	--	0.75 U	--	0.75 U	--	3.1 J	25 U	--	3.2 J	0.75 U	20 U	25 U	20 U	0.75 U	4.3 J
Iron	7640	99 J	365	2710	1100	3530	4240	--	954	--	265	--	4460	3090	--	444 J	2990	5360	60.4 J	480	44.1 J	849
Lead	15 U	1 U	15 U	2.5 U	5.4 R	11.4	4.8 J	--	1 U	--	1 UJ	--	2.5 U	1 U	--	2.5 U	1 UJ	15 U	1 U	15 U	1 UJ	15 U
Magnesium	4330	1490 J	1870	1930	1040 J	1170 J	2040	--	2640 J	--	3000 J	--	6060	6460	--	10100	7310	4720	7540	7960	1660 J	1960
Manganese	220	626 J	85.2	97.3	61.4	62.2 J	104	--	10.7 J	--	25.3 J	--	401	90.2	--	38 J	289 J	326	99.9 J	164	20.6 J	62.2
Nickel	128	108	114	2 J	6.5 J	5.8	2.5 J	--	0.24 J	--	6.1	--	53.3	40.6	--	17.7 J	10.3	9.93 J	0.47 J	20 U	6.2	8.46 J
Potassium	3950	5840	8660	551	1480 J	5000 U	955	--	5000 U	--	5000 U	--	2550	5000 U	--	1740 J	5000 U	3920	7350	8320	5000 U	2140
Selenium	25 U	4.2 U	25 U	5.6 J	4.2 U	4.2 U	5 U	--	4.2 U	--	4.2 U	--	5 U	4.2 U	--	5 U	4.2 U	25 U	4.2 U	25 U	4.2 U	25 U
Silver	20 U	0.069 U	20 U	1 U	5 U	0.069 U	1 U	--	0.069 U	--	0.069 U	--	1 U	0.069 U	--	1 U	0.069 U	20 U	0.069 U	20 U	0.069 U	20 U
Sodium	68000	8290	8850	354000	337000	330000	357000	--	120000	--	32400	--	35400	47400	--	333000 J	122000	35000	64100	27000	5000 U	15200
Thallium	15 U	0.098 J	15 U	5 U	0.092 J	0.11 J	5 U	--	0.053 J	--	0.097 J	--	5 U	0.12 J	--	5 U	0.07 J	15 U	0.044 J	15 U	0.031 J	15 U
Vanadium	20 U	1.2 U	20 U	1 J	5.2 J	14.7 J	8.3	--	5.1 J	--	1.2 U	--	1 U	1.2 U	--	1 U	1.2 U	20 U	1.2 U	20 U	1.2 U	20 U
Zinc	29.5	6.5 J	51	9.5 J	12.7 J	60 U	5.2 J	--	60 U	--	4.6 J	--	84.5	135	--	20.1 J	18.2 J	13.6 J	3.5 J	11.6 J	8.5 J	28.9
Radionuclides (pCi/L)																						
Actinium-228	--	-5.08 U	--	-5.11 UJ	12.3 J	-2.76 U	11.2 UJ	--	-1.33 U	--	5.22 U	--	-2.61 UJ	-2.26 U	--	7.79 U	-0.59 U	--	3.77 U	--	9.71 U	--
Bismuth-212	--	3.99 U	--	9.71 UJ	8.15 U	1.98 U	-6.09 UJ	--	4.01 U	--	9.42 U	--	-7.12 UJ	-0.14 U	--	6.06 U	-1.02 U	--	-9.89 U	--	-4.24 U	--
Bismuth-214	--	0.837 U	--	6.28 UJ	-0.472 U	-2.75 U	12.2 U	--	14.7 J	--	1.75 U	--	15 U	15 J	--	10.6 UJ	2.49 U	--	8.23 J	--	-2.59 U	--
Gross Alpha	--	1.14 J	--	1.68 UJ	2.07 U	11.4	5.76 J	--	6.39 J	--	7.25	--	0.16 U	1.12 U	--	3.02	1.39 U	--	2.71 J	--	0.586 U	--
Gross Beta	--	5.08	--	3.26 UJ	7.54 J	8.48 J	6.28	--	10.3	--	7.26	--	3.22	4.05 J	--	3.63	5.95 J	--	7.35	--	2.45 J	--
Potassium-40	--	27.55 UJ	--	-2.52 UJ	15.3 U	-4.21 U	48.6 UJ	--	8.27 U	--	-3.18 U	--	27.5 U	10 U	--	24.4 U	7.13 U	--	-1.11 U	--	-6.39 U	--
Protactinium-234M	--	-187 U	--	--	63.6 U	206 UJ	--	--	-72.7 U	--	299 UJ	--	--	48.2 U	--	--	-132 UJ	--	-63.8 UJ	--	27.9 UJ	--
Lead-212	--	0.354 U	--	-4.31 UJ	-1.22 U	-0.211 U	-3.41 UJ	--	-0.231 UJ	--	-1.21 U	--	-4.84 UJ	-4.44 R	--	0.646 UJ	0.483 U	--	0.352 U	--	0.587 U	--
Lead-214	--	-0.607 U	--	9.05 UJ	2.87 U	7.34 UJ	10.2 UJ	--	9.45 UJ	--	-1.56 UJ	--	11 UJ	12.8 J	--	8.53 UJ	3.4 U	--	-1.3 U	--	-2.81 U	--
Radium-226	3.41	0.357 J	0.01 U	0.385	0.536	0.967	0.721	--	0.244 UJ	--	0.242 UJ	--	0.169 U	0.203 J	--	-0.154 U	1.01	--	0.418	--	0.0837 UJ	--
Radium-228	5.1	1.21 R	1.69	0.349 U	0.378 U	0.343 U	0.493 UJ	--	0.41 U	--	0.779 J	--	0.313 U	0.374 UJ	--	0.793	1.6 J	--	1.7 J	--	0.876 J	--
Thorium-227	--	0.234 J	--	--	0.0492 UJ	0.282 J	--	--	0.253 UJ	--	0.0476 U	--	--	0.00363 U	--	--	0.0951 U	--	-0.00338 U	--	0.128 UJ	--
Thorium-228	0.121 UJ	-0.00785 UJ	-0.00928 U	0.0844 U	0.285 UJ	0.495 J	0.419	--	0.171 UJ	--	0.0255 U	--	-0.00875 U	-0.0146 U	--	0.00748 U	0.176 UJ	--	-0.0139 U	--	-0.0117 U	--
Thorium-230	0.253	0.487 J	-0.0628 U	0.043 U	0.59 J	0.799 J	0.463	--	0.0686 U	--	0.21 J	--	0.0212 U	0.236 R	--	0.0108 U	0.0797 UJ	--	0.031 UJ	--	0.0791 UJ	--
Thorium-232	-0.00952 UJ	0.0378 U	-0.00952 U	0.00955 U	0.141 UJ	0.508	0.486	--	-0.00468 U	--	0.0346 U	--	-0.0153 U	0.018 U	--	-0.00893 U	0.0143 U	--	0.0156 UJ	--	0.043 U	--
Thorium-234	--	12.1 U	--	63.9 UJ	1.96 U	-2.27 U	122 UJ	--	-3.2 U	--	-17 U	--	296 U	-4.72 U	--	-3.67 U	17.1 U	--	0.784 U	--	-24.4 U	--
Thallium-208	--	2.24 U	--	-0.871 UJ	-4.58 U	-3 U	1.01 UJ	--	5.27 U	--	-3.31 U	--	-1.46 UJ	2.09 U	--	-1.38 UJ	-2.49 U	--	-1.06 U	--	-3.96 U	--
Total Uranium	21.2	1.06 J	1.37	0.459 UJ	0.415 UJ	1.86	1.59	--	11.6	--	0.461 J	--	0.579 U	0.556 U	--	0.579 U	0.395 UJ	--	0.273 UJ	--	0.411 UJ	--
Uranium-234	6.76	0.521	0.604	0.21	0.317 J	0.828 J	0.491	--	3.23	--	0.248	--	0.0722 U	0.119 UJ	--	0.0438 UJ	0.0442 U	--	0.101 U	--	0.0472 UJ	--
Uranium-235	0.424	0.0878 UJ	-0.0113 U	-0.0112 U	-0.0205 U	0.0957 UJ	0.156 UJ	--	0.194 J	--	-0.00579 U	--	-0.0127 U	-0.01 U	--	-0.0118 U	0.0656 UJ	--	-0.00554 U	--	0.0264 U	--
Uranium-238	7.15	0.333 J	0.469	0.151	0.0688 UJ	0.618	0.591	--	3.9	--	0.133 J	--	0.0756 U	0.0748 U	--	0.0702 U	0.0485 UJ	--	0.0263 UJ	--	0.047 UJ	--
VOCs (µg/L)																						
1,1,1-Trichloroethane	0.5 U	1 U	0.5 U	--	--	1 U	1 U	0.5 U	1 U	0.5 U	1 U	0.5 U	1 U	1 U	0.5 U	11	7	18	84	56	1 U	0.5 U
1,1,2-Trichloroethane	0.5 U	1 U	0.5 U	--	--	1 U	1 U	0.5 U	1 U	0.5 U	1 U	0.5 U	1 U	1 U	0.5 U	0.44 J	1 U	0.5 U	3	1.3	1 U	0.5 U
1,1-Dichloroethane	0.5 U	1 U	0.5 U	--	--	1 U	1 U	0.5 U	1 U	0.5 U	2	2.2	1 U	1 U	0.5 U	1.1	1 U	0.5 U	3	1.7	1 U	0.5 U
1,1-Dichloroethene	0.5 U	1 U	0.5 U	--	--	1 U	0.5 U	0.5 U	1 U	0.5 U	1 U	0.5 U	0.5 U	1 U	0.5 U	7	5	11	53	35	1 U	0.5 U
1,2,3-Trichlorobenzene	0.5 U	1 U	0.5 U	--	--	1 U	0.5 U	0.5 U	1 U	0.5 U	1 U	0.5 U	0.5 U	1 UJ	0.5 U	0.5 U	1 U	0.5 U	1 U	0.5 U	1 U	0.5 U
1,2,4-Trichlorobenzene	0.5 U	1 U	0.5 U	--	--	1 U	1 U	0.5 U	1 U	0.5 U	1 UJ	0.5 U	10 U	1 U	0.5 U	1 U	1 UJ	0.5 U	1 U	0.5 U	1 UJ	0.5 U
1,2-Dibromoethane	0.5 U	1 U	0.5 U	--	--	1 U	1 U	0.5 U	1 U	0.5 U	1 U	0.5 U	1 U	1 U	0.5 U	1 U	1 U	0.5 U	1 U	0.5 U	1 U	0.5 U
1,2-Dichloroethane	0.5 U	0.5 U	0.5 U	--	--	0.5 U	1 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	1 U	0.5 U	0.5 U	1 U	0.5 U	0.5 U	1 J	0.5 U	0.5 U	0.5 U
2-Butanone	3 U	5 U	3 U	--	--	5 UJ	2 U	3 U	5 UJ	3 U	5 U	3 U	2 U	5 U	3 U	2 U	5 U	3 U	5 U	3 U	5 U	3 U
2-Hexanone	2 U	5 U	2 U	--	--	5 UJ	2 U	2 U	5 UJ	2 U	5 UJ	2 U	2 U	5 U	2 U	2 U	5 UJ	2 U	5 UJ	2 U	5 UJ	2 U
4-Methyl-2-pentanone	2 U	1 U	2 U	--	--	1 UJ	1 U	2 U	1 UJ	2 U	1 UJ	2 U	1 U	1 U	2 U	1 U	1 UJ	2 U	1 UJ	2 U	1 UJ	2 U
Acetone	2 U	5 U	2 U	--	--	5 U	2 U	2 U	5 U	2 U	5 U	2 U	2 U	5 UJ	2 U	2 U	5 U	2 U	5 U	2 U	5	2 U
Benzene	0.5 U	1 U	0.5 U	--	--	1 U	0.5 U	0.5 U	1 U	0.5 U	1 U	0.5 U	0.15 J	1 U	2	0.26 J	1 U	0.5 U	1 U	0.5 U	1 U	0.5 U
Bromochloromethane	0.5 U	1 U	0.5 U	--	--	1 U	1 U	0.5 U	1 U	0.5 U	1 U	0.5 U	1 U	1 U	0.5 U	1 U	1 U	0.5 U	1 U	0.5 U	1 U	0.5 U
Bromodichloromethane	0.5 U	1 U	0.5 U	--	--	1 U	1 U	0.5 U	1 U	0.5 U	1 U	0.5 U	1 U	1 U	0.5 U	1 U	1 U	0.5 U	1 U	0.5 U	1 U	0.5 U
Bromoform	0.5 U	1 U	0.5 U	--	--	1 U	1 U	0.5 U	1 U	0.5 U	1 U	0.5 U	1 U	1 U	0.5 U	1 U	1 U	0.5 U	1 U	0.5 U	1 U	0.5 U
Carbon disulfide	0.5 U	1 U	0.5 U	--	--	1 U	1 U	0.5 U	1 U	0.5 U	1 U	0.5 U	1 U	1 U	0.5 U	1 U	1 U	0.5 U	1 U	0.5 U	1 U	0.5 U
Chloroform	2.6	1 U	0.5 U	--	--	4	2.9	4.7	15	12	3	1.8	0.5 U	1 U	0.5 U	0.49 J	1 U	0.5 U	1 U	0.5 U	1 U	0.5 U
cis-1,2-Dichloroethene	0.5 U	1 U	0.5 U	--	--	1 U	0.12 J	0.5 U	1 U	0.5 U	1 U	0.5 U	0.43 J	5	0.5 U	0.52	1 U	0.5 U	6	13	1 U	0.5 U
Dibromochloromethane	0.5 U	1 U	0.5 U	--	--	1 U	1 U	0.5 U	1 U	0.5 U	1 U	0.5 U	1 U	1 U	0.5 U	1 U	1 U	0.5 U	1 U	0.5 U	1 U	0.5 U
Dichlorodifluoromethane	0.5 U	1 UJ	0.5 U	--	--	1 U	1 U	0.5 U	1 U	0.5 U	1 U	0.5 U	1 U	1 U	0.5 U	1 U	1 U	0.5 U	1 UJ	0.5 U	1 U	0.5 U
Isopropylbenzene	0.5 U	1 U	0.5 U	--	--	1 U	0.5 UJ	0.5 U	1 U	0.5 U	1 U	0.5 U	0.5 U	1 U	0.5 U	0.5 U	1 U	0.5 U	1 U	0.5 U	1 U	0.5 U
m,p-Xylene	1 U	1 U	1 U	--	--	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	0.11 J	1 U	1 U	1 U	1 U	1 U	1 U
Methyl tert-Butyl Ether	0.5 U	1 U	0.5 U	--	--	1 U	1 U	0.5 U	1 U	0.5 U	1 U	0.5 U	1 U	1 U	0.5 U	1 U	1 U	0.5 U	2	0.55	1 U	0.5 U
Tetrachloroethene	20	8	18	--	--	8	31	6.5	5	0.5 U	340 J	540	320	360 D	170	0.54 J	5	0.5 U	2 U	2.7	4	170
Toluene	0.5 U	1 U	0.5 U	--	--	1 U	0.17 J	0.5 U	1 U	0.5 U	1 U	0.5 U	0.25 J	1 U	0.5 U	0.3 J	1 U	0.5 U	1 U	0.5 U	1 U	0.5 U
trans-1,3-Dichloropropene	0.5 U	0.4 U	0.5 U	--	--	0.4 U	1 U	0.5 U	0.4 U	0.5 U	0.4 U	0.5 U	1 U	0.4 U	0.5 U	1 U	0.4 U	0.5 U	0.4 U	0.5 U	0.4 U	0.5 U
Trichloroethene	1.5	0.5 U	0.57	--	--	0.7	0.9	0.5 U	0.5 U	0.5 U	3	2.5	5.1	4	5.2	2.4	1	8.6	44	190	0.5 U	0.5 U

Table 4.7-8 Comparison of Monitoring Well Data with Vertical Profile Data at Depth, Sylvania Corning FUSRAP Site, Hicksville, NY

Sample ID:	MW-31D-GW	MW-31D-GWR2	MW-31D-VP28	MW-31I-GWR2	MW-31I-VP14	MW-32D-GW	MW-32D-GWR2-F	MW-32D-GWR2-U	MW-32D-VP25	MW-33D-GW	MW-33D-GWR2	MW-33D-VP25	MW-33S-GWR2	MW-33D-VP02	MW-34D-GW-F	MW-34D-GWR2-F	MW-34D-GWR2-U	MW-34D-GW-U	MW-34D-VP23	MW-34S-GWR2	MW-34D-VP02	MW-39S-GW
Sample Depth (feet BGS):	320-330	320-330	327	180-190	185-189	295-305	295-305	295-305	296	290-300	290-300	296	65-75	66	270-280	270-280	270-280	270-280	277	65-75	67	76-86
Analyte																						
Metals (µg/L)																						
Aluminum	2210	683	318	91.8 J	--	68 U	116 J	1820	211	373	414	429	426	848	232	206	9140	1980	--	200 U	--	195 J
Antimony	3 U	0.1 U	25 U	0.1 U	--	3 U	2 U	2 U	25 U	3 U	2 U	25 U	0.1 U	25 U	3 U	0.1 U	2 U	3 U	--	0.1 U	--	3 U
Arsenic	5 U	1 U	25 U	1 U	--	5 U	1 U	1 U	25 U	5 U	0.45 J	25 U	0.11 J	25 U	5 U	2.4	9.1	6.2 J	--	0.1 J	--	5 U
Barium	110	91.9 J	744	42.2 J	--	115	51.3 J	55.5 J	403	31	36.2 J	68.3	17 J	48	12.7	8 J	81.5 J	27.2	--	38.7 J	--	41
Beryllium	1 U	0.18 J	20 U	0.048 U	--	1 U	0.074 J	0.08 J	20 U	1 U	0.048 U	20 U	0.9 J	20 U	1 U	0.048 U	0.33 J	1 U	--	0.048 U	--	1 U
Cadmium	1 U	0.083 U	10 U	0.083 U	--	1 U	0.083 U	0.32 J	10 U	1 U	0.15 J	10 U	0.15 J	10 U	1 U	0.083 U	0.15 J	1 U	--	0.21 J	--	1 U
Calcium	21900	18300	21600	22000	--	30600	25600	24200	29500	15900	10800	7010	5000 U	4340	10500	17400	19500	12100	--	5440	--	4370
Chromium	2 U	0.36 J	20 U	0.097 UJ	--	2 U	0.097 U	2.4 J	20 U	2.4 J	3.1 J	20 U	0.75 J	20 U	2 U	1.1 J	23.5	2.9 J	--	0.52 J	--	2 U
Cobalt	24.7	57.8	20 U	0.029 U	--	5.8	6.7 J	6.2 J	20 U	8	6 J	20 U	6.6 J	20 U	1.2 J	0.029 U	0.44 J	1 J	--	4.9 J	--	1.8 J
Copper	3 U	0.75 U	20 U	0.75 U	--	3 U	2.6 J	25 U	20 U	5.4 J	25 U	4.76 J	25 U	4.49 J	3 U	25 U	45.6	15.9	--	25 U	--	3 U
Iron	2360	898	501	117	--	5710	168	731	576	855	1460	1750	109	2710	311	146	32400	2710	--	147	--	320
Lead	2.5 U	2.2 J	15 U	1 UJ	--	2.5 U	1 U	2.3	15 U	3.5 J	2.4	15 U	1 U	15 U	2.5 U	1 U	31.1	7.5 J	--	1 U	--	2.5 U
Magnesium	4870	3700 J	5010	6130	--	8220	7800	7440	9980	4760	5000 U	2070	5000 U	746	3560	5000 U	5000 U	3920	--	5000 U	--	977
Manganese	1300	1710 J	445	54.9 J	--	944	18.5	18	61	67.8	56 J	195	228 J	114	23.1	1 U	14.3 J	33.1	--	661 J	--	40.1
Nickel	189	472	72.8	4.2 J	--	6.6	10.8 J	11.7	20 U	12.5	10.8	8.06 J	9.6	12.6 J	1 U	0.068 U	3.2 J	2.3 J	--	2 J	--	2.3 J
Potassium	2570	5000 U	5290	5000 U	--	3690	5000 U	5000 U	3090	1890	5000 U	6750	5000 U	1660	8990	17100	19400	8770	--	5000 U	--	2350
Selenium	5 U	4.2 U	25 U	4.2 U	--	6.1 J	4.2 U	4.2 U	25 U	5 U	4.2 U	25 U	4.2 U	25 U	5 U	5.2 J	7.6	5 U	--	4.2 U	--	5 U
Silver	1 U	0.069 U	20 U	0.069 U	--	1 U	0.069 U	1 U	20 U	1 U	0.069 U	20 U	5 U	20 U	1 U	0.069 U	5 U	1 U	--	0.069 U	--	1 U
Sodium	390000	372000	65200	65400	--	125000	338000	324000	45000	78700	152000	15500	5000 U	2610	29800	31900	30200	29200	--	6150	--	16900
Thallium	5 U	0.15 J	15 U	0.069 J	--	5 U	0.035 J	0.14 J	15 U	5 U	0.074 J	15 U	0.073 J	15 U	5 U	0.05 J	0.16 J	5 U	--	0.059 J	--	5 U
Vanadium	1.1 J	1.2 U	20 U	1.2 U	--	1 U	1.9 J	3.5 J	20 U	1.3 J	2 J	20 U	1.2 U	20 U	2.2 J	3.3 J	83.6	12.7	--	1.2 U	--	1 U
Zinc	14.9	28.8 J	15.3 J	5 J	--	5.1 UJ	32.4 J	97.6	65.5	16.9	23.9 J	114	11.1 J	92.2	3.2 J	3 J	21 J	6.6 J	--	3.1 J	--	8 UJ
Radionuclides (pCi/L)																						
Actinium-228	5.3 U	2.92 U	--	1.78 U	--	21.2 UJ	3.15 U	8.12 U	--	2.24 U	-2.27 U	--	5.6 U	--	2.45 U	4.66 U	0.736 U	3.87 UJ	--	4.84 U	--	3.64 U
Bismuth-212	2.14 U	4.7 U	--	-7.28 U	--	-0.734 UJ	21.5 UJ	4.35 U	--	14.9 U	-0.0666 U	--	10.5 U	--	19.1 UJ	0.0136 U	8.67 U	12.3 U	--	5.97 U	--	8.44 U
Bismuth-214	1.98 U	-1.77 U	--	-4.33 UJ	--	33.4 U	-0.865 U	7.18 UJ	--	5.61 UJ	-0.949 UJ	--	9.09 J	--	10.2 UJ	1.09 UJ	-1.11 U	20.3 U	--	-1.03 UJ	--	8.64 UJ
Gross Alpha	2.1 UJ	16.9 J	--	1.8 J	--	12.8	12.7 J	7.66 J	--	2.07 UJ	2.96 J	--	59	--	0.912 J	3.1	32.4	28.7 J	--	0.394 U	--	0.993 U
Gross Beta	3.04 UJ	5.08 U	--	2.29 J	--	5.23	11.2 J	6.69 J	--	2.43	5.21 J	--	10.8	--	7.9	16.6	48.2	38.8	--	1.52 J	--	3.61
Potassium-40	-18.8 UJ	-17.6 U	--	36.4 UJ	--	0.332 UJ	-13.3 U	21.7 U	--	-5.4 U	-7.66 U	--	7.89 U	--	10.9 U	15.4 U	32.8 J	25.4 UJ	--	-13.6 U	--	-19.3 U
Protactinium-234M	--	98.3 U	--	324 UJ	--	--	-100 U	383 J	--	--	38.5 UJ	--	-4.1 UJ	--	--	442 J	14.5 UJ	--	--	79.3 UJ	--	--
Lead-212	1.98 UJ	-1.8 UJ	--	-5.12 R	--	4.05 UJ	2.38 U	-1.85 UJ	--	-2.56 UJ	-1.43 U	--	3.46 U	--	8.79 U	6.87 J	0.797 U	5.33 UJ	--	4.75 UJ	--	0.17 UJ
Lead-214	8.1 UJ	-0.404 U	--	-1.26 UJ	--	18.2 U	1.21 U	1.89 U	--	2.11 U	0.06 UJ	--	1.08 U	--	11.3 U	8.44 UJ	1.39 U	11.5	--	-2.35 UJ	--	8.69 UJ
Radium-226	0.992 J	2.02	--	0.0633 U	--	0.155 U	3.1 J	1.57 J	--	0.118 UJ	0.738	--	0.0981 UJ	0.118 U	0.0868 U	0.208 J	1.19	0.127 U	--	0.146 UJ	--	-0.22 U
Radium-228	2.23	1.54 J	--	1.15 J	--	1.76	2.14 J	1.63 J	--	0.508 UJ	1.13 J	--	0.742 J	0.829 U	0.421 U	1.47 J	0.76 UJ	1.56	--	0.578 UJ	--	0.0855 U
Thorium-227	--	0.466	--	0.0111 U	--	--	-0.0305 U	0.00269 U	--	--	0.108 UJ	--	0.239 UJ	--	--	0.0969 U	0.011 U	--	--	0.0245 U	--	--
Thorium-228	0.174	2.83	--	0.00155 U	--	0.133 U	0.0784 U	0.143 J	--	0.0208 U	0.00519 U	--	0.0579 U	0.0302 U	0.0206 U	0.0419 U	1.02 J	3.58	--	0.0615 U	--	-0.00857 U
Thorium-230	0.164	3 J	--	-0.00806 UJ	--	0.0332 UJ	0.268 UJ	0.0826 UJ	--	0.124	0.0559 UJ	--	0.124 UJ	0.0789 U	0.0204 U	0.0635 UJ	1.03 J	1.93	--	0.193 J	--	-0.00575 U
Thorium-232	0.099	3.1 J	--	-0.00603 U	--	0.0382 U	0.134 U	0.0484 U	--	0.0106 U	0.0664 UJ	--	-0.000573 U	0.0218 U	-0.00762 UJ	-0.00499 U	0.828	1.89	--	-0.0125 U	--	0.0242 U
Thorium-234	-207 R	-16.2 U	--	38.5 U	--	56.4 U	-27.1 U	-7.41 U	--	131 UJ	-13.3 U	--	30.9 U	--	-131 UJ	-12.6 U	1.1 U	-23.3 UJ	--	-34 U	--	89.3 UJ
Thallium-208	-1.89 UJ	0.468 U	--	-1.53 U	--	6.55 U	-1.68 U	0.546 U	--	-0.451 UJ	-7.24 UJ	--	2.02 U	--	-0.0465 UJ	7.92 U	-3.44 U	0.763 UJ	--	1.78 U	--	-0.744 U
Total Uranium	1.09 J	0.757 J	--	0.545 U	-0.344 U	0.169 UJ	0.635 UJ	0.458 U	--	0.579 U	0.534 J	--	77.8	71.4	0.219 UJ	1.85	5.61	4.37	--	0.535 UJ	--	0.579 U
Uranium-234	0.28	0.146 UJ	--	0.0642 U	--	0.0162 U	0.171 UJ	0.139 J	--	0.0931 UJ	0.243 J	--	25.9	22.5	0.0552 U	0.333 J	1.59	1.44	--	0.266	--	0.0269 U
Uranium-235	-0.000224 U	-0.0163 UJ	--	0.042 U	--	0.151 UJ	0.0211 U	0.0199 U	--	0.087 UJ	0.092 U	--	2.75	2.48	-0.0119 U	0.0732 U	0.225 UJ	0.0337 U	--	-0.012 U	--	0.153 UJ
Uranium-238	0.181	0.228 J	--	0.0126 U	--	0.0928 U	0.154 UJ	0.0404 U	--	0.0114 U	0.168 J	--	26	23.9	0.221 U	0.593	1.85	2.01	--	0.104 UJ	--	0.0414 UJ
VOCs (µg/L)																						
1,1,1-Trichloroethane	0.66 J	1 U	0.5 U	2	--	1 U	--	1 U	0.5 U	1 U	1 U	0.5 U	1 U	0.5 U	--	--	1 U	1 U	0.5 U	1 U	0.5 U	0.56 J
1,1,2-Trichloroethane	1 U	1 U	0.5 U	1 U	--	1 U	--	1 U	0.5 U	1 U	1 U	0.5 U	1 U	0.5 U	--	--	1 U	1 U	0.5 U	1 U	0.5 U	1 U
1,1-Dichloroethane	1 U	1 U	0.5 U	1 U	--	1 U	--	1 U	0.5 U	1 U	1 U	0.5 U	1 U	0.5 U	--	--	1 U	0.3 J	0.5 U	1 U	0.5 U	1 U
1,1-Dichloroethene	0.26 J	1 U	0.5 U	1	--	0.5 U	--	1 U	0.5 U	0.5 U	1 U	0.5 U	1 U	0.5 U	--	--	1 U	0.1 J	0.5 U	1 U	0.5 U	0.5 U
1,2,3-Trichlorobenzene	0.5 U	1 U	0.5 U	1 U	--	0.5 U	--	1 UJ	0.5 U	0.5 U	1 U	0.5 U	1 U	0.5 U	--	--	1 U	0.5 U	0.5 U	1 U	0.5 U	0.5 U
1,2,4-Trichlorobenzene	1 U	1 U	0.5 U	1 U	--	1 U	--	1 U	0.5 U	1 U	1 U	0.5 U	1 U	0.5 U	--	--	1 U	1 U	0.5 U	1 U	0.5 U	1 U
1,2-Dibromoethane	1 U	1 U	0.5 U	1 U	--	1 U	--	1 U	0.5 U	1 U	1 U	0.5 U	1 U	0.5 U	--	--	1 U	1 U	0.5 U	1 U	0.5 U	1 U
1,2-Dichloroethane	1 U	0.5 U	0.5 U	0.5 UJ	--	1 U	--	0.5 U	0.5 U	1 U	0.5 UJ	0.5 U	0.5 UJ	0.5 U	--	--	0.5 UJ	1 U	0.5 U	0.5 U	0.5 U	1 U
2-Butanone	2 U	5 U	3 U	5 U	--	2 U	--	5 U	3 U	2 U	5 U	3 U	5 U	3 U	--	--	5 U	2 U	3 U	5 U	3 U	2 U
2-Hexanone	2 U	5 UJ	2 U	5 UJ	--	2 U	--	5 U	2 U	2 U	5 UJ	2 U	5 UJ	2 U	--	--	5 UJ	2 U	2 U	5 U	2 U	2 U
4-Methyl-2-pentanone	1 U	1 UJ	2 U	1 UJ	--	1 U	--	1 U	2 U	1 U	1 UJ	2 U	1 UJ	2 U	--	--	1 UJ	1 U	2 U	1 U	2 U	1 U
Acetone	2 U	5 U	2 U	5 U	--	2 U	--	5 UJ	2 U	2 U	5 U	2 U	5 U	2 U	--	--	5 U	2 U	2 U	5 U	2 U	2 U
Benzene	0.12 J	1 U	0.5 U	1 U	--	0.5 U	--	1 U	0.5 U	0.5 U	1 U	0.78	1 U	0.5 U	--	--	1 U	0.5 U	0.5 U	1 U	0.5 U	0.5 U
Bromochloromethane	1 U	1 U	0.5 U	1 U	--	1 U	--	1 U	0.5 U	1 U	1 U	0.5 U	1 U	0.5 U	--	--	1 U	1 U	0.5 U	1 U	0.5 U	1 U
Bromodichloromethane	1 U	1 U	0.5 U	1 U	--	1 U	--	1 U	0.5 U	1 U	1 U	0.5 U	1 U	0.5 U	--	--	1 U	1 U	0.5 U	1 U	0.5 U	1 U
Bromoform	1 U	1 U	0.5 U	1 U	--	1 U	--	1 U	0.5 U	1 U	1 U	0.5 U	1 U	0.5 U	--	--	1 U	1 U	0.5 U	1 U	0.5 U	1 U
Carbon disulfide	1 U	1 U	0.5 U	1 U	--	1 U	--	1 U	0.5 U	1 U	1 U	0.5 U	1 U	0.5 U	--	--	1 U	1 U	0.5 U	1 U	0.5 U	1 U
Chloroform	4.4	9	5.8	1 U	--	1.1	--	1	0.5 U	0.5 U	1 U	0.5 U	1 U	0.5 U	--	--	1 U	0.18 J	0.5 U	1 U	0.5 U	0.5 U
cis-1,2-Dichloroethene	0.11 J	1 U	0.5 U	1 U	--	0.4 J	--	1 U	0.53	0.13 J	1 U	0.5 U	1 U	0.5 U	--	--	1 U	0.5 U	0.5 U	1 U	0.5 U	0.17 J
Dibromochloromethane	1 U	1 U	0.5 U	1 U	--	1 U	--	1 U	0.5 U	1 U	1 U	0.5 U	1 U	0.5 U	--	--	1 U	1 U	0.5 U	1 U	0.5 U	1 U
Dichlorodifluoromethane	1 U	1 UJ	0.5 U	1 UJ	--	1 U	--	1 U	0.5 U	1 U	1 UJ	0.5 U	1 UJ	0.5 U	--	--	1 UJ	1 U	0.5 U	1 UJ	0.5 U	1 U
Isopropylbenzene	0.5 U	1 U	0.5 U	1 U	--	0.5 U	--	1 U	0.5 U	0.5 U	1 U	0.5 U	1 U	0.5 U	--	--	1 U	0.5 UJ	0.5 U	1 U	0.5 U	0.5 U
m,p-Xylene	1 U	1 U	1 U	1 U	--	1 U	--	1 U	1 U	0.2 J	1 U	1 U	1 U	1 U	--	--	1 U	1 U	1 U	1 U	1 U	1 U
Methyl tert-Butyl Ether	1 U	1 U	0.5 U	1 U	--	1 U	--	1 U	0.5 U	1 U	1 U	0.5 U	1 U	0.5 U	--	--	1 U	1 U	0.5 U	1 U	0.5 U	1 U
Tetrachloroethene	32	44	42	2	--	81	--	34 J	110	8.7	88	5.3	130	110	--	--	4 U	5.2	12	0.5 U	0.5 U	130
Toluene	0.26 J	1 U	0.5 U	1 U	--	0.19 J	--	1 U	0.5 U	1.1	1 U	0.5 U	1 U	0.5 U	--	--	1 U	0.26 J	0.5 U	1 U	0.5 U	1 U
trans-1,3-Dichloropropene	1 U	0.4 U	0.5 U	0.4 U	--	1 U	--	0.4 U	0.5 U	1 U	0.4 U	0.5 U	0.4 U	0.5 U	--	--	0.4 U	1 U	0.5 U	0.4 U	0.5 U	1 U
Trichloroethene	5.7	8	10	4	--	0.93	--	1	0.81	0.11 J	1	0.5 U	0.5 U	0.5 U	--	--	0.5 U	0.12 J	0.5 U	0.5 U	0.5 U	1 U

Table 4.7-8 Comparison of Monitoring Well Data with Vertical Profile Data at Depth, Sylvania Corning FUSRAP Site, Hicksville, NY

Sample ID:	MW-39S-GWR2	MW-39S-VP03	MW-41S-GWR2	MW-41S-VP02	MW-42I-GWR2	MW-42I-VP10	MW-43S-GWR2	MW-43S-VP02	MW-44S-GWR2	MW-44S-VP02	MW-49S-GWR2	MW-49-VP06	MW-50I-GWR2	MW-50-VP08	MW-51I-GWR2	MW-51-VP09	MW-52D-GWR2	MW-52-VP24	MW-53S-GWR2	MW-53-VP03	MW-55S-GWR2	MW-55S-VP04
Sample Depth (feet BGS):	76-86	76	65-75	66-69	140-150	145-149	65-75	66-69	65-75	64-69	100-110	105-109	120-130	125-129	130-140	130-134	275-285	280-284	70-80	70-74	85-95	85-89
Analyte																						
Metals (µg/L)																						
Aluminum	152 J	--	19.6 U	--	260	--	19.6 U	--	19.6 U	29 J	28 J	125 J	103 J	25.2 J	200 U	23.9 J	268	--	200 U	--	63.6 J	--
Antimony	0.1 U	--	0.1 U	--	0.1 U	--	0.1 U	--	0.1 U	0.37 J	0.1 U	0.14 J	0.18 J	0.1 U	0.1 U	0.41 J	2 U	--	0.1 U	--	2 U	--
Arsenic	0.075 U	--	1 U	--	1 U	--	1 U	--	1 U	0.72 J	1 U	0.33 J	1 U	0.26 J	1.3	1.2	0.89 J	--	0.075 U	--	0.28 J	--
Barium	67.5 J	--	56.8 J	--	92.3 J	--	49 J	--	72.9 J	81.5 J	37.2 J	37.5 J	123 J	44.8 J	36.5 J	88 J	14.4 J	--	14.9 J	--	106 J	--
Beryllium	0.11 J	--	0.048 U	--	0.048 U	--	0.048 U	--	0.048 U	0.048 U	0.048 U	0.048 U	0.049 J	0.048 U	0.048 U	0.048 U	0.048 U	--	0.16 J	--	0.048 U	--
Cadmium	0.083 J	--	0.083 U	--	1.1	--	0.17 J	--	0.083 U	0.083 U	0.097 J	0.26 J	0.083 U	0.38 J	0.083 U	0.23 J	0.092 J	--	0.12 J	--	0.24 J	--
Calcium	8030	--	62300	--	12000	--	73700	--	42500	30100	8140	7220	10600	11400	9290	20500	11300	--	9670	--	17400	--
Chromium	0.097 U	--	0.097 UJ	--	0.097 UJ	--	0.097 UJ	--	0.097 UJ	0.26 J	0.097 U	1.4 J	0.097 U	0.68 J	1.5 J	2.4 J	2.5 J	--	0.31 J	--	1.2 J	--
Cobalt	0.029 U	--	0.029 U	--	3 J	--	0.029 U	--	0.91 J	38 J	3.6 J	33.4	4.2 J	31	3.2 J	84.4	0.88 J	--	11.3 J	--	17.4 J	--
Copper	25 U	--	0.75 U	--	0.75 U	--	0.75 U	--	0.75 U	2 J	0.75 U	0.83 U	0.75 U	0.83 U	0.75 U	3.3 J	25 U	--	25 U	--	25 U	--
Iron	100 U	--	67.8 J	--	577	--	14.9 J	--	22.5 J	9640	245 J	6480	732	941	100 U	59200	734	--	125	--	754	--
Lead	1 U	--	1 UJ	--	1 UJ	--	1 UJ	--	1 UJ	0.16 J	1 U	0.097 J	1 U	0.069 J	1 UJ	0.16 J	1 U	--	1 U	--	1 U	--
Magnesium	1650 J	--	10000	--	3220 J	--	16800	--	4560 J	5440	1390 J	1680 J	3020 J	2660 J	1740 J	3410 J	1820 J	--	5000 U	--	2850 J	--
Manganese	8.8 J	--	189 J	--	189 J	--	130 J	--	380 J	2470	784 J	4520	510 J	1600	21.7 J	1700	39 J	--	567 J	--	1450 J	--
Nickel	1.7 J	--	5.2	--	3.4 J	--	2.4 J	--	1350	493 J	5.4	27.6	152	438	15.6	139	3.9 J	--	16.8	--	16.4	--
Potassium	5000 U	--	5000 U	--	5000 U	--	5000 U	--	5000 U	9610 J	5000 U	1750 J	5000 U	2850 J	5000 U	8890	5000 U	--	5000 U	--	5000 U	--
Selenium	4.2 U	--	4.2 U	--	4.2 U	--	4.2 U	--	4.2 U	2.5 U	4.2 U	2.5 U	4.2 U	2.5 UJ	4.2 U	2.5 U	4.2 U	--	4.2 U	--	4.2 U	--
Silver	0.069 U	--	0.069 U	--	0.069 U	--	0.069 U	--	0.069 U	0.59 J	0.069 U	0.069 U	0.069 U	0.89 J	0.069 U	1.3 J	0.069 U	--	0.069 U	--	0.069 U	--
Sodium	21000	--	24700	--	111000	--	56000	--	42800	62000	5000 U	2540 J	66800	17100	66100	87000	28600	--	5900	--	108000	--
Thallium	0.04 J	--	0.055 J	--	0.064 J	--	0.085 J	--	0.042 J	0.078 J	0.046 J	0.11 J	0.15 J	0.073 J	0.33 J	0.21 J	0.062 J	--	0.11 J	--	0.18 J	--
Vanadium	1.2 U	--	1.2 U	--	1.2 U	--	1.2 U	--	1.2 U	1.4 U	1.2 U	1.4 U	1.2 U	1.4 U	1.2 U	2.6 J	3.3 J	--	1.2 U	--	1.2 U	--
Zinc	10.5 J	--	6.5 J	--	13.9 J	--	3.9 J	--	4.7 J	19.8 J	60 U	5.6 J	60 U	1.5 J	60 U	22.9 J	5.7 J	--	8.9 J	--	4.5 J	--
Radionuclides (pCi/L)																						
Actinium-228	-0.339 U	--	1.87 U	--	-1.71 U	--	9.94 U	--	0.812 U	--	1.75 U	--	5.91 U	--	-1.03 U	--	2.73 U	--	0.834 U	--	0.01 UJ	--
Bismuth-212	2.09 U	--	-2.05 UJ	--	2.85 U	--	-8.37 UJ	--	11.4 UJ	--	-7.03 U	--	-3.34 U	--	12.2 UJ	--	12.9 U	--	35.8 J	--	-0.8 U	--
Bismuth-214	0.079 U	--	-2.53 UJ	--	-1.49 U	--	-1.65 UJ	--	3.29 UJ	--	-0.98 U	--	1.75 U	--	2.48 U	--	-0.815 UJ	--	2.12 U	--	-2.89 U	--
Gross Alpha	1.44 J	--	956	--	9.92	--	22.8	--	17.2	--	0.462 UJ	--	5.22	--	0.653 U	--	1.07 U	--	5.87	--	1.65 J	--
Gross Beta	4.22 J	--	104	--	4.03 J	--	6.99	--	4.94 J	--	0.233 UJ	--	5.49	--	1.23 U	--	2.16 J	--	1.92 J	--	2.87 J	--
Potassium-40	-6.08 U	--	-13.7 UJ	--	-6.66 U	--	-21.3 U	--	-2.2 UJ	--	5.75 U	--	20.4 U	--	5.3 UJ	--	3.108 U	--	-16.6 U	--	--	--
Protactinium-234M	-54.5 U	--	532 UJ	--	249 UJ	--	-41.1 U	--	129 U	--	209 U	--	48.9 U	--	440 J	--	159 U	--	-4.1 UJ	--	-53.2 U	--
Lead-212	-0.984 U	--	1.75 UJ	--	-3.21 R	--	0.956 UJ	--	-4.05 R	--	-0.8 U	--	1.74 U	--	-1.89 UJ	--	4.55 UJ	--	2.86 U	--	-1.59 U	--
Lead-214	3.02 UJ	--	1.64 UJ	--	1.49 U	--	2.66 UJ	--	-0.248 UJ	--	3.63 U	--	0.919 U	--	1.02 UJ	--	2.12 UJ	--	-1.1 U	--	-0.271 UJ	--
Radium-226	0.289 J	--	0.516 J	--	0.79 J	--	0.721 J	--	0.256 J	--	0.415 J	--	0.583	--	0.386 J	--	0.661 J	--	0.0456 U	--	0.206 UJ	--
Radium-228	0.528 J	--	1.34	--	0.755 J	--	1.05 J	--	0.464 J	--	0.53 J	--	0.399 U	--	1.2 J	--	0.91 R	--	0.268 UJ	--	1.34 R	--
Thorium-227	0.0631 U	--	0.639 UJ	--	0.822	--	0.17 U	--	0.0269 U	--	0.0429 U	--	0.171 UJ	--	0.327 J	--	0.218 UJ	--	0.0371 U	--	0.0278 UJ	--
Thorium-228	-0.0254 UJ	--	-0.0612 U	--	10.5	--	-0.0115 U	--	0.0105 U	--	-0.0128 U	--	0.0383 UJ	--	2.19	--	0.0621 UJ	--	0.00725 U	--	-0.0233 UJ	--
Thorium-230	0.0741 UJ	--	0.312 UJ	--	6.73	--	0.803 J	--	0.0862 UJ	--	0.0158 U	--	0.22 J	--	2.58	--	0.668 J	--	0.134 J	--	0.0721 UJ	--
Thorium-232	0.0288 U	--	-0.0118 U	--	10.8	--	0.0493 U	--	0.124 UJ	--	0.0239 UJ	--	0.0238 U	--	1.48	--	0.0265 U	--	-0.00379 U	--	0.0179 U	--
Thorium-234	54.5 J	--	177	--	5.44 U	--	-23.5 UJ	--	14.4 U	--	-37 U	--	-43.4 U	--	-18.5 U	--	-2.37 U	--	91.7 J	--	-18.1 U	--
Thallium-208	-1.19 U	--	-3.19 U	--	1.68 U	--	-2.49 UJ	--	-0.543 U	--	3.33 U	--	-4.71 U	--	0.745 U	--	0.0305 U	--	0.978 U	--	-4.52 U	--
Total Uranium	0.533 U	--	1170	28.2	7.63 J	65.2	26.4	35.7	19.7	5.02	0.414 J	--	6.54	--	0.518 UJ	-0.00448 U	0.522 U	--	8.22	0.741 J	0.635 U	-0.137 U
Uranium-234	0.109 UJ	--	381	--	3.12 J	--	9.63	--	7.71	--	0.174 J	--	2.51 J	--	0.0706 UJ	--	0.115 UJ	--	2.76	--	0.13 J	--
Uranium-235	-0.0263 U	--	28.1	--	0.34 J	--	0.733	--	0.313 UJ	--	0.0804 UJ	--	0.079 U	--	0.0192 UJ	--	0.0296 UJ	--	0.257 J	--	0.0493 U	--
Uranium-238	-0.0053 U	--	393	--	2.54 J	--	8.86	--	6.66	--	0.13 J	--	2.21	--	0.0778 UJ	--	0.0513 U	--	2.75	--	0.0574 U	--
VOCs (µg/L)																						
1,1,1-Trichloroethane	1 U	0.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	--
1,1,2-Trichloroethane	1 U	0.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	--
1,1-Dichloroethane	1 U	0.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	--
1,1-Dichloroethene	1 U	0.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	--
1,2,3-Trichlorobenzene	1 UJ	0.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	--
1,2,4-Trichlorobenzene	1 U	0.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 UJ	1 U	1 UJ	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	--
1,2-Dibromoethane	1 U	0.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	--
1,2-Dichloroethane	0.5 U	0.5 U	0.5 UJ	0.5 U	0.5 UJ	0.5 U	0.5 UJ	0.5 U	0.5 UJ	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 UJ	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	--
2-Butanone	5 U	3 U	5 U	4 J	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5	5 U	5 U	5 U	3 J	5 U	5 U	5 U	5 U	5 U	--
2-Hexanone	5 U	2 U	5 UJ	5 U	5 UJ	5 U	5 UJ	5 U	5 UJ	5 U	5 UJ	5 U	5 UJ	5 U	5 UJ	5 U	5 U	5 U	5 U	5 U	5 U	--
4-Methyl-2-pentanone	1 U	2 U	1 UJ	1 U	1 UJ	1 U	1 UJ	1 U	1 UJ	1 U	1 UJ	4	1 UJ	1 U	1 UJ	1 U	1 U	1 U	1 U	1 U	1 U	--
Acetone	5 UJ	2 U	5 U	14	5 U	2 J	5 U	4 J	5 U	5	5	4 J	5 U	5 U	5 U	3 J	3 J	5 U	5 U	3 J	5 U	--
Benzene	1 U	0.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	--
Bromochloromethane	1 U	0.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	--
Bromodichloromethane	1 U	0.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	--
Bromoform	1 U	0.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	--
Carbon disulfide	1 U	0.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	--
Chloroform	1 U	0.5 U	0.4 J	1 U	22	13	8	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	23	--
cis-1,2-Dichloroethene	1 U	0.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	--
Dibromochloromethane	1 UJ	0.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	--
Dichlorodifluoromethane	1 U	0.5 U	1 UJ	1 U	1 UJ	1 U	1 UJ	1 U	1 UJ	1 U	1 U	1 U	1 U	1 U	1 UJ	1 U	1 UJ	1 U	1 UJ	1 U	1 UJ	--
Isopropylbenzene	1 U	0.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	--
m,p-Xylene	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	--
Methyl tert-Butyl Ether	1 U	0.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	--
Tetrachloroethene	1200 D	420	9	6	0.5 U	0.5 U	10	130	41	31	0.5 U	0.5 U	0.5 U	3	3	2	100	55	910	480 J	2	--
Toluene	1 U	0.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	0.9 J	1 U	--
trans-1,3-Dichloropropene	0.4 U	0.5 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	--
Trichloroethene	0.5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.55	0.6	0.5 U	0.5 U	0.5 U	0.6	0.5 U	0.5 U	0.5 U	0.9	0.6	2	1	0.5 U	--

Note: sample groups for comparison are shaded and unshaded

Key:
BGS Below ground surface.
ID Identification
J Estimated.
µg/L Micrograms per liter.
piC/L Picocurie per liter.
NA Not analyzed.
ND Not detected.
VOCs Volatile organic compounds.
UJ Estimated/Not detected.

Table 4.7-9 Groundwater Monitoring Well Summary Table for Metals and VOC Analyses, Sylvania Corning FUSRAP Site

Sample Name	MW-3-GWR2		MW-4-GWR2		MW-8-GWR2		MW-9-GWR2		MW-10-GWR2		MW-11-GWR2		MW-12-GWR2		MW-13D-GWR2		MW-13S-GWR2		MW-14DD-GWR2		MW-14D-GWR2		MW-14S-GWR2		MW-15DD-GWR2	
Location Name	MW-3		MW-4		MW-8		MW-9		MW-10		MW-11		MW-12		MW-13D		MW-13S		MW-14DD		MW-14D		MW-14S		MW-15DD	
Sample Date	03/21/2010		03/21/2010		03/21/2010		03/21/2010		03/21/2010		03/22/2010		03/21/2010		03/24/2010		03/24/2010		03/22/2010		03/23/2010		03/22/2010		03/23/2010	
Metals (µg/L)																										
Aluminum	488		396		200	U	200	U	535		200	U	200	U	19.6	U	61.4	J	521		1910		200	U	200	U
Barium	39.4	J	39.7	J	67.3	J	44.8	J	69.5	J	67.4	J	4.3	J	18.5	J	89.4	J	20.5	J	24	J	9.5	J	10.7	J
Calcium	8130		9630		10600		6000		25200		13200		14600		6750		31600		14800		10800		8330		7080	
Copper	25	U	25	U	25	U	25	U	25	U	25	U	25	U	25	U	25	U	25	U	25	U	0.75	U	25	U
Iron	260		189		122		100	U	294		119		100	U	154		100	U	381		369		100	U	100	U
Magnesium	1910	J	1950	J	1940	J	395	J	3310	J	1390	J	1990	J	1860	J	6610		4010	J	3620	J	4060	J	2120	J
Potassium	5000	U	5000	U	5000	U	5000	U	5000	U	5000	U	5000	U	5000	U	5000	U	5070		5000	U	5000	U	5000	U
Selenium	4.2	U	4.2	U	4.2	U	4.2	U	4.2	U	4.2	U	4.2	U	4.2	U	4.2	U	4.2	U	4.2	U	4.2	U	4.2	U
Sodium	22000		8680		49600		5000	U	15400		5270		76500		7640		179000		19800		29500		73600		8510	
Vanadium	2.9	J	1.3	J	1.7	J	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	2.2	J	1.2	U	1.2	U
Zinc	39.9	J	71.7		20.5	J	25.6	J	41.1	J	30.1	J	88.8		8.5	J	11.6	J	52.5	J	9.7	J	1.1	U	3	J
Antimony	2	U	0.1	U	0.1	U	0.1	U	0.1	U	0.1	U	0.1	U	0.1	U	0.1	U	0.1	U	2	U	0.1	U	0.1	U
Arsenic	2.1		1	U	1.3		1	U	1	U	0.075	U	1	U	1	U	0.075	U	1	U	1	U	1	U	0.075	U
Beryllium	0.093	J	0.08	J	0.048	U	0.07	J	0.38	J	0.054	J	0.048	U	0.048	U	0.19	J	0.11	J	0.05	J	0.052	J	0.048	U
Cadmium	0.23	J	0.17	J	0.34	J	0.14	J	1.2		0.083	U	0.083	U	0.083	U	0.52	J	0.14	J	0.18	J	0.083	U	0.12	J
Chromium	2.5	J	2.8	J	3.5	J	7		15		4.5	J	2.5	J	0.097	U	0.1	J	7.2		0.097	U	0.097	U	0.31	J
Cobalt	11.9	J	16.3	J	7	J	5.1	J	18.2	J	8.9	J	1.8	J	0.029	U	2.4	J	1.5	J	2.4	J	0.029	UJ	0.43	J
Lead	1	U	1	U	1	U	1	U	1.2		1	U	1	U	1	U	1	U	1.2		1		1	U	1	U
Manganese	33.6		44.4		5.2		9.3		80.9		12.2		5.8		12.9	J	117	J	63.7		32.3		11.3		23.8	
Nickel	8.6		5.4		189		5	U	36.3		14.9		5	U	0.66	J	3.9	J	5	U	5	U	0.068	U	5	U
Silver	1	U	1	U	0.069	U	1	U	1	U	1	U	0.069	U	0.069	U	0.069	U	0.069	U	0.069	U	0.069	U	0.069	U
Thallium	0.37	J	0.048	J	0.2	J	0.039	J	0.095	J	0.027	U	0.12	J	0.036	J	0.15	J	0.12	J	0.085	J	0.043	J	0.1	J
Mercury	0.1	U	0.1	U	0.1	U	0.1	U	0.1	U	0.1	U	0.1	U	0.1	U	0.1	U	0.1	U	0.1	U	0.1	U	0.1	U
VOCs (mg/L)																										
1,1,1-Trichloroethane	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,1,2-Trichloroethane	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,1-Dichloroethane	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,1-Dichloroethene	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,2,3-Trichlorobenzene	1	UJ	1	UJ	1	UJ	1	UJ	1	UJ	1	UJ	1	UJ	1	UJ	1	UJ	1	UJ	1	UJ	1	UJ	1	UJ
1,2,4-Trichlorobenzene	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,2-Dibromoethane	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,2-Dichloroethane	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
2-Hexanone	5	UJ	5	UJ	5	UJ	5	UJ	5	UJ	5	UJ	5	UJ	5	U	5	U	5	UJ	5	U	5	UJ	5	UJ
4-Methyl-2-pentanone	1	UJ	1	UJ	1	UJ	1	UJ	1	UJ	1	UJ	1	UJ	1	U	1	U	1	UJ	1	U	1	UJ	1	UJ
Acetone	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	UJ	5	UJ	4	J	5	UJ	5	U	5	U
Bromochloromethane	1	U	1	U	0.4	J	0.4	J	0.5	J	0.4	J	0.4	J	1	U	1	U	1	U	1	U	1	U	1	U
Bromodichloromethane	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Bromoform	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	4		1	U	1	U	1	U
Carbon disulfide	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Chloroform	1	U	1	U	1	U	1	U	1	U	1	U	7		1	U	1	U	1	U	1	U	1	U	1	U
cis-1,2-Dichloroethylene	1	U	2		1	U	1	U	1	U	1	U	7		1	U	1	U	1	U	1	U	1	U	1	U
Dibromochloromethane	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	3		3		1	U	1	U
Dichlorodifluoromethane	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
tert-Butyl Methyl Ether	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
tetrachloroethene	38		280	D	8		470	D	1400	D	450	D	1000	D	0.5	U	2		0.5	U	0.5	U	0.5	U	0.5	U
trans-1,3-Dichloropropene	0.4	U	0.4	U	0.4	U	0.4	U	0.4	U	0.4	U	0.4	U	0.4	U	0.4	U	0.4	U	0.4	U	0.4	U	0.4	U
Trichloroethene	1		3		0.7		0.7		7		1		26		0.5	U	0.5	U	0.5	U	0.5		0.5	U	0.5	U

Table 4.7-9 Groundwater Monitoring Well Summary Table for Metals and VOC Analyses, Sylvania Corning FUSRAP Site

Sample Name	MW-15D-GWR2		MW-15S-GWR2		MW-16D-GWR2-F		MW-16D-GWR2-U		MW-16S-GWR2		MW-17S-GWR2		MW-18I-GWR2		MW-18S-GWR2		MW-19D-GWR2		MW-19S-GWR2		MW-20D-GWR2		MW-20I-GWR2		MW-20S-GWR2	
Location Name	MW-15D		MW-15S		MW-16D		MW-16D		MW-16S		MW-17S		MW-18I		MW-18S		MW-19D		MW-19S		MW-20D		MW-20I		MW-20S	
Sample Date	03/23/2010		03/23/2010		04/07/2010		04/07/2010		04/07/2010		03/23/2010		03/31/2010		04/01/2010		03/31/2010		03/24/2010		04/05/2010		04/01/2010		04/01/2010	
Metals (µg/L)																										
Aluminum	19.6	U	200	U	200	U	3210		51.8	J	200	U	36.9	J	19.6	U	71.3	J	19.6	U	200	U	44.2	J	19.6	U
Barium	15	J	39.1	J	40.5	J	57.9	J	35.5	J	40.5	J	164	J	59.1	J	118	J	23.5	J	75.8	J	90.3	J	48.2	J
Calcium	11300		25000		18600		22200		11000		5000	U	14300		140000		12100		7310		22200		10700		102000	
Copper	25	U	0.75	U	25	U	25	U	25	U	25	U	0.75	U	2.3	J	0.75	U	25	U	25	U	0.75	U	0.75	U
Iron	100	U	100	U	27.4	J	3790		701		4000		190		41.9	J	1190		208		87	J	367		66.5	J
Magnesium	3700	J	5960		5000	U	3930	J	1900	J	405	J	3930	J	29800		3470	J	1240	J	5930		2660	J	21400	
Potassium	5000	U	11100		5000	U	5000	U	5000	U	5000	U	5000	U	6320		5000	U	5000	U	5000	U	5000	U	5760	
Selenium	4.2	U	4.2	U	4.2	UJ	4.2	U	4.2	U	4.2	U	4.2	U	4.2	U	4.2	U	4.2	U	4.2	U	4.2	U	4.2	U
Sodium	15700		491000		19000		17200		13300		17800		191000		29700		32400		5080		455000		224000		87500	
Vanadium	1.2	U	1.2	U	1.2	U	9.5	J	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U
Zinc	8.3	J	3	J	6.5	J	19.4	J	4	J	3.5	J	60	U	60	U	5.5	J	21.4	J	6.2	J	60	U	60	U
Antimony	0.1	U	0.1	U	0.1	U	2	U	0.1	U	0.1	U	0.1	U	0.1	U	0.1	U	0.1	U	2	U	0.1	U	0.1	U
Arsenic	1	U	0.075	U	1	U	1.6		0.16	J	1	U	1	U	1	U	1	U	1	U	0.075	U	0.075	U	1	U
Beryllium	0.048	U	0.048	U	0.048	U	0.17	J	0.048	U	0.048	U	0.048	U	0.048	U	0.048	U	0.048	U	0.048	U	0.048	U	0.048	U
Cadmium	0.083	U	0.27	J	0.083	U	0.11	J	0.11	J	0.083	U	0.13	J	0.083	U	0.083	U	0.17	J	0.083	U	0.083	U	0.083	U
Chromium	0.097	U	0.51	J	0.5	J	5.7		0.38	J	0.47	J	0.097	UJ	0.097	UJ	0.25	J	0.097	U	1.4	J	0.097	UJ	0.097	UJ
Cobalt	2.7	J	0.029	UJ	0.87	J	1.1	J	0.52	J	3	J	3	J	0.029	U	0.029	U	1.2	J	0.029	UJ	0.4	J	0.029	U
Lead	1	U	0.068	J	1	U	3.5		1	U	1	U	1	UJ	1	UJ	1	U	1	U	1	U	1	UJ	1	UJ
Manganese	28.2		55.7		21.1		33.6	J	736	J	929		142	J	9	J	22.6	J	70.3	J	9.3	J	59.7	J	251	J
Nickel	5	U	5	U	1.4	J	3.2	J	1.4	J	5	U	9.9		4.7	J	2.8	J	5		0.35	J	2.3	J	1.2	J
Silver	0.069	U	0.069	U	0.069	U	0.069	U	0.069	U	0.069	U	0.069	U	0.069	U	0.069	U	0.069	U	5	U	0.069	U	0.069	U
Thallium	0.068	J	0.12	J	0.036	J	0.075	J	0.071	J	0.045	J	0.12	J	0.061	J	0.045	J	0.042	J	0.086	J	0.051	J	0.066	J
Mercury	0.1	U	0.1	U	0.1	U	0.2	U	0.1	U	0.1	U	0.1	U	0.1	U	0.1	U	0.1	U	0.1	U	0.1	U	0.1	U
VOCs (mg/L)																										
1,1,1-Trichloroethane	1	U	1	U	--		1	U	1	U	1	U	1	U	1	U	2		1	U	1	U	1	U	1	U
1,1,2-Trichloroethane	1	U	1	U	--		1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,1-Dichloroethane	1	U	1	U	--		1		1	U	1	U	1	U	1	U	2		1	U	1	U	1	U	1	U
1,1-Dichloroethene	1	U	1	U	--		1	U	1	U	1	U	1	U	1	U	2		1	U	1	U	1	U	1	U
1,2,3-Trichlorobenzene	1	UJ	2	J	--		1	U	1	U	1	UJ	1	U	1	U	1	U	1	UJ	1	U	1	U	1	U
1,2,4-Trichlorobenzene	1	U	2		--		1	U	1	U	1	U	1	UJ	1	UJ	1	U	1	U	1	U	1	UJ	1	UJ
1,2-Dibromoethane	1	U	2		--		1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,2-Dichloroethane	0.5	U	0.5	U	--		0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	UJ	0.5	U	0.5	U
2-Hexanone	5	UJ	3	J	--		5	U	5	U	5	U	5	UJ	5	UJ	5	UJ	5	U	5	UJ	5	UJ	5	UJ
4-Methyl-2-pentanone	1	UJ	2	J	--		1	U	1	U	1	U	1	UJ	1	UJ	1	UJ	1	U	1	UJ	1	UJ	1	UJ
Acetone	5	U	5	U	--		5	U	3	J	5	UJ	5	U	5	U	5	U	5	UJ	5	U	5	U	5	U
Bromochloromethane	1	U	1	U	--		1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Bromodichloromethane	1	U	2		--		1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Bromoform	1	U	4		--		1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Carbon disulfide	1	U	1	U	--		1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Chloroform	1	U	3		--		1	U	1	U	1	U	17		1		1	U	1	U	2		12		1	U
cis-1,2-Dichloroethylene	1	U	1	U	--		1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Dibromochloromethane	1	U	3		--		1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Dichlorodifluoromethane	1	U	1		--		1	UJ	1	UJ	1	U	1	U	1	U	1	U	1	U	1	UJ	1	U	1	U
tert-Butyl Methyl Ether	1	U	1	U	--		1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
tetrachloroethene	0.5	U	2		--		3		2		0.5	U	0.5	U	3		2		2		2	U	0.5	U	6	
trans-1,3-Dichloropropene	0.4	U	0.9		--		0.4	U	0.4	U	0.4	U	0.4	U	0.4	U	0.4	U	0.4	U	0.4	U	0.4	U	0.4	U
Trichloroethene	0.5	U	0.5	U	--		2		0.5	U	0.5	U	0.5	U	0.5	U	4		0.5	U	0.5	U	0.5	U	0.5	U

Table 4.7-9 Groundwater Monitoring Well Summary Table for Metals and VOC Analyses, Sylvania Corning FUSRAP Site

Sample Name	MW-21D-GWR2		MW-21I-GWR2		MW-21S-GWR2		MW-22D-GWR2		MW-22I-GWR2		MW-22S-GWR2		MW-23D-GWR2		MW-23I-GWR2		MW-23S-GWR2		MW-24DD-GWR2		MW-24S-GWR2		MW-25D-GWR2		MW-25I-GWR2	
Location Name	MW-21D		MW-21I		MW-21S		MW-22D		MW-22I		MW-22S		MW-23D		MW-23I		MW-23S		MW-24DD		MW-25S		MW-25D		MW-25I	
Sample Date	03/24/2010		03/24/2010		03/24/2010		04/01/2010		04/01/2010		03/31/2010		03/31/2010		03/29/2010		03/29/2010		03/31/2010		03/31/2010		03/31/2010		03/31/2010	
Metals (µg/L)																										
Aluminum	24.1	J	672		19.6	U	81.7	J	24.3	J	20.8	J	89.7	J	308		43.5	J	37.6	J	19.6	U	31.6	J	25.3	J
Barium	148	J	89	J	31.5	J	15	J	188	J	52.8	J	35.7	J	109	J	27.3	J	21.8	J	42.7	J	155	J	196	J
Calcium	18600		25100		18100		16300		19000		32900		16800		20200		7810		8590		13100		22600		17700	
Copper	25	U	25	U	25	U	0.75	U	0.75	U	0.75	U	4.2	J	0.8	J	0.75	U	0.75	U	0.75	U	0.75	U	0.75	U
Iron	233		1410		3480		107		20.3	J	904		1980		765		49.8	J	71.4	J	23.3	J	471		19.4	J
Magnesium	5630		6490		2210	J	5150		5460		4850	J	2710	J	3650	J	1680	J	2420	J	1800	J	7040		6150	
Potassium	5000	U	5000	U	5000	U	5000	U	5000	U	5000	U	5960		5000	U	5000	U	5000	U	5000	U	6590		6490	
Selenium	4.2	U	4.2	U	4.2	U	4.2	U	4.2	U	4.2	U	4.2	U	4.2	U	4.2	U	4.2	U	4.2	U	4.2	U	4.2	U
Sodium	27400		144000		14300		338000		160000		22900		87700		75400		7630		17900		6670		162000		70500	
Vanadium	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U
Zinc	6.1	J	39.2	J	1.9	J	60	U	60	U	60	U	60	U	69.2		60	U	60	U	60	U	60	U	60	U
Antimony	0.1	U	0.1	U	0.1	U	0.1	U	0.1	U	0.1	U	0.11	J	0.1	U	0.1	U	0.1	U	0.1	U	0.1	U	0.1	U
Arsenic	1	U	1	U	1	U	1	U	0.075	U	1	U	1.1		0.82	J	0.075	U	1	U	1	U	1	U	1	U
Beryllium	0.048	U	2.8		0.048	U	0.048	U	0.048	U	0.048	U	0.048	U	0.051	J	0.048	U	0.048	U	0.048	U	0.048	U	0.06	J
Cadmium	0.083	U	0.47	J	0.083	U	0.083	U	0.15	J	1.5		0.083	U	0.083	U	0.083	U	0.083	U	0.083	U	0.083	U	0.083	U
Chromium	0.097	U	1.2	J	0.097	U	0.097	UJ	0.097	UJ	0.097	UJ	0.96	J	2	J	0.097	U	0.097	U	0.097	U	0.097	U	0.097	U
Cobalt	0.029	U	1.9	J	0.21	J	0.07	J	0.26	J	7.1		2.1	J	1.6	J	0.029	U	0.029	U	0.029	U	0.37	J	0.029	U
Lead	1	U	1	U	1	U	1	UJ	1	UJ	1	UJ	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Manganese	11	J	225	J	535	J	27.5	J	248	J	620	J	171	J	191	J	35.7	J	10.5	J	12.2	J	42	J	197	J
Nickel	0.59	J	5	J	3.4	J	4.9	J	3.1	J	18.6		4.6	J	11.6		2240		0.64	J	89.1		3.7	J	4.1	J
Silver	0.069	U	0.069	U	0.069	U	0.069	U	0.069	U	0.069	U	0.069	U	0.069	U	0.069	U	0.069	U	0.069	U	0.069	U	0.069	U
Thallium	0.029	J	0.11	J	0.027	U	0.11	J	0.085	J	0.049	J	0.027	U	0.096	J	0.059	J	0.038	J	0.041	J	0.096	J	0.13	J
Mercury	0.1	U	0.1	U	0.1	U	0.1	U	0.1	U	0.1	U	0.1	U	0.1	U	0.1	U	0.2	U	0.1	U	0.1	U	0.2	U
VOCs (mg/L)																										
1,1,1-Trichloroethane	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	3		1	U	1	U	1	
1,1,2-Trichloroethane	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,1-Dichloroethane	1	U	1	U	1	U	1	U	1	U	1	U	2		1	U	1	U	3		1	U	1	U	1	U
1,1-Dichloroethene	1	U	1	U	1	U	1	U	1	U	1	U	1		1	U	1	U	2		1	U	1	U	1	U
1,2,3-Trichlorobenzene	1	UJ	1	UJ	1	UJ	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,2,4-Trichlorobenzene	1	U	1	U	1	U	1	UJ	1	UJ	1	UJ	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,2-Dibromoethane	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,2-Dichloroethane	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
2-Hexanone	5	U	5	U	5	U	5	UJ	5	UJ	5	UJ	5	UJ	5	UJ	5	UJ	5	UJ	5	UJ	5	UJ	5	UJ
4-Methyl-2-pentanone	1	U	1	U	1	U	1	UJ	1	UJ	1	UJ	2	J	1	UJ	1	UJ	1	UJ	1	UJ	1	UJ	1	UJ
Acetone	5	U	5	UJ	5	UJ	5	U	5	U	3	J	5		6		5	U	5	U	5	U	5	U	5	U
Bromochloromethane	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Bromodichloromethane	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Bromoform	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Carbon disulfide	1	U	1	U	1	U	1	U	1	U	1	U	1		1	U	1	U	1	U	1	U	1	U	1	U
Chloroform	1	U	1	U	1	U	4		20		1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
cis-1,2-Dichloroethylene	1	U	1	U	1	U	1	U	1	U	6		1	U	1	U	1	U	1	U	1	U	1	U	1	U
Dibromochloromethane	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Dichlorodifluoromethane	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
tert-Butyl Methyl Ether	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
tetrachloroethene	2		2		2		5		0.5	U	1800	J	3		2		2		3		40		2		0.5	U
trans-1,3-Dichloropropene	0.4	U	0.4	U	0.4	U	0.4	U	0.4	U	0.4	U	0.4	U	0.4	U	0.4	U	0.4	U	0.4	U	0.4	U	0.4	U
Trichloroethene	0.6		0.5	U	0.5	U	0.5	U	0.5	U	130		1		0.5		0.5	U	10		0.5	U	0.5	U	0.5	U

Table 4.7-9 Groundwater Monitoring Well Summary Table for Metals and VOC Analyses, Sylvania Corning FUSRAP Site

Sample Name	MW-25S-GWR2		MW-26D-GWR2		MW-26I-GWR2		MW-26S-GWR2		MW-27DD-GWR2		MW-27D-GWR2-F		MW-27D-GWR2-U		MW-27S-GWR2		MW-28D-GWR2-F		MW-28D-GWR2-I		MW-28I-GWR2		MW-28S-GWR2		MW-29S-GWR2	
Location Name	MW-25S		MW-26D		MW-26I		MW-26S		MW-27DD		MW-27I		MW-27I		MW-27S		MW-28D		MW-28D		MW-28I		MW-28S		MW-29S	
Sample Date	03/31/2010		03/29/2010		03/24/2010		03/24/2010		04/02/2010		04/02/2010		04/02/2010		04/07/2010		03/31/2010		03/31/2010		03/31/2010		03/31/2010		03/23/2010	
Metals (µg/L)																										
Aluminum	25.4	J	19.6	U	19.6	U	19.6	U	328		204		1940		31.7	J	19.6	R	5030		664		50	J	19.6	U
Barium	144	J	142	J	133	J	130	J	13.8	J	147	J	162	J	18.3	J	25.9	J	43.3	J	8.2	J	15.3	J	50.1	J
Calcium	15600		14600		8630		8600		8490		21500		21200		9160		5000	U	3940	J	9160		25300		37400	
Copper	0.75	U	0.75	U	0.75	U	0.75	U	25	J	25	U	25	U	25	U	5.6	J	8.8	J	0.75	U	0.75	U	25	U
Iron	27.8	J	33	J	107	U	110	U	1460		503		1140		99	J	1100		3530		954		265		3090	
Magnesium	3480	J	4260	J	1880	J	1900	J	5000	U	5330		5410		1490	J	1040	J	1170	J	2640	J	3000	J	6460	
Potassium	5000	U	5000	U	5000	U	5000	U	5000	U	5000	U	5000	U	5840		1480	J	5000	U	5000	U	5000	U	5000	U
Selenium	4.2	U	4.2	U	4.2	U	4.2	U	4.2	U	4.2	UJ	4.2	U	4.2	U	4.2	U	4.2	U	4.2	U	4.2	U	4.2	U
Sodium	38600		26800		64300		64000		16700		610000		627000		8290		337000		330000		120000		32400		47400	
Vanadium	1.2	U	1.2	U	1.2	U	1.2	U	4	J	1.2	U	2.7	J	1.2	U	5.2	J	14.7	J	5.1	J	1.2	U	1.2	U
Zinc	60	U	60	U	60	U	60	U	8.7	J	15.7	J	25.7	J	6.5	J	12.7	J	60	U	60	U	4.6	J	135	
Antimony	0.1	U	0.1	U	0.1	U	0.1	U	0.1	U	2	U	2	U	0.1	U	0.31	J	0.19	J	0.1	U	0.1	U	2	U
Arsenic	1	U	1	U	1	U	1	U	0.9	J	0.075	U	0.13	J	0.17	J	1		2.4		5.8		0.075	U	1	U
Beryllium	0.081	J	0.054	J	0.048	U	0.048	U	0.051	J	0.24	J	0.28	J	0.048	U	0.14	J	0.27	J	0.049	J	0.048	U	0.048	U
Cadmium	0.083	U	0.083	U	0.083	U	0.083	U	0.083	U	0.33	J	0.31	J	0.083	U	0.083	U	0.083	U	0.083	U	0.083	U	0.16	J
Chromium	0.097	U	0.097	U	0.097	U	0.097	U	2.3	J	1.2	J	3.4	J	0.4	J	2.3	J	7.3		1.2	J	0.097	UJ	0.097	U
Cobalt	0.029	U	0.029	U	5.7		5.7		0.029	UJ	5.4		4.5	J	10	J	0.029	R	0.029	R	0.029	U	0.21	J	5.6	J
Lead	1	U	1	U	1	U	1	U	1	U	1	U	1.9		1	U	0.023	R	11.4		1	U	1	UJ	1	U
Manganese	198	J	31.4	J	632	J	630	J	17	J	182		180	J	626	J	61.4		62.2	J	10.7	J	25.3	J	90.2	
Nickel	62.9		5.2		193		190		1.2	J	75.9		75.4		108		6.5	J	5.8		0.24	J	6.1		40.6	
Silver	0.069	U	0.069	U	0.069	U	0.069	U	0.069	U	5	U	0.069	U	0.069	U	5	U	0.069	U	0.069	U	0.069	U	0.069	U
Thallium	0.094	J	0.051	J	0.19	J	0.19	J	0.066	J	0.12	J	0.13	J	0.098	J	0.092	J	0.11	J	0.053	J	0.097	J	0.12	J
Mercury	0.1	U	0.1	U	0.1	U	0.1	U	0.2	U	0.1	U	0.1	U	0.1	U	0.1	U	0.1	U	0.1	U	0.1	U	0.1	U
VOCs (mg/L)																										
1,1,1-Trichloroethane	1		1		1	U	1	U	2		--		1	U	1	U	--		1	U	1	U	1	U	1	U
1,1,2-Trichloroethane	1	U	1	U	1	U	1	U	1	U	--		1	U	1	U	--		1	U	1	U	1	U	1	U
1,1-Dichloroethane	1	U	2		1	U	1	U	3		--		1	U	1	U	--		1	U	1	U	2		1	U
1,1-Dichloroethene	1		1		1	U	1	U	2		--		1	U	1	U	--		1	U	1	U	1	U	1	U
1,2,3-Trichlorobenzene	1	U	1	U	1	U	1	U	1	U	--		1	U	1	U	--		1	U	1	U	1	U	1	UJ
1,2,4-Trichlorobenzene	1	U	1	UJ	1	U	1	U	1	U	--		1	U	1	U	--		1	U	1	U	1	UJ	1	U
1,2-Dibromoethane	1	U	1	U	1	U	1	U	1	U	--		1	U	1	U	--		1	U	1	U	1	U	1	U
1,2-Dichloroethane	0.5	U	0.5	U	0.5	U	0.5	U	0.5	UJ	--		0.5	UJ	0.5	U	--		0.5	U	0.5	U	0.5	U	0.5	U
2-Hexanone	5	UJ	5	UJ	5	UJ	5	UJ	5	UJ	--		5	UJ	5	U	--		5	UJ	5	UJ	5	UJ	5	U
4-Methyl-2-pentanone	1	UJ	1	UJ	1	UJ	1	UJ	1	UJ	--		1	UJ	1	U	--		1	UJ	1	UJ	1	UJ	1	U
Acetone	5	U	5	U	5	U	5	U	5	U	--		2	J	5	U	--		5	U	5	U	5	U	5	UJ
Bromochloromethane	1	U	1	U	1	U	1	U	1	U	--		1	U	1	U	--		1	U	1	U	1	U	1	U
Bromodichloromethane	1	U	1	U	1	U	1	U	1	U	--		1	U	1	U	--		1	U	1	U	1	U	1	U
Bromoform	1	U	1	U	1	U	1	U	1	U	--		1	U	1	U	--		1	U	1	U	1	U	1	U
Carbon disulfide	1	U	1	U	1	U	1	U	1	U	--		1	U	1	U	--		1	U	1	U	1	U	1	U
Chloroform	1	U	1	U	1	U	1	U	1	U	--		7		1	U	--		4		15		3		1	U
cis-1,2-Dichloroethylene	1	U	1	U	1	U	1	U	1	U	--		1	U	1	U	--		1	U	1	U	1	U	5	
Dibromochloromethane	1	U	1	U	1	U	1	U	1	U	--		1	U	1	U	--		1	U	1	U	1	U	1	U
Dichlorodifluoromethane	1	U	1	U	1	U	1	U	1	UJ	--		1	UJ	1	UJ	--		1	U	1	U	1	U	1	U
tert-Butyl Methyl Ether	1	U	1	U	1	U	1	U	1	U	--		1	U	1	U	--		1	U	1	U	1	U	1	U
tetrachloroethene	0.5	U	2		0.5	U	0.5	U	2	U	--		15		8		--		8		5		340	J	360	D
trans-1,3-Dichloropropene	0.4	U	0.4	U	0.4	U	0.4	U	0.4	U	--		0.4	U	0.4	U	--		0.4	U	0.4	U	0.4	U	0.4	U
Trichloroethene	0.5	U	3		0.5	U	0.5	U	10		--		1		0.5	U	--		0.7		0.5	U	3		4	

Table 4.7-9 Groundwater Monitoring Well Summary Table for Metals and VOC Analyses, Sylvania Corning FUSRAP Site

Sample Name	MW-30D-GWR2		MW-30I-GWR2		MW-30S-GWR2		MW-31D-GWR2		MW-31I-GWR2		MW-32D-GWR2-F		MW-32D-GWR2-U		MW-33D-GWR2		MW-33S-GWR2		MW-34D-GWR2-F		MW-34D-GWR2-U		MW-34S-GWR2		MW-39S-GWR2	
Location Name	MW-30D		MW-30I		MW-30S		MW-31D		MW-31I		MW-32D		MW-32D		MW-33D		MW-33S		MW-34D		MW-34D		MW-34S		MW-39S	
Sample Date	04/01/2010		04/02/2010		04/01/2010		04/01/2010		04/01/2010		03/23/2010		03/23/2010		04/02/2010		04/02/2010		04/05/2010		04/05/2010		04/05/2010		03/24/2010	
Metals (µg/L)																										
Aluminum	38.5	J	200	U	455		683		91.8	J	116	J	1820		414		426		206		9140		200	U	152	J
Barium	127	J	129	J	45	J	91.9	J	42.2	J	51.3	J	55.5	J	36.2	J	17	J	8	J	81.5	J	38.7	J	67.5	J
Calcium	24800		27000		11100		18300		22000		25600		24200		10800		5000	U	17400		19500		5440		8030	
Copper	0.75	U	25	U	0.75	U	0.75	U	0.75	U	2.6	J	25	U	25	U	25	U	25	U	45.6		25	U	25	U
Iron	2990		60.4	J	44.1	J	898		117		168		731		1460		109		146		32400		147		100	U
Magnesium	7310		7540		1660	J	3700	J	6130		7800		7440		5000	U	5000	U	5000	U	5000	U	5000	U	1650	J
Potassium	5000	U	7350		5000	U	5000	U	5000	U	5000	U	5000	U	5000	U	5000	U	17100		19400		5000	U	5000	U
Selenium	4.2	U	4.2	U	4.2	U	4.2	U	4.2	U	4.2	U	4.2	U	4.2	U	4.2	U	5.2	J	7.6		4.2	U	4.2	U
Sodium	122000		64100		5000	U	372000		65400		338000		324000		152000		5000	U	31900		30200		6150		21000	
Vanadium	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.9	J	3.5	J	2	J	1.2	U	3.3	J	83.6		1.2	U	1.2	U
Zinc	18.2	J	3.5	J	8.5	J	28.8	J	5	J	32.4	J	97.6		23.9	J	11.1	J	3	J	21	J	3.1	J	10.5	J
Antimony	0.1	U	0.1	U	0.1	U	0.1	U	0.1	U	2	U	2	U	2	U	0.1	U	0.1	U	2	U	0.1	U	0.1	U
Arsenic	1	U	0.24	J	1	U	1	U	1	U	1	U	1	U	0.45	J	0.11	J	2.4		9.1		0.1	J	0.075	U
Beryllium	0.048	U	0.048	U	0.56	J	0.18	J	0.048	U	0.074	J	0.08	J	0.048	U	0.9	J	0.048	U	0.33	J	0.048	U	0.11	J
Cadmium	0.083	U	0.44	J	0.083	U	0.083	U	0.083	U	0.083	U	0.32	J	0.15	J	0.15	J	0.083	U	0.15	J	0.21	J	0.083	J
Chromium	0.097	UJ	0.63	J	0.097	UJ	0.36	J	0.097	UJ	0.097	U	2.4	J	3.1	J	0.75	J	1.1	J	23.5		0.52	J	0.097	U
Cobalt	2.8	J	0.029	UJ	0.029	U	57.8		0.029	U	6.7	J	6.2	J	6	J	6.6	J	0.029	U	0.44	J	4.9	J	0.029	U
Lead	1	UJ	1	U	1	UJ	2.2	J	1	UJ	1	U	2.3		2.4		1	U	1	U	31.1		1	U	1	U
Manganese	289	J	99.9	J	20.6	J	1710	J	54.9	J	18.5		18		56	J	228	J	1	U	14.3	J	661	J	8.8	J
Nickel	10.3		0.47	J	6.2		472		4.2	J	10.8	J	11.7		10.8		9.6		0.068	U	3.2	J	2	J	1.7	J
Silver	0.069	U	0.069	U	0.069	U	0.069	U	0.069	U	0.069	U	1	U	0.069	U	5	U	0.069	U	5	U	0.069	U	0.069	U
Thallium	0.07	J	0.044	J	0.031	J	0.15	J	0.069	J	0.035	J	0.14	J	0.074	J	0.073	J	0.05	J	0.16	J	0.059	J	0.04	J
Mercury	0.1	U	0.1	U	0.1	U	0.1	U	0.1	U	0.1	U	0.1	U	0.1	U	0.2	U	0.1	U	0.2	U	0.1	U	0.1	U
VOCs (mg/L)																										
1,1,1-Trichloroethane	7		84		1	U	1	U	2		--		1	U	1	U	1	U	--		1	U	1	U	1	U
1,1,2-Trichloroethane	1	U	3		1	U	1	U	1	U	--		1	U	1	U	1	U	--		1	U	1	U	1	U
1,1-Dichloroethane	1	U	3		1	U	1	U	1	U	--		1	U	1	U	1	U	--		1	U	1	U	1	U
1,1-Dichloroethene	5		53		1	U	1	U	1		--		1	U	1	U	1	U	--		1	U	1	U	1	U
1,2,3-Trichlorobenzene	1	U	1	U	1	U	1	U	1	U	--		1	UJ	1	U	1	U	--		1	U	1	U	1	UJ
1,2,4-Trichlorobenzene	1	UJ	1	U	1	UJ	1	U	1	U	--		1	U	1	U	1	U	--		1	U	1	U	1	U
1,2-Dibromoethane	1	U	1	U	1	U	1	U	1	U	--		1	U	1	U	1	U	--		1	U	1	U	1	U
1,2-Dichloroethane	0.5	U	1	J	0.5	U	0.5	U	0.5	UJ	--		0.5	U	0.5	UJ	0.5	UJ	--		0.5	UJ	0.5	U	0.5	U
2-Hexanone	5	UJ	5	UJ	5	UJ	5	UJ	5	UJ	--		5	U	5	UJ	5	UJ	--		5	UJ	5	U	5	U
4-Methyl-2-pentanone	1	UJ	1	UJ	1	UJ	1	UJ	1	UJ	--		1	U	1	UJ	1	UJ	--		1	UJ	1	U	1	U
Acetone	5	U	5	U	5		5	U	5	U	--		5	UJ	5	U	5	U	--		5	U	5	U	5	UJ
Bromochloromethane	1	U	1	U	1	U	1	U	1	U	--		1	U	1	U	1	U	--		1	U	1	U	1	U
Bromodichloromethane	1	U	1	U	1	U	1	U	1	U	--		1	U	1	U	1	U	--		1	U	1	U	1	U
Bromoform	1	U	1	U	1	U	1	U	1	U	--		1	U	1	U	1	U	--		1	U	1	U	1	U
Carbon disulfide	1	U	1	U	1	U	1	U	1	U	--		1	U	1	U	1	U	--		1	U	1	U	1	U
Chloroform	1	U	1	U	1	U	9		1	U	--		1		1	U	1	U	--		1	U	1	U	1	U
cis-1,2-Dichloroethylene	1	U	6		1	U	1	U	1	U	--		1	U	1	U	1	U	--		1	U	1	U	1	U
Dibromochloromethane	1	U	1	U	1	U	1	U	1	U	--		1	U	1	U	1	U	--		1	U	1	U	1	UJ
Dichlorodifluoromethane	1	U	1	UJ	1	U	1	UJ	1	UJ	--		1	U	1	UJ	1	UJ	--		1	UJ	1	UJ	1	U
tert-Butyl Methyl Ether	1	U	2		1	U	1	U	1	U	--		1	U	1	U	1	U	--		1	U	1	U	1	U
tetrachloroethene	5		2	U	4		44		2		--		34	J	88		130		--		4	U	0.5	U	1200	D
trans-1,3-Dichloropropene	0.4	U	0.4	U	0.4	U	0.4	U	0.4	U	--		0.4	U	0.4	U	0.4	U	--		0.4	U	0.4	U	0.4	U
Trichloroethene	1		44		0.5	U	8		4		--		1		1		0.5	U	--		0.5	U	0.5	U	0.5	

Table 4.7-9 Groundwater Monitoring Well Summary Table for Metals and VOC Analyses, Sylvania Corning FUSRAP Site

Sample Name	MW-41S-GWR2		MW-42I-GWR2		MW-43S-GWR2		MW-44S-GWR2		MW-49S-GWR2		MW-50I-GWR2		MW-51I-GWR2		MW-52D-GWR2		MW-53S-GWR2		MW-55S-GWR2	
Location Name	MW-41S		MW-42I		MW-43S		MW-44S		MW-49S		MW-50I		MW-51I		MW-52D		MW-53S		MW-55S	
Sample Date	03/31/2010		04/01/2010		04/01/2010		04/01/2010		03/31/2010		03/31/2010		04/01/2010		04/05/2010		04/05/2010		04/07/2010	
Metals (µg/L)																				
Aluminum	19.6	U	260		19.6	U	19.6	U	28	J	103	J	200	U	268		200	U	63.6	J
Barium	56.8	J	92.3	J	49	J	72.9	J	37.2	J	123	J	36.5	J	14.4	J	14.9	J	106	J
Calcium	62300		12000		73700		42500		8140		10600		9290		11300		9670		17400	
Copper	0.75	U	0.75	U	0.75	U	0.75	U	0.75	U	0.75	U	0.75	U	25	U	25	U	25	U
Iron	67.8	J	577		14.9	J	22.5	J	245	J	732		100	U	734		125		754	
Magnesium	10000		3220	J	16800		4560	J	1390	J	3020	J	1740	J	1820	J	5000	U	2850	J
Potassium	5000	U	5000	U	5000	U	5000	U	5000	U	5000	U	5000	U	5000	U	5000	U	5000	U
Selenium	4.2	U	4.2	U	4.2	U	4.2	U	4.2	U	4.2	U	4.2	U	4.2	U	4.2	U	4.2	U
Sodium	24700		111000		56000		42800		5000	U	66800		66100		28600		5900		108000	
Vanadium	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	3.3	J	1.2	U	1.2	U
Zinc	6.5	J	13.9	J	3.9	J	4.7	J	60	U	60	U	60	U	5.7	J	8.9	J	4.5	J
Antimony	0.1	U	0.1	U	0.1	U	0.1	U	0.1	U	0.18	J	0.1	U	2	U	0.1	U	2	U
Arsenic	1	U	1	U	1	U	1	U	1	U	1	U	1.3		0.89	J	0.075	U	0.28	J
Beryllium	0.048	U	0.048	U	0.048	U	0.048	U	0.048	U	0.049	J	0.048	U	0.048	U	0.16	J	0.048	U
Cadmium	0.083	U	1.1		0.17	J	0.083	U	0.097	J	0.083	U	0.083	U	0.092	J	0.12	J	0.24	J
Chromium	0.097	UJ	0.097	UJ	0.097	UJ	0.097	UJ	0.097	U	0.097	U	1.5	J	2.5	J	0.31	J	1.2	J
Cobalt	0.029	U	3	J	0.029	U	0.91	J	3.6	J	4.2	J	3.2	J	0.88	J	11.3	J	17.4	J
Lead	1	UJ	1	UJ	1	UJ	1	UJ	1	U	1	U	1	UJ	1	U	1	U	1	U
Manganese	189	J	189	J	130	J	380	J	784	J	510	J	21.7	J	39	J	567	J	1450	J
Nickel	5.2		3.4	J	2.4	J	1350		5.4		152		15.6		3.9	J	16.8		16.4	
Silver	0.069	U	0.069	U	0.069	U	0.069	U	0.069	U	0.069	U	0.069	U	0.069	U	0.069	U	0.069	U
Thallium	0.055	J	0.064	J	0.085	J	0.042	J	0.046	J	0.15	J	0.33	J	0.062	J	0.11	J	0.18	J
Mercury	0.1	U	0.1	U	0.1	U	0.1	U	0.1	U	0.1	U	0.1	U	0.2	U	0.2	U	0.1	U
VOCs (mg/L)																				
1,1,1-Trichloroethane	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,1,2-Trichloroethane	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,1-Dichloroethane	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,1-Dichloroethene	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,2,3-Trichlorobenzene	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,2,4-Trichlorobenzene	1	U	1	U	1	U	1	U	1	UJ	1	UJ	1	U	1	U	1	U	1	U
1,2-Dibromoethane	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,2-Dichloroethane	0.5	UJ	0.5	UJ	0.5	UJ	0.5	UJ	0.5	U	0.5	U	0.5	UJ	0.5	U	0.5	U	0.5	U
2-Hexanone	5	UJ	5	UJ	5	UJ	5	UJ	5	UJ	5	UJ	5	UJ	5	U	5	U	5	U
4-Methyl-2-pentanone	1	UJ	1	UJ	1	UJ	1	UJ	1	UJ	1	UJ	1	UJ	1	U	1	U	1	U
Acetone	5	U	5	U	5	U	5	U	5		5	U	5	U	3	J	5	U	5	U
Bromochloromethane	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Bromodichloromethane	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Bromoform	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Carbon disulfide	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Chloroform	0.4	J	22		8		1	U	1	U	1	U	1	U	1	U	1	U	23	
cis-1,2-Dichloroethylene	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Dibromochloromethane	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Dichlorodifluoromethane	1	UJ	1	UJ	1	UJ	1	UJ	1	U	1	U	1	UJ	1	UJ	1	UJ	1	UJ
tert-Butyl Methyl Ether	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
tetrachloroethene	9		0.5	U	10		41		0.5	U	0.5	U	3		100		910		2	
trans-1,3-Dichloropropene	0.4	U	0.4	U	0.4	U	0.4	U	0.4	U	0.4	U	0.4	U	0.4	U	0.4	U	0.4	U
Trichloroethene	0.5	U	0.5	U	0.5	U	0.6		0.5	U	0.6		0.5	U	0.9		2		0.5	U

Notes:
Sample names ending in "-U" are unfiltered samples.
Sample names ending in "-F" are filtered samples.

Key:
D = Sample result from dilution analysis.
J = Estimated concentration.
R = Data rejected and considered unusable.
U = Not detected above instrument detection limits.
UJ = Not detected, estimated detection limit.
-- = Not analyzed (filtered portions of sample).
VOCs = Volatile Organic Compounds.
ug/L = Micrograms per liter.

Table 4.7-10 Groundwater Monitoring Well Results Summary Table for Radionuclides, Sylvania Corning FUSRAP Site

Sample Name	MW-3-GWR2			MW-4-GWR2			MW-8-GWR2			MW-9-GWR2			MW-10-GWR2			MW-11-GWR2			MW-12-GWR2		
Location Name	MW-3			MW-4			MW-8			MW-9			MW-10			MW-11			MW-12		
Sample Date	03/21/2010			03/21/2010			03/21/2010			03/21/2010			03/21/2010			03/22/2010			03/21/2010		
Radionuclide (pCi/L)	Result		Uncertainty	Result		Uncertainty	Result		Uncertainty	Result		Uncertainty	Result		Uncertainty	Result		Uncertainty	Result		Uncertainty
Actinium-228	7.24	U	11.37	-0.754	U	7.598	-0.443	U	7.851	-0.86	U	9.828	-1.6	U	6.621	2.25	U	7.523	2.5	U	9.828
Bismuth-212	7.58	U	23.5	2.69	U	12.62	-4.19	U	15.7	-3.66	U	25.81	1.9	U	13.51	-4.72	U	13.91	-11.3	UJ	25.07
Bismuth-214	-1.68	UJ	6.375	10.7	J	7.621	9.07	UJ	6.212	6.7	UJ	7.568	-2.62	U	4.257	-0.871	U	4.774	-0.166	U	6.648
Gross Alpha	1.902	J	0.9321	0.9076	J	0.8235	3.156	J	1.366	1.456		0.6616	1.666	J	1.23	0.579	U	0.6301	3.956		1.566
Gross Beta	3.247	J	1.587	1.901	J	1.468	2.961	J	1.58	4.402		1.437	5.303		1.653	2.835	J	1.364	3.93	J	1.595
Lead-212	1.71	U	4.15	-0.0823	U	3.393	5.969	J	5.894	-1.32	UJ	3.966	-2.19	UJ	3.48	2.01	UJ	3.761	1.6	U	4.031
Lead-214	-3.43	UJ	5.836	10.24	J	5.648	6.97	UJ	6.117	5.69	UJ	5.914	6.346	J	4.333	-1.04	UJ	4.428	-0.0346	UJ	5.673
Potassium-40	64.29	J	56	13	U	24.08	-6.34	U	25.5	0.614	U	32.76	31.21	J	21.64	-6.63	U	23.99	-10.8	U	33.37
Protactinium-234	14.6	U	307.6	-42.8	U	244.1	104	U	250.4	77.3	U	327.5	-15.1	U	229.7	182	UJ	241	-9.7	U	336.4
Radium-226	0.165	UJ	0.1548	0.117	UJ	0.1302	0.127	UJ	0.1651	0.2231	J	0.2153	0.4942	J	0.2604	0.235	UJ	0.202	0.2065	J	0.1635
Radium-228	0.6502	J	0.5002	0.6381	J	0.4564	0.247	UJ	0.4638	1.112	J	0.5567	0.442	UJ	0.4608	-0.36	UJ	0.611	0.4198	J	0.3879
Thallium-208	8.23	UJ	9.782	-0.892	U	5.294	6.881	J	6.257	-1.5	U	8.388	0.66	U	5.479	-0.685	U	6.022	6.48	U	8.059
Thorium-227	0.0315	U	0.06967	0.0257	U	0.1197	0.044	U	0.1144	0.142	U	0.1633	0.122	UJ	0.1246	0.185	UJ	0.1701	0.084	U	0.1414
Thorium-228	-0.00801	U	0.01141	0.133	U	0.1636	-0.0274	R	0.02294	-0.0111	U	0.09071	0.0126	U	0.0806	0.0479	U	0.1125	-0.0349	U	0.0782
Thorium-230	0.0154	R	0.04798	0.174	R	0.1606	0.0661	R	0.09406	0.178	R	0.1584	0.0485	R	0.07604	0.318	R	0.2017	0.121	R	0.136
Thorium-232	0.0465	UJ	0.06629	0.0418	U	0.09262	-0.00901	U	0.01285	0.0381	U	0.08429	-0.0045	U	0.009033	0.044	U	0.07642	0.0275	U	0.06743
Thorium-234	-19.6	UJ	40.68	-17.8	U	35.04	76.35	J	65	-39.8	UJ	41.03	-5.55	U	32.91	76.48	J	65.11	-42.7	R	40.09
Uranium-234	0.4682	J	0.3124	0.849	J	0.4019	0.2741	J	0.1757	0.0176	UJ	0.05495	0.2011	J	0.1633	0.105	UJ	0.121	1.335		0.4156
Uranium-235	0.0488	U	0.1195	0.8025		0.4266	0.084	U	0.006571	0.0273	U	0.0669	0.0682	UJ	0.1066	-0.0111	U	0.01573	0.1506	J	0.1415
Uranium-238	0.142	U	0.1661	0.7766		0.3889	0.068	U	0.006571	0.07	U	0.006811	0.0902	UJ	0.105	0.0084	U	0.05549	1.606		0.4648
Total Uranium	0.4918	U	--	2.649		--	0.2378	U	--	0.2754	U	--	0.3116	UJ	--	0.5802	U	--	4.792		--

Table 4.7-10 Groundwater Monitoring Well Results Summary Table for Radionuclides, Sylvania Corning FUSRAP Site

Sample Name	MW-13D-GWR2			MW-13S-GWR2			MW-14DD-GWR2			MW-14D-GWR2			MW-14S-GWR2			MW-15DD-GWR2			MW-15D-GWR2		
Location Name	MW-13D			MW-13S			MW-14DD			MW-14D			MW-14S			MW-15DD			MW-15D		
Sample Date	03/24/2010			03/24/2010			03/22/2010			03/23/2010			03/22/2010			03/23/2010			03/23/2010		
Radionuclide (pCi/L)	Result		Uncertainty	Result		Uncertainty	Result		Uncertainty	Result		Uncertainty	Result		Uncertainty	Result		Uncertainty	Result		Uncertainty
Actinium-228	1.32	U	7.56	3.06	U	11.76	-3.5	U	6.863	-0.379	U	10.33	5.35	U	7.164	-5.15	U	6.58	3.07	U	7.995
Bismuth-212	-2.58	U	13.31	16.2	U	22.81	-0.343	U	14.64	-6.52	U	27.58	-2.52	U	14.45	1.11	U	14.65	7.66	U	13.8
Bismuth-214	1.26	U	4.625	8.48	UJ	9.521	2.58	U	4.354	-3.21	UJ	6.46	-3.15	U	4.795	-1.04	U	4.17	-1.11	U	4.504
Gross Alpha	1.839		0.6813	4.36	J	3.205	1.256	J	0.9134	4.037		1.207	-0.113	U	1.066	0.261	U	0.5728	1.135	J	0.7958
Gross Beta	1.483	J	1.436	11.03	J	3.46	8.141		1.741	2.858	J	1.58	-1.36	U	1.591	3.269	J	1.455	3.787	J	1.509
Lead-212	5.621	J	4.471	2.19	U	4.094	-3.92	R	3.483	1.36	UJ	3.997	0.669	UJ	3.457	-3.96	R	3.514	2.33	U	3.479
Lead-214	3.52	U	4.157	0.378	UJ	5.718	5.002	J	4.605	-5.16	UJ	5.864	-0.931	U	4.181	3.54	U	4.343	0.846	U	4.025
Potassium-40	-9.8	U	19.9	-17.1	U	31.8	14.5	U	18.29	11.4	U	39.04	-8.26	U	25.92	23	U	23.73	-14.3	U	22.77
Protactinium-234	-52.4	U	203.3	149	U	327.2	49.2	U	222	125	U	301.7	-33.9	U	241.4	17.2	U	250	-46.3	U	275.4
Radium-226	0.2963	J	0.202	1	J	0.394	0.4395	J	0.2682	0.7069	J	0.326	0.0669	UJ	0.1134	0.4395	J	0.2653	0.652	J	0.3285
Radium-228	0.4533	J	0.433	1.35	J	0.5279	0.9137	J	0.5999	1.074	J	0.5544	0.692	J	0.4223	0.187	UJ	0.4496	1.513	J	0.6112
Thallium-208	-2.01	U	5.92	6.52	U	8.648	2.31	U	5.444	-7.94	UJ	8.741	-0.457	U	6.045	12.85	J	12.62	1.24	U	6.441
Thorium-227	0.104	U	0.3034	0.133	U	0.1879	0.06	U	0.1113	0.1512	J	0.1345	0.185	UJ	0.1797	0.0538	U	0.1191	0.0616	U	0.1374
Thorium-228	0.0213	UJ	0.2146	0.0722	UJ	0.1436	0.0704	U	0.09896	0.14	UJ	0.1328	0.0585	U	0.1587	-0.0274	U	0.02806	0.0765	UJ	0.1017
Thorium-230	0.8278	J	0.5349	0.131	UJ	0.1622	0.211	R	0.146	0.091	R	0.1068	0.149	R	0.1413	0.4372	J	0.2805	0.147	R	0.1441
Thorium-232	-0.0238	U	0.0342	0.0193	U	0.08204	0.112	UJ	0.1062	0.0388	U	0.07555	0.0559	UJ	0.07972	0.105	U	0.01015	0.1374	J	0.1303
Thorium-234	72.17	J	50.87	-4.2	U	40.06	-15.2	U	33.7	-41	R	40.95	-61.8	R	40.83	-1.04	U	35.3	-48.1	R	40.23
Uranium-234	0.0437	UJ	0.07577	0.0431	UJ	0.06731	0.108	UJ	0.1093	0.3715	J	0.1955	0.113	UJ	0.1099	0.0774	UJ	0.09006	0.0375	UJ	0.07297
Uranium-235	0.0539	U	0.09347	-0.0148	U	0.01722	0.0537	UJ	0.07634	0.0233	U	0.05706	0.079	U	0.006147	0.0318	UJ	0.06382	0.0457	U	0.1124
Uranium-238	0.0173	U	0.05396	0.0155	U	0.04824	0.1444	J	0.1169	0.121	UJ	0.1134	0.00769	U	0.05082	0.0514	UJ	0.07303	0.0833	UJ	0.1025
Total Uranium	0.4924	U	--	0.4482	U	--	0.4571	J	--	0.4907	UJ	--	0.4947	U	--	0.2386	UJ	--	0.5969	UJ	--

Table 4.7-10 Groundwater Monitoring Well Results Summary Table for Radionuclides, Sylvania Corning FUSRAP Site

Sample Name	MW-15S-GWR2			MW-16D-GWR2-F			MW-16D-GWR2-U			MW-16S-GWR2			MW-17S-GWR2			MW-18I-GWR2			MW-18S-GWR2		
Location Name	MW-15S			MW-16D			MW-16D			MW-16S			MW-17S			MW-18I			MW-18S		
Sample Date	03/23/2010			04/07/2010			04/07/2010			04/07/2010			03/23/2010			03/31/2010			04/01/2010		
Radionuclide (pCi/L)	Result		Uncertainty	Result		Uncertainty	Result		Uncertainty	Result		Uncertainty	Result		Uncertainty	Result		Uncertainty	Result		Uncertainty
Actinium-228	-0.0721	U	7.164	7.31	U	8.417	-1.97	U	8.552	-1.32	U	7.523	3.18	U	9.774	1.78	U	8.256	-2.53	U	6.395
Bismuth-212	7.25	U	13.19	-10.7	UJ	17.41	-0.601	U	16.59	0.552	U	13.03	-5.39	UJ	30.78	-8.35	U	21.37	-2.52	U	16.37
Bismuth-214	1.63	U	4.25	1.12	U	5.227	2.08	U	5.957	0.618	U	4.661	-2.83	UJ	6.54	1.9	U	5.583	0.598	U	4.51
Gross Alpha	-0.599	U	5.627	1.332	J	0.8346	5.326		1.668	0.8186	J	0.6807	-0.6	U	0.9658	2.617	J	1.564	74.54		8.12
Gross Beta	15.81		5.259	3.506	J	1.416	8.169		2.004	0.738	U	1.603	3.811	J	1.721	9.148		3.043	13.88		2.987
Lead-212	4.62	UJ	5.034	0.166	U	3.516	5.443	J	5.322	-0.293	U	3.109	-0.876	UJ	4.418	-0.157	U	3.821	-2.17	U	3.455
Lead-214	2.92	U	4.252	0.301	U	4.512	1.01	U	4.811	0.256	UJ	4.385	4.43	UJ	5.911	5.22	UJ	6.196	-1.35	UJ	4.47
Potassium-40	22.3	UJ	26.13	-4.245	U	23.89	21.62	U	32.12	4.904	U	25.33	79.99		43.98	-3.08	U	26.67	17	U	27.24
Protactinium-234	-264	R	229.3	85.9	U	342.6	-13.5	U	277.6	190	U	211.3	171	U	345.7	73.7	U	283.9	2318		632.3
Radium-226	0.3837	J	0.2269	0.5153	J	0.2741	0.8604	J	0.3708	0.0294	UJ	0.1042	0.278	J	0.2026	1.907		0.5472	0.484	UJ	0.5879
Radium-228	0.6787	J	0.4299	0.8987	R	0.4486	1.5	R	0.5438	0.605	R	0.4877	0.5601	J	0.4435	1.03	J	0.5143	2.68	UJ	2.926
Thallium-208	2.54	U	5.765	0.285	U	6.415	1.75	U	7.24	0.836	U	6.018	4.95	U	8.413	-2.08	U	6.884	-2.98	U	6.224
Thorium-227	0.0709	U	0.1623	0.00861	U	0.1748	0.213	U	0.2864	0.0904	U	0.2637	-0.13	R	0.06979	-0.0303	U	0.06784	1.38	UJ	1.122
Thorium-228	-0.0269	U	0.0712	0.0526	U	0.1297	0.239	UJ	0.3109	0.0511	UJ	0.1256	-0.00851	U	0.09791	-0.025	U	0.06614	0.0682	U	0.5623
Thorium-230	0.0659	R	0.1094	0.328	UJ	0.259	0.7255	J	0.4889	0.0505	UJ	0.1242	0.4391	J	0.3104	0.2412	J	0.1776	0.9489	UJ	0.8227
Thorium-232	0.0202	U	0.06303	0.0293	U	0.07191	0.188	U	0.2478	0.0504	U	0.1239	0.153	UJ	0.1809	-0.00482	U	0.00969	0.348	U	0.5335
Thorium-234	-5.58	U	35.06	-5.07	U	43.59	-5.25	U	48.89	-3.1	U	32.09	-35	UJ	40.31	26.8	U	48.79	1794		195.1
Uranium-234	0.0799	UJ	0.09325	0.2627	J	0.1736	0.4572		0.2385	0.0608	U	0.08629	0.121	UJ	0.1219	58.4		10.2	4009		741.1
Uranium-235	0.0517	UJ	0.08079	0.132	UJ	0.1333	0.135	UJ	0.1429	0.0148	U	0.06288	0.0995	UJ	0.1224	3.475		1.599	284.5		143
Uranium-238	0.243	J	0.1554	0.1285	J	0.1208	0.1326	UJ	0.1295	0.1175	J	0.1104	0.0201	U	0.04915	53.52		9.47	3638		685
Total Uranium	0.7734	J	--	0.4177	J	--	0.4633	UJ	--	0.4274	J	--	0.4133	U	--	159		--	10830		--

Table 4.7-10 Groundwater Monitoring Well Results Summary Table for Radionuclides, Sylvania Corning FUSRAP Site

Sample Name	MW-19D-GWR2			MW-19S-GWR2			MW-20D-GWR2			MW-20I-GWR2			MW-20S-GWR2			MW-21D-GWR2			MW-21I-GWR2		
Location Name	MW-19D			MW-19S			MW-20D			MW-20I			MW-20S			MW-21D			MW-21I		
Sample Date	03/31/2010			03/24/2010			04/05/2010			04/01/2010			04/01/2010			03/24/2010			03/24/2010		
Radionuclide (pCi/L)	Result		Uncertainty	Result		Uncertainty	Result		Uncertainty	Result		Uncertainty	Result		Uncertainty	Result		Uncertainty	Result		Uncertainty
Actinium-228	1.34	U	7.717	0.686	U	7.016	2.66	U	9.772	1.55	U	8.66	-3.65	U	7.359	-1.76	U	7.573	3.13	U	7.9
Bismuth-212	-9.1	U	16.88	9.36	U	14.05	18.6	UJ	20.38	2.85	UJ	20.24	1.98	U	13.2	2.58	U	14.66	-0.18	U	16.98
Bismuth-214	0.143	U	5.234	0.0543	U	4.61	-2.53	U	5.067	1.72	UJ	5.239	0.0413	U	4.378	0.611	U	4.348	2.43	U	4.498
Gross Alpha	1.54	UJ	1.009	0.268	U	0.5867	7.321	J	5.659	3.27	UJ	2.397	1895		47.97	0.446	U	0.9407	6.187	J	3.615
Gross Beta	4.365	J	1.632	3.552	J	1.503	7.464	J	5.375	5.237	J	3.246	231.4		9.105	1.75	J	1.679	5.403	J	4.053
Lead-212	5.792	J	3.931	5.887	J	4.885	0.809	U	3.837	-1.39	UJ	4.045	6.784	J	5.142	-0.597	UJ	3.575	-0.494	UJ	3.448
Lead-214	0.907	U	4.604	2.48	U	4.264	0.582	U	4.436	-6.39	R	4.787	-0.345	UJ	4.416	7.51	UJ	6.043	-4.14	R	4.048
Potassium-40	-4.23	U	22.5	0.272	U	27.14	3.59	U	29.05	-2.29	UJ	36.05	12.6	U	24.56	25.2	UJ	24.84	3.32	U	27.64
Protactinium-234	360.6	J	202	-16	U	239	180	UJ	278.9	-109	U	277.6	412.1	J	311.4	405.2	J	373.4	312	UJ	292.5
Radium-226	0.9509	J	0.3872	0.104	UJ	0.1302	1.498		0.4608	0.7488	J	0.3655	0.7076	J	0.3272	0.3401	J	0.2287	1.471	J	0.4757
Radium-228	1.196	J	0.593	0.205	UJ	0.4446	1.573	J	0.7265	0.8708	J	0.4946	0.9408	J	0.5817	1.309	J	0.4941	1.065	J	0.46
Thallium-208	4.94	U	6.92	-2.01	U	6.295	7.636	J	7.056	0.257	U	6.885	-4.28	U	5.952	1.52	U	5.818	3.41	U	5.918
Thorium-227	0.069	U	0.1155	0.0286	U	0.1332	0.042	U	0.09772	0.27	J	0.217	-0.0311	U	0.3593	0.0825	U	0.1299	0.109	U	0.1233
Thorium-228	-0.00465	U	0.05356	-0.0426	R	0.03341	0.00552	U	0.03648	0.0842	U	0.1418	0.0517	U	0.3414	-0.00524	U	0.06044	0.0553	U	0.1001
Thorium-230	-0.0123	U	0.01441	0.188	UJ	0.179	0.0848	UJ	0.08638	0.084	UJ	0.1198	0.745	UJ	0.7503	0.0267	UJ	0.08035	0.166	UJ	0.139
Thorium-232	0.0441	UJ	0.06916	0.129	UJ	0.1445	-0.00289	U	0.005808	0.00505	U	0.07205	0.292	UJ	0.4623	0.00407	U	0.05809	-0.000476	U	0.05132
Thorium-234	-11.7	U	46.81	-61.2	R	41.08	92.98	J	78.6	-43.4	U	47.6	220.1		65.08	2.57	U	34.71	58.2	UJ	62.39
Uranium-234	0.0635	U	0.1132	0.2053	J	0.1378	0.058	U	0.08873	0.3501	J	0.2094	816.8		148.4	0.0392	UJ	0.06806	0.0849	UJ	0.09907
Uranium-235	0.0198	U	0.06162	0.0173	U	0.05398	0.0204	U	0.06356	0.0496	U	0.09639	66.63		30.68	-0.0248	U	0.02246	-0.0102	U	0.0145
Uranium-238	0.0961	UJ	0.1107	0.0351	U	0.0609	0.0663	UJ	0.08766	0.5502		0.2594	767.9		141	0.0546	U	0.08346	0.157	UJ	0.141
Total Uranium	0.5951	UJ	--	0.3975	U	--	0.4682	UJ	--	1.709		--	2289		--	0.5411	U	--	0.6713	UJ	--

Table 4.7-10 Groundwater Monitoring Well Results Summary Table for Radionuclides, Sylvania Corning FUSRAP Site

Sample Name	MW-21S-GWR2			MW-22D-GWR2			MW-22I-GWR2			MW-22S-GWR2			MW-23D-GWR2			MW-23I-GWR2			MW-23S-GWR2		
Location Name	MW-21S			MW-22D			MW-22I			MW-22S			MW-23D			MW-23I			MW-23S		
Sample Date	03/24/2010			04/01/2010			04/01/2010			03/31/2010			03/31/2010			03/29/2010			03/29/2010		
Radionuclide (pCi/L)	Result		Uncertainty	Result		Uncertainty	Result		Uncertainty	Result		Uncertainty	Result		Uncertainty	Result		Uncertainty	Result		Uncertainty
Actinium-228	1.11	U	7.355	5.99	U	9.532	4.4	U	9.657	3.56	U	8.545	3.97	U	8.166	-0.111	U	8.833	2.34	U	7.999
Bismuth-212	-0.637	U	15.11	-12	UJ	18.32	7.89	U	20.26	-1.75	UJ	18.98	-2.72	U	19.19	11.7	U	16.21	12.7	U	16.64
Bismuth-214	-1.11	U	4.491	8.925	J	6.526	-0.821	U	5.725	1.13	UJ	5.394	-2.64	U	4.757	-3.29	U	5.162	-1.46	U	5.012
Gross Alpha	2	J	0.9522	9.26	UJ	6	1.16	U	136.7	2.834		1.246	2.347	J	1.394	4.617	J	2.239	7.023		1.473
Gross Beta	2.873	J	1.506	7.384	J	4.958	2.63	U	27.98	6.495		1.616	6.841		1.754	7.078		1.822	3.132	J	1.727
Lead-212	1.44	U	3.394	-1.09	UJ	3.964	-2.7	UJ	3.647	2.56	U	3.703	-1.64	UJ	3.825	0.0513	U	3.729	1.65	U	3.635
Lead-214	1.87	U	3.981	3.88	U	4.825	-2.56	U	4.972	0.788	U	4.559	-2.54	J	4.951	-1.61	UJ	4.797	-3.22	UJ	4.632
Potassium-40	-0.378	U	24.3	12.6	U	29.54	34.1	UJ	37.13	5.94	UJ	26.95	-10.9	U	27.6	14.2	UJ	23.8	-2.1	UJ	26.68
Protactinium-234	-79	U	259.3	-138	U	308.3	-135	U	328	251.9	J	229.4	-122	UJ	327.4	-60	U	292.1	342	UJ	384.9
Radium-226	0.1947	J	0.1636	2.138		0.5581	1.112	J	0.4157	0.2945	J	0.2111	0.4311	J	0.2524	0.9094	J	0.4156	0.3646	J	0.2335
Radium-228	0.6	J	0.4215	2.609	J	0.6208	1.07	J	0.6497	1.027	J	0.5084	0.52	UJ	0.6402	-0.217	U	0.6465	0.6966	J	0.4407
Thallium-208	7.19	UJ	7.655	-5.24	U	6.894	-2.23	U	6.392	2.89	U	8.105	2.31	U	7.22	2.98	U	6.527	-1.85	U	6.599
Thorium-227	0.0374	U	0.1412	0.2037	UJ	0.1907	0.195	U	0.2015	0.166	UJ	0.1528	0.242	J	0.1897	0.049	U	0.1148	0.127	U	0.1406
Thorium-228	0.0969	UJ	0.1364	0.116	U	0.1477	0.0587	U	0.1254	0.0154	U	0.07219	0.0141	U	0.09001	-0.0321	R	0.02503	-0.0134	U	0.05664
Thorium-230	0.12	UJ	0.1335	0.0947	UJ	0.111	0.0637	UJ	0.1058	0.0868	UJ	0.1103	0.103	UJ	0.1213	-0.0136	U	0.01594	0.0372	U	0.0724
Thorium-232	0.0382	U	0.08449	-0.00536	U	0.01076	-0.0151	U	0.01767	0.0117	U	0.0497	0.0591	UJ	0.08433	-0.00453	U	0.009104	-0.00423	U	0.008503
Thorium-234	-18.1	U	41.44	-42.9	U	47.62	-42.5	U	48.47	-25.2	U	47.41	-16.6	U	47.07	-42.4	U	44.55	69.15	J	40.21
Uranium-234	0.0752	UJ	0.08772	0.00357	U	0.05117	0.162	J	0.124	0.8195		0.3372	0.3664	J	0.2288	1.798		0.4983	3.733		0.9047
Uranium-235	-0.0136	U	0.01577	-0.0201	U	0.02028	0.027	UJ	0.1068	0.138	UJ	0.1456	0.0393	UJ	0.0789	0.1495	J	0.1405	0.6407	J	0.3354
Uranium-238	0.0822	UJ	0.08686	-0.0121	U	0.01414	0.056	UJ	0.08655	0.3812	J	0.2253	0.0581	UJ	0.09089	1.42		0.429	3.652		0.8898
Total Uranium	0.3603	UJ	--	0.5052	U	--	0.177	UJ	--	1.196	J	--	0.4939	UJ	--	4.245		--	11.03		--

Table 4.7-10 Groundwater Monitoring Well Results Summary Table for Radionuclides, Sylvania Corning FUSRAP Site

Sample Name	MW-24DD-GWR2			MW-24S-GWR2			MW-25D-GWR2			MW-25I-GWR2			MW-25S-GWR2			MW-26D-GWR2			MW-26S-GWR2		
Location Name	MW-24DD			MW-25S			MW-25D			MW-25I			MW-25S			MW-26D			MW-26S		
Sample Date	03/31/2010			03/31/2010			03/31/2010			03/31/2010			03/31/2010			03/29/2010			03/24/2010		
Radionuclide (pCi/L)	Result		Uncertainty	Result		Uncertainty	Result		Uncertainty	Result		Uncertainty	Result		Uncertainty	Result		Uncertainty	Result		Uncertainty
Actinium-228	-1.88	U	8.029	3.48	U	8.748	6.48	U	8.572	0.144	U	9.865	-2.12	U	7.521	-3.76	U	9.725	-0.131	U	6.783
Bismuth-212	-6.41	UJ	14.58	4.52	U	17.37	6.55	U	12.77	9.91	U	17.46	12.4	U	15.02	-5.53	U	18.47	-1.03	UJ	15.13
Bismuth-214	-2.46	UJ	4.232	3.11	U	5.554	3.91	U	4.75	0.492	U	5.436	-4.34	UJ	4.502	-0.0275	U	5.699	8.943	J	5.908
Gross Alpha	1.17	UJ	0.7604	11.67		1.833	3.075	J	2.509	5.042	J	1.991	13.3		2.743	1.73	U	0.7087	4.748		1.687
Gross Beta	8.383	J	1.708	5.024		1.627	9.615		2.262	6.514		1.848	5.83		1.891	2.568	J	1.476	6.783		1.688
Lead-212	-0.922	U	3.335	1.44	U	4.133	-0.733	U	3.322	-1.84	UJ	3.89	-0.208	U	3.315	0.119	U	3.892	1.07	U	3.27
Lead-214	3.72	U	4.522	-0.904	U	4.534	0.427	U	4.396	-1.36	U	4.387	0.795	U	4.442	-1.38	U	4.756	-0.433	UJ	4.294
Potassium-40	37.92	J	28.1	4.16	U	29.15	29.2	UJ	33.55	-4.04	U	29.92	21.1	U	22.97	-9.74	U	27.81	-3.29	U	22.89
Protactinium-234	-71	U	217.4	497.7	J	347.1	-81.4	U	228.6	-23.5	U	290.5	41.3	U	205.3	51.4	U	294.6	-121	U	217.8
Radium-226	0.4856	J	0.289	0.105	U	0.1266	2.442		0.6211	1.302	J	0.462	0.889	J	0.3627	0.3283	J	0.2133	0.9033		0.3803
Radium-228	1.047	J	0.4787	0.363	U	0.5802	2.073		0.6198	0.7721	J	0.4864	0.255	U	0.4032	0.465	U	0.4987	0.26	U	0.5899
Thallium-208	-4	U	5.866	2.03	U	7.444	-6.56	R	5.99	1.2	U	6.816	0.217	U	5.786	-0.94	U	7.7	-0.674	U	5.745
Thorium-227	0.213	UJ	0.1811	0.2617	J	0.1757	0.2559	J	0.1719	-0.0686	U	0.0689	0.105	U	0.1567	0.181	UJ	0.1758	0.222	UJ	0.1923
Thorium-228	0.13	UJ	0.137	0.0173	UJ	0.05413	0.0365	UJ	0.071	0.0252	U	0.09624	0.0806	U	0.1133	-0.0194	UJ	0.06307	0.00486	UJ	0.06939
Thorium-230	0.0131	UJ	0.05579	0.2597	J	0.1715	0.0926	UJ	0.09859	0.108	UJ	0.1199	0.0119	U	0.05055	0.1322	J	0.1253	0.0529	UJ	0.09197
Thorium-232	0.0221	U	0.05429	0.0474	UJ	0.0744	0.0966	UJ	0.0982	-0.0133	U	0.01552	-0.0123	U	0.01442	-0.00464	U	0.00933	-0.0054	U	0.01086
Thorium-234	-5.53	U	34.42	-3.38	U	49.33	-22.7	U	34.62	10.7	U	47.63	-23.9	U	34.17	-8.57	U	48.86	-7.42	U	35.81
Uranium-234	0.109	UJ	0.1106	5.137	J	1.092	0.0386	UJ	0.06688	0.107	UJ	0.1193	2.602		0.6193	0.2678	J	0.1939	1.825	J	0.4887
Uranium-235	0.0147	U	0.06248	0.6816		0.329	0.0811	UJ	0.1004	0.109	UJ	0.1264	0.2024	J	0.1557	0.165	UJ	0.1672	0.133	UJ	0.1294
Uranium-238	0.0159	U	0.04978	6.273		1.27	0.1811	J	0.1336	0.0485	U	0.08415	2.474		0.5977	0.1666	J	0.1513	1.374		0.4066
Total Uranium	0.4625	U	--	18.76		--	0.5922	J	--	0.5045	U	--	7.369		--	0.5398	J	--	4.111		--

Table 4.7-10 Groundwater Monitoring Well Results Summary Table for Radionuclides, Sylvania Corning FUSRAP Site

Sample Name	MW-27DD-GWR2			MW-27D-GWR2-F			MW-27D-GWR2-U			MW-27S-GWR2			MW-28D-GWR2-F			MW-28D-GWR2-U			MW-28I-GWR2		
Location Name	MW-27DD			MW-27D			MW-27D			MW-27S			MW-28D			MW-28D			MW-28I		
Sample Date	04/02/2010			04/02/2010			04/02/2010			04/07/2010			03/31/2010			03/31/2010			03/31/2010		
Radionuclide (pCi/L)	Result		Uncertainty	Result		Uncertainty	Result		Uncertainty	Result		Uncertainty	Result		Uncertainty	Result		Uncertainty	Result		Uncertainty
Actinium-228	-5.31	U	8.484	9.857	J	7.597	2.44	U	7.683	-5.08	U	8.945	12.25	J	5.819	-2.76	U	7.283	-1.33	U	10.07
Bismuth-212	-20.9	R	17.16	-6.07	U	18.4	4.42	U	11.79	3.99	U	16.53	8.15	U	15.05	1.98	U	13.99	4.01	U	22.07
Bismuth-214	2.89	U	5.368	-1.83	U	5.139	2.56	U	4.767	0.837	U	5.63	-0.472	U	4.788	-2.75	U	4.324	14.66	J	9.284
Gross Alpha	1.602	J	0.8054	11.7	J	6.069	16.39	J	8.738	1.142	J	0.8846	2.07	U	3.176	11.44		4.722	6.391	J	2.546
Gross Beta	1.789	J	1.641	8.535	J	5.514	20.08		7.083	5.084		1.54	7.538	J	3.067	8.478	J	3.928	10.34		2.183
Lead-212	6.3	UJ	6.479	-4.22	R	3.973	-0.24	U	3.184	0.354	U	3.697	-1.22	U	3.286	-0.211	U	3.315	-0.231	UJ	4.203
Lead-214	3.35	U	4.87	2	U	4.676	2.98	U	4.357	-0.607	U	4.527	2.87	U	4.621	7.34	UJ	5.291	9.45	UJ	9.926
Potassium-40	-2.47	U	29.09	-9.34	U	28.57	9.08	U	22.69	27.55	UJ	33.6	15.3	U	25.36	-4.21	U	19.66	8.27	U	32.68
Protactinium-234	-39.9	UJ	301.9	-155	UJ	278.1	37.4	UJ	236.2	-187	U	294.9	63.6	U	204.9	206	UJ	251.2	-72.7	U	333.1
Radium-226	0.7973		0.3021	3.115		0.6882	3.71		0.7948	0.3566	J	0.2271	0.5362		0.277	0.9674		0.4027	0.244	UJ	0.1867
Radium-228	0.468	UJ	0.7771	3.865		0.7023	4.837		0.7547	1.21	R	0.4985	0.378	U	0.5951	0.343	U	0.7422	0.41	U	0.5516
Thallium-208	7.588	J	7.345	-0.365	U	7.344	0.266	U	5.68	2.24	U	6.571	-4.58	U	5.748	-3	U	5.581	5.27	U	8.444
Thorium-227	0.0568	U	0.07306	0.09	UJ	0.09051	0.0486	U	0.06011	0.2341	J	0.2161	0.0491	UJ	0.1375	0.2818	J	0.2	0.253	UJ	0.1963
Thorium-228	0.0448	UJ	0.05854	0.0157	U	0.0598	0.1929		0.09812	-0.00785	UJ	0.01581	0.285	UJ	0.2345	0.4953	J	0.2669	0.171	UJ	0.1639
Thorium-230	0.0464	UJ	0.05742	0.13	UJ	0.1064	0.2961	J	0.1244	0.4869	J	0.3236	0.5902	J	0.3201	0.7986	J	0.34	0.0686	U	0.09767
Thorium-232	0.0116	U	0.0284	0.0024	U	0.03427	0.1681		0.09016	0.0378	U	0.0929	0.141	UJ	0.1508	0.5078		0.2641	-0.00468	U	0.009395
Thorium-234	-17.5	U	45.42	-28.6	U	47.62	-8.47	U	35.1	12.1	U	47.7	1.96	U	35.01	-2.27	U	34.72	-3.21	U	40.32
Uranium-234	0.0653	UJ	0.08639	1.448		0.4835	3.878		0.85	0.5212		0.2515	0.3168	J	0.1892	0.8276	J	0.317	3.231		0.7224
Uranium-235	0.111	UJ	0.1231	0.0577	U	0.1121	0.1588	J	0.1439	0.0877	UJ	0.1161	-0.0205	U	0.02069	0.0957	UJ	0.1114	0.1942	J	0.1574
Uranium-238	0.0447	UJ	0.06995	1.926		0.5723	3.742		0.8268	0.3326	J	0.1987	0.0688	UJ	0.08515	0.618		0.2682	3.899		0.8258
Total Uranium	0.4024	UJ	--	5.77		--	11.08		--	1.059	J	--	0.4153	UJ	--	1.856		--	11.56		--

Table 4.7-10 Groundwater Monitoring Well Results Summary Table for Radionuclides, Sylvania Corning FUSRAP Site

Sample Name	MW-28S-GWR2			MW-29S-GWR2			MW-30D-GWR2			MW-30I-GWR2			MW-30S-GWR2			MW-31D-GWR2			MW-31I-GWR2		
Location Name	MW-28S			MW-29S			MW-30D			MW-30I			MW-30S			MW-31D			MW-31I		
Sample Date	03/31/2010			03/23/2010			04/01/2010			04/02/2010			04/01/2010			04/01/2010			04/01/2010		
Radionuclide (pCi/L)	Result		Uncertainty	Result		Uncertainty	Result		Uncertainty	Result		Uncertainty	Result		Uncertainty	Result		Uncertainty	Result		Uncertainty
Actinium-228	5.22	U	7.583	-2.25	U	8.083	-0.59	U	7.35	3.77	U	9.601	9.71	U	10.13	2.92	U	9.283	1.78	U	10.78
Bismuth-212	9.42	U	12.46	-0.14	U	13.91	-1.02	U	12.84	-9.89	U	19.61	-4.24	U	18.99	4.7	U	18.48	-7.28	U	24.2
Bismuth-214	1.75	U	4.404	14.96	J	5.783	2.5	U	4.823	8.229	J	5.666	-2.59	U	5.342	-1.77	U	5.03	-4.33	UJ	7.38
Gross Alpha	7.25		2.863	1.12	U	1.349	1.39	U	2.172	2.713	J	1.407	0.586	U	0.6376	16.86	J	7.595	1.796	J	1.067
Gross Beta	7.263		2.081	4.049	J	1.709	5.945	J	2.226	7.353		1.991	2.453	J	1.438	5.08	U	6.036	2.29	J	1.528
Lead-212	-1.21	U	3.275	-4.44	R	3.747	0.483	U	3.236	0.352	U	3.643	0.588	U	3.742	-1.8	UJ	3.788	-5.12	R	4.114
Lead-214	-1.56	UJ	4.457	12.76	J	4.943	3.4	U	4.567	-1.3	U	4.564	-2.81	U	4.459	-0.404	U	4.54	-1.26	UJ	5.665
Potassium-40	-3.18	U	22.42	10	U	21.86	7.13	U	22.89	-1.11	U	28.21	-6.39	U	27.25	-17.6	U	30.88	36.4	UJ	40.15
Protactinium-234	299	UJ	289.4	48.2	U	239.9	-132	UJ	225.9	-63.9	UJ	269.7	27.9	UJ	298	98.3	U	314.8	324	UJ	371.2
Radium-226	0.2417	UJ	0.196	0.2029	J	0.1682	1.014		0.3538	0.4179		0.2365	0.0837	UJ	0.0968	2.017		0.5696	0.0633	U	0.1038
Radium-228	0.7793	J	0.5414	0.374	UJ	0.4881	1.6	J	0.6119	1.702	J	0.5586	0.8757	J	0.6015	1.542	J	0.8136	1.154	J	0.5762
Thallium-208	-3.31	U	5.85	2.09	U	6.057	-2.49	U	5.881	-1.06	U	6.912	-3.96	U	6.944	0.468	U	7.266	-1.53	U	8.044
Thorium-227	0.0476	U	0.1271	0.00363	U	0.08513	0.0951	U	0.133	-0.00338	U	0.04949	0.128	UJ	0.1173	0.4656		0.2458	0.0111	U	0.05801
Thorium-228	0.0255	U	0.09729	-0.0146	U	0.06188	0.176	UJ	0.1481	-0.0139	U	0.03666	-0.0117	U	0.03796	2.827		0.7839	0.00155	U	0.03673
Thorium-230	0.2096	J	0.164	0.2363	R	0.1702	0.0797	UJ	0.08955	0.031	UJ	0.05612	0.0791	UJ	0.07522	2.997	J	0.8163	-0.00806	UJ	0.008193
Thorium-232	0.0346	U	0.07655	0.018	U	0.05612	0.0143	U	0.04483	0.0156	UJ	0.03141	0.043	U	0.004183	3.095	J	0.8364	-0.00603	U	0.007054
Thorium-234	-17	U	35.11	-4.72	U	34.87	17.1	U	34.98	0.784	U	47.87	-24.4	U	48.04	-16.2	U	50.6	38.5	U	43.65
Uranium-234	0.2483		0.1695	0.119	UJ	0.1198	0.0442	U	0.07661	0.101	U	0.1071	0.0472	UJ	0.07378	0.1462	UJ	0.141	0.0642	U	0.09107
Uranium-235	-0.00579	U	0.01161	-0.01	U	0.01423	0.0656	UJ	0.09333	-0.00554	U	0.01111	0.0264	U	0.06465	-0.0163	UJ	0.01898	0.042	U	0.09272
Uranium-238	0.1327	J	0.1248	0.0748	U	0.09731	0.0485	UJ	0.0758	0.0263	UJ	0.05275	0.047	UJ	0.07347	0.2279	J	0.1586	0.0126	U	0.05355
Total Uranium	0.461	J	--	0.5565	U	--	0.3954	UJ	--	0.2727	UJ	--	0.4111	UJ	--	0.7571	J	--	0.5446	U	--

Table 4.7-10 Groundwater Monitoring Well Results Summary Table for Radionuclides, Sylvania Corning FUSRAP Site

Sample Name	MW-32D-GWR2-F			MW-32D-GWR2-U			MW-33D-GWR2			MW-33S-GWR2			MW-34D-GWR2-F			MW-34D-GWR2-U			MW-34S-GWR2		
Location Name	MW-32D			MW-32D			MW-33D			MW-33S			MW-34D			MW-34D			MW-34S		
Sample Date	03/23/2010			03/23/2010			04/02/2010			04/02/2010			04/05/2010			04/05/2010			04/05/2010		
Radionuclide (pCi/L)	Result		Uncertainty	Result		Uncertainty	Result		Uncertainty	Result		Uncertainty	Result		Uncertainty	Result		Uncertainty	Result		Uncertainty
Actinium-228	3.15	U	7.644	8.12	U	12.24	-2.27	U	6.713	5.6	U	8.437	4.66	U	11.01	0.736	U	6.795	4.84	U	6.658
Bismuth-212	21.5	UJ	17.23	4.35	U	24.45	-0.0666	U	13.28	10.5	U	19.63	0.0136	U	26.16	8.67	U	15.32	5.96	U	13.68
Bismuth-214	-0.865	U	4.705	7.17	UJ	7.475	-0.949	UJ	4.413	9.087	J	6.778	1.09	UJ	6.834	-1.11	U	4.356	-1.03	UJ	4.452
Gross Alpha	12.75	J	5.643	7.662	J	3.678	2.96	J	2.537	58.98		3.93	3.1		1.249	32.37		7.02	0.394	U	0.5463
Gross Beta	11.19	J	4.196	6.688	J	3.591	5.206	J	2.065	10.84		2.115	16.58		2.043	48.21		5.266	1.525	J	1.344
Lead-212	2.38	U	3.609	-1.85	UJ	3.887	-1.43	U	3.252	3.46	U	4.155	6.867	J	5.084	0.797	U	3.414	4.75	UJ	4.953
Lead-214	1.21	U	4.829	1.89	U	5.602	0.06	UJ	4.302	1.08	U	4.381	8.435	UJ	7.621	1.39	U	4.389	-2.35	UJ	4.294
Potassium-40	-13.3	U	27.93	21.7	U	37.69	-7.66	U	21.39	7.89	U	26.35	15.4	U	38.78	32.84	J	28.75	-13.6	U	22.46
Protactinium-234	-100	U	242.2	383.2	J	358.7	38.5	UJ	211.6	-4.1	UJ	264	442.3	J	334	14.5	UJ	221.4	79.3	UJ	216.8
Radium-226	3.101	J	0.7361	1.57	J	0.5026	0.7378		0.3078	0.0981	UJ	0.1189	0.2076	J	0.1635	1.19		0.4009	0.146	UJ	0.1358
Radium-228	2.138	J	0.4743	1.625	J	0.5164	1.133	J	0.7306	0.7417	J	0.5559	1.468	J	0.7985	0.76	UJ	0.7631	0.578	UJ	0.6305
Thallium-208	-1.69	U	5.921	0.546	U	7.624	-7.24	UJ	5.65	2.02	U	6.917	7.92	U	8.942	-3.44	U	5.839	1.78	U	6.168
Thorium-227	-0.0305	U	0.1731	0.00269	U	0.1293	0.1084	UJ	0.0891	0.239	UJ	0.2051	0.0969	U	0.09999	0.011	U	0.1095	0.0245	U	0.0685
Thorium-228	0.0784	U	0.2604	0.143	J	0.1358	0.00519	U	0.06121	0.0579	U	0.1047	0.0419	U	0.06167	1.021	J	0.3789	0.0615	U	0.08667
Thorium-230	0.268	UJ	0.3004	0.0826	UJ	0.1029	0.0559	UJ	0.06348	0.124	UJ	0.1322	0.0635	UJ	0.06766	1.028	J	0.3751	0.1927	J	0.129
Thorium-232	0.134	U	0.1925	0.0484	U	0.08415	0.06645	UJ	0.06301	-0.000573	U	0.06214	-0.00499	U	0.007125	0.8278		0.3283	-0.0125	U	0.01275
Thorium-234	-27.1	U	39.36	-7.41	U	40.84	-13.3	U	33.53	30.9	U	49.69	-12.6	U	40.14	1.1	U	35.37	-34	U	34.22
Uranium-234	0.171	UJ	0.1608	0.1385	J	0.1221	0.2428	J	0.1726	25.88		5.098	0.3332	J	0.2335	1.591		0.69	0.2664	J	0.1861
Uranium-235	0.0211	U	0.06578	0.0199	U	0.06215	0.0917	U	0.007149	2.748		1.244	0.0732	U	0.1271	0.225	UJ	0.2791	-0.012	U	0.01705
Uranium-238	0.154	UJ	0.1399	0.0404	U	0.07013	0.1675	J	0.139	26.01		5.112	0.5931		0.3087	1.852		0.7477	0.104	UJ	0.1157
Total Uranium	0.635	UJ	--	0.4577	U	--	0.5343	J	--	77.75		--	1.852		--	5.613		--	0.5348	UJ	--

Table 4.7-10 Groundwater Monitoring Well Results Summary Table for Radionuclides, Sylvania Corning FUSRAP Site

Sample Name	MW-39S-GWR2			MW-41S-GWR2			MW-42I-GWR2			MW-43S-GWR2			MW-44S-GWR2			MW-49S-GWR2			MW-50I-GWR2		
Location Name	MW-39S			MW-41S			MW-42I			MW-43S			MW-44S			MW-49S			MW-50I		
Sample Date	03/24/2010			03/31/2010			04/01/2010			04/01/2010			04/01/2010			03/31/2010			03/31/2010		
Radionuclide (pCi/L)	Result		Uncertainty	Result		Uncertainty	Result		Uncertainty	Result		Uncertainty	Result		Uncertainty	Result		Uncertainty	Result		Uncertainty
Actinium-228	-0.339	U	7.118	1.87	U	9.578	-1.71	U	6.686	9.94	U	11.95	0.812	U	7.669	1.75	U	7.546	5.91	U	8.915
Bismuth-212	2.09	U	14.01	-2.05	UJ	24.1	2.85	U	13.47	-8.37	UJ	25.83	11.4	UJ	13.71	-7.03	U	18.97	-3.34	U	18.42
Bismuth-214	0.079	U	4.128	-2.53	UJ	7.086	-1.49	U	4.35	-1.65	UJ	6.865	3.29	UJ	4.465	-0.98	U	5.198	1.75	U	5.46
Gross Alpha	1.439	J	0.7605	955.6		22.78	9.918		3.306	22.85		4.249	17.16		3.214	0.462	UJ	0.5011	5.22		1.946
Gross Beta	4.217	J	1.5	104		5.641	4.034	J	2.844	6.994		2.098	4.944	J	2.149	0.233	UJ	1.462	5.487		1.7
Lead-212	-0.984	U	3.298	1.75	UJ	4.08	-3.21	R	3.19	0.956	UJ	4.14	-4.05	R	3.2	-0.8	U	3.723	1.74	U	3.956
Lead-214	3.02	UJ	4.632	1.64	UJ	5.847	1.49	U	4.325	2.66	UJ	5.698	-0.248	UJ	4.306	3.63	U	4.865	0.919	U	4.672
Potassium-40	-6.08	U	25.16	-13.7	UJ	37.13	-6.66	U	20.38	-21.3	U	37.53	-2.2	UJ	21.05	5.75	U	26.91	20.4	U	30.89
Protactinium-234	-54.5	U	185.2	531.8	UJ	478.7	249	UJ	258.9	-41.1	U	332.1	129	U	220	209	U	317.6	48.9	U	265
Radium-226	0.2886	J	0.1983	0.5159	J	0.2725	0.7896	J	0.3388	0.7207	J	0.3605	0.2556	J	0.2002	0.4153	J	0.2565	0.5829		0.2903
Radium-228	0.5283	J	0.4045	1.341		0.4426	0.7546	J	0.556	1.051	J	0.6262	0.4639	J	0.419	0.5301	J	0.4729	0.399	U	0.5237
Thallium-208	-1.19	U	5.626	-3.19	U	8.809	1.68	U	5.697	-2.5	UJ	10.23	-0.543	U	5.9	3.33	U	7.339	-4.71	U	6.675
Thorium-227	0.0631	U	0.1685	0.6386	UJ	0.498	0.8225		0.4117	0.17	U	0.2862	0.0269	U	0.09875	0.0429	U	0.1274	0.171	UJ	0.1612
Thorium-228	-0.0254	UJ	0.1107	-0.0612	U	0.1621	10.52		2.563	-0.0115	U	0.1319	0.0105	U	0.06923	-0.0128	U	0.05424	0.0383	UJ	0.08475
Thorium-230	0.0741	UJ	0.1453	0.312	UJ	0.3202	6.728		1.745	0.8031	J	0.4916	0.0862	UJ	0.1147	0.0158	U	0.04933	0.2198	J	0.1683
Thorium-232	0.0288	U	0.07068	-0.0118	U	0.02373	10.83		2.625	0.0493	U	0.1212	0.124	UJ	0.1323	0.0239	UJ	0.04799	0.0238	U	0.05829
Thorium-234	54.53	J	53.66	176.6		72.65	5.44	U	34.76	-23.5	UJ	40.11	14.4	U	34.46	-37	U	48.7	-43.4	U	47.73
Uranium-234	0.109	UJ	0.1446	381.3		72.26	3.123	J	0.6832	9.629		1.67	7.714		1.618	0.1739	J	0.1253	2.51	J	0.6078
Uranium-235	-0.0263	U	0.02659	28.09		14.52	0.3397	J	0.2024	0.7327		0.3177	0.3134	UJ	0.2852	0.0804	UJ	0.09356	0.079	U	0.1203
Uranium-238	-0.0053	U	0.01064	392.9		73.91	2.543	J	0.5916	8.858		1.557	6.659		1.455	0.1299	J	0.1076	2.211		0.5578
Total Uranium	0.5331	U	--	1168		--	7.634	J	--	26.39		--	19.73		--	0.4144	J	--	6.539		--

Table 4.7-10 Groundwater Monitoring Well Results Summary Table for Radionuclides, Sylvania Corning FUSRAP Site

Sample Name	MW-51I-GWR2			MW-52D-GWR2			MW-53S-GWR2			MW-55S-GWR2		
Location Name	MW-51I			MW-52D			MW-53S			MW-55S		
Sample Date	04/01/2010			04/05/2010			04/05/2010			04/07/2010		
Radionuclide (pCi/L)	Result		Uncertainty	Result		Uncertainty	Result		Uncertainty	Result		Uncertainty
Actinium-228	-1.03	U	10.12	2.73	U	10.02	0.834	U	7.869	0.01	UJ	8.556
Bismuth-212	12.2	UJ	26.7	12.9	U	23.44	35.75	J	28.15	-0.8	U	13.83
Bismuth-214	2.48	U	6.8	-0.815	UJ	6.734	2.12	U	5.056	-2.89	U	4.382
Gross Alpha	0.653	U	1.693	1.07	U	1.821	5.869		1.365	1.65	J	1.528
Gross Beta	1.23	U	1.907	2.158	J	2.059	1.919	J	1.682	2.874	J	1.637
Lead-212	-1.89	UJ	4.407	4.55	UJ	4.754	2.86	U	3.987	-1.59	U	3.221
Lead-214	1.02	UJ	5.996	2.12	UJ	5.972	-1.1	U	4.549	-0.271	UJ	4.281
Potassium-40	5.29	UJ	40.94	3.108	U	35.09	-16.6	U	27.75	5.448	U	23.14
Protactinium-234	439.8	J	348.8	159	U	349	-4.1	UJ	306.9	-53.1	U	213.1
Radium-226	0.386	J	0.234	0.6606	J	0.3153	0.0456	U	0.0822	0.2065	UJ	0.1713
Radium-228	1.201	J	0.5612	0.91	R	0.4457	0.268	UJ	0.6887	1.338	R	0.4303
Thallium-208	0.745	U	8.831	0.0305	U	8.526	0.978	U	7.494	-4.52	U	5.789
Thorium-227	0.3267	J	0.2209	0.218	UJ	0.3323	0.0371	U	0.09653	0.0278	UJ	0.0558
Thorium-228	2.189		0.6746	0.0621	UJ	0.2009	0.00725	U	0.0479	-0.0233	UJ	0.02131
Thorium-230	2.58		0.7534	0.6684	J	0.4255	0.1341	J	0.1137	0.0721	UJ	0.09577
Thorium-232	1.476		0.5126	0.0265	U	0.1131	-0.00379	U	0.007634	0.0179	U	0.05574
Thorium-234	-18.5	U	40.45	-2.37	U	39.57	91.7	J	80.62	-18.1	U	34.5
Uranium-234	0.0706	UJ	0.08214	0.115	UJ	0.1205	2.761		0.6494	0.1296	J	0.1218
Uranium-235	0.0192	UJ	0.05978	0.0296	UJ	0.05927	0.2573	J	0.1826	0.0493	U	0.09591
Uranium-238	0.0778	UJ	0.09572	0.0513	U	0.08494	2.754		0.6469	0.0574	U	0.09514
Total Uranium	0.5178	UJ	--	0.5224	U	--	8.217		--	0.6352	U	--

Notes:
Sample names ending in "-U" are unfiltered samples.
Sample names ending in "-F" are filtered samples.

Key:
-- = Not applicable.
J = Estimated concentration.

pCi/L = picoCuries per liter.
R = Data rejected and considered unusable.
U = Not detected above instrument detection limits.
UJ = Not detected, estimated detection limit.

Table 4.9-1 Chemical COPC Selection Detail for Soils Based on Protection of Groundwater

Analyte	Number of Samples	Number of Detections	Percent of Detections	Maximum Non-Detect	Maximum Detected	Comparison Concentration	COPC (Yes/No)	Rationale	BTV	Number Detected Above BTV	SL 1: USEPA RSL for Groundwater Protection; DAF = 1	Number of Detections Above SL 1	SL 2: NYSDEC SCO for Groundwater Protection; DAF = 100	Number of Detection Above SL 2
Metals (mg/kg)														
Aluminum	64	64	100.0%	NA	17,200	17,200	NO	BSL	5,950	18	55,000	0	NAV	NA
Antimony	**64**	**47**	**73.4%**	**2.39**	**4.4**	**4.4**	**YES**	**ASL**	**0.639**	**35**	**0.66**	**35**	**NAV**	**NA**
Arsenic	**62**	**62**	**100.0%**	**NA**	**15.7**	**15.7**	**YES**	**ASL**	**2.42**	**43**	**1.30E-03**	**62**	**16**	**0**
Barium	62	62	100.0%	NA	37.2	37.2	NO	BSL	24.7	7	300	0	820	0
Beryllium	843	669	79.4%	0.86	1.4	1.4	NO	BSL	0.350	49	58	0	47	0
Cadmium	62	19	30.6%	0.52	0.41	0.52	NO	BSL	NAV	NA	1.40	0	7.5	0
Calcium	62	62	100.0%	NA	33,100	33,100	NO	Nutrient*	NAV	NA	NAV	NA	NAV	NA
Chromium	**62**	**62**	**100.0%**	**NA**	**37.8**	**37.8**	**YES**	**NSL; >BTV**	**7.56**	**19**	**NAV**	**NA**	**NAV**	**NA**
Cobalt	**56**	**56**	**100.0%**	**NA**	**156**	**156**	**YES**	**ASL**	**4.60**	**7**	**0.49**	**56**	**NAV**	**NA**
Copper	**62**	**62**	**100.0%**	**NA**	**168**	**168**	**YES**	**ASL**	**9.19**	**14**	**51**	**2**	**1,720**	**0**
Iron	**62**	**62**	**100.0%**	**NA**	**20,300**	**20,300**	**YES**	**ASL**	**10,790**	**11**	**640**	**62**	**NAV**	**NA**
Lead	62	62	100.0%	NA	180	180	NO	BSL	10.4	12	NAV	NA	450	0
Magnesium	62	62	100.0%	NA	20,100	20,100	NO	Nutrient*	NAV	NA	NAV	NA	NAV	NA
Manganese	**62**	**62**	**100.0%**	**NA**	**406**	**406**	**YES**	**ASL**	**224**	**2**	**57**	**46**	**2,000**	**0**
Mercury	**62**	**38**	**61.3%**	**0.034**	**0.216**	**0.216**	**YES**	**ASL**	**0.171**	**3**	**3.00E-02**	**17**	**0.73**	**0**
Nickel	**2515**	**2333**	**92.8%**	**12.4**	**16,900**	**16,900**	**YES**	**ASL**	**16.1**	**299**	**48**	**173**	**130**	**94**
Potassium	56	55	98.2%	515	960	960	NO	Nutrient*	NAV	NA	NAV	NA	NAV	NA
Selenium	**62**	**61**	**98.4%**	**0.52**	**11**	**11**	**YES**	**ASL**	**0.376**	**61**	**0.95**	**57**	**4**	**16**
Silver	**62**	**17**	**27.4%**	**1**	**12.6**	**12.6**	**YES**	**ASL**	**0.137**	**16**	**1.60**	**6**	**8.30**	**1**
Sodium	62	57	91.9%	38.5	1,590	1,590	NO	Nutrient*	NAV	NA	NAV	NA	NAV	NA
Vanadium	62	62	100.0%	NA	53	53	NO	BSL	14.7	17	180	0	NAV	NA
Zinc	62	62	100.0%	NA	98.1	98.1	NO	BSL	25.1	12	680	0	2,480	0
PCBs (mg/kg)														
Aroclor 1254	**13**	**6**	**46.2%**	**0.036**	**1**	**1**	**YES**	**ASL; BTV NA**	**NAV**	**NA**	**8.80E-03**	**6**	**NAV**	**NA**
Aroclor 1260	**13**	**4**	**30.8%**	**0.2**	**0.065**	**0.2**	**YES**	**ASL; BTV NA**	**NAV**	**NA**	**2.40E-02**	**3**	**NAV**	**NA**
VOCs (mg/kg)														
1,1,1-Trichloroethane	2532	21	0.8%	3.7	0.043	3.7	NO	IFD	NAV	NA	3.20	0	0.68	0
1,1,2,2-Tetrachloroethane	2550	2	0.1%	13	0.00082	13	NO	IFD	NAV	NA	2.60E-05	2	NAV	NA
1,1,2-Trichloroethane	2550	3	0.1%	13	0.0095	13	NO	IFD	NAV	NA	7.80E-05	3	NAV	NA
1,1-Dichloroethane	2550	2	0.1%	13	0.0022	13	NO	IFD	NAV	NA	6.90E-04	2	0.27	0
1,1-Dichloroethene	2544	1	0.0%	13	15	15	NO	IFD	NAV	NA	0.12	1	0.33	1
1,2,3-Trichlorobenzene	600	2	0.3%	3.7	0.034	3.7	NO	IFD	NAV	NA	8.70E-02	0	NAV	NA
1,2,4-Trichlorobenzene	603	1	0.2%	3.7	0.00081	3.7	NO	IFD	NAV	NA	6.80E-03	0	NAV	NA
1,2-Dichlorobenzene	2548	40	1.6%	25	0.15	25	NO	IFD	NAV	NA	0.36	0	1.10	0
1,2-Dichloroethane	2535	5	0.2%	3.7	0.0021	3.7	NO	IFD	NAV	NA	4.20E-05	5	2.00E-02	0
1,3-Dichlorobenzene	2553	8	0.3%	25	0.0015	25	NO	IFD	NAV	NA	NAV	NA	2.40	0
1,4-Dichlorobenzene	2549	36	1.4%	25	83.00001	83	NO	IFD	NAV	NA	4.10E-04	27	1.80	1
2-Butanone	2306	25	1.1%	15	0.046	15	NO	IFD	NAV	NA	1.5	0	0.12	0
2-Hexanone	2549	7	0.3%	51	0.0054	51	NO	IFD	NAV	NA	1.10E-02	0	NAV	NA
Acetone	**2218**	**337**	**15.2%**	**30**	**46**	**46**	**YES**	**ASL; BTV NA**	**NAV**	**NA**	**4.5**	**2**	**5.00E-02**	**17**
Benzene	2550	17	0.7%	13	0.0035	13	NO	IFD	NAV	NA	2.10E-04	12	6.00E-02	0
Bromodichloromethane	2550	2	0.1%	13	0.00022	13	NO	IFD	NAV	NA	3.20E-05	2	NAV	NA

Table 4.9-1 Chemical COPC Selection Detail for Soils Based on Protection of Groundwater

Analyte	Number of Samples	Number of Detections	Percent of Detections	Maximum Non-Detect	Maximum Detected	Comparison Concentration	COPC (Yes/No)	Rationale	BTV	Number Detected Above BTV	SL 1: USEPA RSL for Groundwater Protection; DAF = 1	Number of Detections Above SL 1	SL 2: NYSDEC SCO for Groundwater Protection; DAF = 100	Number of Detection Above SL 2
Bromomethane	2550	36	1.4%	25	0.031	25	NO	IFD	NAV	NA	2.20E-03	2	NAV	NA
Carbon disulfide	2542	34	1.3%	13	0.0072	13	NO	IFD	NAV	NA	0.31	0	NAV	NA
Carbon tetrachloride	2532	12	0.5%	3.7	0.034	3.7	NO	IFD	NAV	NA	7.70E-05	12	0.76	0
Chlorobenzene	2550	8	0.3%	13	0.0058	13	NO	IFD	NAV	NA	0.06	0	1.10	0
Chloroform	2549	12	0.5%	3.7	0.00092	3.7	NO	IFD	NAV	NA	5.30E-05	12	0.37	0
Chloromethane	2547	33	1.3%	25	0.0019	25	NO	IFD	NAV	NA	4.90E-02	0	NAV	NA
cis-1,2-Dichloroethene	2550	36	1.4%	13	210	210	NO	IFD	NAV	NA	0.11	3	0.25	1
Cyclohexane	600	2	0.3%	3.7	0.00041	3.7	NO	IFD	NAV	NA	13	0	NAV	NA
Ethylbenzene	2549	11	0.4%	13	7.70E-02	13	NO	IFD	NAV	NA	1.70E-03	3	1	0
Isopropylbenzene	600	5	0.8%	3.7	0.0029	3.7	NO	IFD	NAV	NA	1.10	0	NAV	NA
m,p-Xylene	628	25	4.0%	0.23	0.0086	0.23	NO	IFD	NAV	NA	NAV	NA	NAV	NA
Methyl acetate	600	10	1.7%	3.7	0.0064	3.7	NO	IFD	NAV	NA	7.5	0	NAV	NA
Methylene chloride	**2550**	**367**	**14.4%**	**4.4**	**40**	**40**	**YES**	**ASL; BTV NA**	**NAV**	**NA**	**1.20E-03**	**356**	**5.00E-02**	**2**
o-Xylene	679	11	1.6%	3.7	0.0091	3.7	NO	IFD	NAV	NA	1.20	0	NAV	NA
Styrene	2519	37	1.5%	13	8.80E-03	13	NO	IFD	NAV	NA	1.80	0	NAV	NA
Tetrachloroethene	**2552**	**568**	**22.3%**	**0.39**	**40,000**	**40,000**	**YES**	**ASL; BTV NA**	**NAV**	**NA**	**4.90E-05**	**568**	**1.30**	**25**
Toluene	2550	106	4.2%	13	20	20	NO	IFD	NAV	NA	1.60	1	0.70	1
trans-1,2-Dichloroethene	2550	21	0.8%	13	6.9	13	NO	IFD	NAV	NA	3.10E-02	1	0.19	1
Trichloroethene	**2551**	**284**	**11.1%**	**13**	**1,600**	**1,600**	**YES**	**ASL; BTV NA**	**NAV**	**NA**	**7.20E-04**	**222**	**0.47**	**7**
Trichlorofluoromethane	600	73	12.2%	7.4	0.0061	7.4	NO	MaxDet < SC	NAV	NA	0.83	0	NAV	NA
Vinyl chloride	2547	3	0.1%	25	3.7	25	NO	IFD	NAV	NA	5.60E-06	3	2.00E-02	1
Xylenes (total)	1926	8	0.4%	13	0.85	13	NO	IFD	NAV	NA	0.20	2	1.60	0

Note: Gray shading denotes analyte selected as a COPC.

Key:
* = Analyte is considered an essential nutrient.
> = Greater than.
ASL = Above screening level.
BSL = Below screening level.
BTV = Background Threshold Value.
COPC= Contaminant of potential concern.
IFD = Infrequent detection.
MaxDet < SL = Maximum detection less than screening level.
mg/kg = milligrams per kilogram.
NA= Not applicable.
NAV= Not available.
NSL = No screening level.
NYSDEC= New York State Department of Environemtnal Conservation.
PCBs = Polychlorinated Biphenyls.
RSL= Regional screening level.
SCO= Soil cleanup objectives.
SL = Screening level concentration.
USEPA= United States Environmental Protection Agency.
VOCs = Volatile Organic Compounds.

Table 4.9-2 Chemical COPC Selection Detail For Soils Based on Direct Contact, Sylvania Corning FUSRAP Site, Hicksville, New York

Analyte	Number of Samples	Number of Detections	Percent Detected	Maximum Nondetect	Maximum Detected	Comparison Concentration	COPC (Yes/No)	Rationale	BTV	Number Detected Above BTV	SL 1: USEPA RSL for Residential Soil	Number Detected Above SL 1	SL 2: USEPA RSL for Industrial Soil	Number Detected Above SL 2	SL 3: NYSDEC SCO for Unrestricted Land Use	Number of Samples Above SL 3	SL 4: NYSDEC SCO for Commercial Land Use	Number of Samples Above SL 4	SL 5: NYSDEC SCO for Industrial Land Use	Number of Samples Above SL 5
Metals (mg/kg)																				
Aluminum	62	62	100.0%	NA	17,200	17,200	NO	BSL	5,950	17	77,000	0	990,000	0	NAV	NA	NAV	NA	NAV	NA
Antimony	62	45	72.6%	2.39	4.4	4.4	NO	BSL	0.639	33	31	0	410	0	NAV	NA	NAV	NA	NAV	NA
Arsenic	62	62	100.0%	NA	15.7	15.7	YES	ASL	2.42	43	0.39	61	1.60	57	13	3	16	0	16	0
Barium	62	62	100.0%	NA	37.2	37.2	NO	BSL	24.7	7	15,000	0	190,000	0	350	0	400	0	10,000	0
Beryllium	807	633	78.4%	0.86	1.40	1.40	NO	BSL	0.35	43	160	0	2,000	0	7.20	0	590	0	2,700	0
Cadmium	62	19	30.6%	0.52	0.41	0.52	NO	BSL	NAV	NA	70	0	800	0	2.5	0	9.30	0	60	0
Calcium	62	62	100.0%	NA	33,100	33,100	NO	Nutrient*	NAV	NA	NAV	NA	NAV	NA	NAV	NA	NAV	NA	NAV	NA
Chromium	62	62	100.0%	NA	37.8	37.8	YES	NSL; >BTV	7.56	19	NAV	NA	NAV	NA	NAV	NA	NAV	NA	NAV	NA
Cobalt	62	61	98.4%	2.8	156	156	YES	ASL	4.60	6	23	1	300	0	NAV	NA	NAV	NA	NAV	NA
Copper	62	62	100.0%	NA	168	168	YES	ASL	9.19	14	3,100	0	41,000	0	50	2	270	0	10,000	0
Iron	62	62	100.0%	NA	20,300	20,300	NO	BSL	10,790	11	55,000	0	720,000	0	NAV	NA	NAV	NA	NAV	NA
Lead	62	62	100.0%	NA	180	180	YES	ASL	10.4	12	400	0	800	0	63	1	1,000	0	3,900	0
Magnesium	62	62	100.0%	NA	20,100	20,100	NO	Nutrient*	NAV	NA	NAV	NA	NAV	NA	NAV	NA	NAV	NA	NAV	NA
Manganese	62	62	100.0%	NA	406	406	NO	BSL	224	2	1,800	0	23,000	0	1,600	0	10,000	0	10,000	0
Mercury	62	37	59.7%	0.03	0.216	0.216	YES	ASL	0.171	3	5.60	0	34	0	0.18	2	2.80	0	6	0
Nickel	2,435	2,261	92.9%	12.4	16,900	16,900	YES	ASL	16.1	294	1,500	11	20,000	0	30	218	310	59	10,000	1
Potassium	62	61	98.4%	515	960	960	NO	Nutrient*	NAV	NA	NAV	NA	NAV	NA	NAV	NA	NAV	NA	NAV	NA
Selenium	62	61	98.4%	0.52	11	11	YES	ASL	0.376	61	390	0	5,100	0	3.90	16	1,500	0	6,800	0
Silver	62	16	25.8%	1	12.6	12.6	YES	ASL	0.137	15	390	0	5,100	0	2	5	1,500	0	6,800	0
Sodium	62	57	91.9%	38.5	1,590	1,590	NO	Nutrient*	NAV	NA	NAV	NA	NAV	NA	NAV	NA	NAV	NA	NAV	NA
Vanadium	62	62	100.0%	NA	53	53	NO	BSL	14.7	17	390	0	5,200	0	NAV	NA	NAV	NA	NAV	NA
Zinc	62	62	100.0%	NA	98.1	98.1	NO	BSL	25.1	12	23,000	0	310,000	0	109	0	10,000	0	10,000	0
PCBs (mg/kg)																				
Aroclor 1254	13	6	46.2%	0.036	1	1	YES	ASL; BTV NA	NAV	NA	0.22	1	0.74	1	NAV	NA	NAV	NA	NAV	NA
Aroclor 1260	13	4	30.8%	0.2	0.069	0.2	NO	BSL	NAV	NA	0.22	0	0.74	0	NAV	NA	NAV	NA	NAV	NA
VOCs (mg/kg)																				
1,1,1-Trichloroethane	2,492	21	0.8%	3.7	0.043	3.7	NO	IFD	NAV	NA	8,700	0	38,000	0	0.68	0	500	0	1,000	0
1,1,2,2-Tetrachloroethane	2,510	2	0.1%	13.0	8.20E-04	13.0	NO	IFD	NAV	NA	0.56	0	2.80	0	NAV	NA	NAV	NA	NAV	NA
1,1,2-Trichloroethane	2,509	3	0.1%	13.0	0.0095	13.0	NO	IFD	NAV	NA	1.10	0	5.30	0	NAV	NA	NAV	NA	NAV	NA
1,1-Dichloroethane	2,451	2	0.1%	13.0	0.0022	13.0	NO	IFD	NAV	NA	3.30	0	17	0	0.27	0	240	0	480	0
1,1-Dichloroethene	2,504	1	0.0%	13.0	15.0	15.0	NO	IFD	NAV	NA	240	0	1,100	0	0.33	1	500	0	1,000	0
1,2,3-Trichlorobenzene	591	2	0.3%	3.7	0.034	3.7	NO	IFD	NAV	NA	49	0	490	0	NAV	NA	NAV	NA	NAV	NA
1,2,4-Trichlorobenzene	594	1	0.2%	3.7	0.00081	3.7	NO	IFD	NAV	NA	22	0	99	0	NAV	NA	NAV	NA	NAV	NA
1,2-Dichlorobenzene	2,483	38	1.5%	25.0	0.15	25.0	NO	IFD	NAV	NA	1,900	0	9,800	0	1.10	0	500	0	1,000	0
1,2-Dichloroethane	2,494	5	0.2%	3.7	0.0021	3.7	NO	IFD	NAV	NA	0.43	0	2.20	0	2.00E-02	0	30	0	60	0
1,3-Dichlorobenzene	2,502	8	0.3%	25.0	1.50E-03	25.0	NO	IFD	NAV	NA	NAV	NA	NAV	NA	2.40	0	280	0	560	0
1,4-Dichlorobenzene	2,495	36	1.4%	25.0	83.0	83	NO	IFD	NAV	NA	2.40	1	12	1	1.80	1	130	0	250	0
2-Butanone	1,928	25	1.3%	15	0.046	15	NO	IFD	NAV	NA	28,000	0	200,000	0	0.119999997	0	500	0	1,000	0
2-Hexanone	2,509	7	0.3%	51.0	5.40E-03	51.0	NO	IFD	NAV	NA	210	0	1,400	0	NAV	NA	NAV	NA	NAV	NA
Acetone	1,831	318	17.4%	30	46.0	46.0	YES	ASL; BTV NA	NAV	NA	61,000	0	630,000	0	5.00E-02	17	500	0	1,000	0
Benzene	2,510	17	0.7%	13.0	3.50E-03	13.0	NO	IFD	NAV	NA	1.10	0	5.40	0	6.00E-02	0	44	0	89	0
Bromodichloromethane	2,499	2	0.1%	13.0	2.20E-04	13.0	NO	IFD	NAV	NA	0.27	0	1.40	0	NAV	NA	NAV	NA	NAV	NA
Bromomethane	2,505	35	1.4%	25.0	0.031	25.0	NO	IFD	NAV	NA	7.30	0	32	0	NAV	NA	NAV	NA	NAV	NA
Carbon disulfide	2,478	31	1.3%	13.0	0.0072	13.0	NO	IFD	NAV	NA	820	0	3,700	0	NAV	NA	NAV	NA	NAV	NA
Carbon tetrachloride	2,492	12	0.5%	3.7	0.034	3.7	NO	IFD	NAV	NA	0.25	0	1.20	0	0.76	0	22	0	44	0
Chlorobenzene	2,469	8	0.3%	13.0	0.0058	13.0	NO	IFD	NAV	NA	290	0	1,400	0	1.10	0	500	0	1,000	0
Chloroform	2,480	11	0.4%	3.7	0.00092	3.7	NO	IFD	NAV	NA	0.29	0	1.5	0	0.370000005	0	350	0	700	0
Chloromethane	2,504	31	1.2%	25.0	1.90E-03	25.0	NO	IFD	NAV	NA	120	0	500	0	NAV	NA	NAV	NA	NAV	NA

Table 4.9-2 Chemical COPC Selection Detail For Soils Based on Direct Contact, Sylvania Corning FUSRAP Site, Hicksville, New York

Analyte	Number of Samples	Number of Detections	Percent Detected	Maximum Nondetect	Maximum Detected	Comparison Concentration	COPC (Yes/No)	Rationale	BTV	Number Detected Above BTV	SL 1: USEPA RSL for Residential Soil	Number Detected Above SL 1	SL 2: USEPA RSL for Industrial Soil	Number Detected Above SL 2	SL 3: NYSDEC SCO for Unrestricted Land Use	Number of Samples Above SL 3	SL 4: NYSDEC SCO for Commercial Land Use	Number of Samples Above SL 4	SL 5: NYSDEC SCO for Industrial Land Use	Number of Samples Above SL 5
cis-1,2-Dichloroethene	2,473	36	1.5%	13.0	210	210	NO	IFD	NAV	NA	780	0	10,000	0	0.25	1	500	0	1,000	0
Cyclohexane	592	2	0.3%	3.7	0.00041	3.7	NO	IFD	NAV	NA	7,000	0	29,000	0	NAV	NA	NAV	NA	NAV	NA
Ethylbenzene	2,489	11	0.4%	13.0	7.70E-02	13.0	NO	IFD	NAV	NA	5.40	0	27	0	1	0	390	0	780	0
Isopropylbenzene	592	5	0.8%	3.7	0.0029	3.7	NO	IFD	NAV	NA	2,100	0	11,000	0	NAV	NA	NAV	NA	NAV	NA
m,p-Xylene	663	23	3.5%	7.4	0.0042	7.4	NO	IFD	NAV	NA	NAV	NA	NAV	NA	NAV	NA	NAV	NA	NAV	NA
Methyl acetate	592	9	1.5%	3.7	0.0064	3.7	NO	IFD	NAV	NA	78,000	0	1,000,000	0	NAV	NA	NAV	NA	NAV	NA
Methylene chloride	2,509	348	13.9%	4.40	40	40	YES	ASL; BTV NA	NAV	NA	11	1	53	0	5.00E-02	2	500	0	1,000	0
o-Xylene	671	10	1.5%	3.7	0.0052	3.7	NO	IFD	NAV	NA	3,800	0	19,000	0	NAV	NA	NAV	NA	NAV	NA
Styrene	2,473	35	1.4%	13.0	8.80E-03	13.0	NO	IFD	NAV	NA	6,300	0	36,000	0	NAV	NA	NAV	NA	NAV	NA
Tetrachloroethene	2,458	548	22.3%	0.39	40000	40,000	YES	ASL; BTV NA	NAV	NA	0.55	27	2.60	21	1.30	23	150	11	300	9
Toluene	2,513	105	4.2%	13.0	20	20	NO	IFD	NAV	NA	5,000	0	45,000	0	0.70	1	500	0	1,000	0
trans-1,2-Dichloroethene	2,510	21	0.8%	13.0	6.90	13.0	NO	IFD	NAV	NA	150	0	690	0	0.189999998	1	500	0	1,000	0
Trichloroethene	2,480	261	10.5%	13.0	1,600	1,600	YES	ASL; BTV NA	NAV	NA	2.80	3	14	1	0.469999999	7	200	1	400	1
Trichlorofluoromethane	592	72	12.2%	7.4	0.0061	7.4	NO	BSL	NAV	NA	790	0	3,400	0	NAV	NA	NAV	NA	NAV	NA
Vinyl chloride	2,508	3	0.1%	25.0	3.70	25.0	NO	IFD	NAV	NA	6.00E-02	1	1.70	1	2.00E-02	1	13	0	27	0
Xylenes (total)	1,882	8	0.4%	13.0	0.85	13.0	NO	IFD	NAV	NA	630	0	2,700	0	0.26	2	500	0	1,000	0

Note: Gray shading denotes analyte selected as a COPC.

Key:
* = Analyte is considered an essential nutrient.
> = Greater than.
ASL = Above screening level.
BSL = Below screening level.
BTV = Background Threshold Value.
COPC = Contaminant of potential concern.
IFD = Infrequent detection.
MaxDet < SL = Maximum detection less than screening level.
mg/kg = milligrams per kilogram.
NA = Not applicable.
NAV = Not available.
NSL = No screening level.
NYSDEC = New York State Department of Environemtnal Conservation.
PCBs = Polychlorinated Biphenyls.
RSL = Regional screening level.
SCO = Soil cleanup objectives.
SL = Screening level concentration.
USEPA = United States Environmental Protection Agency.
VOCs = Volatile Organic Compounds.

Table 4.9-3 Radionuclide COPC Selection Detail For Soils Based on Direct Contact, Sylvania Corning FUSRAP Site, Hicksville, New York

Analyte	Number of Samples	Number of Detections	Percent Detected	Maximum Nondetect	Maximum Detection	Comparison Concentration	COPC (YES/NO)	Rationale	BTV	Number Detected Above BTV	SL 1: USEPA PRGs for Radionuclides for Residential Soil	Number Detected Above SL 1	SL 2: USEPA PRGs for Radionuclides for Outdoor Worker Soil	Number Detected Above SL 2	SL 3: USEPA PRGs for Radionuclides for Indoor Worker Soil	Number Detected Above SL 3
Radionuclides (pCi/g)																
Actinium-228	1449	539	37.2%	1.42	98.8	98.8	NO	BSL	0.878	104	732	0	1,190	0	2,690	0
Bismuth-212	1228	26	2.1%	1.50	65.5	65.5	NO	IFD	NAV	NA	22,600	0	37,000	0	83,300	0
Bismuth-214	1617	885	54.7%	0.81	1.51	1.51	NO	BSL	0.510	175	8,190	0	13,400	0	30,100	0
Cesium-137	56	34	60.7%	0.07	0.31	0.310	NO	BSL	NAV	NA	3.88	0	65	0	120	0
Lead-210	**55**	**19**	**34.5%**	**2.04**	**4.8**	**4.8**	**YES**	**ASL; BTV NA**	**NAV**	**NA**	**0.33**	**19**	**4.19**	**2**	**8**	**0**
Lead-212	1758	1640	93.3%	0.62	103	103	NO	BSL	0.854	128	3640	0	6,130	0	13,800	0
Lead-214	1692	1186	70.1%	0.34	1.75	1.75	NO	BSL	0.576	156	46,300	0	75,600	0	170,000	0
Potassium-40	1739	1734	99.7%	1.60	19.2	19.20	NO*	Ubiquitous*	12.9	17	0.11	1,734	0.27	1,734	0.62	1,734
Protactinium-234m	1191	38	3.2%	23	2130	2130	NO	IFD	NAV	NA	15,200,000	0	24,800,000	0	55,700,000	0
Radium-226	**1773**	**759**	**42.8%**	**0.60**	**1.51**	**1.51**	**YES**	**ASL**	**0.504**	**193**	**0.19**	**657**	**3.70**	**0**	**7.22**	**0**
Radium-228	**1773**	**475**	**26.8%**	**1.42**	**98.8**	**98.8**	**YES**	**ASL**	**0.733**	**140**	**0.26**	**431**	**8.40**	**1**	**15.10000038**	**1**
Thallium-208	1514	746	49.3%	0.66	35	35	NO	BSL	0.261	166	22,600	0	36,800	0	82,800	0
Thorium-228	**2727**	**2487**	**91.2%**	**0.69**	**114**	**114**	**YES**	**ASL**	**1.20**	**113**	**24.20**	**1**	**125**	**0**	**251**	**0**
Thorium-230	**2732**	**2707**	**99.1%**	**0.30**	**23.6**	**23.6**	**YES**	**ASL**	**1.02**	**202**	**3.49**	**1**	**20.20**	**1**	**37.20**	**0**
Thorium-232	**2732**	**2618**	**95.8%**	**0.43**	**129**	**129**	**YES**	**ASL**	**1.18**	**115**	**3.10**	**4**	**19**	**2**	**34.80**	**1**
Thorium-234	1361	775	56.9%	2.41	1020	1,020	NO	BSL	0.625	756	1,330	0	3,280	0	7,260	0
Uranium-234	**2732**	**2709**	**99.2%**	**2.50**	**1900**	**1,900**	**YES**	**ASL**	**0.810**	**1,442**	**4.01**	**579**	**32.40**	**32**	**59.20**	**14**
Uranium-235	**2732**	**1518**	**55.6%**	**0.70**	**104**	**104**	**YES**	**ASL**	**0.091**	**971**	**0.20**	**621**	**0.42**	**295**	**0.94**	**88**
Uranium-238	**2732**	**2692**	**98.5%**	**3.60**	**1920**	**1,920**	**YES**	**ASL**	**0.901**	**1,312**	**4.46**	**474**	**36.80**	**18**	**66.70**	**7**

Note: Gray shading denotes analyte selected as a COPC.

Key:
* = Analyte is considered ubiquitous in the environment and not site related.
> = Greater than.
ASL = Above screening level.
BSL = Below screening level.
BTV = Background Threshold Value.
COPC = Contaminant of potential concern.
pCi/g = Picocuries per gram.
IFD = Infrequent detection.
NA = Not applicable.
NAV = Not available.
PRG = Preliminary remediation goals.
USEPA = United States Environmental Protection Agency.

Table 4.9-4 Radionuclide COPC Selection Detail For Soils Based on Protection of Groundwater

Analyte	Number of Samples	Number of Detections	Percent Detected	Maximum Nondetect	Maximum Detection	Comparison Concentration	COPC (YES/No)	Rationale	BTV	Number Detected Above BTV	SL 1: USEPA PRGs for Radionuclides for Groundwater Protection DAF=20	Number Detected Above SL 1	SL 2: USEPA PRGs for Radionuclides for Groundwater Protection DAF=1	Number Detected Above SL 2
Radionuclides (pCi/g)														
Actinium-228	1449	539	37.2%	1.42	98.8	98.8	YES	NSL; >BTV	0.878	104	NAV	NA	NAV	NA
Bismuth-212	1228	26	2.1%	1.50	65.5	65.5	NO	IFD	NAV	NA	NAV	NA	NAV	NA
Bismuth-214	1617	885	54.7%	0.81	1.51	1.51	YES	NSL; >BTV	0.510	175	NAV	NA	NAV	NA
Cesium-137	56	34	60.7%	0.07	0.31	0.310	NO	BSL	NAV	NA	56.6	0	2.83	0
Lead-210	55	19	34.5%	2.04	4.8	4.8	YES	ASL; BTV NA	NAV	NA	0.0158	19	0.00079	19
Lead-212	1758	1640	93.3%	0.62	103	103	NO	BSL	0.854	128	7.E+07	0	3.E+06	0
Lead-214	1692	1186	70.1%	0.34	1.75	1.75	NO	BSL	0.576	156	3.E+12	0	1.E+11	0
Potassium-40	1739	1734	99.7%	1.60	19.2	19.20	NO*	Ubiquitous*	12.9	17	NAV	NA	NAV	NA
Protactinium-234m	1191	38	3.2%	23	2130	2130	NO	IFD	NAV	NA	NAV	NA	NAV	NA
Radium-226	1773	759	42.8%	0.60	1.51	1.51	YES	ASL	0.504	193	0.32	384	0.02	759
Radium-228	1773	475	26.8%	1.42	98.8	98.8	YES	ASL	0.733	140	1.19	22	0.06	474
Thallium-208	1514	746	49.3%	0.66	35	35	YES	NSL; >BTV	0.261	166	NAV	NA	NAV	NA
Thorium-228	2727	2487	91.2%	0.69	114	114	YES	ASL	1.20	113	66.0	1	3.30	4
Thorium-230	2732	2707	99.1%	0.30	23.6	23.6	YES	ASL	1.02	202	6.06	1	0.30	1608
Thorium-232	2732	2618	95.8%	0.43	129	129	YES	ASL	1.18	115	6.06	3	0.30	1198
Thorium-234	1361	775	56.9%	2.41	1020	1,020	NO	BSL	0.625	756	82,600	0	4,130	0
Uranium-234	2732	2709	99.2%	2.50	1900	1,900	YES	ASL	0.810	1,442	2,240	0	112.00	4
Uranium-235	2732	1518	55.6%	0.70	104	104	YES	ASL	0.091	971	0.78	114	0.04	1297
Uranium-238	2732	2692	98.5%	3.60	1920	1,920	YES	ASL	0.901	1,312	0.12	2612	0.01	2692

Note: Gray shading denotes analyte selected as a COPC.

Key:
* = Analyte is considered ubiquitous in the environment and not site related.
> = Greater than.
ASL = Above screening level.
BSL = Below screening level.
BTV = Background Threshold Value.
COPC= Contaminant of potential concern.
DAF = Dilution attenuation factor
pCi/g = Picocuries per gram
IFD = Infrequent detection.
NA= Not applicable.
NAV= Not available.
NSL = No screening level.
SL = Screening level concentration.
USEPA= United States Environmental Protection Agency.

Table 4.9-5 COPC Determination for Groundwater Summary, Sylvania Corning FUSRAP Site, Hicksville, New York

Chemical	Number of Samples Analyzed	Number of Detections	Percent Detected	Maximum Nondetect	Maximum Detected	Comparison Concentration	COPC (Yes/No)	Rationale	BTV for Local Groundwater	Number Detected Above BTV	Criteria 1: USEPA RSL for Tapwater	Number Detected Above Criteria 1	Criteria 2: USEPA PRG for Radionuclides in Tapwater	Number Detected Above Criteria 2
Metals (µg/L)														
Aluminum	59	40	67.8%	200	9,140	9,140	NO	BSL	2,580	2	37,000	0	NAV	NA
Antimony	59	3	5.1%	2	0.19	2	NO	BSL	NAV	NA	15	0	NAV	NA
Arsenic	59	17	28.8%	1	9.1	9.1	YES	ASL	1.13	6	0.045	17	NAV	NA
Barium	59	59	100.0%	--	196	196	NO	BSL	88.1	19	7,300	0	NAV	NA
Beryllium	59	22	37.3%	0.058	2.8	2.8	NO	BSL	0.183	7	73	0	NAV	NA
Cadmium	59	25	42.4%	0.083	1.5	1.5	NO	BSL	0.416	4	18	0	NAV	NA
Calcium	59	57	96.6%	5,000	140,000	140,000	NO	Nutrient	31,200	7	NAV	NA	NAV	NA
Chromium	59	29	49.2%	1	23.5	23.5	NO	BSL	6.31	4	100a	0	NAV	NA
Cobalt	58	39	67.2%	0.029	57.8	57.8	YES	ASL	2.96	24	11	6	NAV	NA
Copper	59	6	10.2%	25	45.6	45.6	NO	BSL	NAV	NA	1,500	0	NAV	NA
Iron	59	54	91.5%	107	32,400	32,400	YES	ASL	2,680	6	26,000	1	NAV	NA
Lead	59	8	13.6%	1	31.1	31.1	YES	ASL	2.63	2	15b	1	NAV	NA
Magnesium	59	54	91.5%	5,000	29,800	29,800	NO	Nutrient	6,850	8	NAV	NA	NAV	NA
Manganese	59	59	100.0%	--	1,710	1,710	YES	ASL	107	26	880	3	NAV	NA
Nickel	59	56	94.9%	5	2,165	2,165	YES	ASL	4.54	36	730	2	NAV	NA
Potassium	59	8	13.6%	5,000	19,400	19,400	NO	Nutrient	9,150	1	NAV	NA	NAV	NA
Selenium	59	1	1.7%	4	8	8	NO	IFD	NAV	NA	180	0	NAV	NA
Sodium	59	55	93.2%	5,000	627,000	627,000	NO	Nutrient	432,000	2	NAV	NA	NAV	NA
Thallium	59	56	94.9%	0.03	0.4	0.4	NO	BSL	0.156	6	2c	0	NAV	NA
Uranium, total	59	30	50.8%	0.67	10,830	10,830	YES	ASL	0.665	25	110	4	NAV	NA
Vanadium	59	11	18.6%	1.2	83.6	83.6	NO	BSL	7.14	2	180	0	NAV	NA
Zinc	59	38	64.4%	60	134	134	NO	BSL	39.7	7	11,000	0	NAV	NA
Radionuclides (pCi/L)														
Bismuth-212	58	1	1.7%	18.56	35.75	35.75	NO	IFD	NAV	NA	NAV	NA	67.1	0
Bismuth-214	59	9	15.3%	9.08	14.66	14.66	NO	NSL; Bkg na/nd	NAV	NA	NAV	NA	NAV	NA
Lead-212	56	4	7.1%	6.30	6.78	6.78	YES	ASL	5.58	4	NAV	NA	1.90	4
Lead-214	57	5	8.8%	9.45	10.2	10.2	NO	BSL	5.00	3	NAV	NA	138	0
Potassium-40*	56	6	10.7%	36.4	80.0	80.0	NO	Ubiquitous*	NAV	NA	NAV	NA	1.93	6
Protactinium-234	59	8	13.6%	532	2,318	2,318	YES	ASL; Bkg na/nd	NAV	NA	NAV	NA	18.6	8
Radium-226	59	44	74.6%	0.48	3.71	3.71	YES	ASL	1.00	12	NAV	NA	0.00082	44
Radium-228	56	38	67.9%	2.68	4.84	4.84	YES	ASL	1.64	3	NAV	NA	0.046	38
Thallium-208	58	3	5.2%	8.2	7.64	8.2	NO	NSL;<Bkg	12.9	0	NAV	NA	NAV	NA
Thorium-227	58	9	15.5%	1.38	0.82	1.38	NO	MaxDet < SL	0.151	9	NAV	NA	1	0
Thorium-228	56	7	12.5%	0.18	10.52	10.52	YES	ASL; Bkg na/nd	NAV	NA	NAV	NA	0.44	5
Thorium-230	51	17	33.3%	0.95	6.73	6.73	YES	ASL	0.969	4	NAV	NA	0.52	7
Thorium-232	59	6	10.2%	0.35	10.83	10.83	YES	ASL	0.137	6	NAV	NA	0.47	5
Thorium-234	57	9	15.8%	58.2	1,794	1,794	YES	ASL	72.2	7	NAV	NA	2.06	9
Uranium-234	59	37	62.7%	0.15	4,009	4,009	YES	ASL	0.429	24	NAV	NA	0.67	22
Uranium-235	59	17	28.8%	0.23	285	285	YES	ASL; Bkg na/nd	NAV	NA	NAV	NA	0.68	7

Table 4.9-5 COPC Determination for Groundwater Summary, Sylvania Corning FUSRAP Site, Hicksville, New York

Chemical	Number of Samples Analyzed	Number of Detections	Percent Detected	Maximum Nondetect	Maximum Detected	Comparison Concentration	COPC (Yes/No)	Rationale	BTV for Local Groundwater	Number Detected Above BTV	Criteria 1: USEPA RSL for Tapwater	Number Detected Above Criteria 1	Criteria 2: USEPA PRG for Radionuclides in Tapwater	Number Detected Above Criteria 2
Uranium-238	59	30	50.8%	0.16	3,638	3,638	YES	ASL	0.205	25	NAV	NA	0.74	20
VOCs (µg/L)														
1,1,1-Trichloroethane	59	9	15.3%	1	84.5	84.5	NO	BSL	NAV	NA	9,100	0	NAV	NA
1,1,2-Trichloroethane	59	1	1.7%	1	3	3	NO	IFD	NAV	NA	0.24	1	NAV	NA
1,1-Dichloroethane	59	7	11.9%	1	3	3	YES	ASL	1.00	7	2.40	3	NAV	NA
1,1-Dichloroethene	59	9	15.3%	1	55	55	NO	BSL	NAV	NA	340	0	NAV	NA
1,2-Dichloroethane	59	1	1.7%	0.5	1	1	NO	IFD	NAV	NA	0.15	1	NAV	NA
Acetone	59	7	11.9%	5	6	6	NO	BSL	4.46	4	22,000	0	NAV	NA
Bromochloromethane**	59	5	8.5%	1	0.5	1	NO	NSL; Bkg na/nd	NAV	NA	NAV	NA	NAV	NA
Carbon Disulfide	59	1	1.7%	1	1	1	NO	IFD	NAV	NA	1,000	0	NAV	NA
Chloroform	59	17	28.8%	1	23	23	YES	ASL	3.00	12	0.19	17	NAV	NA
Cis-1,2-Dichloroethene	59	5	8.5%	1	7	7	NO	BSL	NAV	NA	370	0	NAV	NA
Methyl isobutyl ketone	59	1	1.7%	1	2	2	NO	IFD	2.00	0	2,000	0	NAV	NA
Methyl tert-butyl ether	59	1	1.7%	1	2	2	NO	IFD	NAV	NA	12	0	NAV	NA
Tetrachloroethene	57	42	73.7%	6	1,400	1,400	YES	ASL	2.71	31	0.11	42	NAV	NA
Trichloroethene	59	30	50.8%	0.5	130	130	YES	ASL	1.51	14	2.00	13	NAV	NA

Notes:

* Potassium-40 occurs naturally and accounts for 0.01% of all of the potassium in the environment.

** Biproduct of chlorination of water - not believed to be site related.

a: Drinking Water Equivalent Level (DWEL)

b: Drinking Water action level at tap

c: Drinking Water Equivalent Level (DWEL)

Key:

< = Less than.
ASL = Above screening level.
BSL = Below screening level.
BTV = Background Threshold Value.
COPC= Contaminant of potential concern.
pCi/L = Picocuries per liter.
IFD = Infrequent detection.
NA= Not applicable.
NAV= Not available.
NSL = No screening level.
PRG= Preliminary remediation goals.
RSL= Regional screening level.
USEPA= United States Environmental Protection Agency.
µg/L = Micrograms per liter.
VOCs= Volatile organic compounds.

Table 6.2-1 Selection of Exposure Pathways, Sylvania Corning FUSRAP Site, Hicksville, County of Nassau, New York

Scenario Timeframe	Source Medium	Exposure Medium	Exposure Points	Receptor Population	Receptor Age	Exposure Routes	Type of Analysis	Rationale for Selection or Exclusion of Exposure Pathway
1. Current and Future Site Conditions: Existing Buildings and Paving; Intact Site Redeveloped for Commercial or Industrial Use	Soil 0-2 ft BGS	Soil	Individual Properties (70, 100, 140)	C-I Workers	Adults	Ingestion, Dermal	Qualitative	Potentially complete exposure pathways but minimal areas accessible for direct contact. No significant exposure
				Child Visitors	1-6 yrs			
				Trespassers	7-17 years			
		Indoor Air		C-I Workers	Adults	Inhalation	Quantitative	Migration of soil vapors to indoor air could result in inhalation exposure.
				Child Visitors	1-6 yrs			
		Radiation		C-I Workers	Adults	External Exposure	Quantitative	Direct contact with soil not required for external radiation exposure.
				Child Visitors	1-6 yrs			
				Trespassers	7-17 years			
2. Current and Future Site Conditions: Existing Buildings and Paving Intact or Removed; Site Redeveloped for Various Uses	Soil 0-10 ft BGS	Soil	Individual Properties (70, 100, 140)	Construction/Utility Workers	Adults	Ingestion, Dermal	Quantitative	May engage in intrusive demolition / construction / maintenance activities - potentially complete pathways
		Outdoor Air				Inhalation		
		Radiation				External Exposure		
3. Future Site Conditions - Existing Buildings and Paving Removed; Site Redeveloped for Commercial or Industrial Use 3a - Minimal Soil Disturbance 3b - Substantial Soil Disturbance	Soil 3a - 0-2 ft 3b - 0-10 ft	Soil, Indoor air, Radiation	Individual Properties (70, 100, 140)	C-I Workers	Adults	Ingestion, Dermal, Inhalation, External	Quantitative	Potentially complete pathways
				Child Visitors	1-6 yrs	Ingestion, Dermal, Inhalation, External	Quantitative	Potentially complete pathways
				Trespassers	7-17 years	Ingestion, Dermal, Inhalation, External Rad	Quantitative	Potentially complete pathways
4. Future Site Conditions: Existing Buildings and Paving Removed; Site Redeveloped for Residential Use 4a - Minimal Soil Disturbance 4b - Substantial Soil Disturbance	Soil 4a - 0-2 ft 4b - 0-10 ft	Soil, Indoor air, Radiation	Individual Properties (70, 100, 140)	Residents	Children, 1-6 yrs, Child/Adults, 1-31 yrs	Ingestion, Dermal, Inhalation, External Rad	Quantitative	Potentially complete pathways
5. Future Site Conditions: Existing Buildings and Paving Removed; Site Redeveloped for Recreational Use	Soil 0-2 ft BGS	Soil, Indoor air, Radiation	Individual Properties (70, 100, 140)	Recreational Users	Children, 1-6 yrs, Child/Adults, 1-31 yrs	Ingestion, Dermal, Inhalation, External Rad	Quantitative	Potentially complete pathways
6. Current and Future Site Conditions	Soil 0-10 ft BGS	Soil, Radiation	Driving Range Remedial Cell 14	Driving Range Workers	Adults	Ingestion, Dermal, Inhalation, External Rad	Qualitative	Potentially complete exposure pathways but minimal areas accessible for direct contact; 3-4 ft of clean cover attenuates radiation; minimal time spent in area. No significant exposure expected.
7. Hypothetical Future use of Site Groundwater as a Source of Potable Water	Groundwater	Drinking Water	Multiple overlapping plumbes at various locations and depths	Hypothetical Future Users of Site Groundwater as a Source of Potable Water	All Ages	Ingestion, Dermal, Inhalation	Quantitative	Hypothetic Exposure Scenario evaluated to support risk management options.

Table 6.6-1 Overall Summary of Cancer Risk, Noncancer Hazard and Radiation Dose Estimates for 140 Cantiague Rock Road Property

Scenario	Source Media	Receptor	Exposure Point Concentration Dataset	Cancer Risk Estimates			Noncancer Hazard Index - Chemical	Maximum Radiation Dose (mrem/yr)	Risk Ratio (Site/Bkgd)	Noncancer Hazard Ratio (Site/Bkgd)
				Chemical	Radiological	Total				
1. Current and Future Site Conditions - Existing Buildings and Paving Intact; Site Redeveloped for Commercial or Industrial Use	Soil 0-2 feet BGS (all Rad); Ambient and Indoor Air (Chemical Inhalation)	Adult Commercial/Industrial	Background	8.98E-07	3.43E-05	3.52E-05	2.10E-03	1.88E+00		
			140 Property	1.32E-05	5.36E-05	6.68E-05	1.16E-02	3.03E+00	1.90	5.51
		Child Visitor 1-6 years of age	Background	1.34E-08	5.25E-07	5.38E-07	2.23E-05	1.17E-01		
			140 Property	1.96E-07	8.23E-07	1.02E-06	7.28E-05	1.88E-01	1.89	3.26
		Adult Trespasser 7-17 years of age	Background	--	1.37E-06	1.37E-06	--	1.67E-01		
			140 Property	--	2.13E-06	2.13E-06	--	2.65E-01	1.55	--
2. Current and Future Site Conditions: Existing Buildings and Paving Intact or Removed; Site Redeveloped for Various Uses	Soil 0-10 feet BGS	Construction/Utility Workers	Background	4.57E-08	9.38E-07	9.84E-07	4.67E-02	1.30E+00		
			140 Property	2.11E-07	1.09E-06	1.30E-06	5.99E-01	1.58E+00	1.32	12.85
3a. Future Site Conditions: Existing Buildings and Paving Removed; Site Redeveloped for Commercial or Industrial Use with Minimal Soil Disturbance	Soil 0-2 feet BGS	Adult Commercial/Industrial Workers	Background	7.34E-07	3.93E-05	4.00E-05	1.59E-02	2.16E+00		
			140 Property	2.83E-06	6.07E-05	6.35E-05	4.50E-02	3.46E+00	1.59	2.84
	Soil 0-2 feet BGS; Groundwater		Background	2.14E-05	5.36E-05	7.50E-05	8.78E-02	--		
			140 Property	7.60E-05	2.55E-03	2.63E-03	2.23E+01	--	35.07	254.06
	Soil 0-2 feet BGS	Child Visitors 1-6 years of age	Background	4.03E-07	6.03E-07	1.01E-06	3.64E-02	1.34E-01		
			140 Property	1.56E-06	9.35E-07	2.49E-06	1.03E-01	2.14E-01	2.48	2.84
	Soil 0-2 feet BGS	Adolescent Trespassers 7-17 years of age	Background	6.95E-08	1.37E-06	1.44E-06	3.43E-03	1.67E-01		
			140 Property	2.68E-07	2.13E-06	2.40E-06	9.76E-03	2.66E-01	1.66	2.85
3b. Future Site Conditions: Existing Buildings and Paving Removed; Site Redeveloped for Commercial or Industrial Use with Substantial Soil Disturbance	Soil 0-10 feet BGS	Adult Commercial/Industrial Workers	Background	7.34E-07	4.23E-05	4.30E-05	1.59E-02	2.24E+00		
			140 Property	3.05E-06	5.07E-05	5.38E-05	2.04E-01	2.71E+00	1.25	12.86
	Soil 0-10 feet BGS; Groundwater		Background	2.14E-05	5.66E-05	7.80E-05	8.78E-02	--		
			140 Property	7.62E-05	2.54E-03	2.62E-03	2.25E+01	--	33.58	255.87
	Soil 0-10 feet BGS	Child Visitors 1-6 years of age	Background	4.03E-07	6.07E-07	1.01E-06	3.64E-02	1.37E-01		
			140 Property	1.63E-06	6.92E-07	2.33E-06	4.67E-01	1.64E-01	2.30	12.85
	Soil 0-10 feet BGS	Adolescent Trespassers 7-17 years of age	Background	6.95E-08	1.44E-06	1.51E-06	3.43E-03	2.24E+00		
			140 Property	2.83E-07	1.68E-06	1.97E-06	4.39E-02	2.71E+00	1.31	12.79
4a. Future Site Conditions: Existing Buildings and Paving Removed; Site Redeveloped for Residential Use with Minimal Soil Disturbance	Soil 0-2 feet BGS	Child/Adult Residents	Background	3.60E-06	2.00E-04	2.03E-04	6.20E-02	9.14E+00		
			140 Property	1.39E-05	3.07E-04	3.21E-04	1.78E-01	1.45E+01	1.58	2.87
	Soil 0-2 feet BGS; Groundwater		Background	5.96E-05	2.38E-04	2.98E-04	6.96E-01	--		
			140 Property	1.94E-04	6.92E-03	7.12E-03	2.33E+02	--	23.91	335.26
	Soil 0-2 feet BGS	Child Residents 1-6 years of age	Background	2.56E-06	4.04E-05	4.29E-05	2.12E-01	9.14E+00		
			140 Property	9.79E-06	4.60E-05	5.58E-05	6.07E-01	1.10E+01	1.30	2.86
	Soil 0-2 feet BGS; Groundwater		Background	2.25E-05	4.64E-05	6.89E-05	6.90E-01	--		
			140 Property	6.82E-05	1.12E-03	1.19E-03	1.82E+02	--	17.26	263.34
4b. Future Site Conditions: Existing Buildings and Paving Removed; Site Redeveloped for Residential Use with Substantial Soil Disturbance	Soil 0-10 feet BGS	Child/Adult Residents	Background	3.60E-06	2.00E-04	2.03E-04	6.20E-02	9.14E+00		
			140 Property	1.49E-05	2.36E-04	2.51E-04	7.84E-01	1.45E+01	1.24	12.64
	Soil 0-10 feet BGS; Groundwater		Background	5.96E-05	2.38E-04	2.98E-04	6.96E-01	--		
			140 Property	1.95E-04	6.85E-03	7.05E-03	2.34E+02	--	23.67	336.13
	Soil 0-10 feet BGS	Child Residents 1-6 years of age	Background	2.48E-06	4.55E-05	4.80E-05	2.12E-01	1.11E+01		
			140 Property	1.01E-05	5.20E-05	6.21E-05	2.68E+00	1.35E+01	1.29	12.65
	Soil 0-10 feet BGS; Groundwater		Background	2.25E-05	5.15E-05	7.40E-05	6.90E-01	--		
			140 Property	6.87E-05	1.13E-03	1.20E-03	1.84E+02	--	16.15	266.34
5. Future Site Conditions: Existing Buildings and Paving Removed; Site Redeveloped for Recreational Use	Soil 0-2 feet BGS	Child/Adult Recreational Users	Background	6.32E-07	7.33E-06	7.97E-06	1.12E-02	3.39E-01		
			140 Property	2.44E-06	1.13E-05	1.37E-05	3.30E-02	5.39E-01	1.72	2.95
		Child Recreational Users	Background	4.37E-07	1.52E-06	1.96E-06	3.77E-02	3.39E-01		
			140 Property	1.69E-06	2.36E-06	4.05E-06	1.09E-01	5.41E-01	2.07	2.89

Table 6.6-2 Summary of Risks for COPCs, 140 Property, Scenarios 4a and 4b

	Soil 0-2 ft BGS		Soil 0-10 ft BGS		Groundwater	
	Cancer Risk	Hazard Index	Cancer Risk	Hazard Index	Cancer Risk	Hazard Index
Chemicals						
Arsenic	1.37E-05	7.17E-02	1.43E-05	7.49E-02	--	--
Cobalt	6.90E-08	9.47E-02	5.10E-07	7.00E-01	--	--
Manganese (Water)	--	--	--	--	--	3.09E+00
Nickel Soluble Salts	1.43E-08	1.13E-02	1.04E-08	8.20E-03	--	--
Uranium, total	--	--	--	--	--	2.29E+02
Chloroform*	--	--	--	--	0.00E+00	3.58E-01
Tetrachloroethylene	7.55E-08	1.05E-10	1.13E-07	4.90E-05	9.47E-05	1.30E-01
Trichloroethylene	1.07E-10	1.12E-08	8.83E-11	9.43E-09	2.12E-06	6.39E-03
Radionuclides						
Radium-226 + D	7.79E-05	--	5.60E-05	--	1.12E-05	--
Radium-228 + D	1.32E-06	--	8.75E-07	--	2.90E-05	--
Thorium-228	1.91E-10	--	1.56E-10	--	2.24E-05	--
Thorium-230	2.37E-06	--	2.01E-06	--	6.17E-06	--
Thorium-232	2.03E-04	--	1.62E-04	--	2.18E-05	--
Uranium-234	2.37E-06	--	1.82E-06	--	2.89E-03	--
Uranium-235 + D	7.50E-06	--	3.01E-06	--	2.10E-04	--
Uranium-238 + D	1.20E-05	--	1.03E-05	--	3.24E-03	--
Totals	3.21E-04	1.78E-01	2.51E-04	7.84E-01	6.53E-03	2.33E+02

Notes:

Scenarios 4a+b - Future Child-Adult Resident Receptor

* When the HI is 1 or less for chloroform, the cancer risk is zero (EPA 2010; see BLRA Section 4.2).

Table 6.6-3 Overall Summary of Cancer Risk, Noncancer Hazard and Radiation Dose Estimates for 100 Cantiague Rock Road Property

Scenario	Source Media	Receptor	Exposure Point Concentration Dataset	Cancer Risk Estimates			Noncancer Hazard Index - Chemical	Maximum Radiation Dose (mrem/yr)	Risk Ratio (Site/Bkgd)	Noncancer Hazard Ratio (Site/Bkgd)
				Chemical	Radiological	Total				
1. Current and Future Site Conditions - Existing Buildings & Paving Intact Site Redeveloped for Commercial or Industrial Use	Soil 0-2 feet BGS (all Rad); Ambient & Indoor Air (Chemical Inhalation)	Adult Commercial / Industrial Workers	Background	8.83E-07	3.46E-05	3.55E-05	2.09E-03	1.78E+00		
			100 Property	7.97E-06	4.37E-05	5.16E-05	6.78E-03	2.43E+00	1.46	3.25
		Child Visitor 1-6 years of age	Background	1.31E-08	5.16E-07	5.29E-07	2.23E-05	1.09E-01		
			100 Property	1.19E-07	6.83E-07	8.02E-07	3.96E-05	1.45E-01	1.52	1.77
		Adult Trespasser 7-17 years of age	Background	--	1.35E-06	1.35E-06	--	1.05E-01		
			100 Property	--	1.75E-06	1.75E-06	--	1.45E-01	1.29	--
2. Current & Future Site Conditions - Existing Buildings & Paving Intact or Removed; Site Redeveloped for Various Uses	Soil 0-10 feet BGS	Construction/Utility Workers	Background	4.37E-08	9.43E-07	9.86E-07	1.47E-02	1.31E+00		
			100 Property	3.38E-07	1.37E-06	1.71E-06	7.81E-02	3.23E+00	1.73	5.30
			100 Property w/o Outliers	2.18E-07	8.98E-07	1.12E-06	7.09E-02	1.67E+00	1.13	4.81
3a. Future Site Conditions - Existing Buildings & Paving Removed; Site Redeveloped for Commercial or Industrial Use with Minimal Soil Disturbance	Soil 0-2 feet BGS	Adult Commercial / Industrial Workers	Background	7.28E-07	3.91E-05	3.98E-05	5.00E-03	2.13E+00		
			100 Property	3.47E-06	9.78E-05	1.01E-04	2.44E-02	5.24E+00	2.55	4.88
			100 Property w/o Outliers	3.39E-06	4.94E-05	5.27E-05	2.24E-02	1.91E+00	1.33	4.49
	Soil 0-2 feet BGS; Groundwater		Background	1.86E-05	5.29E-05	7.15E-05	6.48E-02	--		
			100 Property	1.72E-04	2.91E-04	4.63E-04	8.13E-01	--	6.47	12.55
			100 Property w/o Outliers	1.72E-04	2.42E-04	4.14E-04	8.11E-01	--	5.79	12.52
	Soil 0-2 feet BGS	Child Visitors 1-6 years of age	Background	4.03E-07	5.92E-07	9.95E-07	1.15E-02	1.32E-01		
			100 Property	1.92E-06	1.39E-06	3.32E-06	5.59E-02	3.25E-01	3.33	4.87
			100 Property w/o Outliers	1.88E-06	7.75E-07	2.65E-06	5.16E-02	1.72E-01	2.67	4.49
	Soil 0-2 feet BGS	Adolescent Trespassers 7-17 years of age	Background	6.94E-08	1.37E-06	1.44E-06	1.10E-03	1.65E-01		
			100 Property	3.31E-07	3.34E-06	3.67E-06	5.35E-03	4.04E-01	2.54	4.86
			100 Property w/o Outliers	3.23E-07	1.76E-06	2.08E-06	4.94E-03	2.13E-01	1.45	4.50
3b. Future Site Conditions - Existing Buildings & Paving Removed; Site Redeveloped for Commercial or Industrial Use with Substantial Soil Disturbance	Soil 0-10 feet BGS	Adult Commercial / Industrial Workers	Background	7.28E-07	4.21E-05	4.28E-05	5.00E-03	2.24E+00		
			100 Property	5.65E-06	5.46E-05	6.02E-05	2.65E-02	2.93E+00	1.41	5.30
			100 Property w/o Outliers	3.64E-06	5.46E-05	5.82E-05	2.40E-02	2.93E+00	1.36	4.81
	Soil 0-10 feet BGS; Groundwater		Background	1.86E-05	5.59E-05	7.45E-05	6.48E-02	--		
			100 Property	1.74E-04	2.48E-04	4.21E-04	8.15E-01	--	5.65	12.58
			100 Property w/o Outliers	1.72E-04	2.48E-04	4.19E-04	8.12E-01	--	5.63	12.54
	Soil 0-10 feet BGS	Child Visitors 1-6 years of age	Background	4.03E-07	5.96E-07	1.00E-06	1.15E-02	1.36E-01		
			100 Property	3.13E-06	7.94E-07	3.92E-06	6.09E-02	1.78E-01	3.93	5.30
			100 Property w/o Outliers	2.02E-06	7.94E-07	2.81E-06	5.53E-02	1.78E-01	2.81	4.81
	Soil 0-10 feet BGS	Adolescent Trespassers 7-17 years of age	Background	6.94E-08	1.43E-06	1.50E-06	1.10E-03	1.73E-01		
			100 Property	5.38E-07	1.88E-06	2.41E-06	5.82E-03	2.25E-01	1.61	5.29
			100 Property w/o Outliers	3.47E-07	1.88E-06	2.22E-06	5.29E-03	2.25E-01	1.48	4.82

Table 6.6-3 Overall Summary of Cancer Risk, Noncancer Hazard and Radiation Dose Estimates for 100 Cantiague Rock Road Property

Scenario	Source Media	Receptor	Exposure Point Concentration Dataset	Cancer Risk Estimates			Noncancer Hazard Index - Chemical	Maximum Radiation Dose (mrem/yr)	Risk Ratio (Site/Bkgd)	Noncancer Hazard Ratio (Site/Bkgd)
				Chemical	Radiological	Total				
4a. Future Site Conditions - Existing Buildings & Paving Removed; Site Redeveloped for Residential Use with Minimal Soil Disturbance	Soil 0-2 feet BGS	Child/Adult Residents	Background	3.57E-06	1.98E-04	2.02E-04	2.06E-02	9.09E+00		
			100 Property	1.70E-05	4.96E-04	5.13E-04	1.00E-01	2.21E+01	2.54	4.88
			100 Property w/o Outliers	1.66E-05	2.50E-04	2.66E-04	9.24E-02	1.19E+01	1.32	4.49
	Soil 0-2 feet BGS; Groundwater		Background	6.68E-05	2.35E-04	3.02E-04	5.26E-01	--		
			100 Property	5.78E-04	1.12E-03	1.70E-03	7.47E+00	--	5.63	14.20
			100 Property w/o Outliers	5.77E-04	8.77E-04	1.45E-03	7.46E+00	--	4.82	14.18
	Soil 0-2 feet BGS	Child Residents 1-6 years of age	Background	2.56E-06	4.04E-05	4.29E-05	7.02E-02	9.09E+00		
			100 Property	1.19E-05	3.09E-04	3.21E-04	3.41E-01	2.21E+01	7.48	4.86
			100 Property w/o Outliers	9.79E-06	4.60E-05	5.58E-05	3.16E-01	1.19E+01	1.30	4.50
	Soil 0-2 feet BGS; Groundwater		Background	2.96E-05	4.55E-05	7.51E-05	4.50E-01	--		
			100 Property	2.44E-04	3.37E-04	5.81E-04	5.97E+00	--	7.74	13.27
			100 Property w/o Outliers	2.44E-04	2.95E-04	5.39E-04	5.94E+00	--	7.17	13.21
4b. Future Site Conditions - Existing Buildings & Paving Removed; Site Redeveloped for Residential Use with Substantial Soil Disturbance	Soil 0-10 feet BGS	Child/Adult Residents	Background	3.57E-06	1.98E-04	2.02E-04	2.06E-02	9.09E+00		
			100 Property	2.68E-05	3.08E-04	3.34E-04	1.09E-01	1.41E+01	1.66	5.28
			100 Property w/o Outliers	1.78E-05	3.08E-04	3.25E-04	9.90E-02	1.41E+01	1.61	4.81
	Soil 0-10 feet BGS; Groundwater		Background	6.68E-05	2.35E-04	3.02E-04	5.26E-01	--		
			100 Property	5.88E-04	9.35E-04	1.52E-03	7.48E+00	--	5.04	14.21
			100 Property w/o Outliers	5.79E-04	9.35E-04	1.51E-03	7.47E+00	--	5.01	14.20
	Soil 0-10 feet BGS	Child Residents 1-6 years of age	Background	2.47E-06	4.49E-05	4.73E-05	7.02E-02	1.09E+01		
			100 Property	1.86E-05	6.00E-05	7.86E-05	3.70E-01	1.41E+01	1.66	5.28
			100 Property w/o Outliers	1.23E-05	6.00E-05	7.23E-05	3.38E-01	1.41E+01	1.53	4.82
	Soil 0-10 feet BGS; Groundwater		Background	2.96E-05	5.07E-05	8.02E-05	4.50E-01	--		
			100 Property	2.51E-04	3.03E-04	5.54E-04	6.00E+00	--	6.90	13.34
			100 Property w/o Outliers	2.45E-04	3.03E-04	5.47E-04	5.97E+00	--	6.82	13.26
5. Future Site Conditions - Existing Buildings & Paving Removed; Site Redeveloped for Recreational Use	Soil 0-2 feet BGS	Child/Adult Recreational Users	Background	6.31E-07	7.29E-06	7.92E-06	4.07E-03	3.33E-01		
			100 Property	3.00E-06	9.38E-06	1.24E-05	2.03E-02	4.40E-01	1.56	4.98
			100 Property w/o Outliers	2.94E-06	9.38E-06	1.23E-05	1.79E-02	4.40E-01	1.56	4.40
		Child Recreational Users 1-6 years of age	Background	4.37E-07	1.49E-06	1.93E-06	1.29E-02	3.34E-01		
			100 Property	2.08E-06	1.99E-06	4.07E-06	6.29E-02	4.41E-01	2.11	4.89
			100 Property w/o Outliers	2.04E-06	1.99E-06	4.02E-06	5.75E-02	4.41E-01	2.08	4.47

Table 6.6-4 Summary of Risks for COPCs, 100 Property, Scenarios 4a and 4b

	Soil 0-2 ft BGS		Soil 0-10 ft BGS		Groundwater	
	Cancer Risk	Hazard Index	Cancer Risk	Hazard Index	Cancer Risk	Hazard Index
Chemicals						
Arsenic	1.66E-05	8.71E-02	1.76E-05	9.25E-02	9.99E-05	1.55E+00
Nickel Soluble Salts	1.78E-08	1.32E-02	1.66E-08	1.23E-02	--	4.85E+00
Chloroform*	--	--	--	--	0.00E+00	2.79E-01
Dichloroethane, 1,1-	--	--	--	--	1.05E-06	6.17E-03
Tetrachloroethylene	3.68E-07	1.60E-04	9.17E-06	3.97E-03	4.32E-04	5.91E-01
Trichloroethylene	8.30E-12	9.51E-10	7.73E-10	8.86E-08	2.82E-05	8.50E-02
Radionuclides						
Radium-226 + D	6.54E-05	--	6.86E-05	--	1.06E-05	--
Radium-228 + D	1.34E-06	--	1.87E-06	--	3.42E-05	--
Thorium-228	--	--	--	--	1.07E-06	--
Thorium-232	1.73E-04	--	2.16E-04	--	1.03E-06	--
Uranium-234	1.28E-06	--	3.19E-06	--	8.44E-06	--
Uranium-235 + D	1.59E-06	--	3.49E-06	--	7.84E-07	--
Uranium-238 + D	7.50E-06	--	1.50E-05	--	1.01E-05	--
Total	2.67E-04	1.00E-01	3.34E-04	1.09E-01	6.27E-04	7.37E+00

Notes:

Scenarios 4a+b - Future Child-Adult Resident Receptor

* When the HI is 1 or less for chloroform, the cancer risk is zero (EPA 2010; see BLRA Section 4.2).

Table 6.6-5 Overall Summary of Cancer Risk, Noncancer Hazard and Radiation Dose Estimates for 70 Cantiague Rock Road Property

Scenario	Source Media	Receptor	Exposure Point Concentration Dataset	Cancer Risk Estimates			Noncancer Hazard Index - Chemical	Maximum Radiation Dose (mrem/yr)	Risk Ratio (Site/Bkgd)	Noncancer Hazard Ratio (Site/Bkgd)
				Chemical	Radiological	Total				
1. Current and Future Site Conditions - Existing Buildings & Paving Intact Site Redeveloped for Commercial or Industrial Use	Soil 0-2 feet BGS (all Rad); Outdoor & Indoor Air (Chemical Inhalation)	Adult Commercial / Industrial Workers	Background	5.74E-07	3.46E-05	3.51E-05	7.13E-04	1.77E+00		
			70 Property	4.58E-06	5.17E-05	5.63E-05	3.28E-03	2.58E+00	1.60	4.60
		Child Visitor 1-6 years of age	Background	8.54E-09	5.16E-07	5.24E-07	8.61E-07	1.09E-01		
			70 Property	6.82E-08	7.61E-07	8.29E-07	8.12E-06	1.60E-01	1.58	9.43
		Adolescent Trespassers 7-17 years of age	Background	--	1.37E-06	1.37E-06	--	1.65E-01		
			70 Property	--	2.04E-06	2.04E-06	--	2.45E-01	1.48	--
2. Current & Future Site Conditions - Existing Buildings & Paving Intact or	Soil 0-10 feet BGS	Construction/Utility Workers	Background	4.37E-08	5.90E-07	6.34E-07	1.47E-02	1.29E+00		
			70 Property	2.16E-07	6.55E-07	8.71E-07	1.11E-01	1.40E+00	1.37	7.52
3a. Future Site Conditions - Existing Buildings & Paving Removed; Site Redeveloped for Commercial or Industrial Use with Minimal Soil Disturbance	Soil 0-2 feet BGS	Adult Commercial / Industrial Workers	Background	7.28E-07	3.90E-05	3.98E-05	5.00E-03	2.13E+00		
			70 Property	3.77E-06	5.84E-05	6.22E-05	5.11E-02	3.17E+00	1.56	10.21
	Soil 0-2 feet BGS; Groundwater		Background	1.86E-05	5.34E-05	7.20E-05	2.05E-01	--		
			70 Property	3.17E-03	8.55E-05	3.25E-03	3.53E+00	--	45.17	17.23
	Soil 0-2 feet BGS	Child Visitors 1-6 years of age	Background	4.03E-07	5.91E-07	9.94E-07	1.15E-02	1.32E-01		
			70 Property	2.09E-06	8.63E-07	2.95E-06	1.18E-01	1.97E-01	2.97	10.25
	Soil 0-2 feet BGS	Adolescent Trespassers 7-17 years of age	Background	6.94E-08	1.37E-06	1.44E-06	1.10E-03	1.65E-01		
			70 Property	3.59E-07	2.03E-06	2.39E-06	1.13E-02	2.44E-01	1.66	10.29
3b. Future Site Conditions - Existing Buildings & Paving Removed; Site Redeveloped for Commercial or Industrial Use with Substantial Soil Disturbance	Soil 0-10 feet BGS	Adult Commercial / Industrial Workers	Background	7.28E-07	4.21E-05	4.28E-05	5.00E-03	2.23E+00		
			70 Property	3.61E-06	4.51E-05	4.87E-05	3.75E-02	2.40E+00	1.14	7.50
	Soil 0-10 feet BGS; Groundwater		Background	1.86E-05	5.64E-05	7.50E-05	2.05E-01	--		
			70 Property	3.17E-03	7.22E-05	3.24E-03	3.51E+00	--	43.18	17.17
	Soil 0-10 feet BGS	Child Visitors 1-6 years of age	Background	4.03E-07	5.96E-07	9.99E-07	1.15E-02	1.36E-01		
			70 Property	2.00E-06	6.12E-07	2.61E-06	8.64E-02	1.46E-01	2.61	7.52
	Soil 0-10 feet BGS	Adolescent Trespassers 7-17 years of age	Background	6.94E-08	1.43E-06	1.50E-06	1.10E-03	1.73E-01		
			70 Property	3.44E-07	1.51E-06	1.85E-06	8.29E-03	1.85E-01	1.23	7.54
4a. Future Site Conditions - Existing Buildings & Paving Removed; Site Redeveloped for Residential Use with Minimal Soil Disturbance	Soil 0-2 feet BGS	Child/Adult Residents	Background	3.57E-06	1.98E-04	2.02E-04	2.06E-02	9.09E+00		
			70 Property	1.91E-05	2.97E-04	3.16E-04	2.49E-01	1.37E+01	1.56	12.08
	Soil 0-2 feet BGS; Groundwater		Background	6.68E-05	2.36E-04	3.03E-04	1.99E+00	--		
			70 Property	1.05E-02	3.69E-04	1.09E-02	2.78E+01	--	35.93	13.95
	Soil 0-2 feet BGS	Child Residents 1-6 years of age	Background	2.56E-06	4.04E-05	4.29E-05	7.02E-02	9.09E+00		
			70 Property	1.19E-05	3.09E-04	3.21E-04	8.45E-01	1.37E+01	7.48	12.03
	Soil 0-2 feet BGS; Groundwater		Background	3.86E-05	7.18E-05	1.10E-04	1.59E+00	--		
			70 Property	4.35E-03	6.94E-05	4.42E-03	2.13E+01	--	40.02	13.39
4b. Future Site Conditions - Existing Buildings & Paving Removed; Site Redeveloped for Residential Use with Substantial Soil Disturbance	Soil 0-10 feet BGS	Child/Adult Residents	Background	3.57E-06	1.98E-04	2.02E-04	2.06E-02	9.09E+00		
			70 Property	1.80E-05	2.56E-04	2.74E-04	1.74E-01	1.19E+01	1.36	8.48
	Soil 0-10 feet BGS; Groundwater		Background	6.68E-05	2.36E-04	3.03E-04	1.99E+00	--		
			70 Property	1.05E-02	3.28E-04	1.09E-02	2.77E+01	--	35.80	13.92
	Soil 0-10 feet BGS	Child Residents 1-6 years of age	Background	2.47E-06	4.48E-05	4.73E-05	7.02E-02	1.09E+01		
			70 Property	1.25E-05	4.62E-05	5.86E-05	5.94E-01	1.19E+01	1.24	8.46
	Soil 0-10 feet BGS; Groundwater		Background	3.86E-05	7.70E-05	1.16E-04	1.59E+00	--		
			70 Property	4.35E-03	5.75E-05	4.41E-03	2.10E+01	--	38.13	13.23
5. Future Site Conditions - Existing Buildings & Paving Removed; Site Redeveloped for Recreational Use	Soil 0-2 feet BGS	Child/Adult Recreational Users	Background	6.31E-07	7.29E-06	7.92E-06	4.07E-03	3.33E-01		
			70 Property	3.37E-06	1.09E-05	1.43E-05	4.52E-02	4.95E-01	1.80	11.11
		Child Recreational Users	Background	4.37E-07	1.49E-06	1.93E-06	1.29E-02	3.34E-01		
			70 Property	2.33E-06	2.18E-06	4.51E-06	1.51E-01	4.97E-01	2.34	11.72

Table 6.6-6 Summary of Risks for COPCs, 70 Property, Scenarios 4a and 4b

Substance	Soil 0-2 ft BGS		Soil 0-10 ft BGS		Groundwater	
	Cancer Risk	Hazard Index	Cancer Risk	Hazard Index	Cancer Risk	Hazard Index
Chemicals						
Arsenic	1.54E-05	8.06E-02	1.63E-05	8.53E-02	3.09E-05	4.81E-01
Cobalt	--	--	--	--	--	8.40E+00
Manganese (Water)	--	--	--	--	--	2.92E+00
Nickel Soluble Salts	2.78E-09	2.07E-03	3.09E-09	2.31E-03	--	1.26E+00
Chloroform*	--	--	--	--	0.00E+00	1.01E-01
Dichloroethane, 1,1-	--	--	--	--	1.05E-06	6.17E-03
Tetrachloroethylene	8.44E-07	3.66E-04	2.67E-07	1.16E-04	1.05E-02	1.43E+01
Trichloroethylene	--	--	--	--	8.65E-06	2.61E-02
Aroclor 1254	2.84E-06	1.66E-01	1.49E-06	8.68E-02	--	--
Radionuclides						
Radium-226 + D	7.76E-05	--	7.27E-05	--	1.37E-05	--
Radium-228 + D	1.29E-06	--	1.09E-06	--	4.38E-05	--
Thorium-228	--	--	--	--	2.44E-06	--
Thorium-230	--	--	--	--	2.63E-06	--
Thorium-232	2.10E-04	--	1.72E-04	--	2.16E-06	--
Uranium-234	1.03E-06	--	2.03E-06	--	3.05E-06	--
Uranium-235 + D	1.18E-06	--	2.35E-06	--	5.03E-07	--
Uranium-238 + D	5.85E-06	--	6.41E-06	--	3.60E-06	--
Total	3.16E-04	2.49E-01	2.74E-04	1.74E-01	1.06E-02	2.75E+01

Notes:

Scenarios 4a+b - Future Child-Adult Resident Receptor

* When the HI is 1 or less for chloroform, the cancer risk is zero (EPA 2010; see BLRA Section 4.2).

Table 6.6-7 Overall Summary of Cancer Risks and Noncancer Hazards for Driving Range Property Groundwater

Scenario	Source Media	Receptor	Exposure Point Concentration Dataset	Cancer Risk Estimates			Noncancer Hazard Index - Chemical	Risk Ratio (Site/Bkgd)	Noncancer Hazard Ratio (Site/Bkgd)
				Chemical	Radiological	Total			
3. Future Site Conditions - Existing Buildings & Paving Removed; Site	Groundwater	C-I Workers	Background	1.72E-05	3.69E-06	2.09E-05	1.96E-01		
			Driving Range	2.68E-03	2.44E-05	2.70E-03	3.33E+00	129.03	17.02
4. Future Site Conditions - Existing Buildings & Paving Removed; Site Redeveloped for Residential Use	Groundwater	Child/Adult Residents	Background	6.20E-05	9.82E-06	7.19E-05	1.94E+00		
			Driving Range	8.91E-03	6.49E-05	8.98E-03	2.70E+01	124.95	13.90
	Groundwater	Child Residents	Background	3.52E-05	8.27E-06	4.35E-05	1.50E+00		
			Driving Range	3.69E-03	1.02E-05	3.70E-03	2.01E+01	85.10	13.43

Figures

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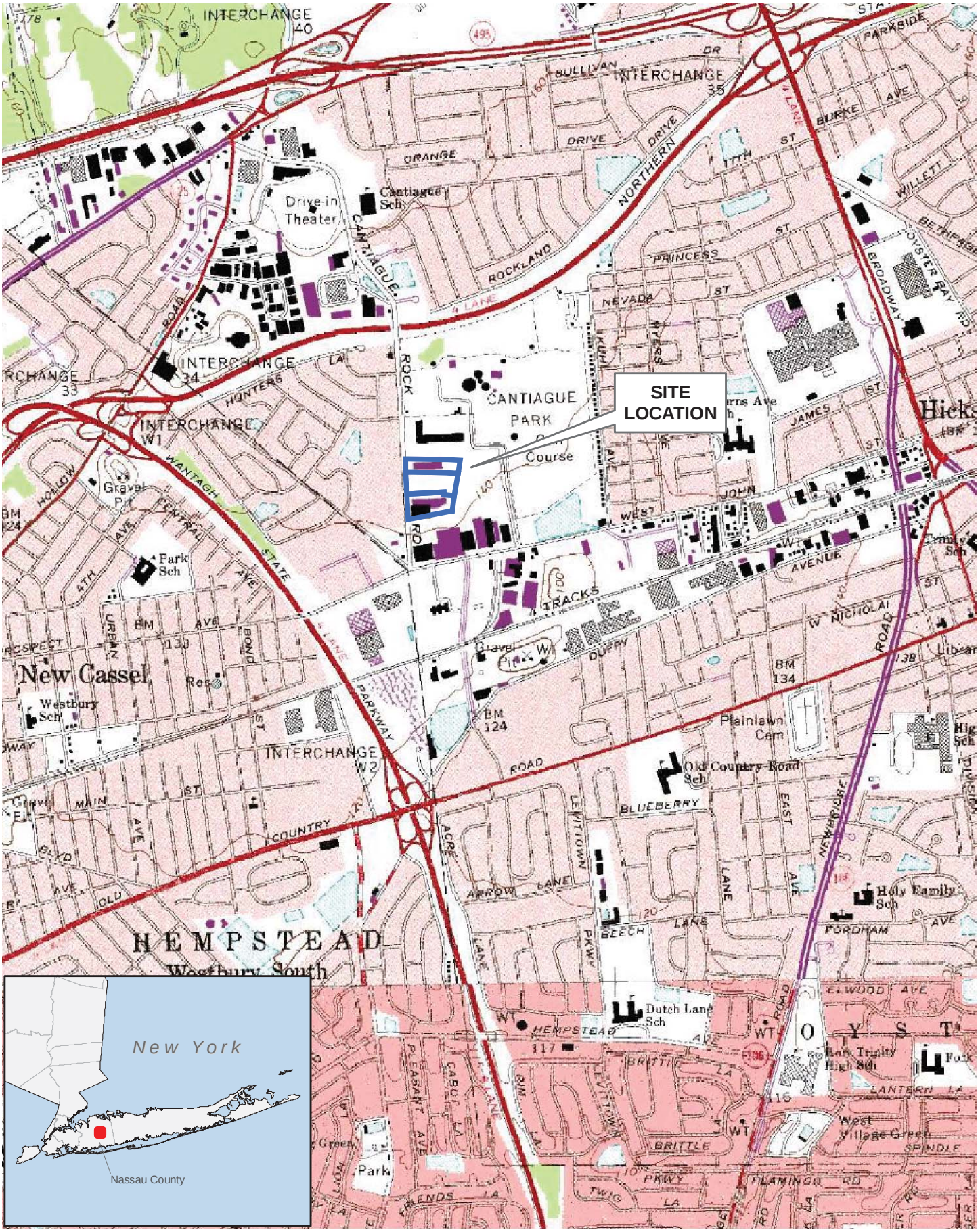

0 1,250 2,500 Feet

0 125 250 500 Meters

Property Boundary

Figure 1-1

Site Location Map
Sylvania Corning FUSRAP Site
Hicksville, NY

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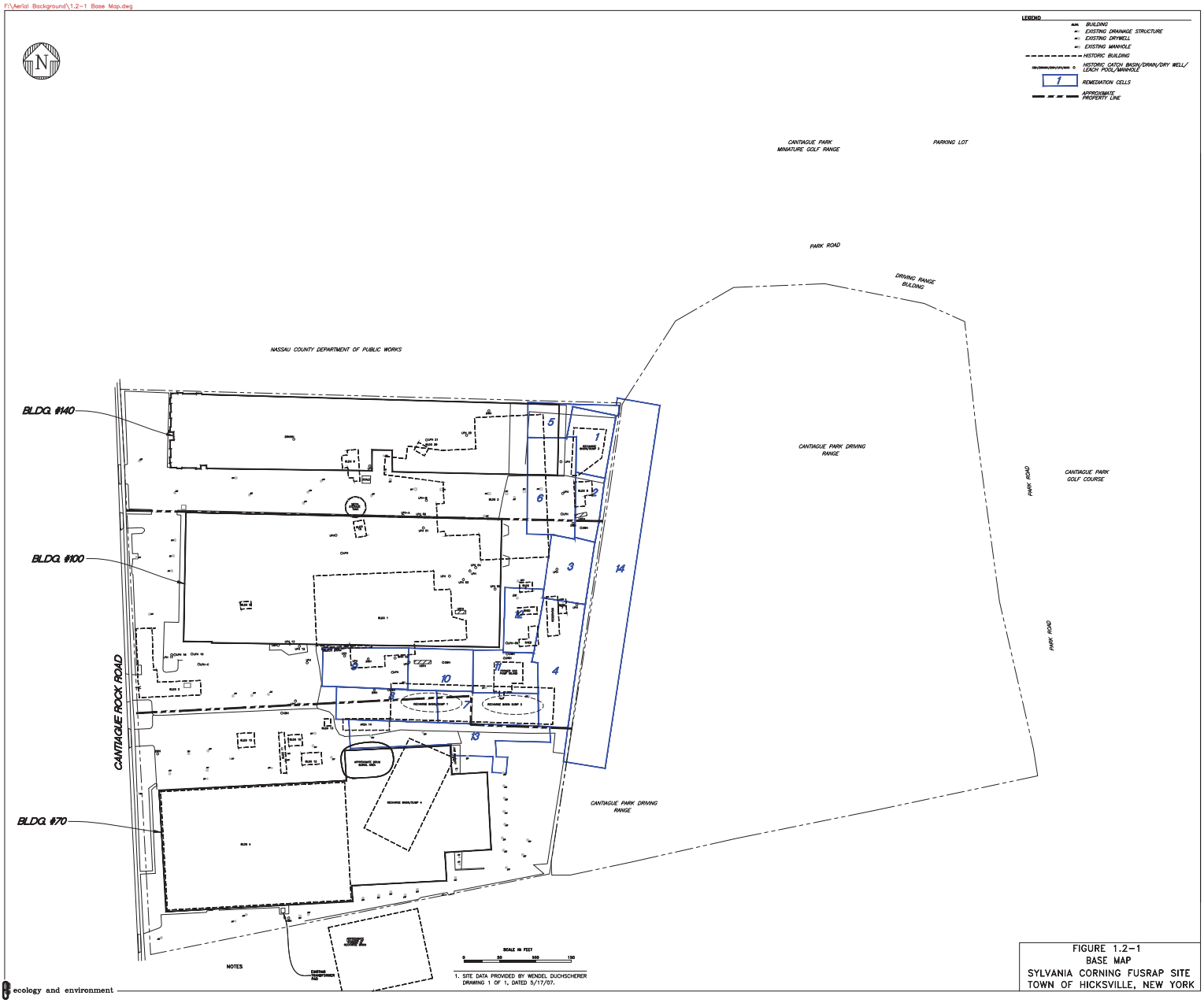

NOTES

1. SITE DATA PROVIDED BY WENDEL DUCHSCHERER DRAWING 1 OF 1, DATED 5/17/07.

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FIGURE 1.2-1
BASE MAP
SYLVANIA CORNING FUSRAP SITE
TOWN OF HICKSVILLE, NEW YORK

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LEGEND

	EXISTING BUILDING
	USED FOR 1293 AND COMMERCIAL WORK
	COMMERCIAL AREA
	1293 AREA
	RECHARGE BASIN/SUMP
	HISTORIC BUILDING
CBH/DRAINH/DWH/LPH/MHH	HISTORIC CATCH BASIN/DRAIN/DRY WELL/ LEACH POOL/MANHOLE
USTH	HISTORIC UST AREA
BLDG 1	AEC PRODUCTION
BLDG 2	AEC PRODUCTION
BLDG 2B	COMMERCIAL AREA
BLDG 3	ADMINISTRATIVE OFFICES
BLDG 4	COMMERCIAL PRODUCTIONS
BLDG 5	GUARD HOUSE
BLDG 6	SOLVENT STORAGE
BLDG 7	PUMP HOUSE
BLDG 8	BURN AND CHEMICAL PROCESSING
BLDG 9	FARMHOUSE
BLDG 10	SNM LONG TERM STORAGE
BLDG 11	GAS STORAGE
BLDG 12	ISOSTATIC PROCESSING
BLDG 13	SNM STORAGE
AREA 14	CONCRETE PAD
BLDG 15	SHED FOR STORAGE AND WOOD
BLDG 16	HOSE AND PUMP HOUSE

SCALE IN FEET

0 100 200 300

FIGURE 1.2-2
HISTORICAL AND
EXISTING FEATURES
SYLVANIA CORNING FUSRAP SITE
TOWN OF HICKSVILLE, NEW YORK

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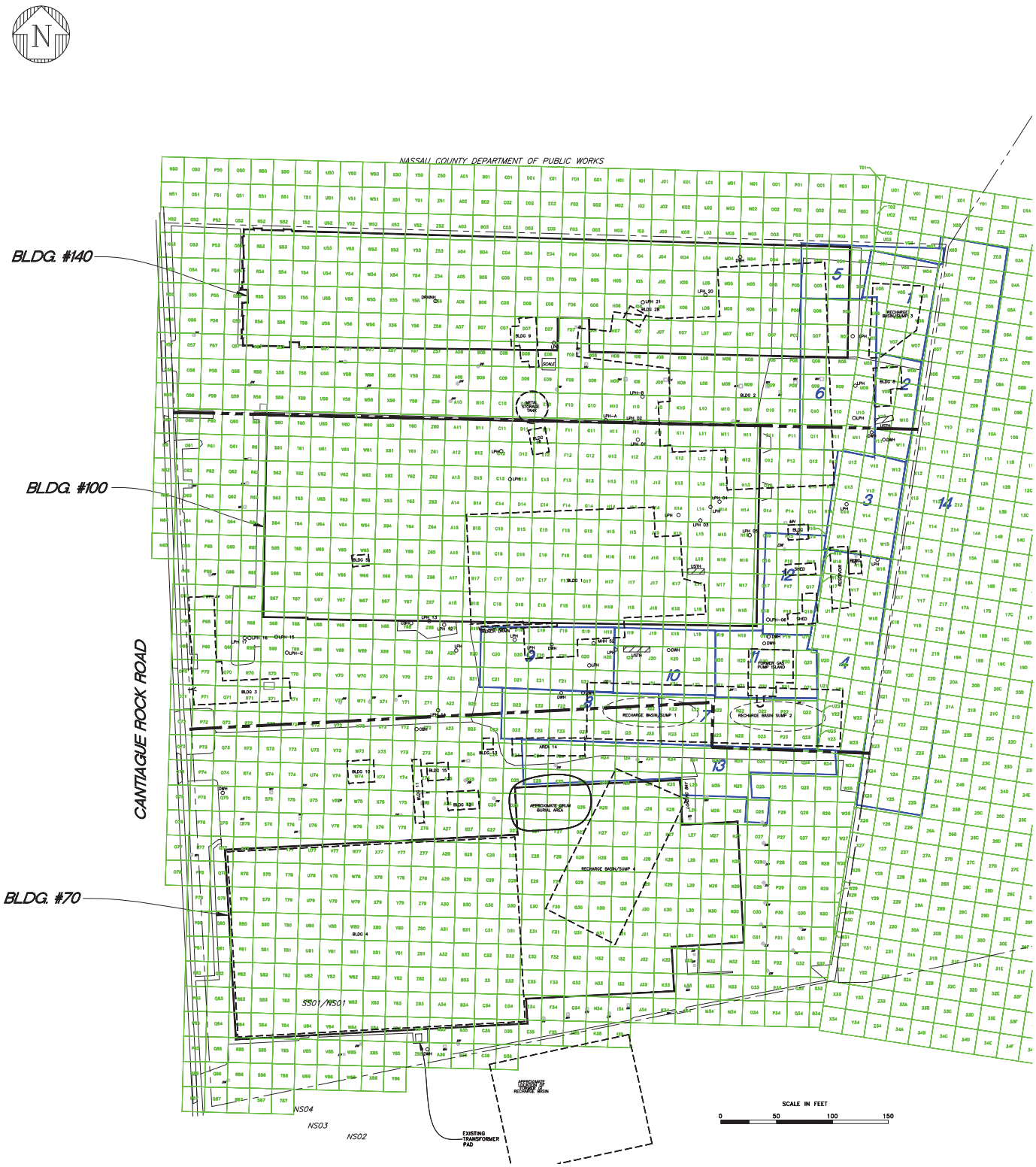


LEGEND

- BLDG. BUILDING
- EXISTING DRAINAGE STRUCTURE
- EXISTING DRYWELL
- EXISTING MANHOLE
- HISTORIC BUILDING
- CBH/DRAINH/DWH/LPH/MHH HISTORIC CATCH BASIN/DRAIN/DRY WELL/ LEACH POOL/MANHOLE
- 1 REMEDIATION CELLS
- 070 SUBCELL GRID LOCATION
- APPROXIMATE PROPERTY LINE

NOTES

1. SITE DATA PROVIDED BY WENDEL DUCHSCHERER DRAWING 1 OF 1, DATED 5/17/07.

FIGURE 1.2-3
GTEOSI SUBCELL SAMPLING GRID
SYLVANIA CORNING FUSRAP SITE
TOWN OF HICKSVILLE, NEW YORK

ecology and environment

F:\SLYVANIA\2010 figures\2.1-1 GTEOSI figure.dwg

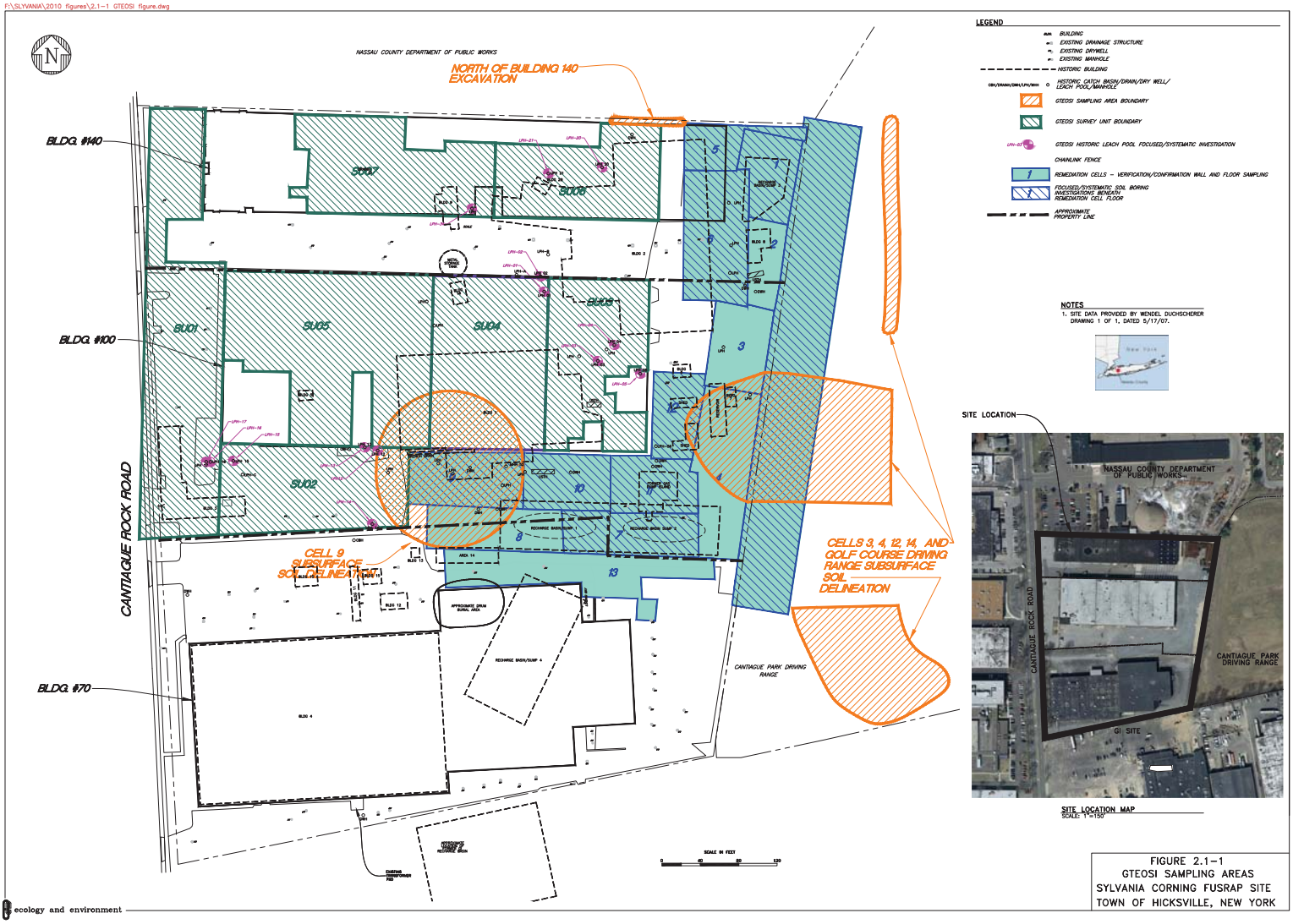


FIGURE 2.1-1
GTEOSI SAMPLING AREAS
SYLVANIA CORNING FUSRAP SITE
TOWN OF HICKSVILLE, NEW YORK

ecology and environment

LEGEND

GTEOSI MONITORING WELL - EXISTING

GTEOSI MONITORING WELL - DECOMMISSIONED

NOTES

1. AERIAL IMAGE FROM NYS GIS CLEARINGHOUSE HIGH RESOLUTION DIGITAL ORTHOIMAGERY (6-INCHES RESOLUTION - 2004).

SCALE IN FEET

0 50 100 200

SOURCE: GTEOSI, Jan. 2007

Figure 2.1-2 GTEOSI On-Site Monitoring Well Locations
Sylvania Corning FUSRAP Site
Town of Hicksville, New York

LEGEND

PROFILE LOCATION - DATA INCLUDED IN PREVIOUS REPORTS

PROFILE LOCATION - DATA INCLUDED WITHIN THIS REPORT

SCALE IN FEET

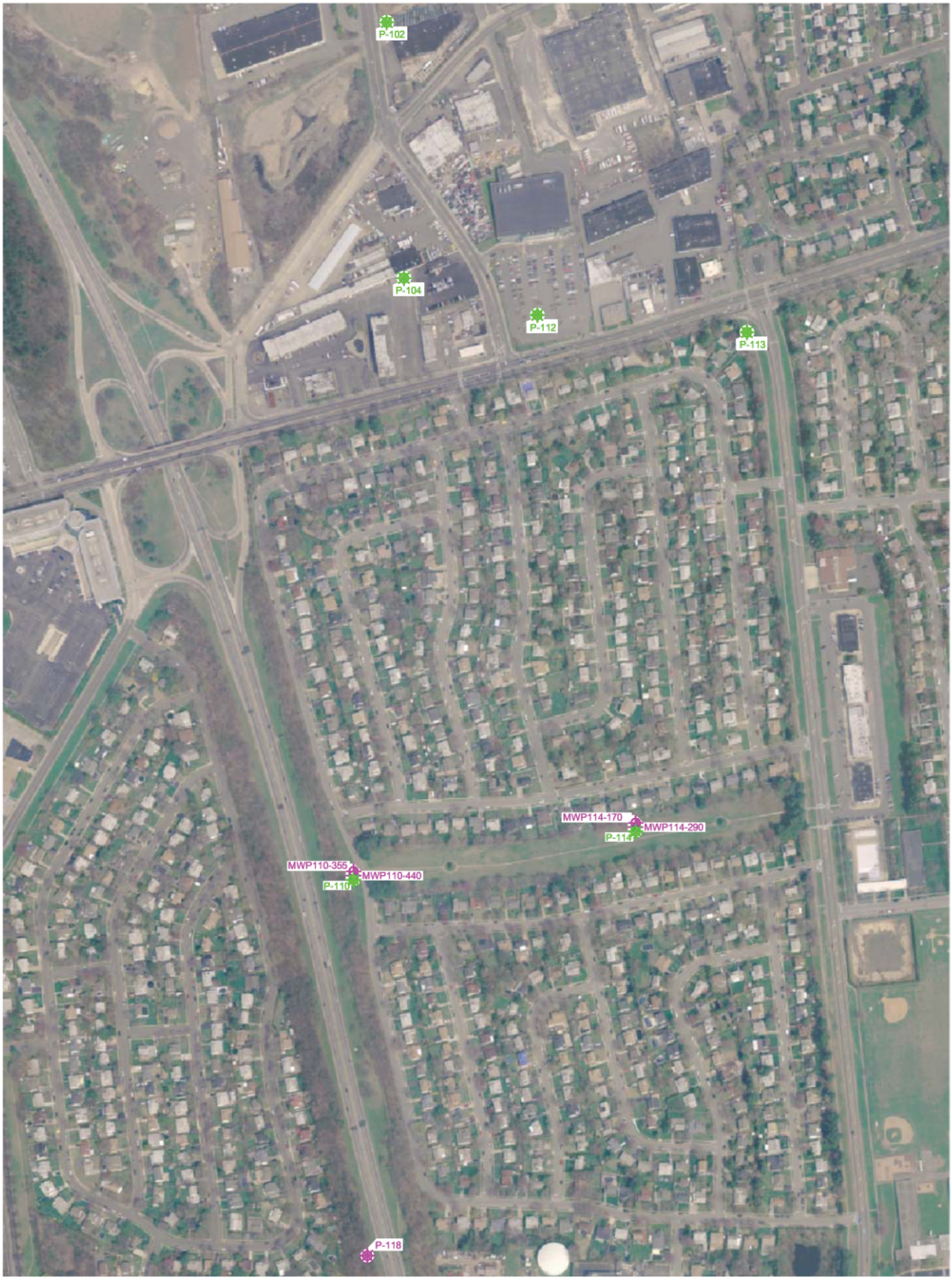
0 300 600 1200

NOTES

1. AERIAL IMAGE FROM NYS GIS CLEARINGHOUSE HIGH RESOLUTION DIGITAL ORTHOIMAGERY (6-INCH RESOLUTION - 2007).

SOURCE: GTEOSI, Nov. 2009

Figure 2.1-3 GTEOSI Profile Locations Completed as of October 2009
Sylvania Corning FUSRAP Site
Town of Hicksville, New York



LEGEND

- PROFILE LOCATION - DATA INCLUDED IN THE MALCOLM PIRNIE DATA REPORT DATED JANUARY 2008.
- PROFILE LOCATION
- MONITORING WELL LOCATION

NOTES

1. AERIAL IMAGE FROM NYS GIS CLEARINGHOUSE HIGH RESOLUTION DIGITAL ORTHOIMAGERY (6-INCH RESOLUTION - 2004).

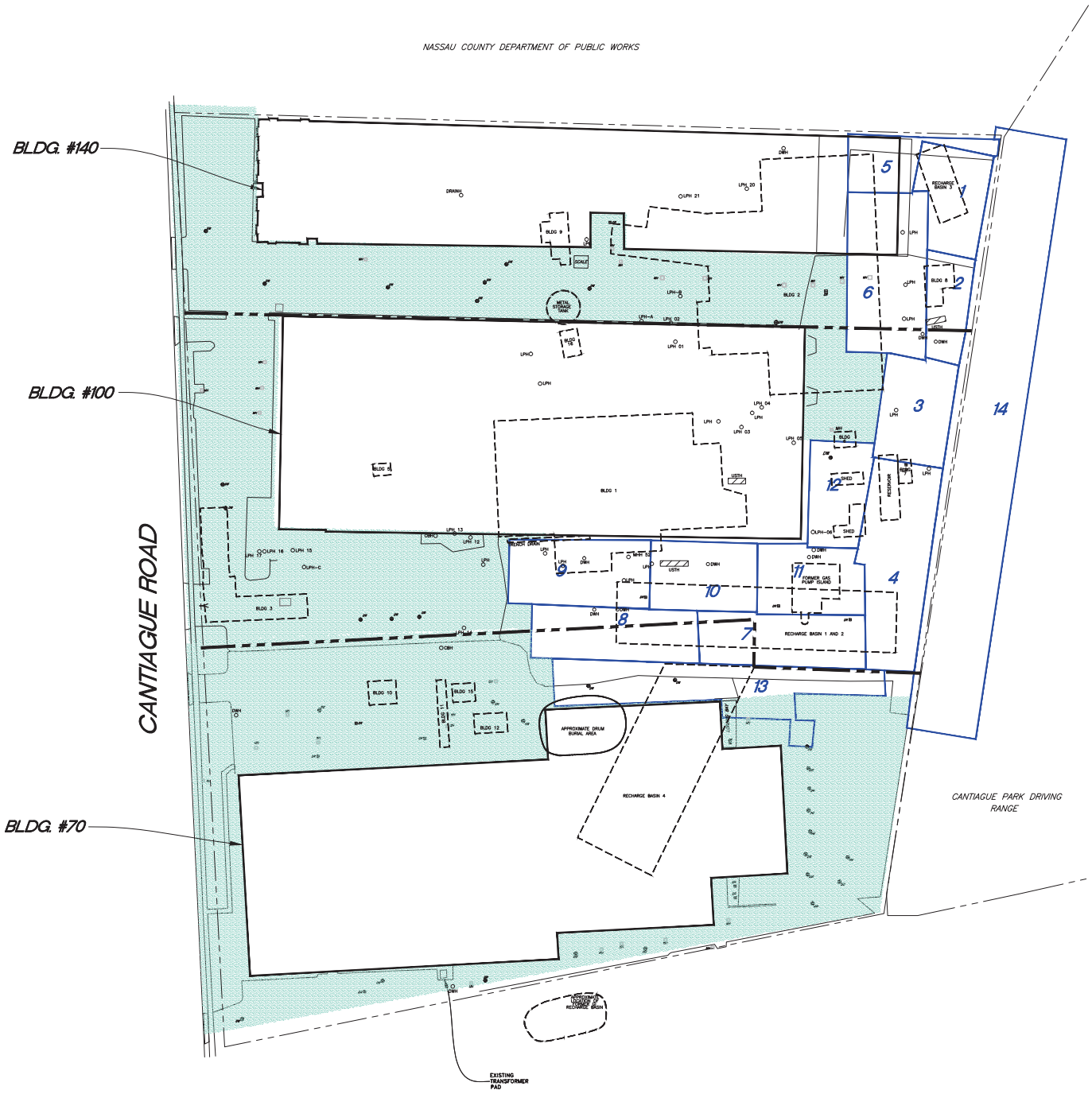
SCALE IN FEET

0 250 500 1000

SOURCE: GTEOSI, April 2008

Figure 2.1-4 GTEOSI Profile and Monitoring Well Locations Completed 2007
Sylvania Corning FUSRAP Site
Town of Hicksville, New York

F:\2010 Figures\Figure 2.5-1 Geophysical areas.dwg



LEGEND

- BLDG. BUILDING
- EXISTING DRAINAGE STRUCTURE
- EXISTING DRYWELL
- EXISTING MANHOLE
- HISTORIC BUILDING
- LPH/DWH/DBH/DRAINH/MHHO — HISTORIC DRY WELL/DRAIN/CATCH BASIN/MANHOLE/LEACH POOL
- 1 — REMEDIATION CELLS
- RI GEOPHYSICAL SURVEY AREA
- APPROXIMATE PROPERTY LINE

SCALE IN FEET

0 50 100 150

NOTES

1. SITE DATA PROVIDED BY WENDEL DUCHSCHERER DRAWING 1 OF 1, DATED 5/17/07.

FIGURE 2.5-1
PHASE I RI
GEOPHYSICAL SURVEY AREAS
SYLVANIA CORNING FUSRAP SITE
TOWN OF HICKSVILLE, NEW YORK

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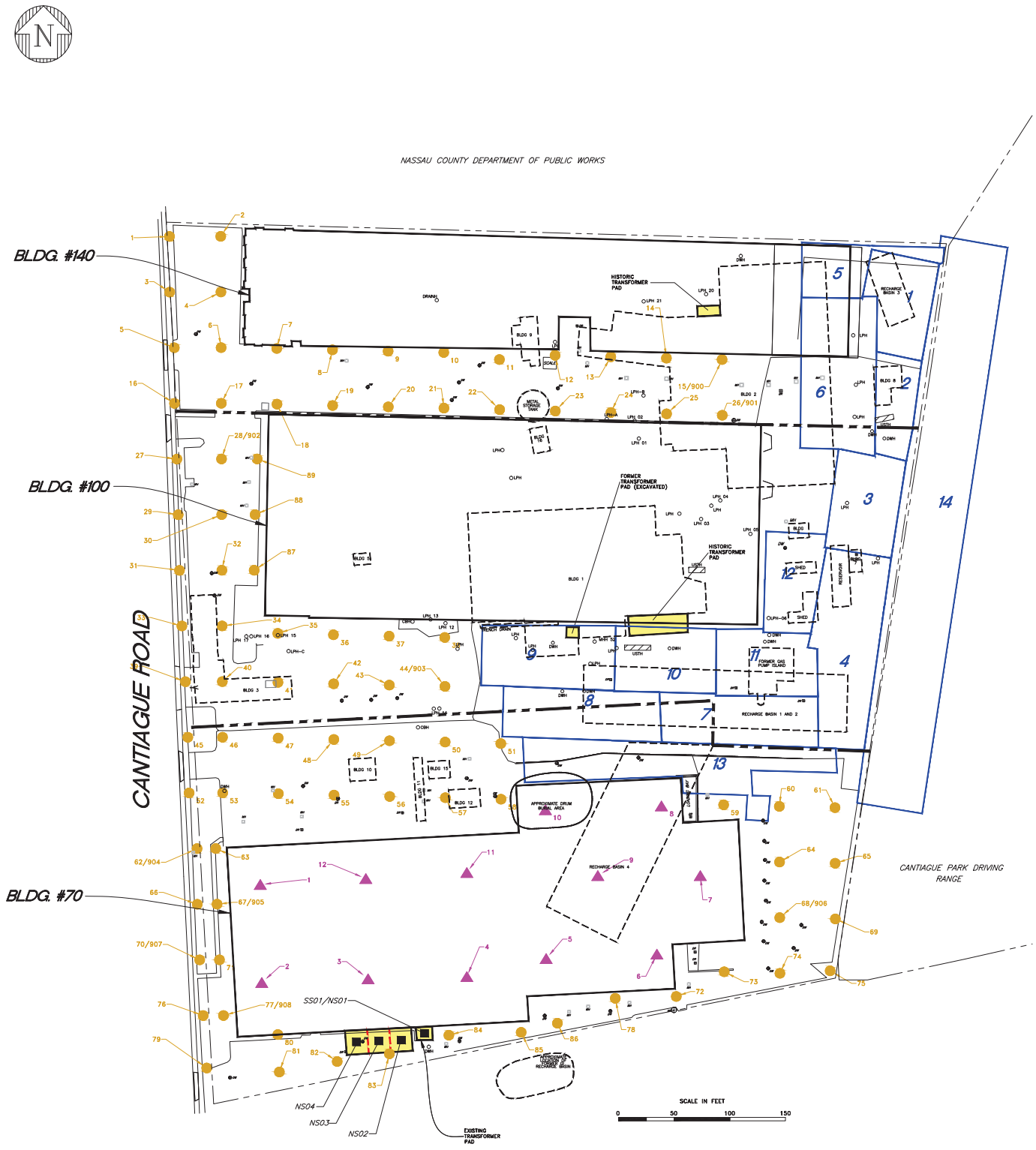
F:\2010 Figures\2.5-2 RI gas, subsoil vapor.dwg



LEGEND

BLDG. BUILDING

EXISTING DRAINAGE STRUCTURE

EXISTING DRYWELL

EXISTING MANHOLE

HISTORIC BUILDING

LPH/DWH/CBH/DRAINH/MHHO — HISTORIC DRY WELL/DRAIN/CATCH BASIN/ MANHOLE/LEACH POOL

RI SOIL GAS SAMPLE LOCATIONS

RI SUB-SLAB SOIL VAPOR LOCATIONS

RI TRANSFORMER PAD SAMPLING LOCATIONS

1 — REMEDIATION CELLS

CURRENT OR FORMER TRANSFORMER PAD

APPROXIMATE PROPERTY LINE

NOTES

1. SITE DATA PROVIDED BY WENDEL DUCHSCHERER DRAWING 1 OF 1, DATED 5/17/07.

FIGURE 2.5-2 PHASE I
RI SOIL GAS, SUB-SLAB SOIL VAPOR, AND TRANSFORMER PAD SAMPLING LOCS
SEPTEMBER 2006
SYLVANIA CORNING FUSRAP SITE
TOWN OF HICKSVILLE, NEW YORK

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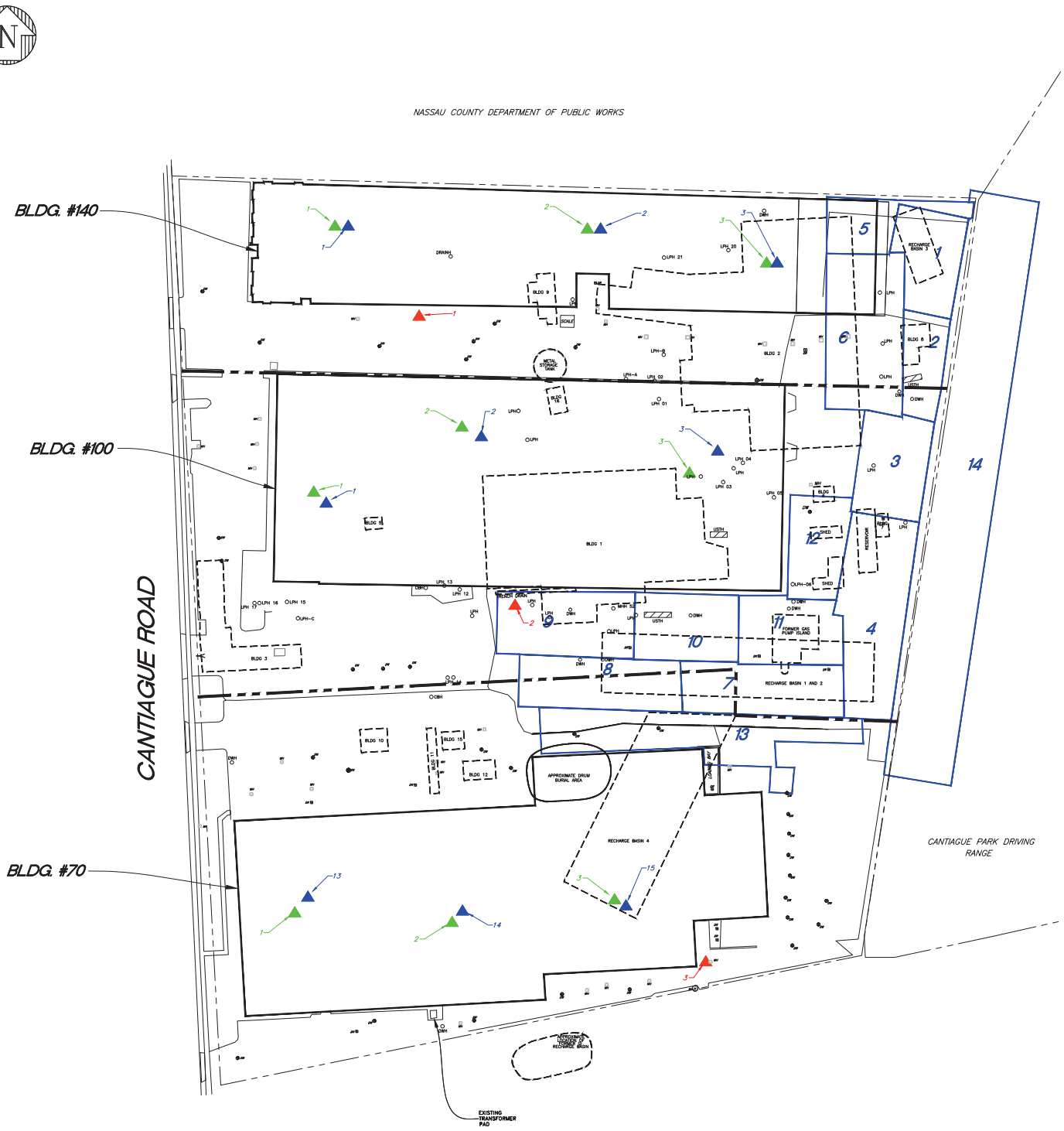
F:\2010 Figures\2.5-3 indoor-outdoor air.dwg



LEGEND

- BLDG. BUILDING
- DS EXISTING DRAINAGE STRUCTURE
- DW EXISTING DRYWELL
- MH EXISTING MANHOLE
- HISTORIC BUILDING
- LPH/DWH/CBH/DRAINH/MHHO — HISTORIC DRY WELL/DRAIN/CATCH BASIN/ MANHOLE/LEACH POOL
- RI SUB-SLAB SOIL VAPOR LOCATIONS
- RI INDOOR AIR SAMPLE LOCATIONS
- RI OUTDOOR AIR SAMPLE LOCATIONS
- 1 REMEDIATION CELLS
- APPROXIMATE PROPERTY LINE

SCALE IN FEET

0 50 100 150

NOTES

1. SITE DATA PROVIDED BY WENDEL DUCHSCHERER DRAWING 1 OF 1, DATED 5/17/07.

FIGURE 2.5-3 PHASE 1
RI INDOOR AIR, SUB-SLAB SOIL VAPOR, AND OUTDOOR AIR SAMPLING LOCATIONS
SYLVANIA CORNING FUSRAP SITE
TOWN OF HICKSVILLE, NEW YORK

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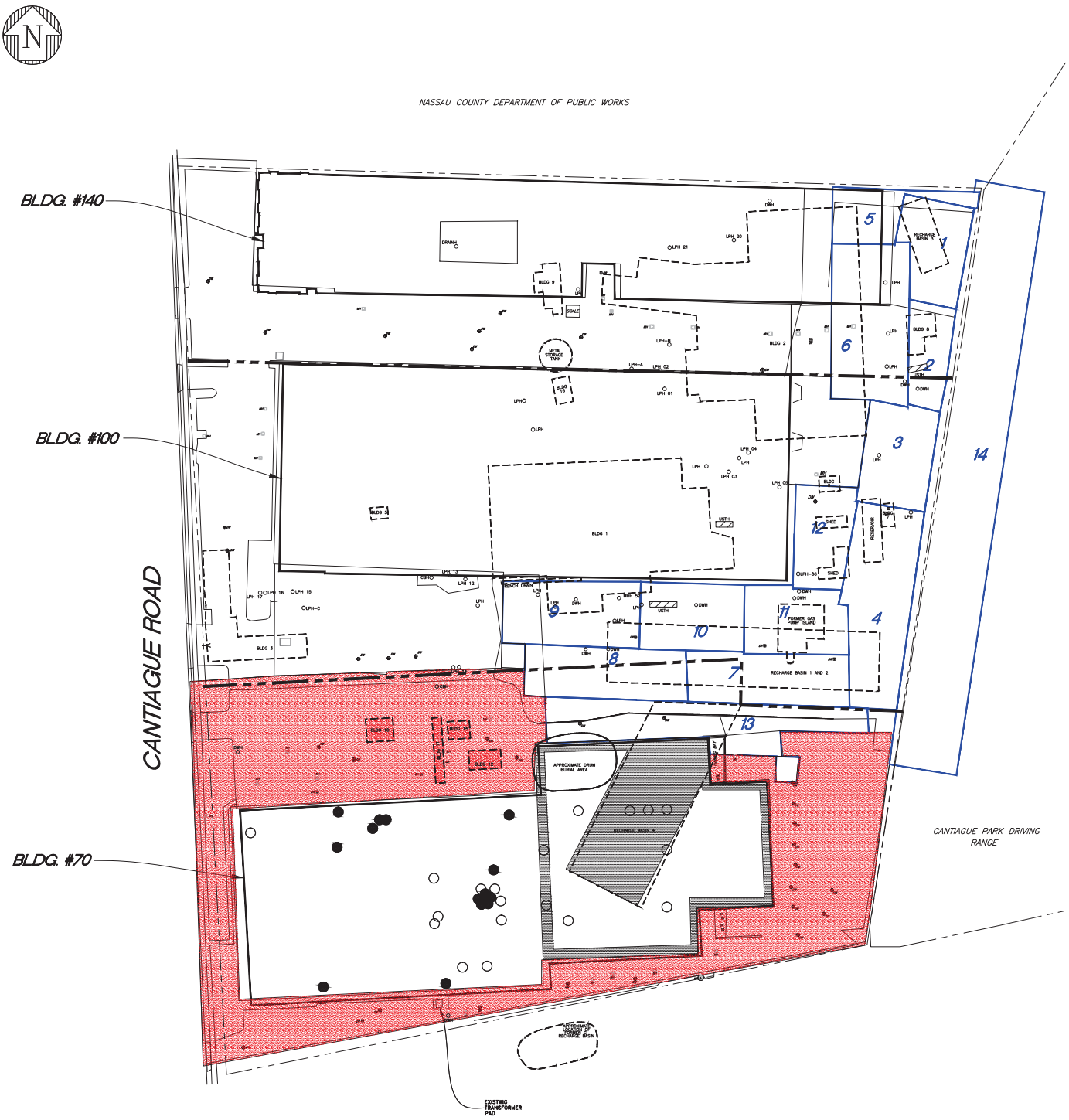
F:\2010 Figures\2.5-4 RI gamma radiation.dwg



LEGEND

- BLDG. BUILDING
- EXISTING DRAINAGE STRUCTURE
- EXISTING DRYWELL
- EXISTING MANHOLE
- HISTORIC BUILDING
- LPH/DWH/CBH/DRAINH/MHHO — HISTORIC DRY WELL/DRAIN/CATCH BASIN/ MANHOLE/LEACH POOL
- 1 — REMEDIATION CELLS
- WALKOVER GAMMA RADIATION SURVEY
- INTERIOR WALKOVER GAMMA RADIATION SURVEY
- VERIFICATION SURVEY POINTS
- DRAIN SURVEY POINTS
- APPROXIMATE PROPERTY LINE

SCALE IN FEET

0 50 100 150

NOTES

1. SITE DATA PROVIDED BY WENDEL DUCHSCHERER DRAWING 1 OF 1, DATED 5/17/07.

FIGURE 2.5-4
PHASE I
RI GAMMA RADIATION SURVEY AREAS
SYLVANIA CORNING FUSRAP SITE
TOWN OF HICKSVILLE, NEW YORK

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F:\SLYVANIA\2010 figures\2.5-5 data gap soil bor locs.dwg

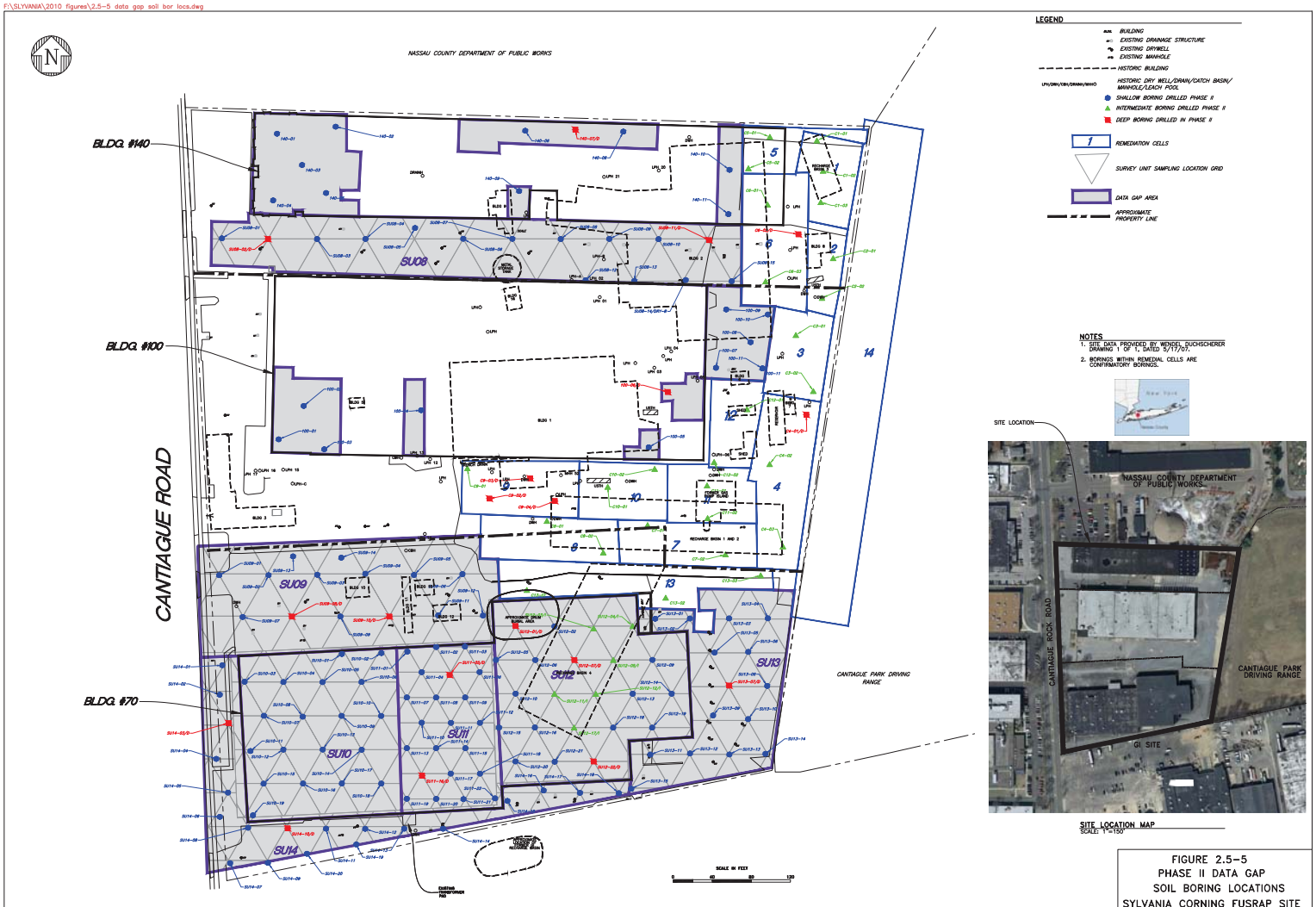

FIGURE 2.5-5
PHASE II DATA GAP
SOIL BORING LOCATIONS
SYLVANIA CORNING FUSRAP SITE
TOWN OF HICKSVILLE, NEW YORK

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F:\SLYVANIA\2010 figures\2.5-6 LP-Drain-Dwell-Sump etc.dwg

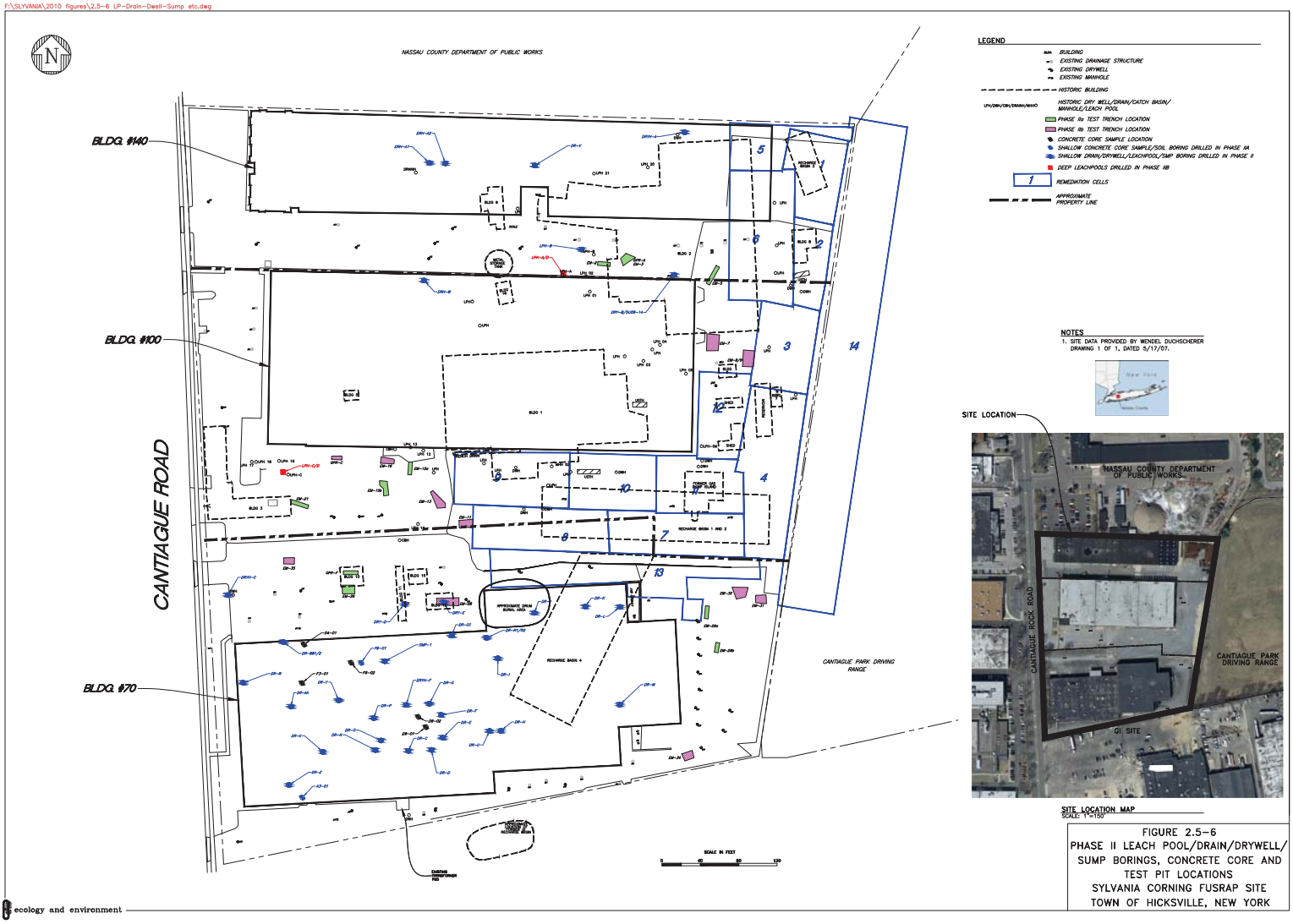

FIGURE 2.5-6
PHASE II LEACH POOL/DRAIN/DRYWELL/ SUMP BORINGS, CONCRETE CORE AND TEST PIT LOCATIONS
SYLVANIA CORNING FUSRAP SITE
TOWN OF HICKSVILLE, NEW YORK

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F:\SLYVANIA\2010 figures\2.5-7 Phase IIIa soil boring locations.dwg

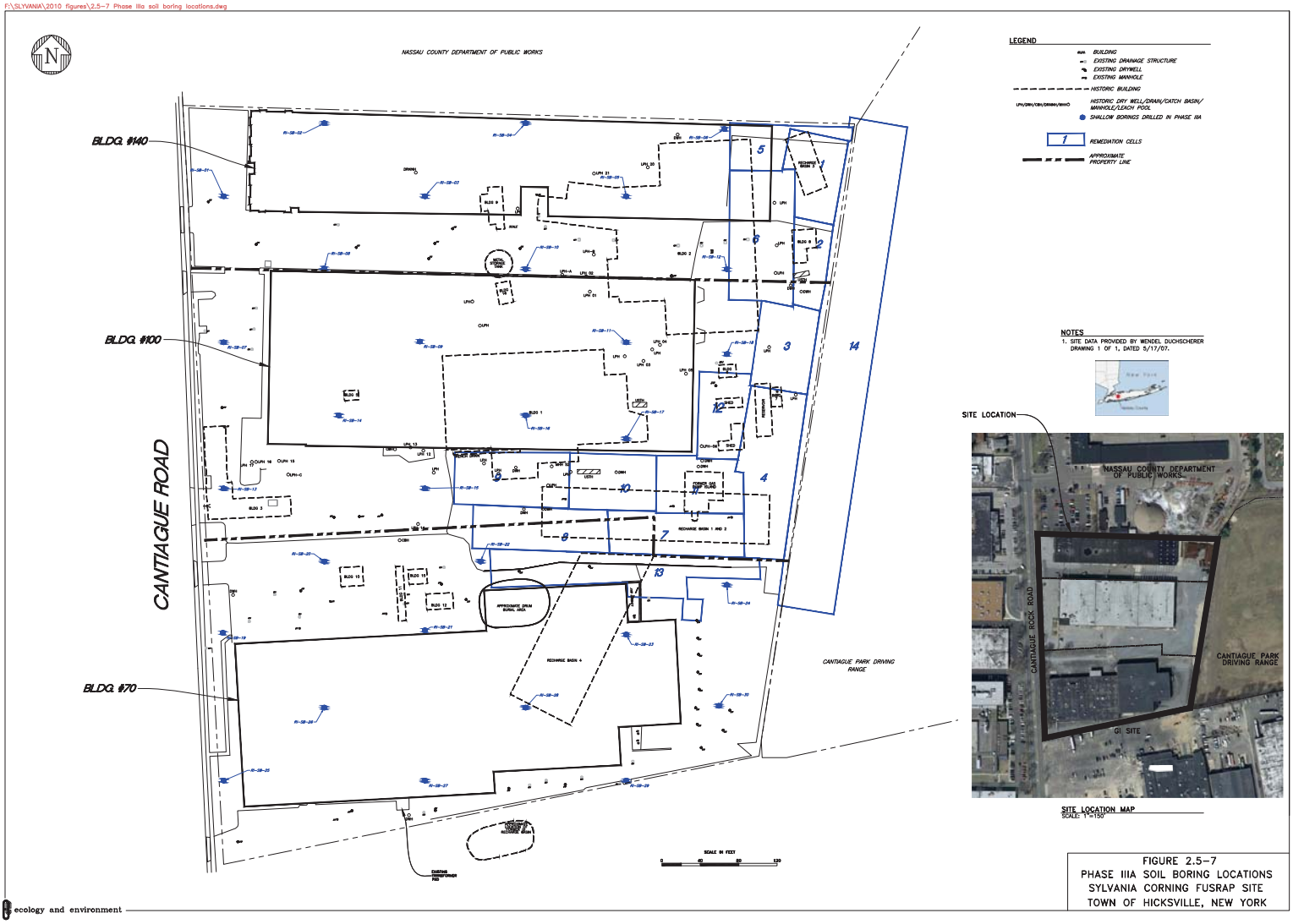

FIGURE 2.5-7
PHASE IIIA SOIL BORING LOCATIONS
SYLVANIA CORNING FUSRAP SITE
TOWN OF HICKSVILLE, NEW YORK

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F:\Aerial Background\2.5-8 Phase III profile borings and gw wells.dwg

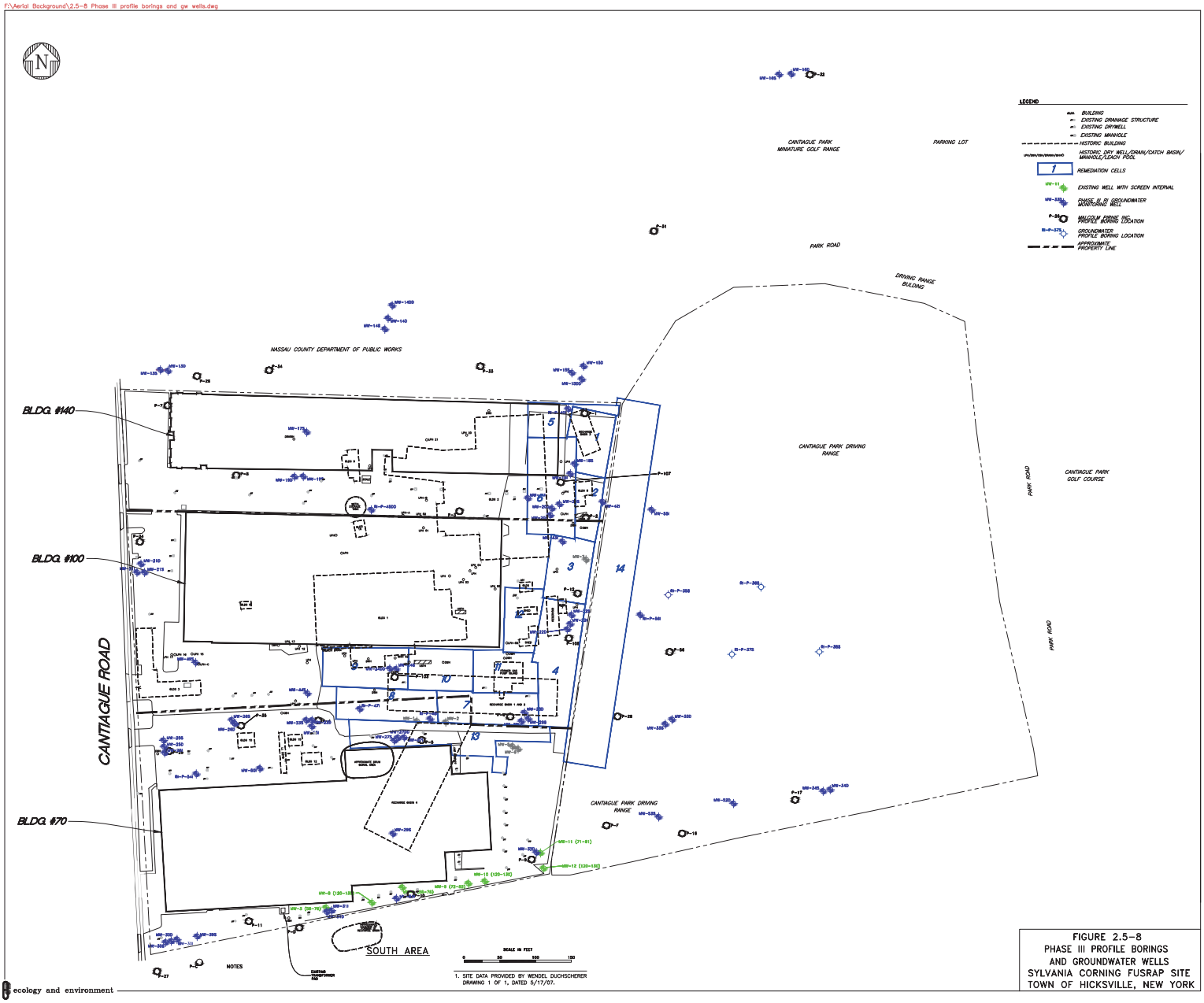


FIGURE 2.5-8
PHASE III PROFILE BORINGS
AND GROUNDWATER WELLS
SYLVANIA CORNING FUSRAP SITE
TOWN OF HICKSVILLE, NEW YORK

ecology and environment

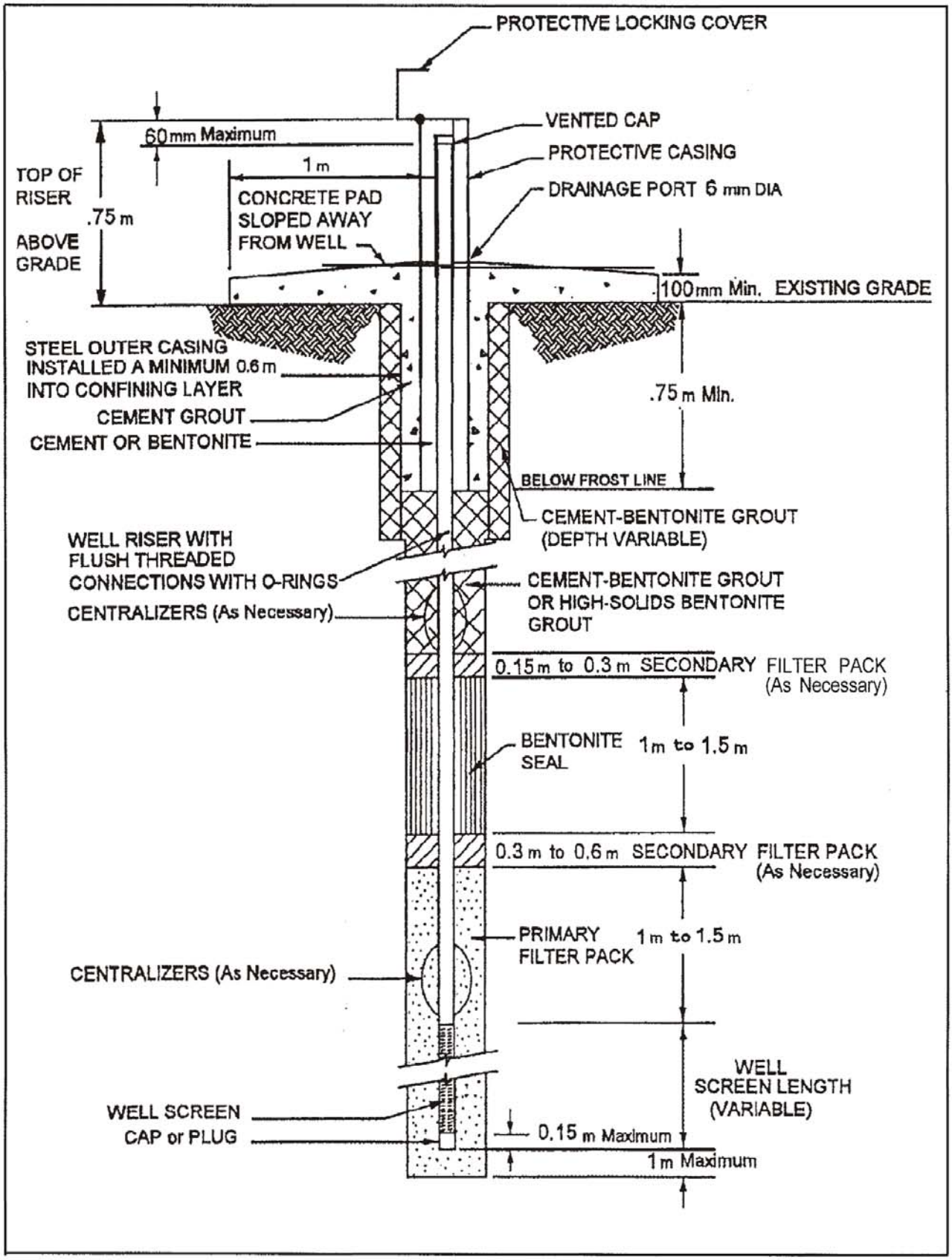
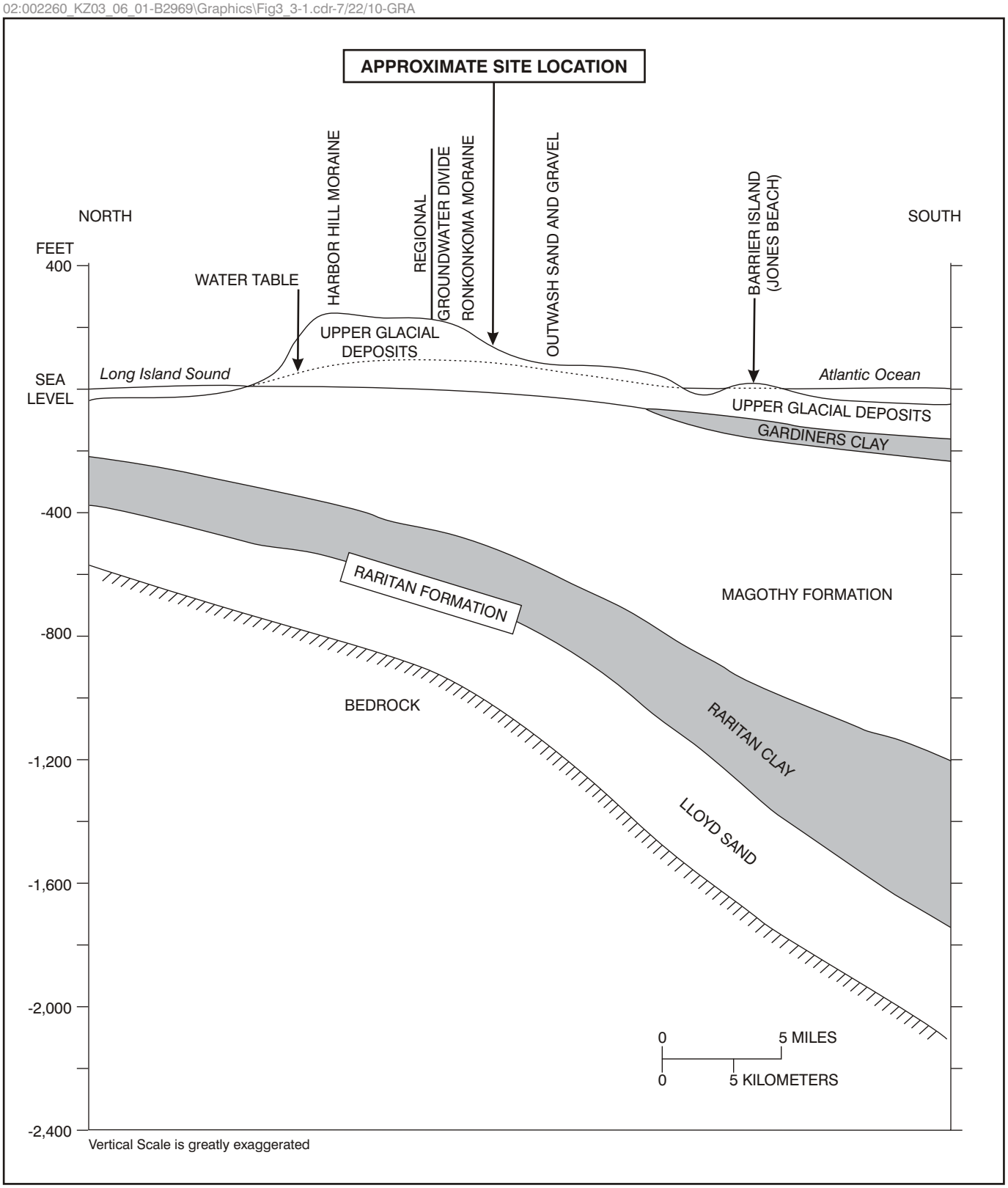
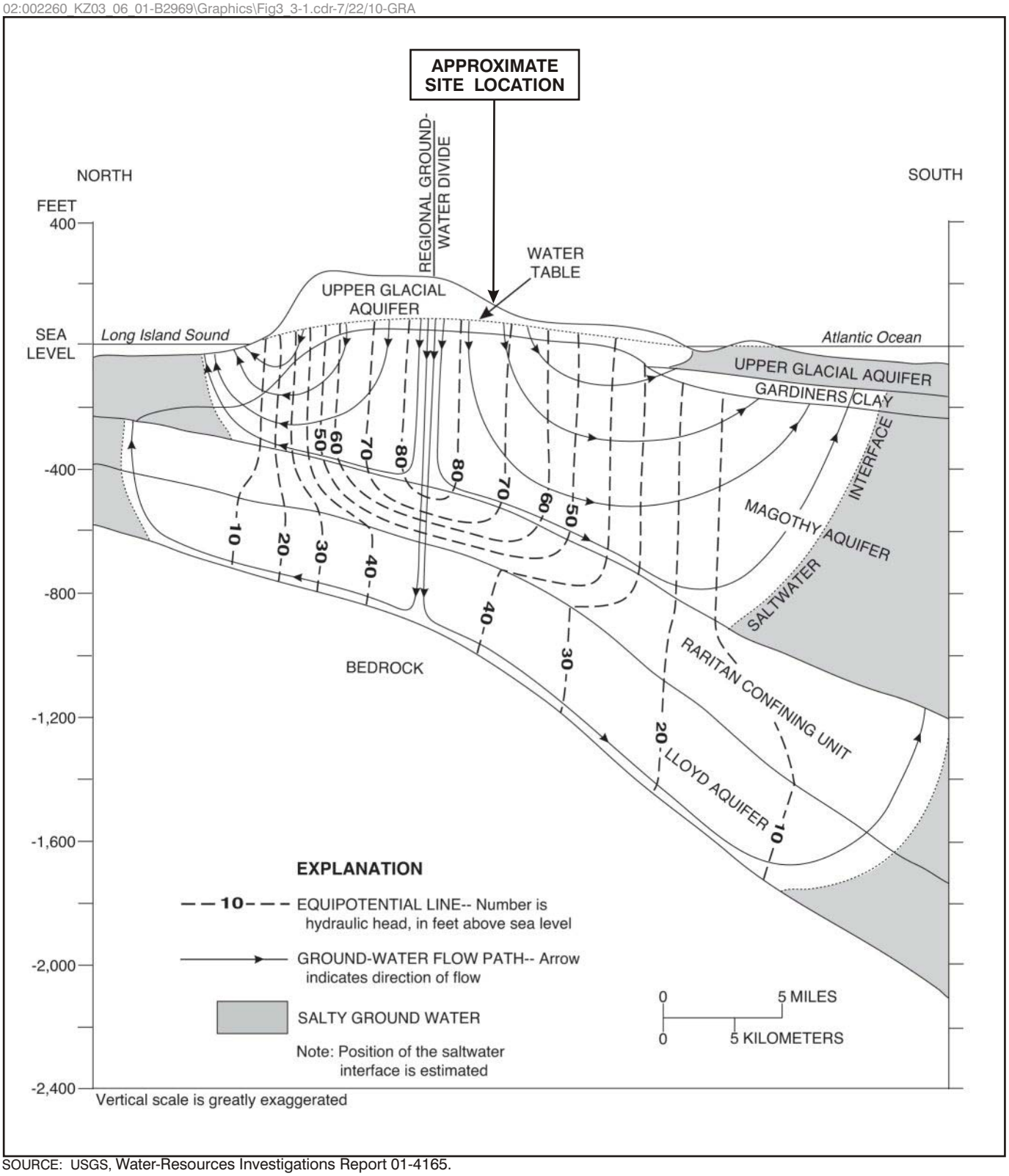


Figure 2.5-9 Typical Monitoring Well Construction



SOURCE: Modified USGS, Water-Resources Investigations Report 01-4165.

Figure 3.2-1 Generalized Site Stratigraphy Sylvania Corning FUSRAP Site Town of Hicksville, New York



SOURCE: USGS, Water-Resources Investigations Report 01-4165.

Figure 3.3-1 Generalized Flow Lines in the Groundwater System of Long Island, N.Y.
Sylvania Corning FUSRAP Site
Town of Hicksville, New York

F:\Aerial Background\2010 Figures\Figure_-GW contours shallow.dwg

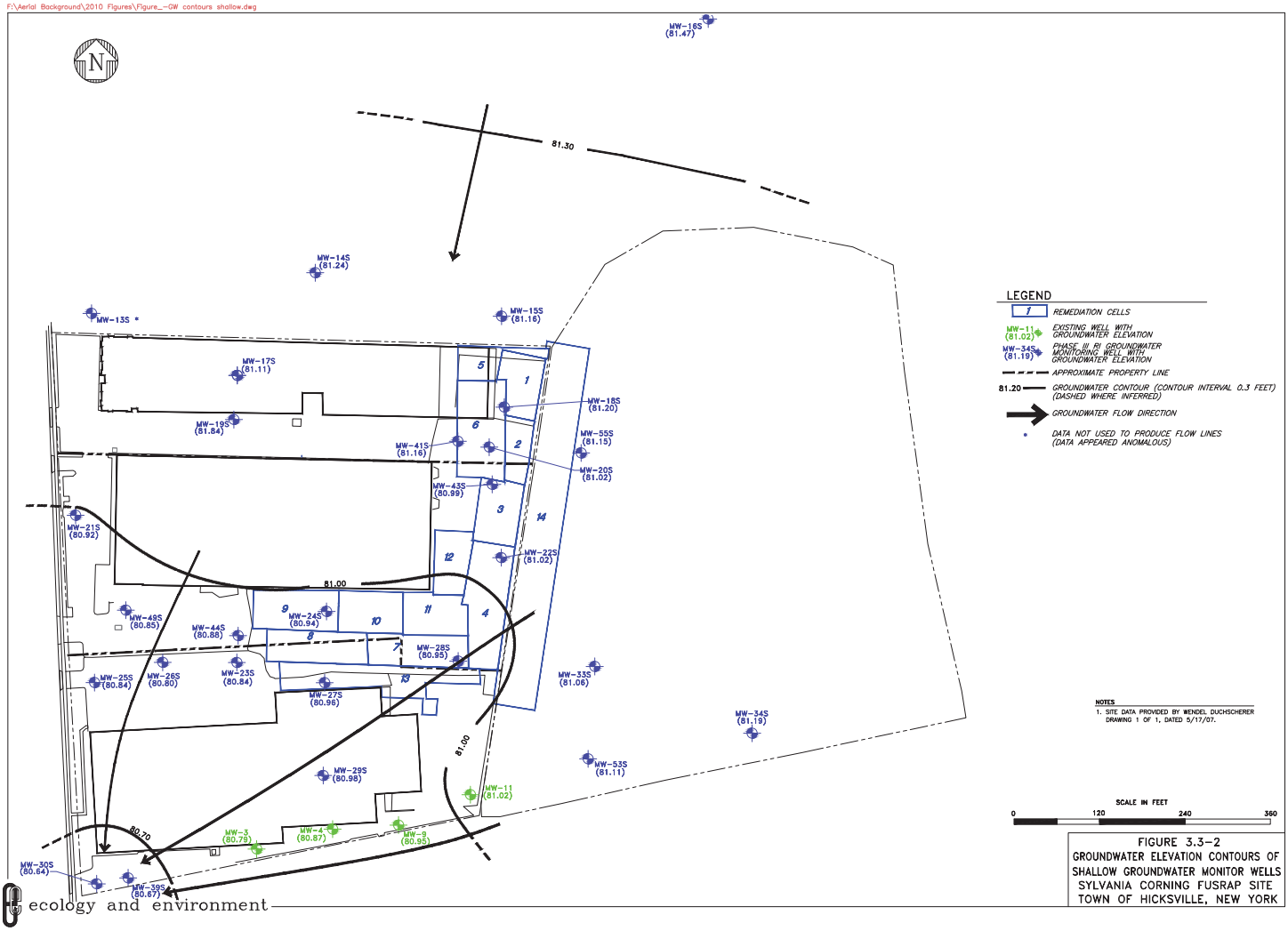


FIGURE 3.3-2
GROUNDWATER ELEVATION CONTOURS OF SHALLOW GROUNDWATER MONITOR WELLS
SYLVANIA CORNING FUSRAP SITE
TOWN OF HICKSVILLE, NEW YORK

F:\Aerial Background\2010 Figures\Figure_-GW contours Intermediate.dwg

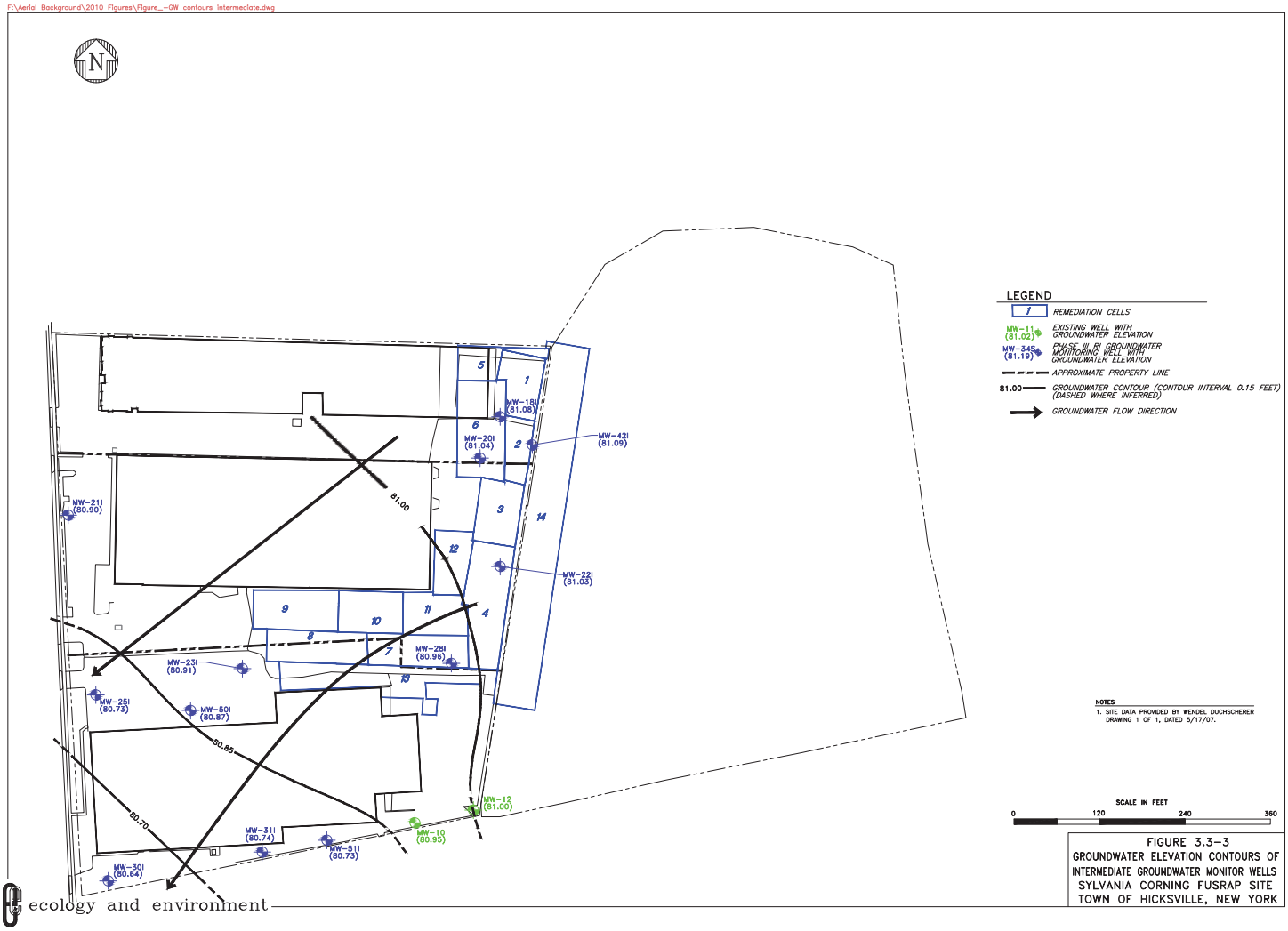


FIGURE 3.3-3
GROUNDWATER ELEVATION CONTOURS OF INTERMEDIATE GROUNDWATER MONITOR WELLS
SYLVANIA CORNING FUSRAP SITE
TOWN OF HICKSVILLE, NEW YORK

ecology and environment

F:\Aerial Background\2010 Figures\Figure_-GW contours Intermediate.dwg

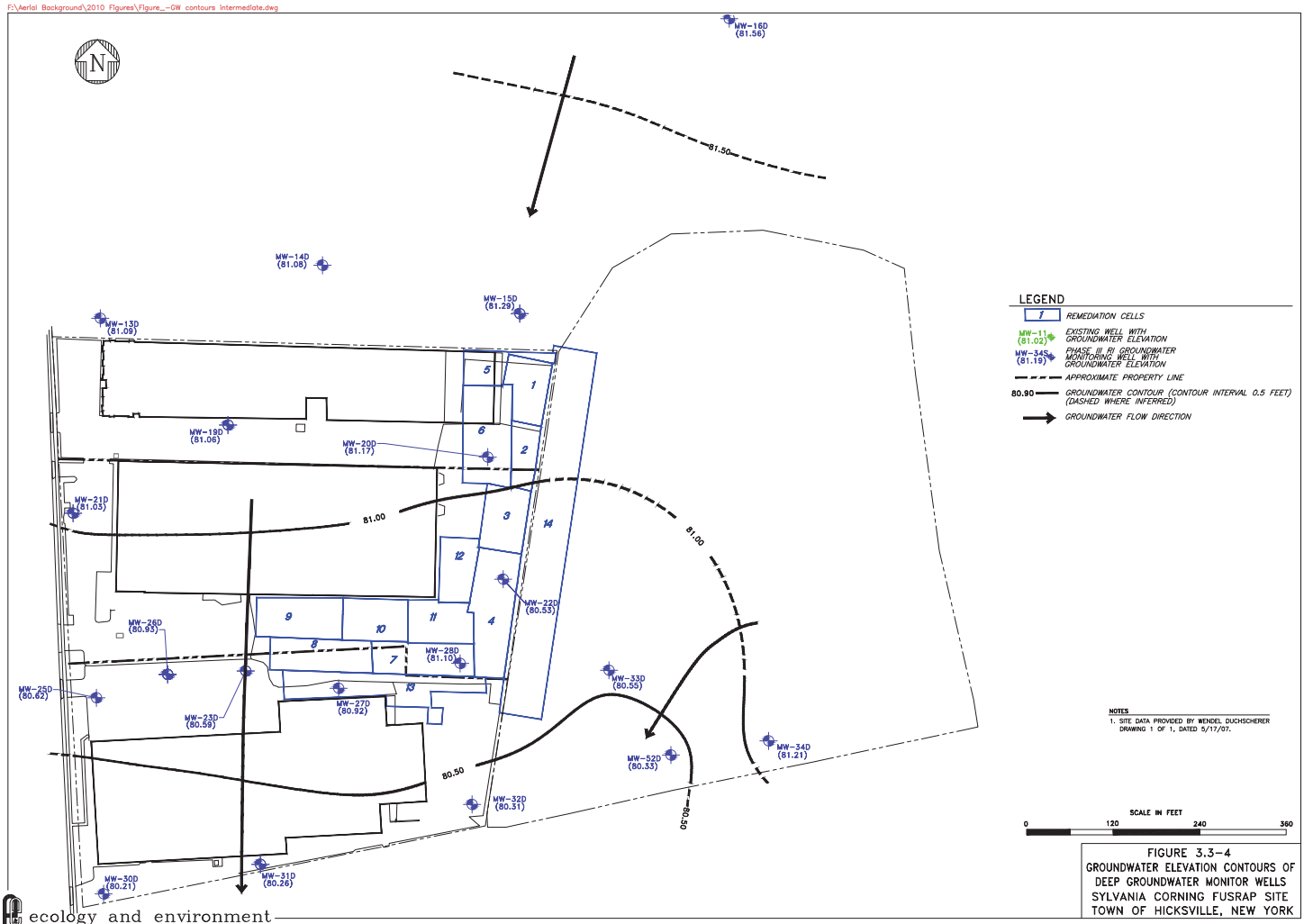


FIGURE 3.3-4
GROUNDWATER ELEVATION CONTOURS OF DEEP GROUNDWATER MONITOR WELLS
SYLVANIA CORNING FUSRAP SITE
TOWN OF HICKSVILLE, NEW YORK

ecology and environment

LEGEND

ACTIVE WELL		1 MILE BUFFER	
INACTIVE WELL		2 MILE BUFFER	
ABANDONED WELL		WATER DISTRICT BOUNDARY (WD)	
EMERGENCY WELL		SYLVANIA PROPERTY	

FROM NASSAU COUNTY DEPARTMENT OF HEALTH 3/12/2009

PUBLIC WATER SUPPLY WELLS WITHIN 2 MILES OF THE SITE
SYLVANIA CORNING FUSRAP SITE
TOWN OF HICKSVILLE, NY

ecology and environment

FIGURE 3.4-1

F:\2010 Figures\Figure 4.4-1.dwg

LEGEND

- BLDG. BUILDING
- EXISTING DRAINAGE STRUCTURE
- EXISTING DRYWELL
- EXISTING MANHOLE
- HISTORIC BUILDING
- LPH/DWH/CBH/DRAINH/MHHO — HISTORIC DRY WELL/DRAIN/CATCH BASIN/ MANHOLE/LEACH POOL
- 1 — RI SUB-SLAB SOIL VAPOR LOCATIONS
- 2800 — PCE RESULT (ug/m^3)
- ND — TCE RESULT (ug/m^3)
- 67 — RI SOIL GAS SAMPLE LOCATIONS
- 1.910 — PCE RESULT (ug)
- ND — TCE RESULT (ug)
- SHALLOW BORING DRILLED PHASE II
- NS02 — RI TRANSFORMER PAD COMPOSITE SAMPLING LOCATIONS
- 63 — TOTAL PCB RESULT (UG/KG)
- PCE PASSIVE SOIL GAS CONCENTRATION ISOLINES (CONTOUR INTERVAL = 10 ug)
- PCE SUB-SLAB SOIL VAPOR CONCENTRATION ISOLINES (CONTOUR INTERVAL = 10,000 ug/m-3)
- CHAINLINK FENCE
- 1 — REMEDIATION CELLS
- APPROXIMATE PROPERTY LINE

NOTES

1. SITE DATA PROVIDED BY WENDEL DUCHSCHERER DRAWING 1 OF 1, DATED 5/17/07.

FIGURE 4.4-1 PHASE I
RI SOIL GAS, SUB-SLAB VAPOR, AND TRANSFORMER PAD SAMPLE RESULTS SEPT 2006
SYLVANIA CORNING FUSRAP SITE
TOWN OF HICKSVILLE, NEW YORK

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LEGEND

- BLDG. BUILDING
- DS EXISTING DRAINAGE STRUCTURE
- DW EXISTING DRYWELL
- MH EXISTING MANHOLE
- HISTORIC BUILDING
- LPH/DWH/CBH/DRAINN/MHHO HISTORIC DRY WELL/DRAIN/CATCH BASIN/ MANHOLE/LEACH POOL
- RI SUB-SLAB SOIL VAPOR LOCATIONS
- RI INDOOR AIR SAMPLE LOCATIONS
- RI OUTDOOR AIR SAMPLE LOCATIONS
- 1 REMEDIATION CELLS
- 20,000 PCE RESULT (ug/m³)
- 4,200 TCE RESULT (ug/m³)
- ND NOT DETECTED
- NA NOT AVAILABLE
- APPROXIMATE PROPERTY LINE

SCALE IN FEET

0 50 100 150

NOTES

1. SITE DATA PROVIDED BY WENDEL DUCHSCHERER DRAWING 1 OF 1, DATED 5/17/07.

FIGURE 4.4-2 PHASE I
RI INDOOR AIR, SUB SLAB SOIL VAPOR, AND OUTDOOR AIR SAMPLING RESULTS
NOVEMBER 2006
SYLVANIA CORNING FUSRAP SITE
TOWN OF HICKSVILLE, NEW YORK

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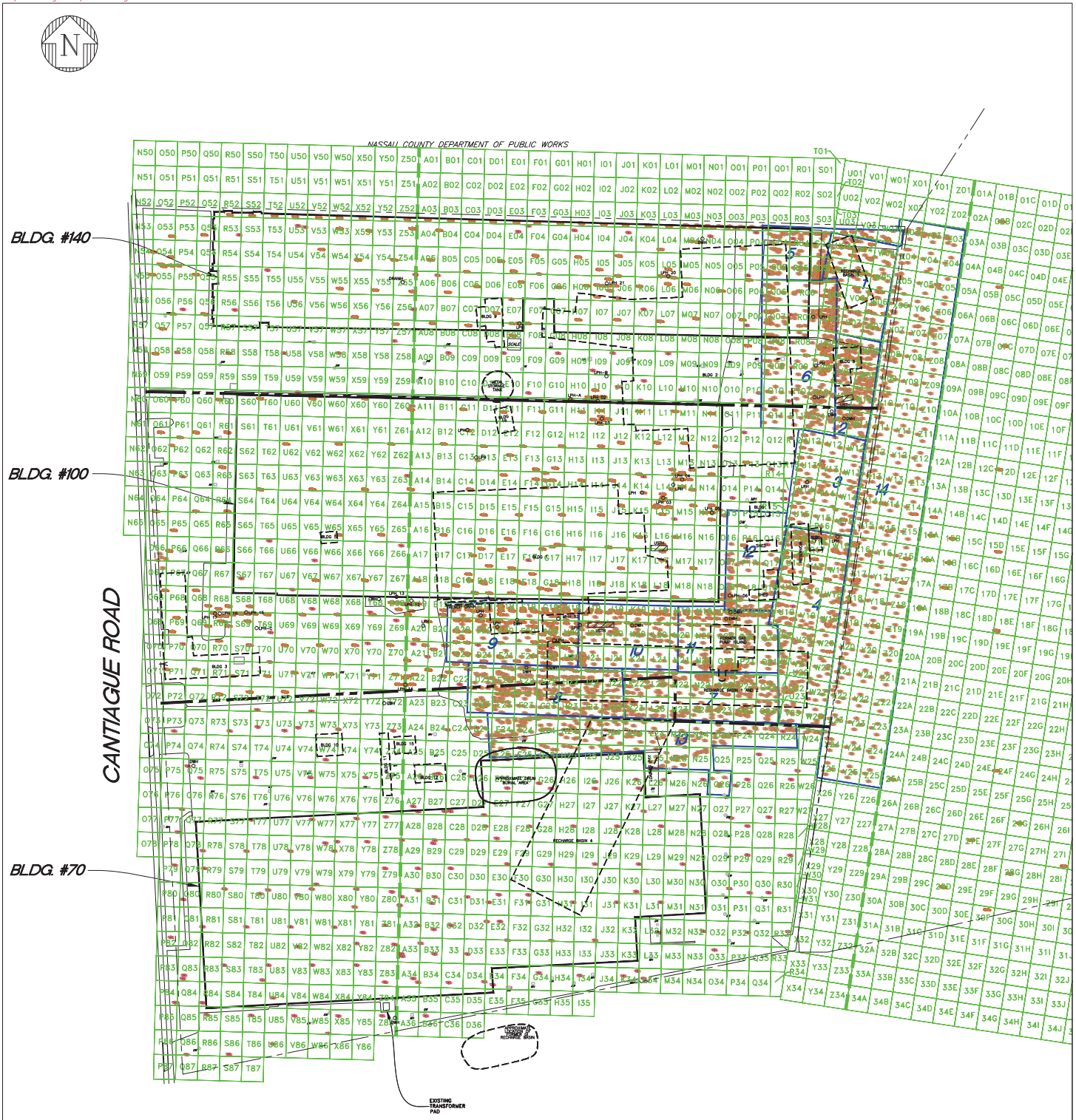


LEGEND

- BLDG. BUILDING
- EXISTING DRAINAGE STRUCTURE
- EXISTING DRYWELL
- EXISTING MANHOLE
- HISTORIC BUILDING
- LPH/DWH/CBH/DRAINH/MHHO — HISTORIC DRY WELL/DRAIN/CATCH BASIN/ MANHOLE/LEACH POOL
- 1 — REMEDIATION CELLS
- 070 — SUBCELL GRID LOCATION
- APPROXIMATE PROPERTY LINE
- SUBCELL GRID NAMING TRANSITION LINE
- USACE SAMPLE LOCATION
- GTEOSI SAMPLE LOCATION

NOTES

1. SITE DATA PROVIDED BY WENDEL DUCHSCHERER DRAWING 1 OF 1, DATED 5/17/07.

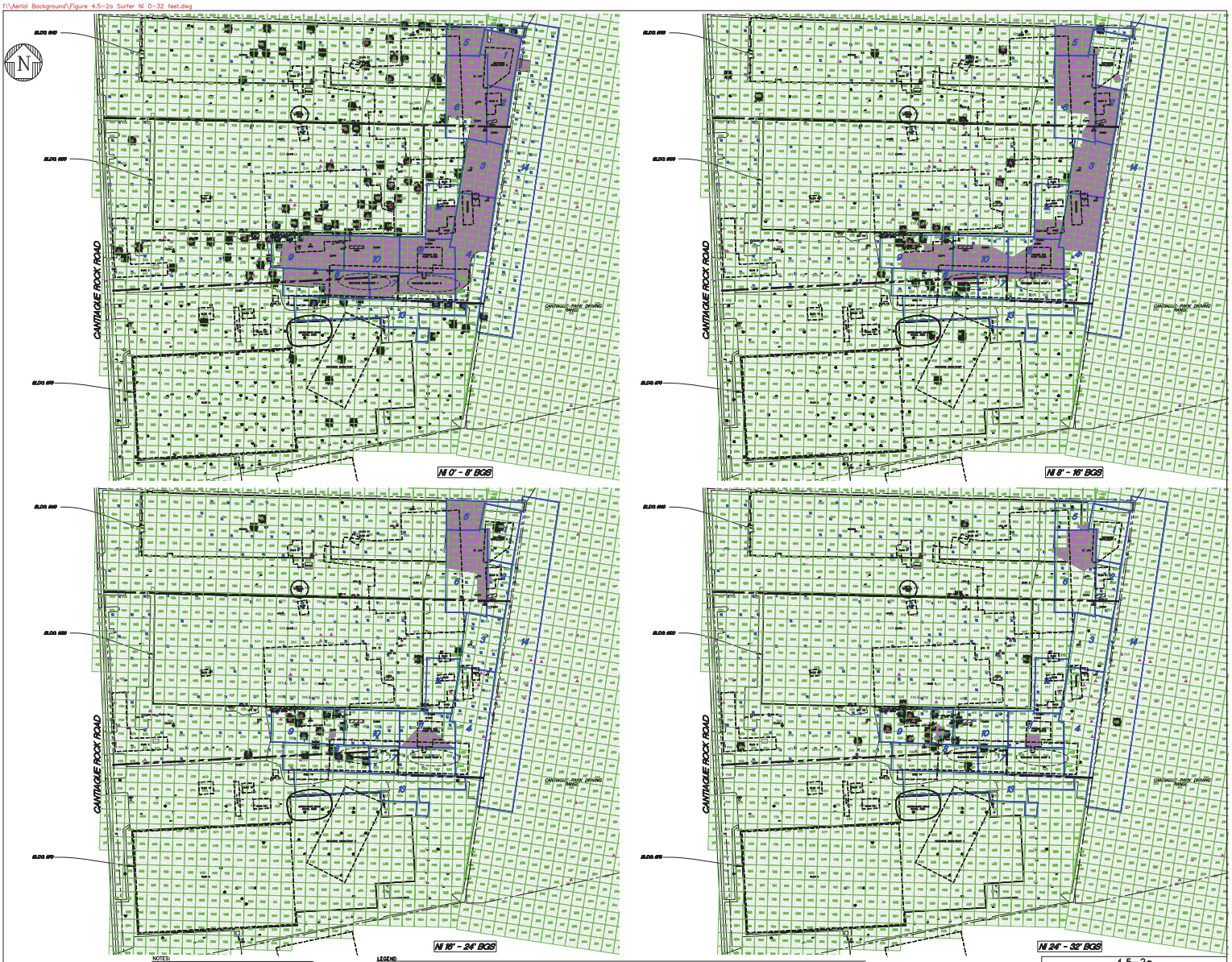
SCALE IN FEET

0 50 100 150

FIGURE 4.5-1
SUBCELL GRID AND SAMPLE LOCATION MAP
SYLVANIA CORNING FUSRAP SITE
TOWN OF HICKSVILLE, NEW YORK

ecology and environment

F:\Aerial Background\Figure 4.5-2a Surfer Ni 0-32 feet.dwg



NOTES:

1. SITE DATA PROVIDED BY WENDEL DUCHSCHERER DRAWING 1 OF 1, DATED 5/17/07.
2. REPRESENTS AREA WITHIN REMEDIAL CELL WHERE ONLY BACKFILL EXISTS ACROSS INTERVAL AND NO NATIVE SOILS ARE PRESENT.

SCALE IN FEET: 0 60 120 180

LEGEND

- BUILDING
- EXISTING DRAINAGE STRUCTURE
- EXISTING DRYWELL
- EXISTING MANHOLE
- HISTORIC BUILDING
- HISTORIC CATCH BASIN/DRAIN/DRY WELL/ LEACH POOL/MANHOLE
- APPROXIMATE PROPERTY LINE
- 1 REMEDIATION CELLS

SAMPLE TYPE	SAMPLE CONCENTRATION RANGE	
VISUAL EXP.-SITE LABORATORY ANALYSIS	16-48 Ni	1,000-2,000 Ni
VISUAL EXP.-SITE LABORATORY ANALYSIS	49-560 Ni	2,000-5,000 Ni
VISUAL EXP.-SITE LABORATORY ANALYSIS	560-1,000 Ni	5,000-10,000 Ni

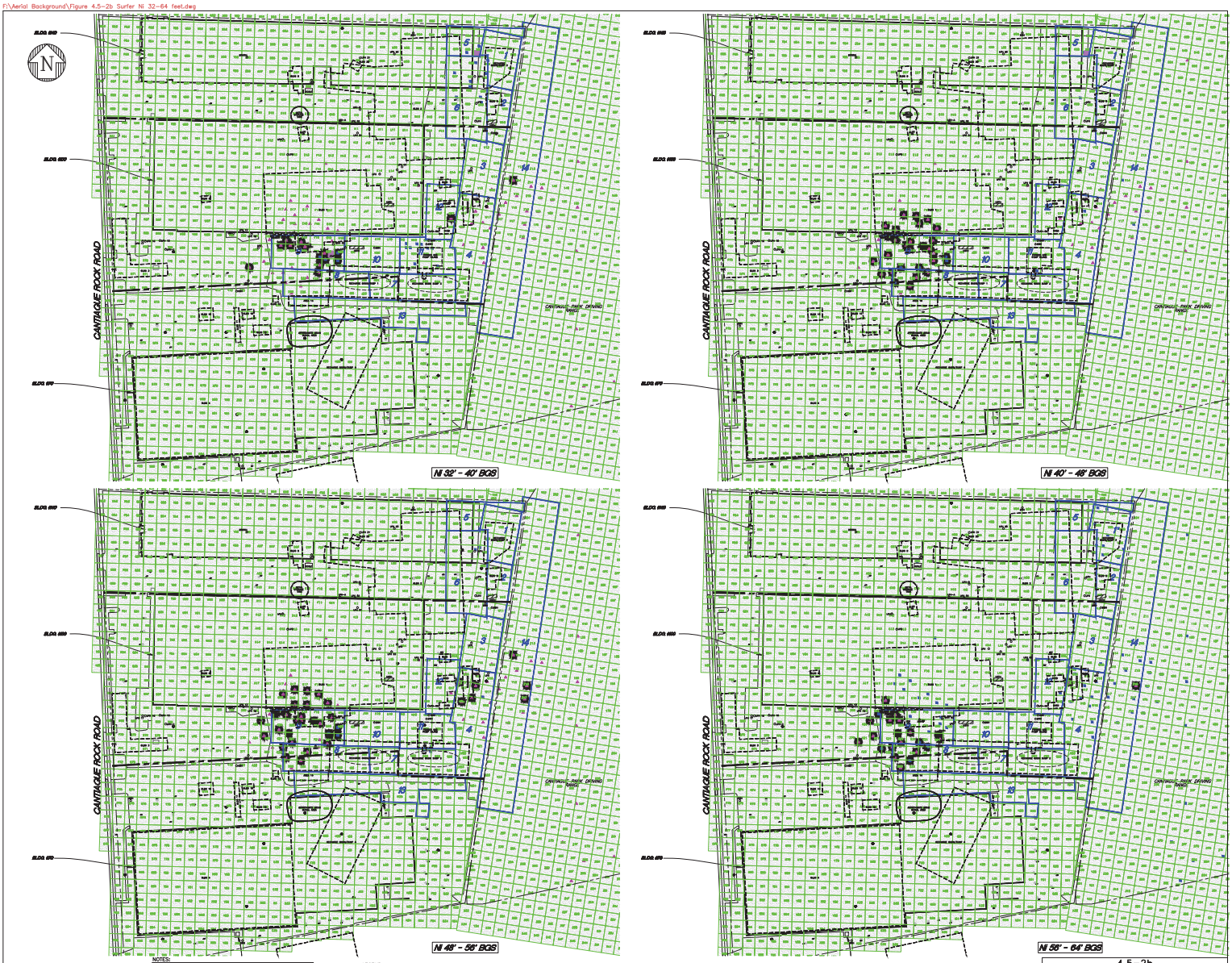
UNITS: mg/kg

- SUBCELL GRID
- AREA WITHIN REMEDIAL CELL WHERE ONLY BACKFILL EXISTS (SEE NOTE 2)

4.5-2a
NICKEL CONCENTRATIONS IN SITE SOILS (0'-32' BGS)
SYLVANIA CORNING FUSRAP SITE
TOWN OF HICKSVILLE, NEW YORK

ecology and environment

F:\Aerial Background\Figure 4.5-2b Surfer Ni 32-64 feet.dwg



NOTES:

1. SITE DATA PROVIDED BY WENDEL DUCHSCHERER DRAWING 1 OF 1, DATED 5/17/07.
2. REPRESENTS AREA WITHIN REMEDIAL CELL WHERE ONLY BACKFILL EXISTS ACROSS INTERVAL AND NO NATIVE SOILS ARE PRESENT.

SCALE IN FEET

0 60 120 180

LEGEND

BUILDING
EXISTING DRAINAGE STRUCTURE
EXISTING DRYWELL
EXISTING MANHOLE
HISTORIC BUILDING
HISTORIC CATCH BASIN/DRAIN/DRY WELL/ LEACH POOL/MANHOLE
REMEDIATION CELLS
APPROXIMATE PROPERTY LINE

SAMPLE TYPE
USACE OFF-SITE LABORATORY ANALYSIS
USEPA ON-SITE LABORATORY ANALYSIS
USEPA OFF-SITE LABORATORY ANALYSIS

SAMPLE CONCENTRATION RANGE
16-48 Ni
48-560 Ni
560-1,000 Ni
1,000-2,000 Ni
2,000-5,000 Ni
5,000-10,000 Ni
UNITS: mg/kg

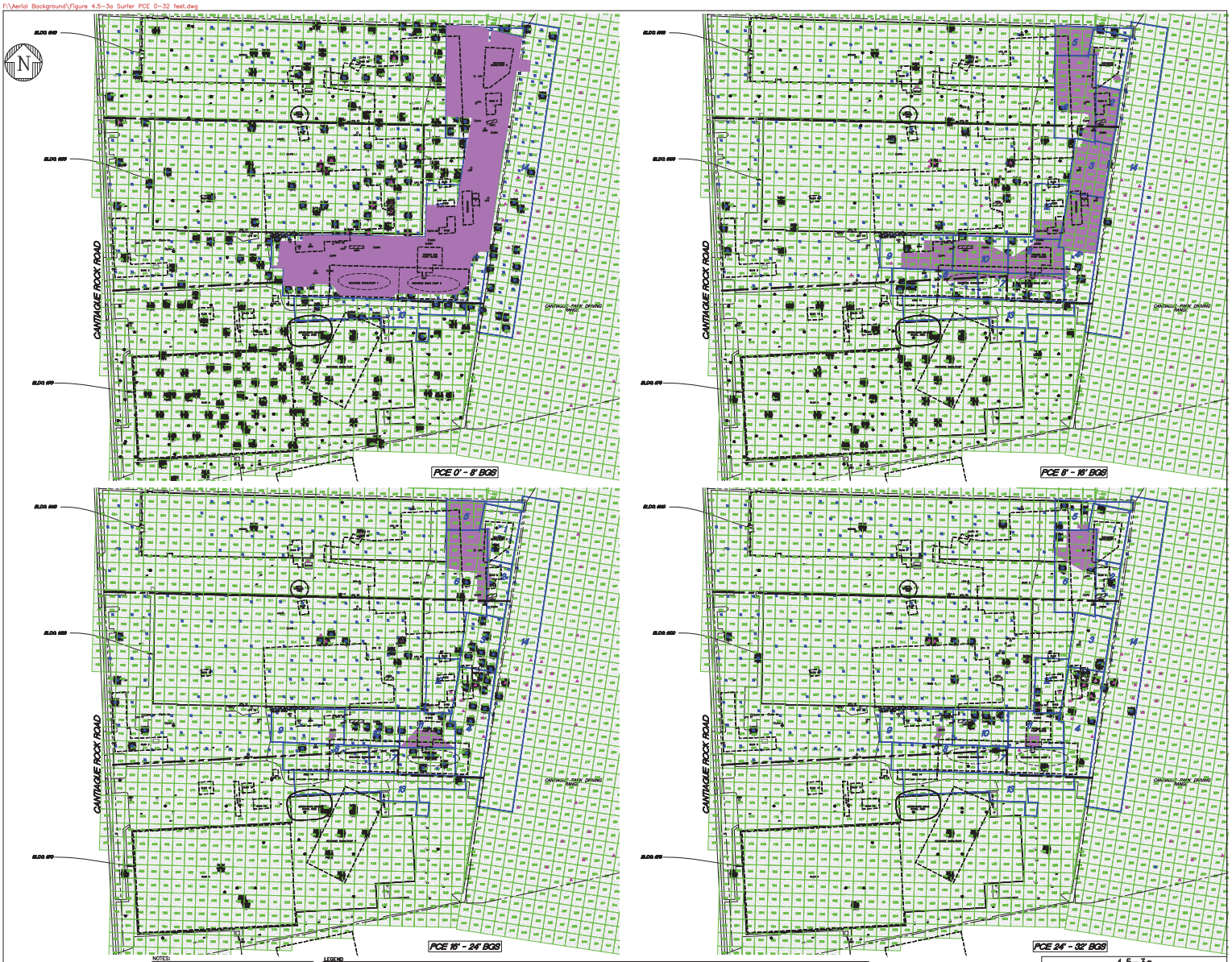
SUBCELL GRID

AREA WITHIN REMEDIAL CELL WHERE ONLY BACKFILL EXISTS (SEE NOTE 2)

4.5-2b
NICKEL CONCENTRATIONS IN SITE SOILS (32'-64' BGS)
SYLVANIA CORNING FUSRAP SITE
TOWN OF HICKSVILLE, NEW YORK

ecology and environment

F:\Aerial Background\Figure 4.5-3a Surfer PCE 0-32 feet.dwg



NOTES:

1. SITE DATA PROVIDED BY WENDEL DUCHSCHERER DRAWING 1 OF 1, DATED 5/17/07.
2. REPRESENTS AREA WITHIN REMEDIAL CELL WHERE ONLY BACKFILL EXISTS ACROSS INTERVAL AND NO NATIVE SOILS ARE PRESENT.

SCALE IN FEET: 0 60 120 180

LEGEND

- BLDG BUILDING
- EXISTING DRAINAGE STRUCTURE
- EXISTING DRYWELL
- EXISTING MANHOLE
- HISTORIC BUILDING
- HISTORIC CATCH BASIN/DRAIN/DRY WELL/ LEACH POOL/MANHOLE
- APPROXIMATE PROPERTY LINE
- 1 REMEDIATION CELLS

SAMPLE TYPE

- USACE (GC-/GS) LABORATORY ANALYSIS
- USEPA (DV-/DS) LABORATORY ANALYSIS
- USEPA (GC-/GS) LABORATORY ANALYSIS

SAMPLE CONCENTRATION RANGE

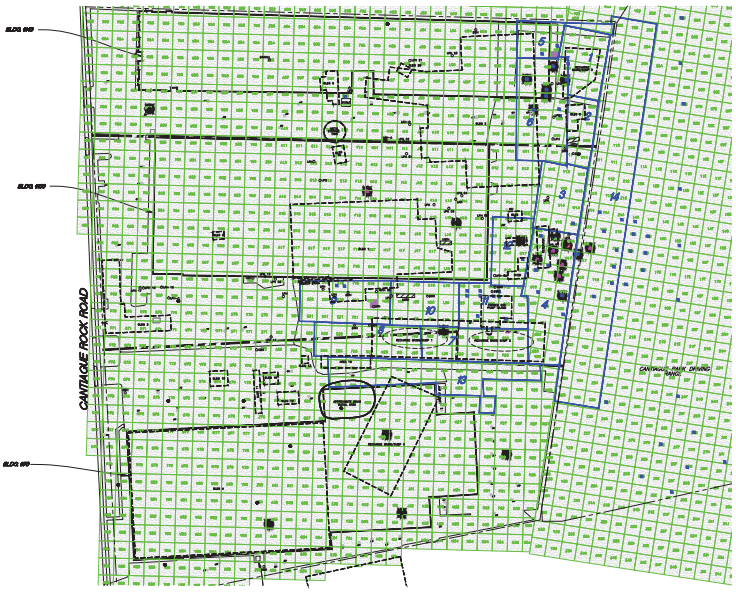
- >0 TO 1,000 PCE
- 1,000 TO 5,000 PCE
- 5,000 TO 10,000 PCE
- 10,000 TO 100,000 PCE
- 100,000 TO 1,000,000 PCE
- >1,000,000 PCE

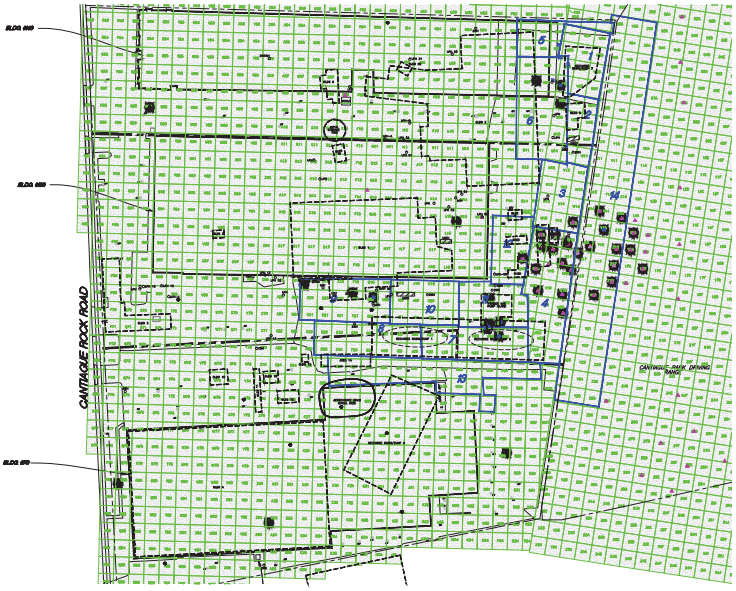
UNITS: ug/kg

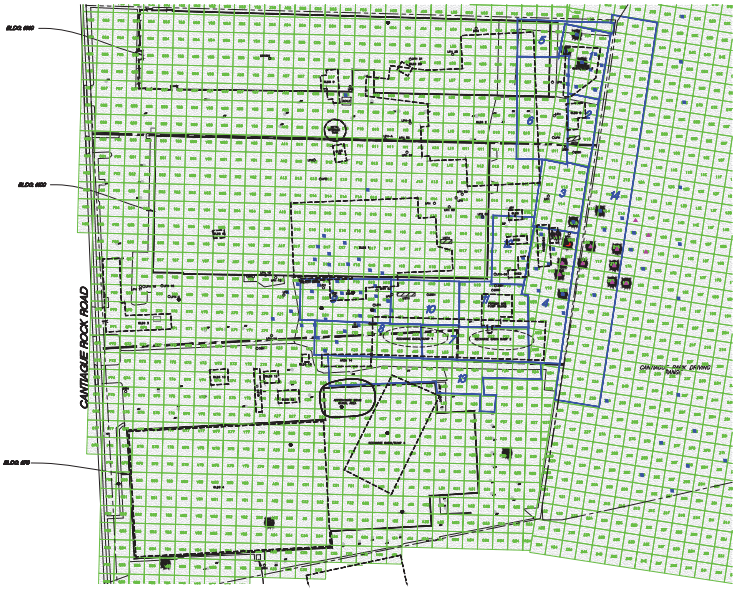
- SUBCELL GRID
- AREA WITHIN REMEDIAL CELL WHERE ONLY BACKFILL EXISTS (SEE NOTE 2)

4.5-3a
PCE CONCENTRATIONS IN SITE SOILS (0'-32' BGS)
SYLVANIA CORNING FUSRAP SITE
TOWN OF HICKSVILLE, NEW YORK

ecology and environment

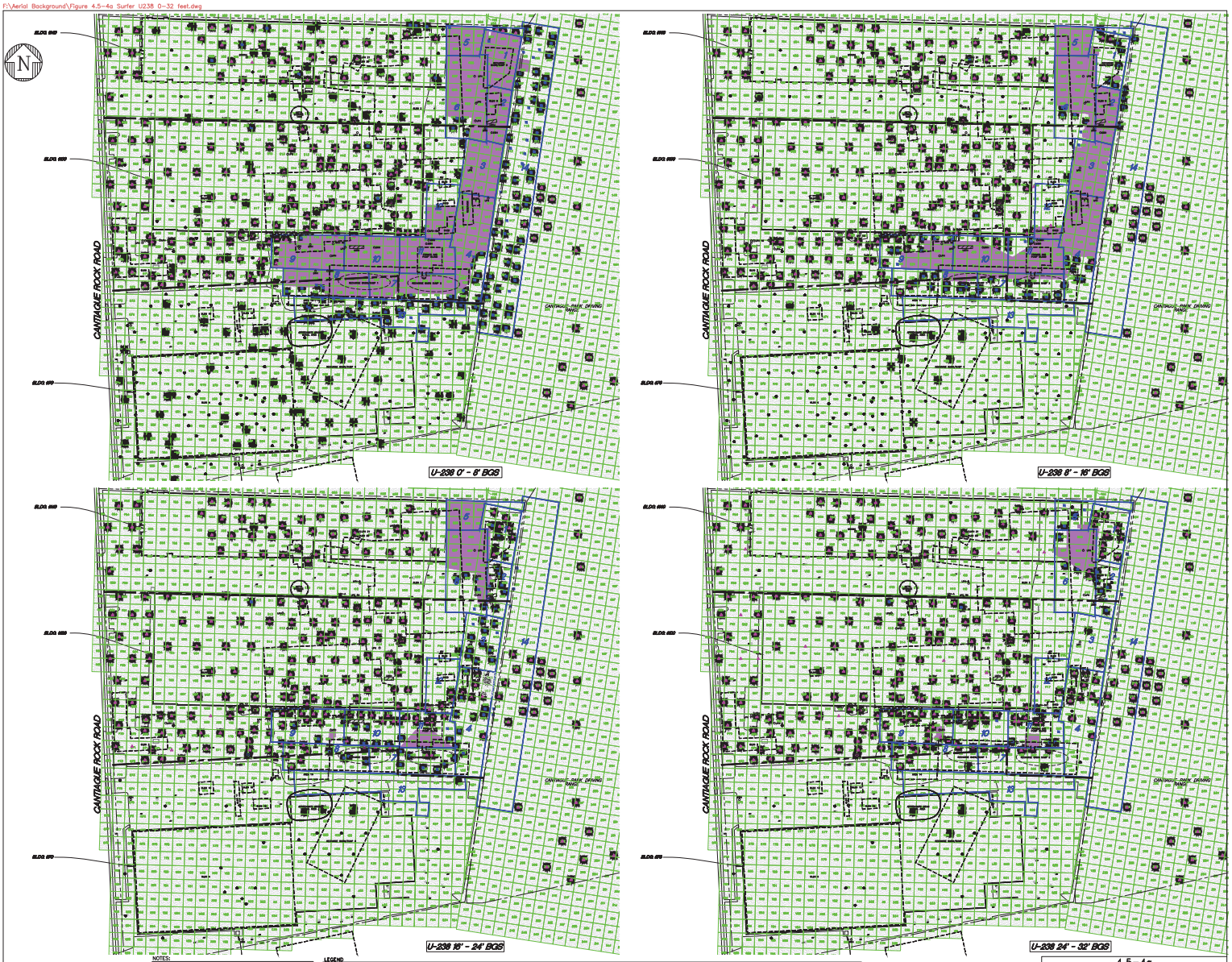






BUILDING
EXISTING DRAINAGE STRUCTURE
EXISTING DRYWELL
EXISTING MANHOLE

F:\Aerial Background\Figure 4.5-4a Surfer U238 0-32 feet.dwg



NOTES:

1. SITE DATA PROVIDED BY WENDEL DUCHSCHERER DRAWING 1 OF 1, DATED 5/17/07.
2. REPRESENTS AREA WITHIN REMEDIAL CELL WHERE ONLY BACKFILL EXISTS ACROSS INTERVAL AND NO NATIVE SOILS ARE PRESENT.

SCALE IN FEET: 0 60 120 180

LEGEND

- BUILDING
- EXISTING DRAINAGE STRUCTURE
- EXISTING DRYWELL
- EXISTING MANHOLE
- HISTORIC BUILDING
- HISTORIC CATCH BASIN/DRAIN/DRY WELL/LEACH POOL/MANHOLE
- APPROXIMATE PROPERTY LINE
- REMEDIATION CELLS

SAMPLE TYPE

- USACE OFF-SITE LABORATORY ANALYSIS
- FUSRAP ON-SITE LABORATORY ANALYSIS
- FUSRAP OFF-SITE LABORATORY ANALYSIS

SAMPLE CONCENTRATION RANGE

- 0.9 TO 10 U-238
- 10 TO 25 U-238
- 25 TO 50 U-238
- 50 TO 200 U-238
- 200 TO 1,000 U-238
- 1,000+ TO 10,000 U-238

UNITS: pCi/g

- SUBCELL GRID
- AREA WITHIN REMEDIAL CELL WHERE ONLY BACKFILL EXISTS (SEE NOTE 2)

4.5-4a
U-238 CONCENTRATIONS IN SITE SOILS (0'-32' BGS)
SYLVANIA CORNING FUSRAP SITE
TOWN OF HICKSVILLE, NEW YORK

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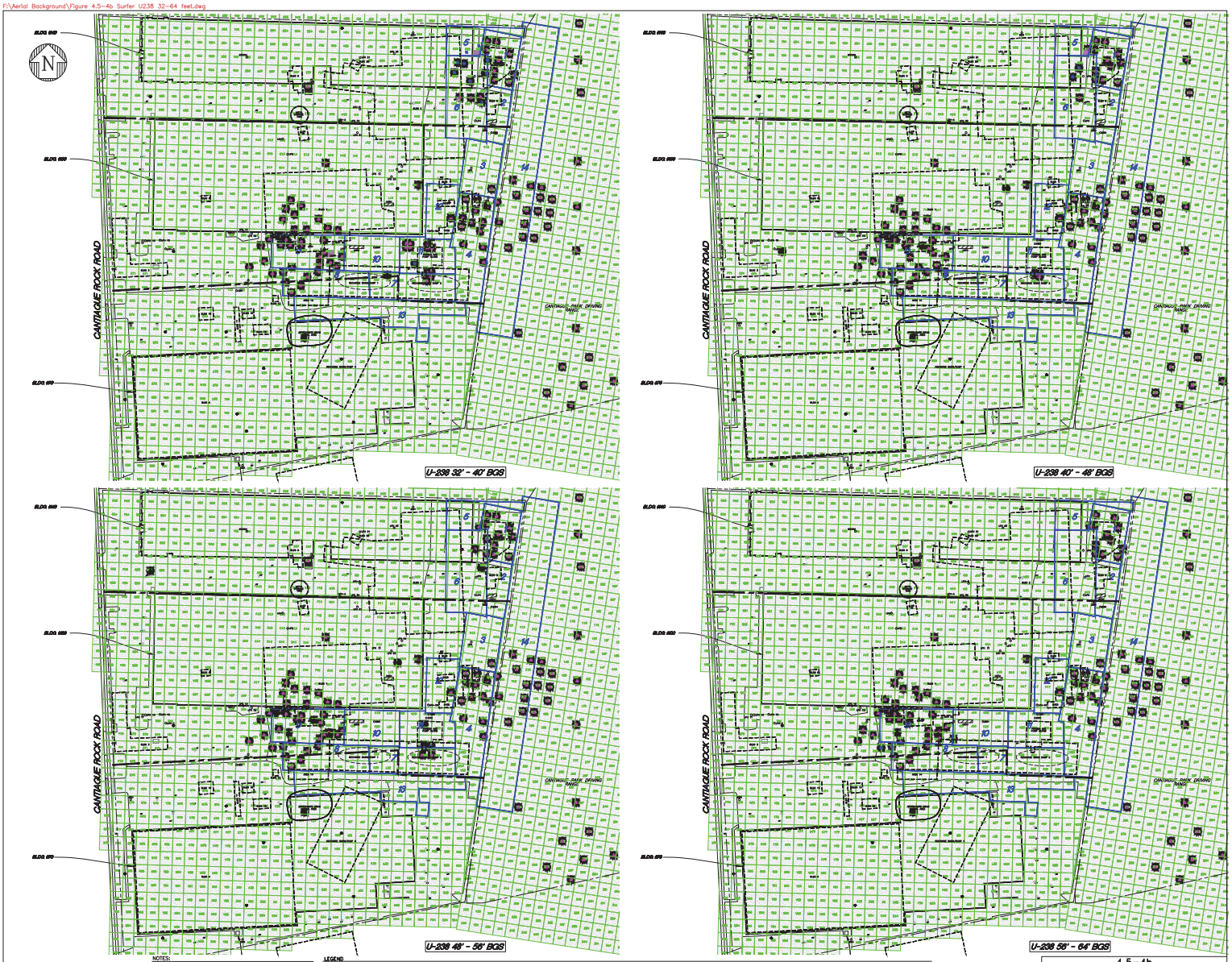
F:\Aerial Background\Figure 4.5-4b Surfer U238 32-64 feet.dwg



LEGEND

BLDG BUILDING
EXISTING DRAINAGE STRUCTURE
EXISTING DRYWELL
EXISTING MANHOLE
HISTORIC BUILDING
HISTORIC CATCH BASIN/DRAIN/DRY WELL/ LEACH POOL/MANHOLE
APPROXIMATE PROPERTY LINE
REMEDIATION CELLS

SAMPLE TYPE
LOCAL OFF-SITE LABORATORY ANALYSIS
LOCAL ON-SITE LABORATORY ANALYSIS
CESQG OFF-SITE LABORATORY ANALYSIS

SAMPLE CONCENTRATION RANGE
0.0 TO 10 U-238
10 TO 25 U-238
25 TO 50 U-238
50 TO 200 U-238
200 TO 1,000 U-238
1,000+ TO 10,000 U-238
UNITS: pCi/g

SUBCELL GRID
AREA WITHIN REMEDIAL CELL WHERE ONLY BACKFILL EXISTS (SEE NOTE 2)

SCALE IN FEET
0 60 120 180

NOTES:
1. SITE DATA PROVIDED BY WENDEL DUCHSCHERER DRAWING 1 OF 1, DATED 5/17/07.
2. REPRESENTS AREA WITHIN REMEDIAL CELL WHERE ONLY BACKFILL EXISTS ACROSS INTERVAL AND NO NATIVE SOILS ARE PRESENT.

4.5-4b
U-238 CONCENTRATIONS IN SITE SOILS (32'-64' BGS)
SYLVANIA CORNING FUSRAP SITE
TOWN OF HICKSVILLE, NEW YORK

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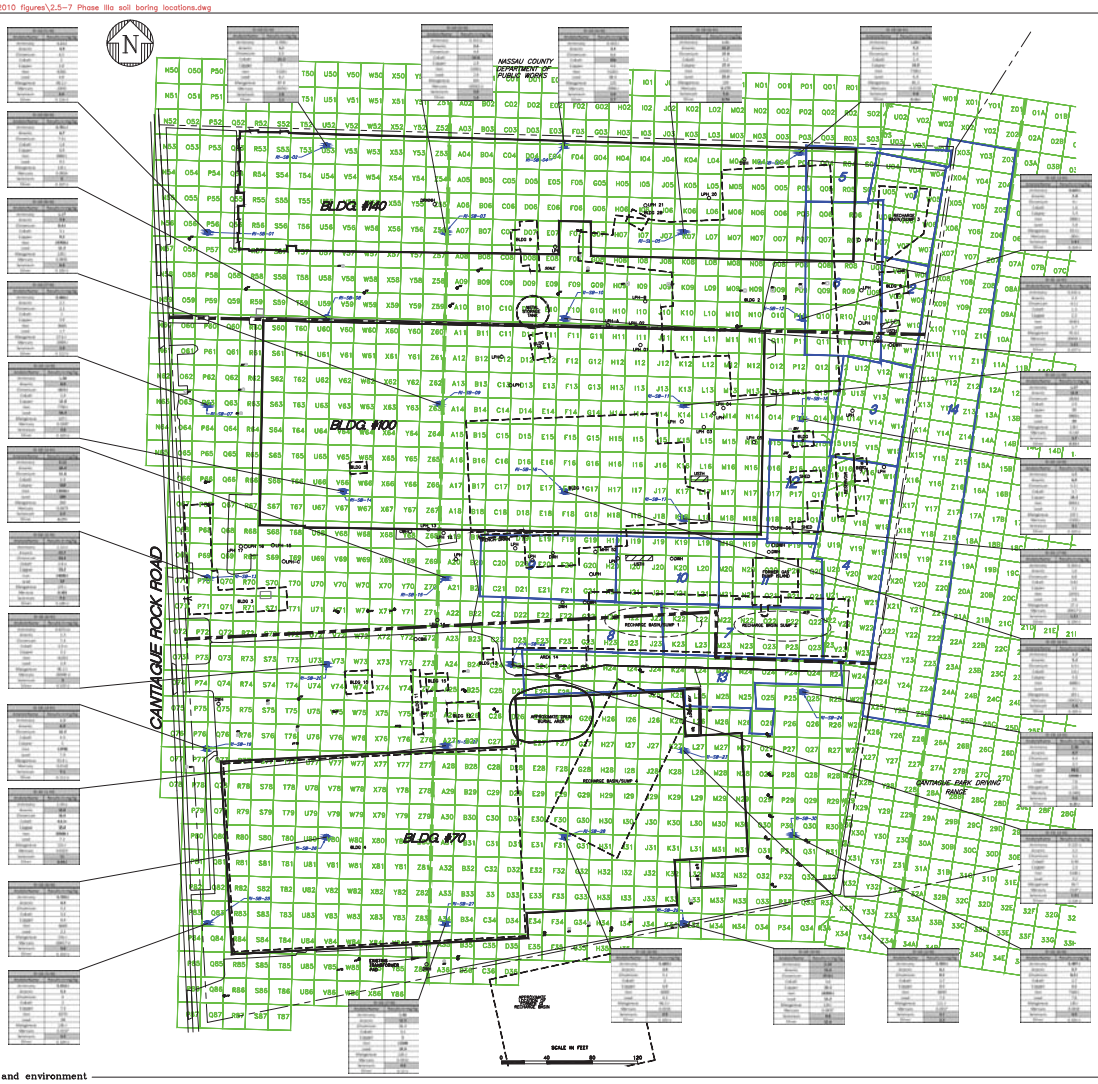
F:\SLYVANIA\2010 figures\2.5-7 Phase IIIa soil boring locations.dwg



LEGEND

- BLDG. — BUILDING
- EXISTING DRAINAGE STRUCTURE
- EXISTING DRYWELL
- EXISTING MANHOLE
- HISTORIC BUILDING
- CBH/DRAIN/DRH/LPH/WHM — HISTORIC CATCH BASIN/DRAIN/DRY WELL/ LEACH POOL/MANHOLE
- SHALLOW BORINGS DRILLED IN PHASE IIIA
- 1 — REMEDIATION CELLS
- APPROXIMATE PROPERTY LINE
- 6PG — SUBCELL GRID LOCATION
- SUBCELL GRID HAMING TRANSITION LINE

NOTES

1. SITE DATA PROVIDED BY WENDEL DUCHSCHERER DRAWING 1 OF 1, DATED 5/17/07.

BOLD VALUES INDICATE CONCENTRATION EXCEEDS BACKGROUND THRESHOLD VALUE

BOLD + HIGHLIGHTED VALUES INDICATE CONCENTRATION EXCEEDS THREE TIMES BACKGROUND THRESHOLD VALUE

Aluminum	5.4x	2.4B
Arsenic	1.2J	0.8B
Chromium	1.4B	0.6B
Copper	1.4B	0.6B
Iron	3.1x	0.4B
Lead	24.4	0.4B
Manganese	0.4J	0.01B
Mercury	0.4B	0.1U
Nickel	1.4B	0.8B
Zinc	6.2x	1.2B

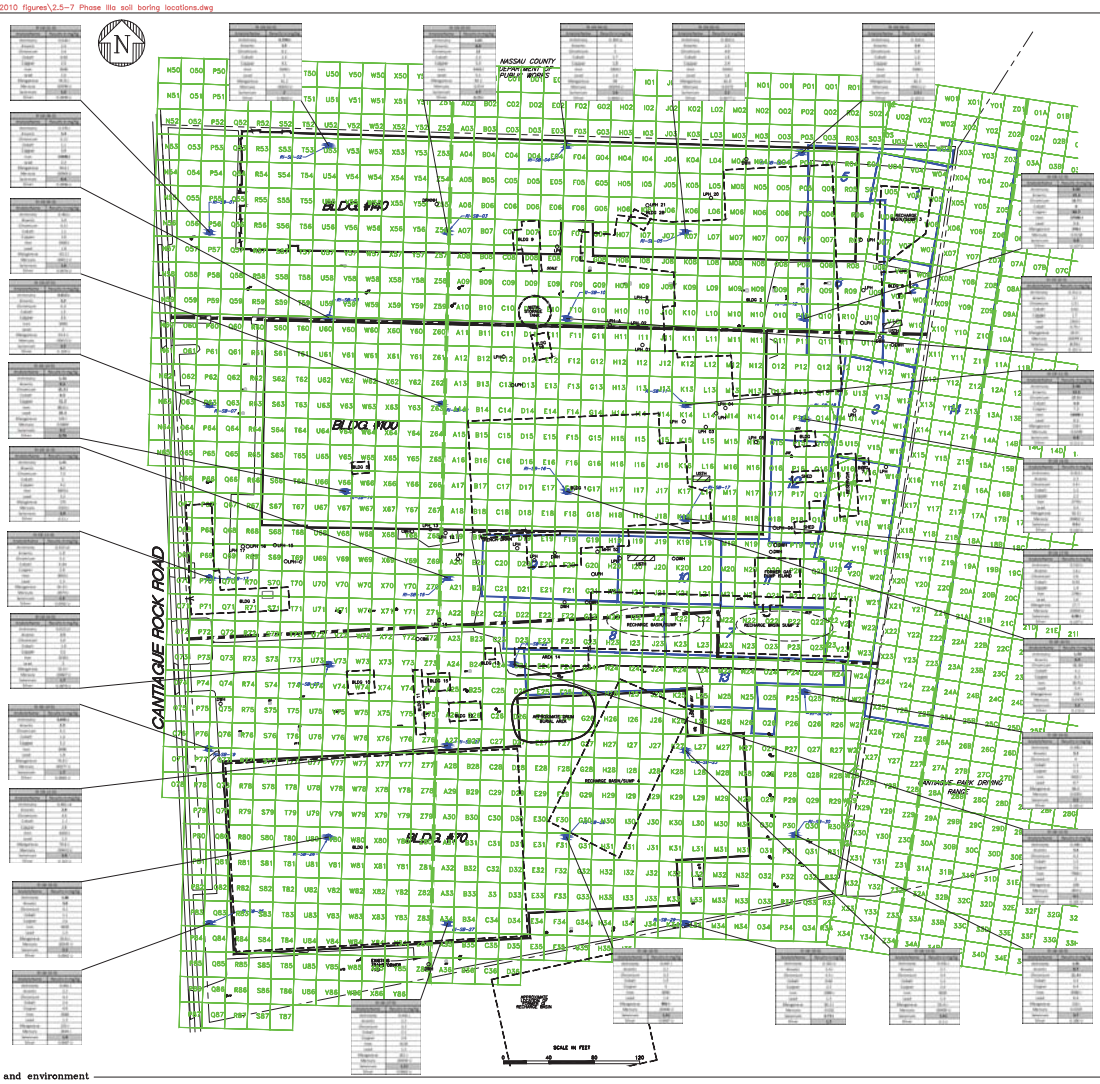
KEY:

U = NOT DETECTED
J = ESTIMATED
J- = ESTIMATED LOW
J+ = ESTIMATED HIGH
mg/kg = MILLIGRAMS PER KILOGRAM
BTV = BACKGROUND THRESHOLD VALUE
3x BTV = THREE TIMES BACKGROUND THRESHOLD VALUE

FIGURE 4.5-5a
PHASE III SOIL BORING LOCATIONS
ANALYTICAL RESULTS 0' - 2'
SYLVANIA CORNING FUSRAP SITE
TOWN OF HICKSVILLE, NEW YORK

ecology and environment

F:\SLYVANIA\2010 figures\2.5-7 Phase IIIa soil boring locations.dwg



LEGEND

- BLDG — BUILDING
- EXISTING DRAINAGE STRUCTURE
- EXISTING DRYWELL
- EXISTING MANHOLE
- HISTORIC BUILDING
- CB/DRAIN/DW/LP/MH — HISTORIC CATCH BASIN/DRAIN/DRY WELL/ LEACH POOL/MANHOLE
- SHALLOW BORINGS DRILLED IN PHASE IIIA
- 1 — REMEDIATION CELLS
- APPROXIMATE PROPERTY LINE
- SCL — SUBCELL GRID LOCATION
- SUBCELL GRID NAMING TRANSITION LINE

NOTES

1. SITE DATA PROVIDED BY WENDEL DUCHSCHERER DRAWING 1 OF 1, DATED 5/17/07.

BOLD VALUES INDICATE CONCENTRATION EXCEEDS BACKGROUND THRESHOLD VALUE

BOLD + HIGHLIGHTED VALUES INDICATE CONCENTRATION EXCEEDS THREE TIMES BACKGROUND THRESHOLD VALUE

Arsenic	8.61	1.08
Barium	1.56	0.47
Cadmium	1.26	0.07
Chromium	1.26	0.47
Copper	1.26	0.47
Lead	8.61	0.47
Iron	24.1M	20,400.00
Mercury	0.14	0.05
Manganese	2.51	201.00
Nickel	1.26	0.47
Selenium	0.63	0.31
Vanadium	3.14	0.94
Zinc	1.26	0.47

KEY:

U = NOT DETECTED
J = ESTIMATED
J- = ESTIMATED LOW
J+ = ESTIMATED HIGH
mg/kg = MILLIGRAMS PER KILOGRAM
BTV = BACKGROUND THRESHOLD VALUE
3x BTV = THREE TIMES BACKGROUND THRESHOLD VALUE

FIGURE 4.5-5b
PHASE III SOIL BORING LOCATIONS
ANALYTICAL RESULTS 2' - 8'
SYLVANIA CORNING FUSRAP SITE
TOWN OF HICKSVILLE, NEW YORK

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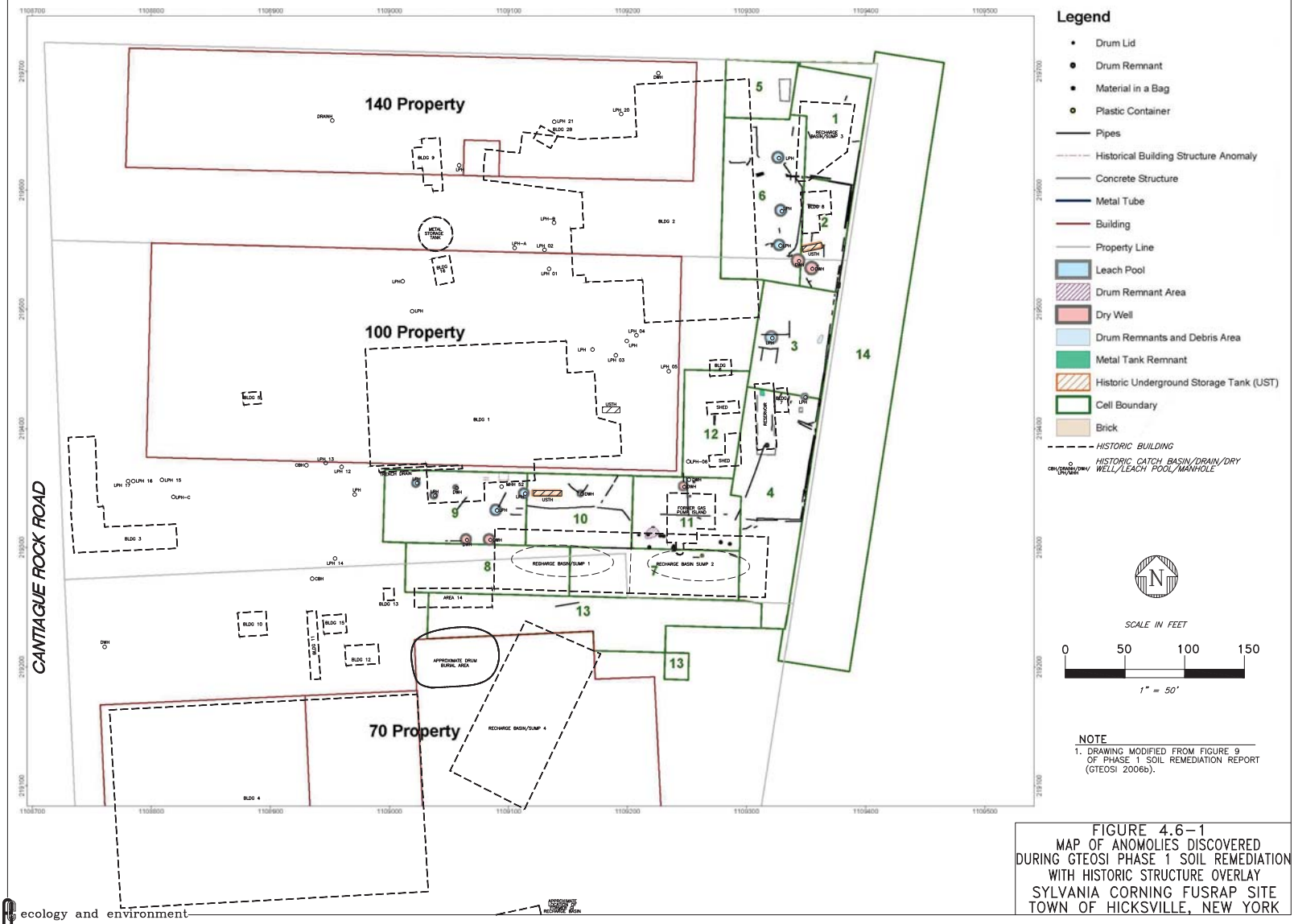

FIGURE 4.6-1
MAP OF ANOMOLIES DISCOVERED DURING GTEOSI PHASE 1 SOIL REMEDIATION WITH HISTORIC STRUCTURE OVERLAY
SYLVANIA CORNING FUSRAP SITE
TOWN OF HICKSVILLE, NEW YORK

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F:\Aerial Background\2010 figures\Fig Shallow Plumes_screening values.dwg

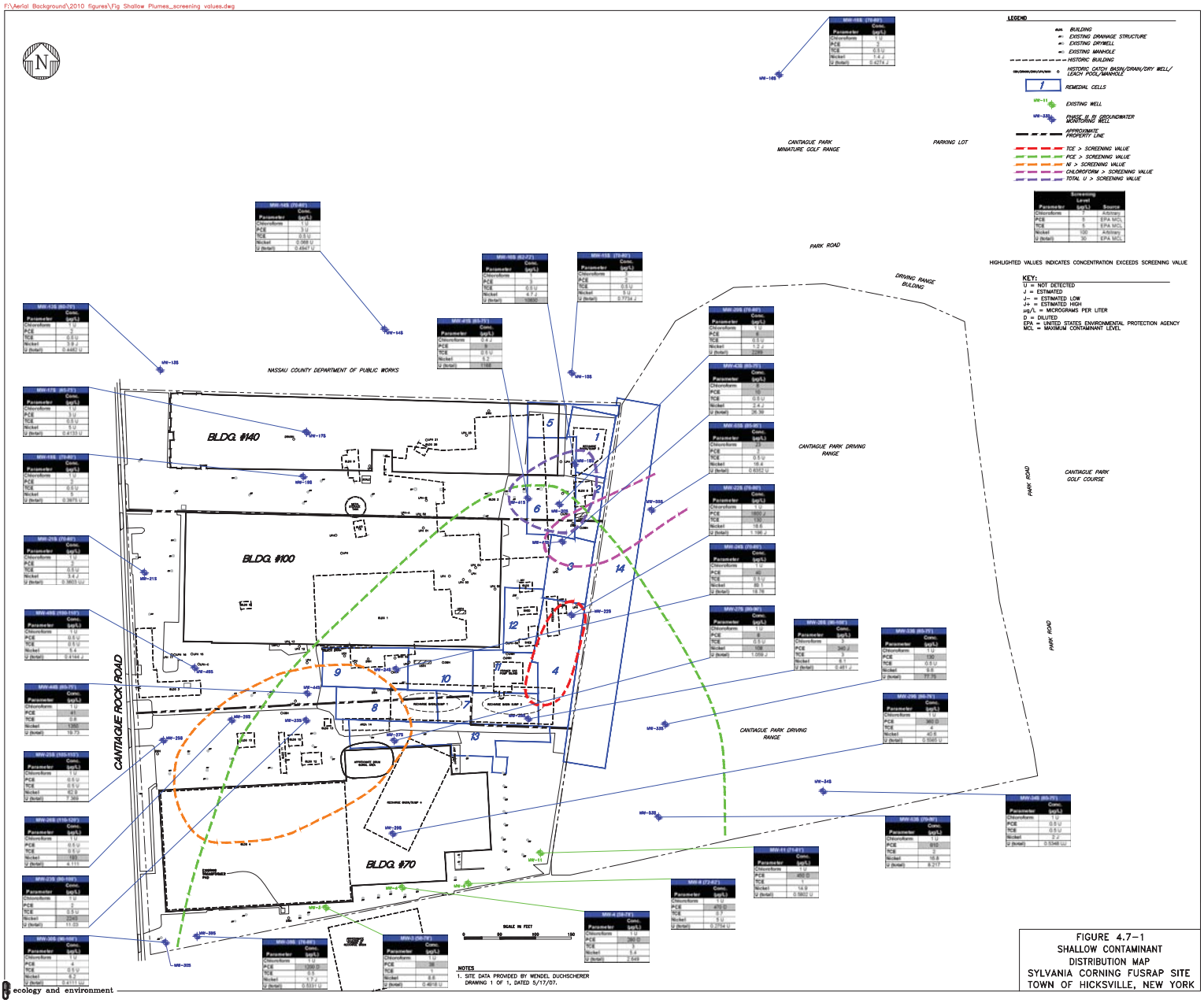

FIGURE 4.7-1
SHALLOW CONTAMINANT DISTRIBUTION MAP
SYLVANIA CORNING FUSRAP SITE
TOWN OF HICKSVILLE, NEW YORK

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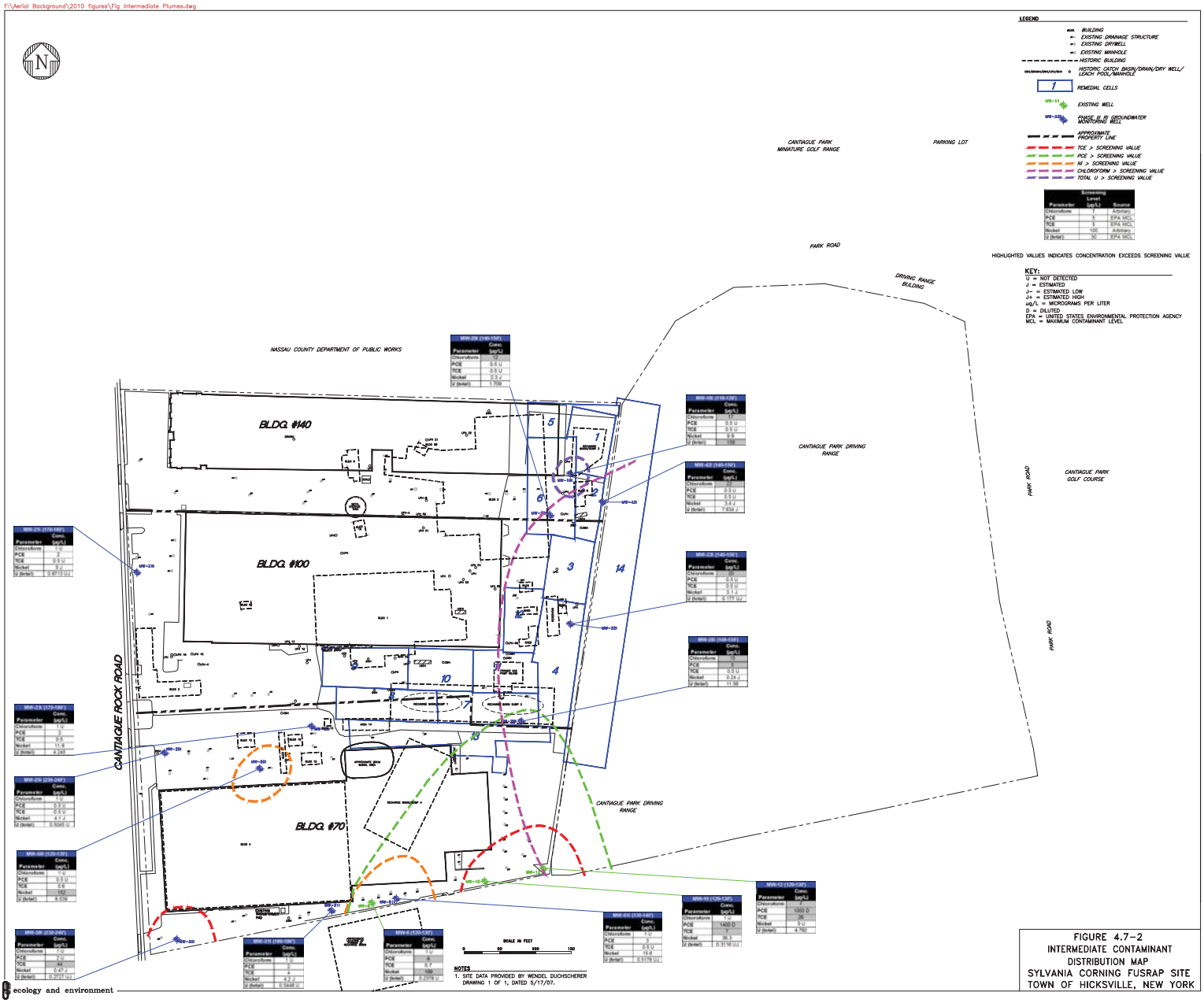

NOTES
1. SITE DATA PROVIDED BY WENDEL DUCHSCHERER DRAWING 1 OF 1, DATED 5/17/07.

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FIGURE 4.7–2
INTERMEDIATE CONTAMINANT DISTRIBUTION MAP
SYLVANIA CORNING FUSRAP SITE
TOWN OF HICKSVILLE, NEW YORK

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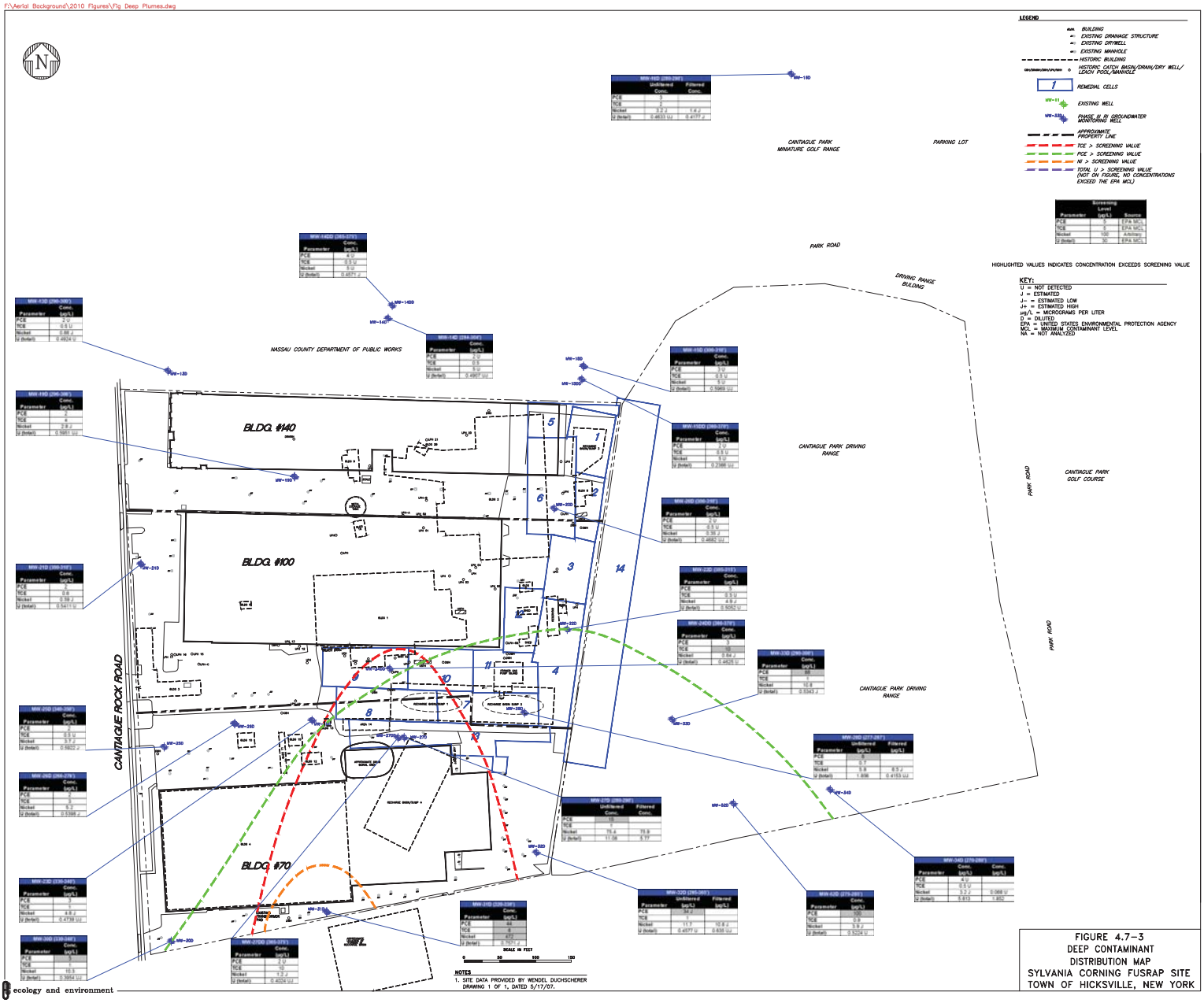

NOTES
1. SITE DATA PROVIDED BY WENDEL DUCHSCHERER DRAWING 1 OF 1, DATED 5/17/07.

FIGURE 4.7-3
DEEP CONTAMINANT DISTRIBUTION MAP
SYLVANIA CORNING FUSRAP SITE
TOWN OF HICKSVILLE, NEW YORK

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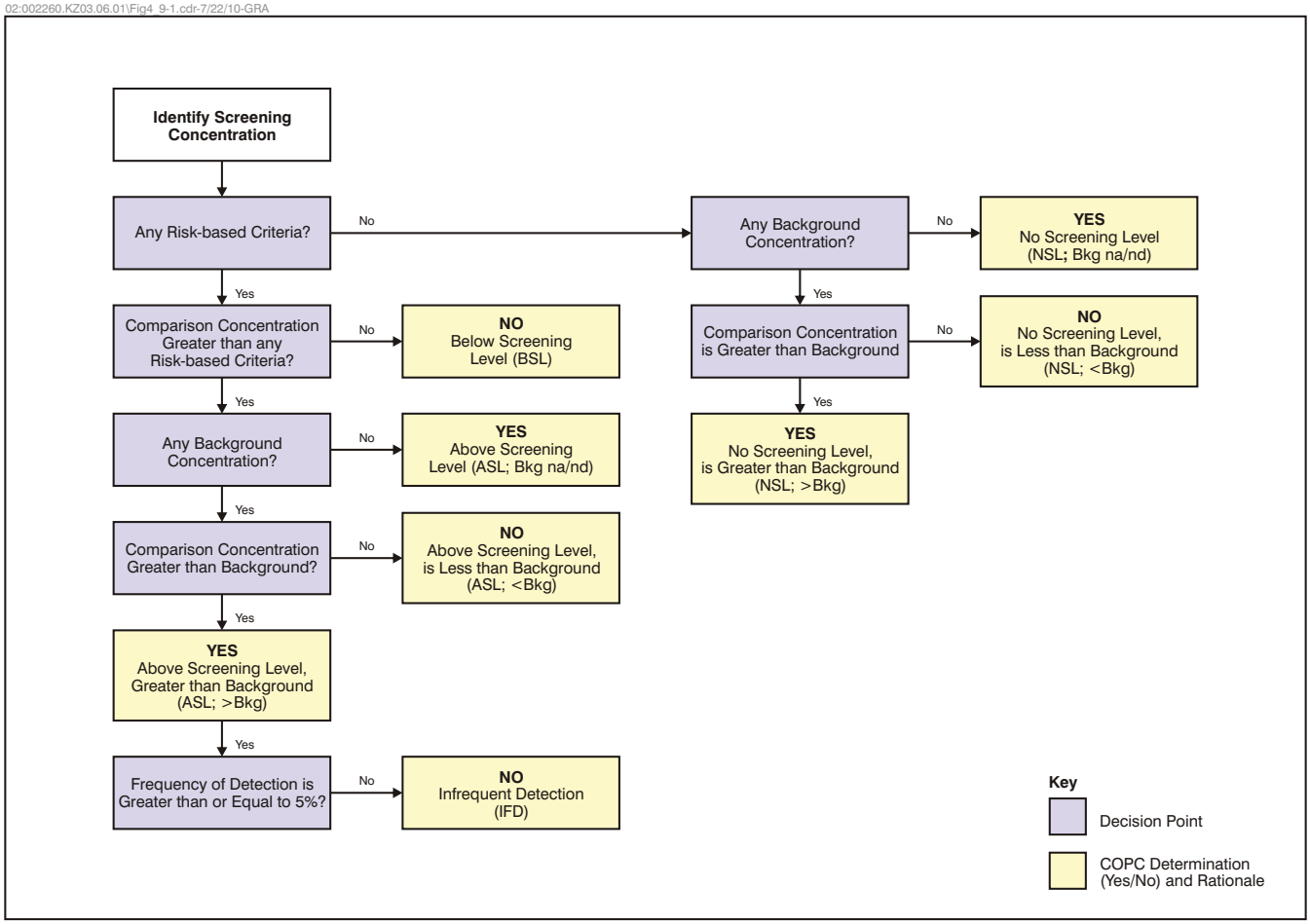

Figure 4.9-1 Initial COPC Identification Flow Chart
Sylvania Corning FUSRAP Site
Town of Hicksville, New York