FINAL ENGINEERING REPORT

New York State Department of Environmental Conservation

Division of Environmental Remediation

Fumex Sanitation Site
NYSDEC Site No: 130041
Nassau County, New York
Contract No. D007692

June 2012

CDM Smith

Certifications

I, Paul Hagerman, am currently a registered professional engineer licensed by the State of New York, I had primary direct responsibility for implementation of the remedial program activities, and I certify that the Remedial Design was implemented and that all construction activities were completed in substantial conformance with the Department-approved Remedial Design.

I certify that the data submitted to the Department with this Final Engineering Report demonstrates that the remediation requirements set forth in the Remedial Design and in all applicable statutes and regulations have been or will be achieved in accordance with the time frames, if any, established in for the remedy.

I certify that all use restrictions, Institutional Controls, Engineering Controls, and/or any operation and maintenance requirements applicable to the Site are contained in an environmental easement created and recorded pursuant ECL 71-3605 and that all affected local governments, as defined in ECL 71-3603, have been notified that such easement has been recorded.

I certify that a Site Management Plan has been submitted for the continual and proper operation, maintenance, and monitoring of all Engineering Controls employed at the Site, including the proper maintenance of all remaining monitoring wells, and that such plan has been approved by Department.

I certify that any financial assurance mechanisms required by the Department pursuant to Environmental Conservation Law have been executed.

I certify that all documents generated in support of this report have been submitted in accordance with the DER's electronic submission protocols and have been accepted by the Department.

I certify that all data generated in support of this report have been submitted in accordance with the Department's electronic data deliverable and have been accepted by the Department.

I certify that all information and statements in this certification form are true. I understand that a false statement made herein is punishable as a Class "A" misdemeanor, pursuant to Section 210.45 of the Penal Law. I, Paul Hagerman, of CDM, 110 Fieldcrest Ave, #8, 6th Floor, Edison, NJ 08837, am certifying as Owner's Designated Site Representative for the Site.

070459	6/5/12	Paul R. Hagerman
NYS Professional Engineer #	Date	Signature

Table of Contents

Acronyms

Section 1 Background and Site Description 1-1

1.1 Introduction 1-1
1.2 Site Geology 1-1
1.3 Site History 1-1

Section 2 Summary of Site Remedy 2-1

2.1 Remedial Action Objectives 2-1
2.2 Description of Selected Remedy 2-1
2.3 Additional Components of the Remedy 2-2

Section 3 Interim Remedial Measures, Operable Units and Remedial Contracts 3-1

Section 4 Summary of Remedial Actions Performed 4-1

4.1 Governing Documents 4-1
4.1.1 Contract Documents 4-1
4.1.2 ROD as amended by the ESD 4-1
4.1.3 Contractor Work Plan 4-1
4.1.4 Groundwater Monitoring Plan 4-1
4.1.5 Site Specific Health & Safety Plan 4-2
4.1.6 Community Air Monitoring Plan 4-2
4.2 Remedial Program elements 4-2
4.2.1 Contractors and Consultants 4-2
4.2.2 Site Preparation 4-3
4.2.3 General Site Controls 4-3
4.2.4 Nuisance controls 4-3
4.2.5 CAMP Results 4-3
4.2.6 Reporting 4-4
4.2.7 Monitoring Well Installation 4-4
4.3 Contaminated Materials Removal 4-4
4.3.1 On-site Soil and Asphalt 4-4
4.3.2 Drywell Removal 4-5
4.3.3 Residential Property 4-5
4.3.4 Underground Storage Tank 4-6
4.3.5 Building Interior Concrete 4-6
4.3.6 Asbestos-Containing Materials 4-6
4.4 Remedial Performance/Documentation Sampling 4-7
4.4.1 On-site Soil and Asphalt 4-7
4.4.2 Drywell 4-7
4.4.3 Residential Property 4-8
4.4.4 UST 4-8
4.4.5 Building Interior Concrete 4-8
4.4.6 ACM 4-8

4.5 Imported Backfill 4-8
4.5.1 On-site Soil 4-8
4.5.2 UST 4-8
4.5.3 Residential Property 4-9
4.6 Contamination Remaining at the Site 4-9
4.7 Soil and Asphalt Cover System 4-9
4.7.1 Cover System 4-9
4.7.2 Stormwater Management System 4-10
4.8 Other Engineering Controls 4-10
4.8.1 Epoxy Resin Coating 4-10
4.8.2 Bridging Encapsulant 4-10
4.8.3 Fencing 4-10
4.8.4 Roof 4-11
4.8.5 Door Repair 4-11
4.9 Restoration 4-11
4.9.1 Onsite Restoration 4-11
4.9.2 Offsite Restoration 4-11
4.10 Institutional Controls 4-11
4.11 Deviations from the Remedial Design 4-12
4.11.1 Change Order No. 1 4-12
4.11.2 Monitoring Well Installation and Groundwater Sampling 4-12

Section 5 Final Completion 5-1

Figures

Figure 1 – Site Location Map

Figure 2 – Study Area Water Table Contour Map

Figure 3 – Building Remediation

Figure 4 – Remaining Contamination

Tables

Table 1 – Soil Cleanup Objectives

Table 2 – Soil Excavation Endpoint Sample Results

Table 3 – Drywell Sample Results

Table 4 – Residential Property Soil Excavation Endpoint Sample Results

Table 5 – Indoor Concrete Surface Composite Sample Results

Appendices

Appendix A – ALTA/ACSM Land Title Survey (As-Builts)

Appendix B – Pre-Construction Meeting Minutes and Progress Meeting Minutes

Appendix C – Baseline Project Schedule

Appendix D – Permits

Appendix E – Equipment Decontamination Certificate

Appendix F – CAMP Results

Appendix G – Daily Reports

Appendix H – GES Field Notes

Appendix I – Contract Drawings

Appendix J – Island Wide Survey

Appendix K –Waste Manifests

Appendix L – Submittal Log

Appendix M –EAR UST Removal Report

Appendix N – Analytical Data

Appendix O – Asbestos Final Clearance Report

Appendix P – Substantial and Final Completion Certificates

Appendix Q – J. Barwick Bid Breakdown

Appendix R – Certified Payroll

Appendix S – Request for Further Information

Appendix T – Potential Change Orders

Appendix U – Change Orders

Appendix V – Groundwater Sampling Data

Appendix W – Environmental Notice

Acronyms

AARCO	AARCO Environmental Services
ACM	asbestos-containing materials
ADT	Aquifer Drilling & Testing, Inc.
APM	American Paving & Masonry
C&D	construction & demolition
CAMP	Community Air Monitoring Plan
CDM	Camp Dresser & McKee
COC	contaminant of concern
D&B	Dvirka and Bartilucci Consulting Engineers
DER	Division of Environmental Remediation
EAR	Environmental Assessment & Remediations
EC	Engineering Control
ECL	Environmental Conservation Law
EPA	Environmental Protection Agency
ESD	Explanation of Significant Differences
FS	Feasibility Study
GES	Groundwater & Environmental Services, Inc.
HASP	Health and Safety Plan
HDPE	high density polyethylene
IC	Institutional Control
NYSDEC	New York State Department of Environmental Conservation
OSHA	Occupational Safety & Health Administration
PID	photo-ionization detector
QAPP	Quality Assurance Project Plan
RAO	Remedial Action Objectives
RCA	recycled concrete aggregate
RCRA	Resource Conservation and Recovery Act
RD	Remedial Design
RI	Remedial Investigation
ROD	Record of Decision
SCO	soil cleanup objective
SMP	Site Management Plan
SVOC	semi-volatile organic compound
TCL	Target Compound List
UST	underground storage tank
VOC	volatile organic compound
YEC	YEC, Inc.

Section 1

Background and Site Description

1.1 Introduction

The New York State Department of Environmental Conservation (NYSDEC), under the State Superfund Program (SSF), remediated a 0.24 acre property located in the Village of Garden City Park, Town of North Hempstead, Nassau County, New York. The SSF program requires the NYSDEC to investigate and remediate contaminated media at the Site.

The Fumex Sanitation site (herein referred to as "Site") is located at 131 Herricks Road, Garden City Park, New York, and identified as Block 174 and Lot 58 on the tax map entitled "Nassau County Department of Assessment Land & Tax," Sheet 1 of 1. The site is a 0.24 acre area bounded by Bedford Avenue to the north, a commercial property to the south, Herricks Road to the east, and a residential property to the west (see Figure 1). The boundaries of the site are more fully described in the Metes and Bounds description provided in the ALTA/ACSM Land Title Survey (Appendix A). There is a one-story brick building present on-site that includes office space and a garage. The property also contains a paved parking area.

The Site was remediated to a level acceptable for commercial and industrial use. The western residential property, located at 280 Bedford Avenue, Garden City Park, NY, has been remediated and determined to be suitable for unrestricted use.

1.2 Site Geology

Beneath the Site are approximately 800 feet of unconsolidated deposits overlying crystalline bedrock. The shallowest soils beneath the Site are the Upper Glacial formation. The Upper Glacial formation consists of Pleistocene age outwash sands and gravels and is approximately 100 feet thick in this vicinity. The depth to groundwater is approximately 40 to 50 feet below grade. Shallow groundwater flow is generally to the southwest (see Figure 2). Immediately beneath the Upper Glacial formation is the Magothy formation. The Magothy is composed of sands with intermittent clay layers and is 300 to 400 feet thick in the vicinity of the Site. The Magothy formation is used as the primary aquifer for public drinking water in Nassau County, with most wells screened 300-400 feet below the water table. Beneath the Magothy formation is the Raritan formation, consisting of the Raritan clay and the Lloyd sand. The Raritan formation is approximately 300 feet thick and overlies bedrock.

1.3 Site History

Fumex operated a commercial termite extermination business at this location from 1952 to 1992. Reportedly, the originally unpaved parking lot was sprayed regularly with chlordane for insect control from 1952 to 1978. The parking lot was then paved sometime between 1978 and 1981. In 1981, a chlordane rinse water spill of less than 30 gallons occurred in the asphalt parking lot. Some of the rinse water entered a dry well located within the parking lot. Site investigations have confirmed that chlordane and other pesticides have contaminated soil and the groundwater beneath the Site and the soil of a neighboring yard. In 1986, the NYSDEC entered into an Order-On-Consent with Fumex Sanitation, Inc. in which Fumex agreed to conduct an investigation to determine the extent of

contamination in the soil and groundwater at the Site. Limited site investigations were conducted by the property owner prior to 1989; NYSDEC completed further investigations in 1989 and based on the results of these investigations, the Site was added to the Registry of Inactive Hazardous Waste Disposal Sites.

Camp Dresser & McKee (CDM) completed a Phase I Remedial Investigation (RI) for NYSDEC in 1996, a Phase II RI in 1998, and an additional investigation in 1999. The remedial investigations identified the primary contaminants as heptachlor, chlordane, and dieldrin in the soil and groundwater. Heptachlor concentrations in the on-site shallow soils ranged from 4.8 parts per million (ppm) to 51 ppm; while chlordane and dieldrin concentrations ranged from 35 to 280 ppm, and 3.5 to 15 ppm, respectively. Concentrations of these pesticides decreased significantly with depth. Soil samples collected from neighboring properties indicated that the residential property that bounds the western side of the Fumex property had surface soil pesticide contamination. Groundwater samples, collected from on-site and off-site monitoring wells, indicate that heptachlor, chlordane and dieldrin detected in the on-site monitoring wells are not migrating off-site.

CDM completed a Feasibility Study (FS) in January 2000 and in March 2001 a Record of Decision (ROD) was signed for the Fumex site.

Pre-design investigations were conducted by Dvirka and Bartilucci Consulting Engineers (D&B) in 2006 and 2007 under contract with the NYSDEC. These investigations included additional soil and groundwater sampling, an asbestos and lead-based paint survey, a property boundary/physical features survey, and a subsurface utility survey.

Based on the results from the pre-design investigation, an Explanation of Significant Differences (ESD) was completed in April 2007. The ROD was amended by the ESD and the ESD was the basis for the completed Remedial Action.

D&B completed the Remedial Design (RD) in October 2009. D&B's contract reached an expenditure limit and CDM was issued a work assignment by NYSDEC to provide bidding assistance and construction management.

Remedial activities were initiated in August 2010 and were completed in December 2011.

Section 2

Summary of Site Remedy

2.1 Remedial Action Objectives

Based on the results of the Remedial Investigation, the following Remedial Action Objectives (RAOs) were identified for the Site:

1. Treat or remove the principal threat posed by the Site to groundwater and potential impacts to downgradient users.

2. Isolate or remove the contaminated material in order to provide protection to human health from direct contact or ingestion of hazardous constituents in wastes or surface soil at the Site.

3. Prevent infiltration of water through the surface soil and subsequent percolation into the subsurface soil and groundwater.

2.2 Description of Selected Remedy

The Site was remediated in accordance with the remedy selected by the NYSDEC in the ROD dated March 2001 and modified by the ESD dated April 2007. The factors considered during the selection of the remedy are those listed in 6NYCRR 375-1.8. The following are the components of the selected remedy:

1. The excavation and off-site disposal of approximately 730 tons of on-site hazardous contaminated soils and asphalt followed by backfilling of the remaining open excavations with clean imported fill. The disturbed areas were covered with asphalt and/or topsoil and sod.

2. Removal of an on-site drywell and installation of a new stormwater management system that connects to the Nassau County stormwater system.

3. Removal and off-site disposal of an underground storage tank (UST).

4. Abatement of asbestos-containing material (ACM) floor tile.

5. Power washing (with detergent) of the concrete floor in the former garage and the application of an epoxy resin coating on the floor.

6. The excavation and off-site disposal of approximately 33 tons of off-site nonhazardous contaminated soils followed by backfilling of the remaining open excavations with clean imported fill. The disturbed areas were covered with topsoil and sod.

7. Installation of two off-site monitoring wells and groundwater sampling of the entire monitoring well network.

8. Recording of an Environmental Notice to restrict land use and prevent future exposure to any contamination remaining at the Site.

9. Development and implementation of a Site Management Plan (SMP) for long term management of remaining contamination as required by the Environmental Notice, which includes plans for: (1) Institutional and Engineering Controls, (2) monitoring, and (3) reporting.

2.3 Additional Components of the Remedy

During remedial construction activities, NYSDEC identified additional actions necessary for completion of remediation. The following are additional components completed as directed by NYSDEC:

1. Encapsulation of ACM wall mastic inside the on-site building.

2. Roof and door repair to the on-site building.

Section 3

Interim Remedial Measures, Operable Units and Remedial Contracts

The remedy for this Site was performed as a single project and no interim remedial measures were performed or separate operable units designated.

Three contractors were used to complete the construction activities. J. Barwick Landscape & Site Developer (J. Barwick) completed the majority of the work, including all on-site excavation, disposal and site restoration. In order to expedite the project completion, NYSDEC utilized two call-out contractors to complete the remedial construction. Environmental Assessment & Remediations (EAR) completed the removal and disposal of the UST and Groundwater & Environmental Services, Inc. (GES) completed the off-site excavation, disposal, and restoration, and installed two monitoring wells. GES also completed on-site activities including an ALTA/ACSM land title survey, fence installation, and restoration activities at the on-site building.

Section 4

Summary of Remedial Actions Performed

Remedial activities completed at the Site were conducted in accordance with the NYSDEC-approved Remedial Design (RD) for the Fumex Sanitation Site (October 2009). Activities commenced in August 2010. The off-site residential property located at 280 Bedford Avenue was remediated to be protective of human health, and is suitable for residential use. The on-site portion of the Site was cleaned up to be protective of groundwater and is now suitable for commercial or industrial reuse. The building repairs were completed in the fall of 2011 and all remedial activities were completed at the Site in December 2011.

The sections that follow detail all components of the completed remedial action. Deviations from the RD are noted in Section 4.11.

4.1 Governing Documents

A submittal log of all submitted documentation is included in Appendix L.

4.1.1 Contract Documents

The contract documents were completed by D&B in October 2009 under Contract No. D007692. These documents include all specifications and drawings relevant to the RD. They provide a detailed description of the observation and testing activities that were used to monitor construction quality and confirm that remedial construction was in conformance with the remediation objectives and specifications. They also provide the specific policies, objectives, organization, functional activities and quality assurance/quality control activities designed to achieve the project data quality objectives. This includes all procedures and policies related to confirmatory sampling.

4.1.2 ROD as amended by the ESD

NYSDEC issued an ESD in response to the results from the pre-design investigation which concluded that pesticides are not migrating off-site. This substituted a soil and asphalt cover system for the impermeable membrane cap called for in the ROD.

4.1.3 Contractor Work Plan

J. Barwick completed a NYSDEC-approved Work Plan prior to initiation of remedial activities. It outlines the contractor's plans for elements of the required site work, including mobilization, storm-water pollution protection, soil/materials management, sheeting and shoring as necessary, decontamination, excavation, and restoration.

4.1.4 Groundwater Monitoring Plan

D&B completed a Groundwater Monitoring Plan is November 2007. This document outlines the procedures for a post remedial action sampling program to be implemented following the completion of remedial construction activities. The long-term sampling program includes the collection and analysis of groundwater samples from on-site, upgradient, and downgradient wells on a semiannual basis for a period of 10 years. The purpose of this program is to monitor the effectiveness of the

remedial action and to demonstrate that groundwater at the site has not been negatively impacted as a result of remedial construction activities.

4.1.5 Site Specific Health & Safety Plan

J. Barwick completed a NYSDEC-approved site-specific Health and Safety Plan (HASP) in September 2010. It outlines procedures to minimize risks to the health and safety of personnel involved in remedial construction activities at the Site.

All remedial work performed under this Remedial Action was in full compliance with governmental requirements, including site and worker safety requirements mandated by Federal OSHA.

The HASP was complied with for all remedial activities including all intrusive work performed at the Site.

4.1.6 Community Air Monitoring Plan

A Community Air Monitoring Plan (CAMP) was provided by Testing Mechanics Corp. to monitor particulate dust and total volatile organic compound (VOC) concentrations during excavation activities. The CAMP required continuous real-time monitoring during work, utilizing an Aerosol Monitor and a Photo-ionization Detector (PID). Action levels and responses were established for both particulates and VOCs.

4.2 Remedial Program Elements

4.2.1 Contractors and Consultants

- CDM – NYSDEC's consultant responsible for construction management.
  - Engineer of Record: Paul Hagerman, P.E.
  - YEC, Inc. – CDM's subcontractor and field representative.
- J. Barwick – Prime contractor responsible for on-site excavation and restoration and installation of the new components of the stormwater management system.
  - Island Wide Surveying – J. Barwick's surveying subcontractor.
  - Unitech Environmental – J. Barwick's asbestos abatement subcontractor.
  - Clean Air Testing Labs, Inc. – J. Barwick's air monitoring subcontractor for asbestos abatement.
  - Testing Mechanics Corp. – J. Barwick's air monitoring subcontractor for excavation activities.
  - American Paving & Masonry (APM) – J. Barwick's subcontractor for asphalt application.
- EAR – NYSDEC's standby Contractor responsible for UST removal.

- GES – NYSDEC's standby Contractor responsible for the residential property excavation and restoration, off-site monitoring well installation, on-site building restoration, and land title survey.
  - AARCO Environmental Services – GES's subcontractor for excavation and application of epoxy on the interior cement floor.
  - Borbas Surveying & Mapping – GES's surveying subcontractor.
  - Aquifer Drilling & Testing, Inc. (ADT) – GES's drilling subcontractor for installation of monitoring wells.

4.2.2 Site Preparation

A pre-construction meeting was held with NYSDEC, J. Barwick, CDM, and YEC on April 21, 2010. The meeting minutes and baseline project schedule are provided in Appendix B and C, respectively.

Permits relating to the remediation project are provided in Appendix D.

All SEQRA requirements and all substantive compliance requirements for attainment of applicable natural resource or other permits were achieved during this Remedial Action.

A NYSDEC-approved project sign was erected at the project entrance and remained in place during all phases of the Remedial Action.

4.2.3 General Site Controls

The Site was secured with a temporary 6 foot chain link construction fence with a 20 foot gate opening for vehicular traffic. Site records were kept at the on-site office trailer.

Erosion control and stormwater protection was achieved through the use of berms, dikes, and silt fencing.

Soils removed during excavation of the UST were stockpiled on site pending results of the stockpile composite soil sample and approval from the selected disposal facility. All other soils were directly loaded out via truck for transport to the disposal facility.

Equipment decontamination was achieved by scraping, brushing, and washing at the specified decontamination pad located at the entrance of the Site at the completion of excavation. A decontamination inspection form for the excavator employed by J. Barwick is included in Appendix E.

4.2.4 Nuisance controls

The RD required mitigation of specified nuisances. Noise was minimized to the greatest degree practicable, conforming to all OSHA standards and local codes. The Contractors sprayed soils with potable water to prevent the migration of dust off-site.

4.2.5 CAMP Results

Air monitoring was performed by Testing Mechanics Corp. during excavation activities in the onsite parking lot area on December 8-10, 2010. Action levels were not exceeded during excavation activities and no response actions were necessary.

GES conducted air monitoring on the residential property during the excavation on August 30, 2011 and during backfilling on September 21, 2011. Action levels were not exceeded during either event and no response actions were necessary.

The air monitoring reports are provided in Appendix F.

4.2.6 Reporting

A daily report was generated by CDM's field representative each day work occurred at the Site. All daily reports with photographic logs are included in electronic format in Appendix G.

4.2.7 Monitoring Well Installation

Two additional downgradient monitoring wells were installed in June 2011 and designated MW-10R and MW-11R. They are located south of the Site on Park Avenue. Installation logs and details are included in Appendix H.

4.3 Contaminated Materials Removal

The soil cleanup objectives (SCOs) for the Site were established for the protection of public health for commercial use. The SCOs for the primary contaminants of concern (COCs) and applicable land use for this site is provided in Table 1.

The location and extent of all material removals and cleaning are shown in the Site Remediation Plan, Drawing 3 of the Contract Drawings provided as Appendix I.

Waste manifests are included in Appendix K. The following table summarizes each generated waste and their quantities, transporters, and final destinations.

Type of Waste	Quantity of Waste Disposed	Category	Transporter	Destination
Onsite Soil and Asphalt	730 tons	Hazardous	J&D Trucking	Clean Earth of New Jersey
Offsite Soil	33 tons	Nonhazardous	J&D Trucking	Clean Earth of New Jersey
UST	1 tank	Nonhazardous	Fenley & Nicol	Gershow Scrap Yard
UST Liquids (fuel/water mixture)	36 gallons	Nonhazardous	Fenley & Nicol	Fenley & Nicol
UST Rinsate/Debris/PPE	90 gallons	Nonhazardous	Fenley & Nicol	Fenley & Nicol
UST Soils	15 cubic yards	Nonhazardous	Greenwood Transport	Soil Safe
Concrete Floor Rinsate	110 gallons	Hazardous	AB Environmental	Chemical Pollution Control
Asbestos Containing Floor Tile	40 bags	Hazardous	ATC	Minerva Enterprises

The following sections provide details on each waste that was removed as part of the remedial construction activities.

4.3.1 On-site Soil and Asphalt

Approximately 730 tons of hazardous contaminated soils and asphalt were excavated and disposed of from the on-site parking lot on December 8-10, 2010. J. Barwick performed the excavation. This excavation removed 4-10 inches of asphalt and 18 inches of contaminated soil. The previously existing elevation contours, the limits of the excavation, and the parking lot excavation detail are shown in the

Site Remediation Plan (Appendix I). The endpoints of the excavation were surveyed by Island Wide Land Surveyors. This survey is provided in Appendix J.

Large pieces of concrete debris that were uncovered during the removal were left in place below the excavation limits. An area was excavated to bury in place several large concrete pieces that were found during the excavation. This area is indicated on Island Wide's survey drawing as "Area of Buried Concrete Debris".

The disposal facility was Clean Earth of North Jersey, Inc., EPA ID Number NJD991291105. The waste transporter was J&D Trucking Inc., EPA ID Number NJR000029967. Excavated hazardous soils were directly loaded out on trucks. A total of 28 loads were shipped to the disposal facility under the Generator ID # of NYD044476836.

Manifests and bills of lading are included in electronic format in Appendix K.

Confirmatory soil sampling methodology and results are discussed in section 4.4.1.

4.3.2 Drywell Removal

Drywell removal took place as part of the on-site parking lot excavation.

The existing drywell, as shown in the Site Remediation Plan, was excavated; the concrete structure and a portion of the bottom was removed and directly transported off-site as hazardous waste by J&D Trucking Inc. for disposal at Clean Earth of North Jersey, Inc.

Confirmatory soil sampling methodology and results are discussed in section 4.4.2.

A second drywell, the existence of which was unknown prior to excavation, was located north of MW-3. When discovered the drywell was partially filled with water. The drywell was constructed of concrete masonry units with a cover constructed of concrete with a rebar grate. Four draining pipes fed into the drywell, two of which originated from the building; the origin of the other two pipes was not determined. At the direction of NYSDEC, the concrete cover was removed and the drywell filled with on-site sand. This sand was sourced from the parking lot footprint at excavation bottom from the area where the concrete debris was placed (Appendix J) and was not sampled. Piping was left intact and the water infiltrated in the surrounding soils when backfilled.

4.3.3 Residential Property

Approximately 33 tons of contaminated soils were excavated and disposed of from the residential property that lies on the western border of the Site. The extent of the excavation was 18-24 inches below the ground surface. The excavation was performed by GES's subcontractor, AARCO, on August 30, 2011. The previously existing elevation contours and the limits of the excavation are shown in the Site Remediation Plan. Final excavation contours are shown on the excavation survey performed by Borbas (Appendix A).

The disposal facility was Clean Earth of North Jersey, Inc., EPA ID Number NJD991291105. The waste transporter was J&D Trucking Inc., EPA ID Number NJR000029967. One load was direct loaded and shipped out for disposal as nonhazardous waste.

Manifests and bills of lading are included in electronic format in Appendix K.

Confirmatory soil sampling methodology and results are discussed in section 4.4.3.

4.3.4 Underground Storage Tank

A UST was excavated from beneath the parking lot on-site on March 11 2011. The former location of the UST is shown on Figure 2 of the UST Removal Report provided as Appendix M. The UST was excavated and discovered to have a volume of 500 gallons and to contain 36 gallons of a mixture of water and petroleum-related compounds. The liquid was removed with the use of a vac-truck before the UST was removed from the excavation. Due to discernible petroleum odors and PID screening results, which indicated the presence of volatile organic compounds (VOCs), approximately 3 feet of soils were removed below the original tank bed bottom. On March 14, 2011 the tank was cleaned of all residual petroleum products using a high-pressure water rinse.

Soil sampling methodology and results are discussed in Section 4.4.4

Following cleaning, the UST was transported off-site and disposed of at Gershow Scrap Yard in Lindenhurst, New York, a steel recycling facility. The rinsate was containerized in two 55-gallon drums for transport by Fenley & Nicol and disposal at Fenley & Nicol's facility as non-hazardous waste.

Fifteen cubic yards of excavated soils were stockpiled to be transported off site at a later date. A composite sample was taken of the stockpile for waste characterization. The laboratory results are included in Appendix B of the UST Removal Report. The disposal facility for this nonhazardous material was Soil Safe, Inc. The transporter was Greenwood Transport.

Waste manifests for the tank contents, rinsate, and excavated soils are included in Appendix A of the UST Removal Report.

4.3.5 Building Interior Concrete

The concrete slab of the building interior was power washed in the locations shown in the Site Remediation Plan but otherwise left intact. Power washing was performed October 7-8, 2010.

The rinsate generated from the power washing was containerized in two drums and stored temporarily on-site. In July 2011 a composite sample was taken to characterize the rinsate, which revealed a chlordane concentration of 31 µg/L. The lab report is included in Appendix N – Analytical Data. The rinsate drums were transported off-site as hazardous waste on August 11, 2011 by AB Environmental (EPA ID Number NYRD00003582) to the disposal facility operated by Chemical Pollution Control Inc. (EPA ID Number NYD082785429). The waste manifest is included in Appendix K.

Following sampling of the concrete floor and determining the necessity of the encapsulation of remaining chlordane (methodology and results are discussed in section 4.4.5) GES installed the epoxy coating on the concrete floor in accordance with the RD in October 2011. The remediated area is depicted in Figure 3.

4.3.6 Asbestos-Containing Materials

Approximately 689 square feet of ACM floor tile were removed from the garage area of the on-site building. Abatement was completed on August 25 2010. Forty bags of ACM were transported off-site and disposed of at Minerva Enterprises, located in Waynesburg, Ohio. The waste manifest is included in Appendix K.

Asbestos air sampling results are discussed in section 4.4.6.

Asbestos containing mastic coated an area of exposed brick and concrete masonry unit on the north and east interior walls, as shown in Figure 3. Removal of the mastic by mechanical means was ruled out due to the poor condition of the masonry walls. During the remedial action, a bridging encapsulant was applied onto the mastic and a simple sheetrock barrier wall was installed against the affected area.

4.4 Remedial Performance/Documentation Sampling

The following sections summarize sampling performed to document the effectiveness of each component of the remedial action. Where applicable, data has been submitted to NYSDEC in the NYSDEC Electronic Information Management System (EIMS) EDD format as specified in the NYSDEC Electronic Data Deliverable Manual dated November 8, 2011. EDD submittals include:

1) An initial submittal containing information regarding the data provider, facility, and locations with surveyed LAT LONG coordinates

2) Available well construction data

3) Field Sample data including matrix, sample date and time, water level data, sample depths, and field parameter data

4) Laboratory analytical data for each field sample collected.

4.4.1 On-site Soil and Asphalt

As specified in the RD, endpoint soil samples were collected from all excavations.

Excavation endpoint samples were collected under the following conditions:

- One sample collected from the bottom of each sidewall for every 30 linear feet of sidewall.
- One sample collected from the excavation bottom for every 900 square feet of bottom area.

Four sidewall samples and six bottom samples were collected from the parking lot excavation and analyzed for TCL pesticides. Figure 4 depicts a summary of analytical data for each sample location. Alpha-chlordane and gamma-Chlordane were detected in all samples. Exceedances of the commercial SCO for alpha-Chlordane (24,000 ppb) were detected at three locations ranging from 25,000 ppb at B-3 to 520,000 ppb at SW-2. There was also an exceedance of the commercial SCO for Dieldrin (1,400 ppb) detected at SW-1 with a concentration of 1,700 ppb. No samples were collected at sidewalls along the building and along the wall footers along the west side of the parking lot because all soils were removed up to these limits. Complete results are presented in Table 2.

4.4.2 Drywell

One endpoint sample was collected from the bottom of the on-site dry well and designated DW-1. Figure 4 depicts the location of DW-1. The sample was analyzed for RCRA Metals, total petroleum hydrocarbons, VOCs, SVOCs, and TCL pesticides. The sample contained concentrations of benzo(a)pyrene, benzo(b)fluoranthene, and dibenz(a,h)anthracene above commercial SCOs. Detectable concentrations of pesticides were present but did not exceed commercial SCOs. Table 3 provides the complete results of these analyses.

4.4.3 Residential Property

Four endpoint grab samples were collected from the excavation on the residential property at a depth of 18 inches. One center point sample and three sidewall samples were collected and analyzed for chlordane. Due to an elevated chlordane result in the center point sample (1.0 ppm), additional soils were removed. A composite endpoint sample was taken from the 4 square foot area surrounding the original center point sample at a depth of 2 feet which produced a result of 0.18 ppm. All endpoint samples in the excavation area meet SCOs for residential use. Results are summarized in Table 4. Sample locations are indicated on Sheet 2 of the survey provided in Appendix A.

4.4.4 UST

Five endpoint samples were collected from the excavation of the UST. The locations of the center-bottom sample and four sidewall samples are shown in Figure 3 of the UST Removal Report (Appendix M). All samples were analyzed for RCRA Metals, gasoline and diesel range organic compounds, VOCs, SVOCs, and pesticides. The analytical results indicated the presence of petroleum-related compounds; diesel range organics were detected at concentrations up to 4,700,000 ppb and gasoline range organics were detected at concentrations up to 290,000 ppb. The east sidewall sample contained an exceedance of the commercial SCO for arsenic. No exceedances of commercial SCOs for VOCs, SVOCs, or pesticides were reported. Complete results are provided in Tables 1 through 5 of the UST Removal Report.

4.4.5 Building Interior Concrete

GES collected three composite concrete chip samples from the building interior floor on August 23, 2011 to determine the presence of residual contamination in the slab. The results revealed high levels of chlordane contamination, ranging from 8.9 ppm to 17 ppm. Complete results are summarized in Table 5. A figure providing the locations of the composite samples is included in Appendix H – GES Field Notes.

4.4.6 ACM

Following the completion of ACM floor tile abatement, final air clearance testing was performed in accordance with applicable state regulations by Testing Mechanics Corp. All post-abatement samples contained less than 0.01 fibers per cubic centimeter. A report of all asbestos air sampling results, including background samples, during-abatement samples, and final clearance samples is provided in Appendix O.

4.5 Imported Backfill

4.5.1 On-site Soil

The on-site parking lot was backfilled in December 2010. Six loads of recycled concrete aggregate (RCA) from Nassau Ready Mix Corp. were used as backfill. One composite sample was taken and results are included in Appendix N.

4.5.2 UST

The space created from the removal of the UST was backfilled by EAR. Appendix E of the UST Removal Report provides the sieve analysis and proctor report for the fill material. This area was later graded and paved as part of the on-site asphalt cover.

4.5.3 Residential Property

The excavation on the residential property was backfilled with approximately 23 tons of material from 110 Sand Company. Five cubic yards of top soil were obtained from Faztec Industries. The source from Faztec (SS-4) met Unrestricted SCOs except for lead (67.9 mg/kg versus 63 mg/kg). At direction of NYSDEC, a topsoil sample was taken by CDM from outside but adjacent to the excavation area in the residential backyard and analyzed at a NYSDEC subcontract laboratory (TestAmerica – Appendix N) determined the yard to contain a concentration for lead of 320 mg/kg.

Per direction of the property owner and documented in the September 23, 2011 letter from NYSDEC, the shrubs along border between the residential lot and the Fumex property were not replaced.

4.6 Contamination Remaining at the Site

Beneath the on-site parking lot, contamination remains beneath the asphalt cover. This contamination was not removed because it lies beneath the depth of excavation selected in the remedy. Figure 4 shows the concentrations of all detected contamination at the excavation limits, in which concentrations in exceedance of commercial SCOs are bolded and italicized. Contact with these contaminated soils and migration of contamination into groundwater is prevented by an asphalt and soil cover system. This system is described in greater detail in Section 4.7.

Elevated levels of chlordane remain in the concrete slab of the on-site structure. A coat of a durable epoxy resin coating was applied to the concrete surface to provide a protective barrier to prevent direct contact with the floors. This area is shown in Figure 3. In the event of any demolition of the existing structure as part of redevelopment of the property, the concrete slab would need to be characterized to identify disposal requirements (as non-hazardous C&D debris or hazardous material). There are no soil samples from beneath the concrete slab; however, in the event of building demolition and removal of any parts of the concrete slab, soil samples must be collected to characterize these soils to determine appropriate management and disposition as well as health and safety requirements for site workers per the SMP.

Asbestos containing mastic remains on portions of the north and east masonry unit walls of the Fumex building. These walls were painted with a bridging encapsulant, and then covered by the construction of sheetrock walls constructed on the same interior wall faces during the remedial action (see Figure 3). The areas of the wall containing mastic would need to be properly abated and disposed of as ACM in the event of any demolition.

The contamination on the residential property was remediated to meet restricted use SCOs for residential use. As a result, no Engineering and Institutional Controls (ECs/ICs) are necessary.

4.7 Soil and Asphalt Cover System

Since contaminated soil and groundwater remains beneath the Site after completion of the Remedial Action, ECs/ICs are required to protect human health and the environment. These ECs/ICs are described in the following sections. Long-term management of these EC/ICs and residual contamination will be performed under the Site Management Plan (SMP) approved by the NYSDEC.

4.7.1 Cover System

Exposure to remaining contamination in the soil at the Site is prevented by a soil and asphalt cover system placed over the site. This cover system is comprised of 11 to 20 inches of clean soil under

asphalt pavement. Drawings 5 and 6 of the Contract Documents (Appendix I) show the cross sections for each remedial cover type used on the Site. The Site Restoration Plan (Drawing 4) shows the location of each cover type built at the Site. J. Barwick completed installation of the asphalt cover in June 2011.

Procedures for the inspection and maintenance of this cover are provided in the SMP. An Excavation Work Plan, which outlines the procedures required in the event the cover system and/or underlying residual contamination are disturbed, is provided in Appendix B of the SMP.

4.7.2 Stormwater Management System

In replacement of the removed on-site drywell, a stormwater management system was installed that is connected to the Nassau County stormwater system. The system consists of an asphalt cover which is graded to direct all runoff to a 15-foot trench drain at the north entrance of the parking lot and three 4-foot diameter precast drainage manholes connected by corrugated HDPE pipe. Manhole #3 is connected to the existing Nassau County drainage manhole on Herricks Road by ductile iron pipe. The locations of these components are shown in the Site Restoration Plan (Drawing 4 of the Contract Drawings – Appendix I). Construction details are provided in Drawings 5 and 6 of the Contract Drawings. J. Barwick achieved substantial completion of this system in June 2011.

Procedures for the inspection of this system are provided in the SMP.

4.8 Other Engineering Controls

In addition to residual contamination in subsurface soils, other contamination remains at the site. Additional ECs are required to protect human health and the environment and are described in the following subsections.

4.8.1 Epoxy Resin Coating

Exposure to remaining contamination in the concrete inside the on-site building is prevented by an epoxy resin coating applied over the cement floor. Procedures for the inspection and maintenance of this EC are provided in the SMP.

4.8.2 Bridging Encapsulant

Exposure to remaining asbestos containing mastic material on the walls of the on-site building is prevented by a bridging encapsulant applied on top of the mastic material. A sheetrock wall was constructed over the encapsulated mastic to prevent disturbance. Procedures for the inspection and maintenance of this EC are provided in the SMP.

4.8.3 Fencing

Security for the Site is provided by fencing that encloses the parking lot. The 21.5 foot wide section of concrete wall on the southern border of the property demolished during remedial construction activities was replaced with a 12-foot chain link fence. The remainder of the southern border is protected with 6-foot chain link fence. The western side of the parking lot is separated from the bordering residential property with 6-foot chain link fencing. The on-site building encloses the eastern side of the parking lot, and the northern edge has a brick and block wall with locking chain link fence swinging gates to provide access.

4.8.4 Roof

GES completed roof repairs to address water leakage into the on-site building. Repairs were made to the roof flashing and the air conditioning unit was sealed.

4.8.5 Door Repair

GES replaced the door and frame located next to the garage door causing rain water to enter the building with a new frame and steel door. New locks were installed on the doors.

4.9 Restoration

4.9.1 Onsite Restoration

Other elements of the site were restored in addition to the ECs previously described.

Several surfaces removed during installation of the stormwater management system were replaced in kind by J. Barwick. The asphalt along Bedford Avenue was removed and replaced in kind. The previously existing areas of grass along Bedford Avenue and Herricks Road were replaced with topsoil and sod. Sod was watered to ensure proper growth. The concrete sidewalk and curb along Herricks Road were removed and replaced in kind. The pavement of Herricks Road disturbed during the connection of the stormwater system to the Nassau County manhole was replaced and the shoulder striping restored. Construction details of all restored surfaces are illustrated in Drawings 5 and 6 of the Contract Drawings (Appendix I).

Four bollards were installed in the parking lot area in locations along the western fence and building wall as shown on the Site Restoration Plan (Appendix I).

4.9.2 Offsite Restoration

Following the placement of backfill and topsoil in the excavation in the residential property's backyard, the area was covered with sod. The sod was watered to ensure proper growth. The concrete pad situated in between the grass area and the driveway was damaged during construction; the pad was replaced in kind.

The shrubs along the eastern edge of the property were removed as part of the excavation. At the request of the property owner, these shrubs were not replaced.

4.10 Institutional Controls

The Site has a series of Institutional Controls (ICs) in the form of site restrictions. Adherence to these ICs is required by the Environmental Notice. The Fumex Environmental Notice was recorded on April 24, 2012 at the Nassau County Clerk's Office under Misc. Lien Documents - Document #142701. A copy of the notice is provided in Appendix W. Site restrictions that apply are:

- The property may only be used for commercial and industrial uses, provided that the long-term Engineering and Institutional Controls included in the SMP are employed.
- All future activities on the property that will disturb remaining contaminated material must be conducted in accordance with the SMP;

- The property may not be used for a higher level of use, such as unrestricted, residential, or restricted residential use without additional remediation and amendment of the Environmental Notice, as approved by the NYSDEC;
- The use of the groundwater underlying the property is prohibited without treatment rendering it safe for intended use;
- The remedial party will submit to NYSDEC a written statement that certifies, under penalty of perjury, that: (1) controls employed at the Site are unchanged from the previous certification or that any changes to the controls were approved by the NYSDEC; and, (2) nothing has occurred that impairs the ability of the controls to protect public health and environment or that constitute a violation or failure to comply with the SMP. NYSDEC retains the right to access the Site at any time in order to evaluate the continued maintenance of any and all controls. This certification will be submitted as required by the SMP.

4.11 Deviations from the Remedial Design

4.11.1 Change Order No. 1

Change Order No. 1 amended several items from the contract. These items address issues presented in Requests for Information (RFIs) which are provided in Appendix S, as well as the changes arising from NYSDEC's utilization of standby contractors to complete portions of the contract, as discussed in Section 3. The Potential Change Order (PCO) Log is provided in Appendix T.

Change Order No. 1 had the following effects:

- Increase of Contract Time by 195 calendar days.
- An increase in Contract Price due to asphalt material being disposed of as hazardous material rather than nonhazardous as originally determined when the contract was awarded.
- Application of epoxy coating on the building floor was removed from the contract and the work was performed by GES.
- Removal of the item pertaining to replacement of the handicap ramp. The ramp was not impacted during construction and therefore no replacement was necessary.
- Installation of groundwater monitoring wells was removed from the contract and the work was performed by GES.
- Post-excavation soil sampling and analysis was removed from the contract and the work was performed by CDM.
- Removal of the UST was removed from the contract and the work was performed by EAR.
- An increase in Contract Price due to the removal of an unexpected mass of concrete encountered that was necessary to complete installation of a drainage manhole.
- An increase in Contract Price due to an increase of 190 cubic yards of material excavated.

This change order increased the contract price by $111,301.57 for a total contract amount of $504,354.07 and increased the contract time to 415 calendar days. A complete copy of the change order is provided in Appendix U.

4.11.2 Monitoring Well Installation and Groundwater Sampling

The RD specified that monitoring wells MW-10R and MW-11R were to be installed and a baseline round of groundwater sampling was to be performed by the contractor before the start of any remedial activities. The wells were not installed prior to remedial construction activities because the contractor was unable to procure a driller before the scheduled excavation activities. As a result this baseline round was not completed. MW-10R and MW-11R were installed by GES in June 2011. The first round of groundwater sampling of 14 monitoring wells (the entire well network including previously existing and newly installed wells) was completed by GES in July 2011. Water quality parameters and analytical data are summarized in Appendix V. The laboratory analytical report is provided in Appendix N. These results will be considered the baseline for comparison to subsequent rounds of sampling to take place as directed by the SMP.

Section 5

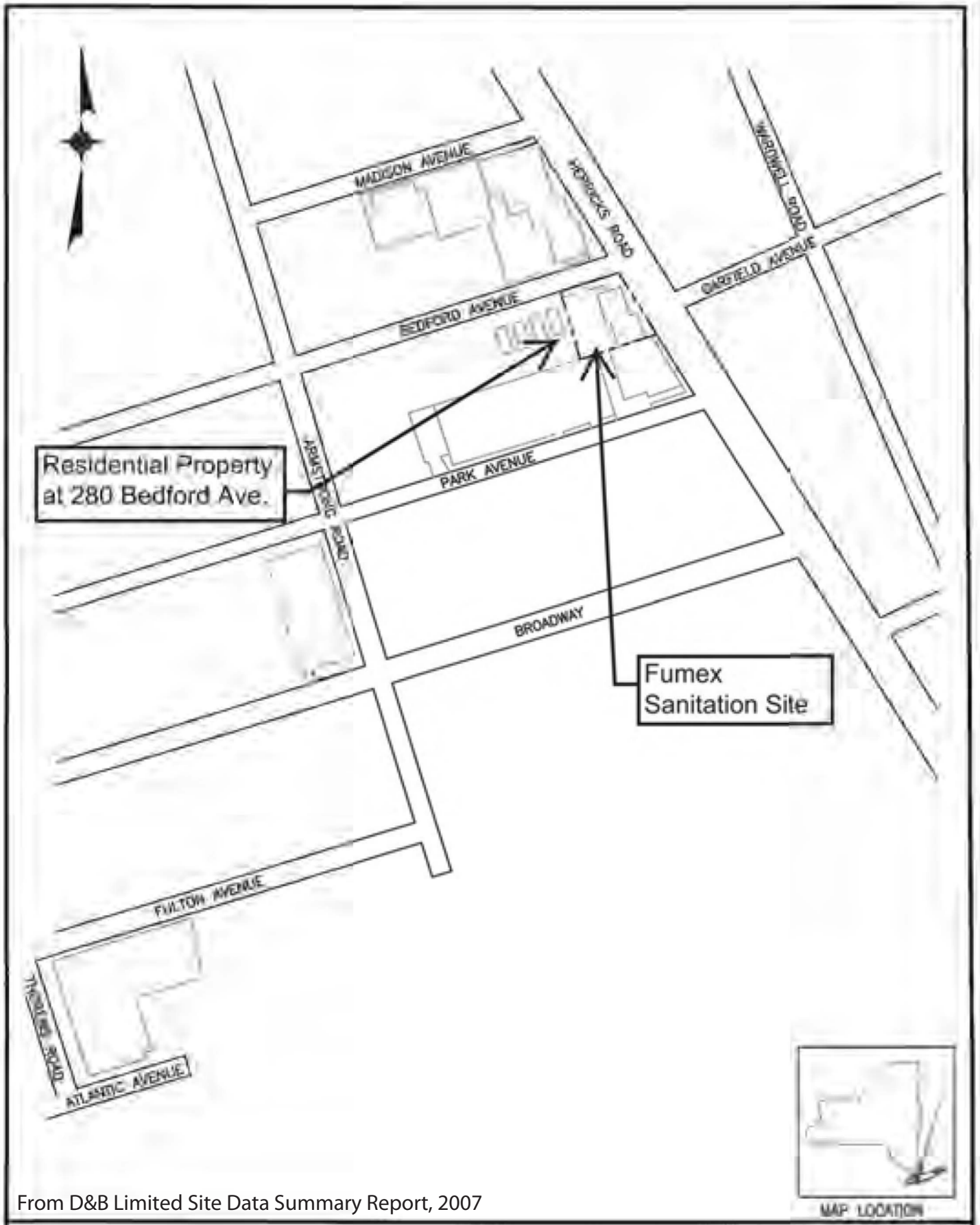
Final Completion

NYDEC issued a Certificate of Substantial Completion to J. Barwick, determining the date of substantial completion to be June 23, 2011. The date of final completion was subsequently determined to be August 11, 2011.

NYSDEC issued a letter dated September 23, 2011 to the owner of the residential property that remedial work on that property was considered complete.

These documents are provided in Appendix P.

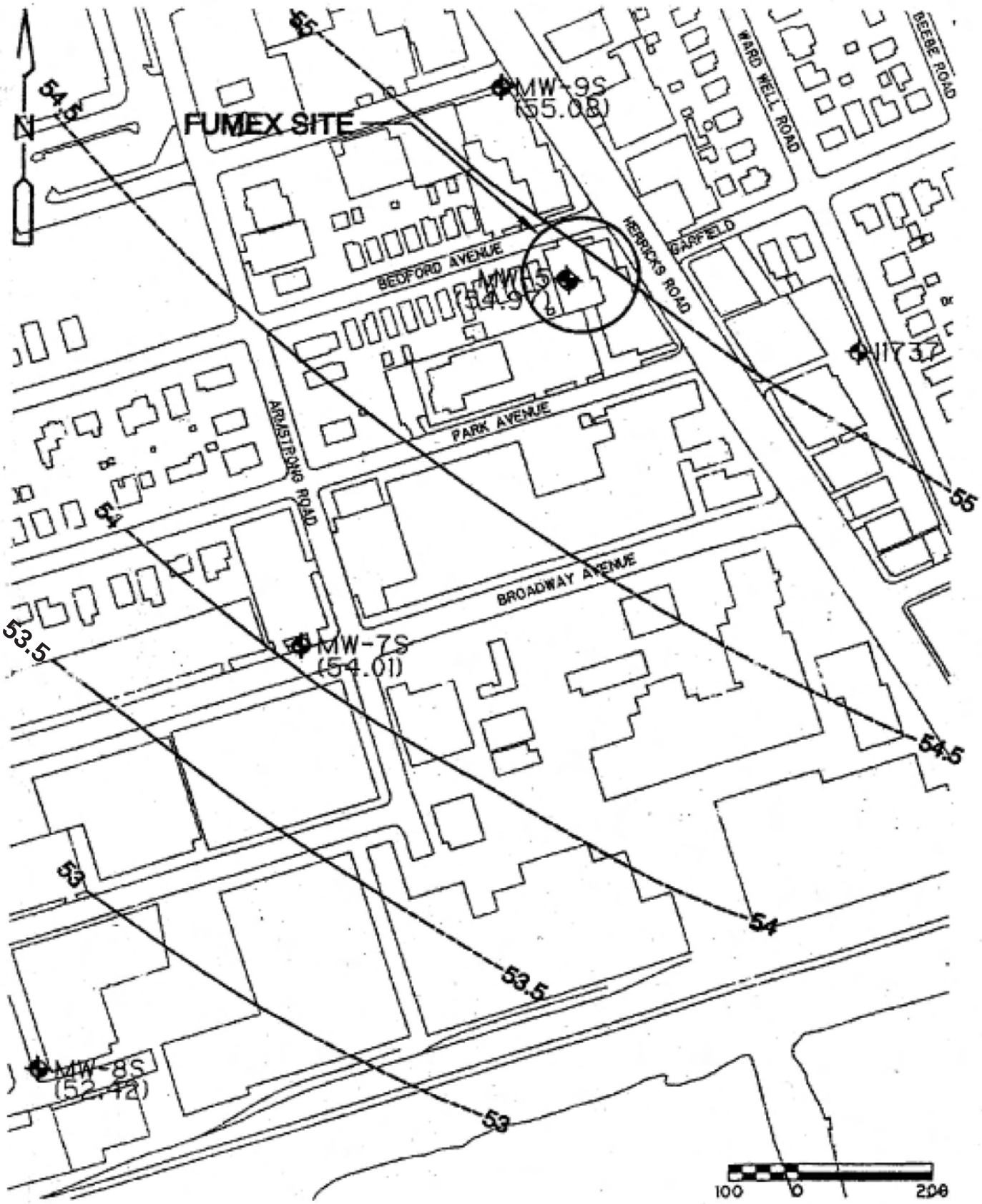
Figures



From D&B Limited Site Data Summary Report, 2007

CDM Smith

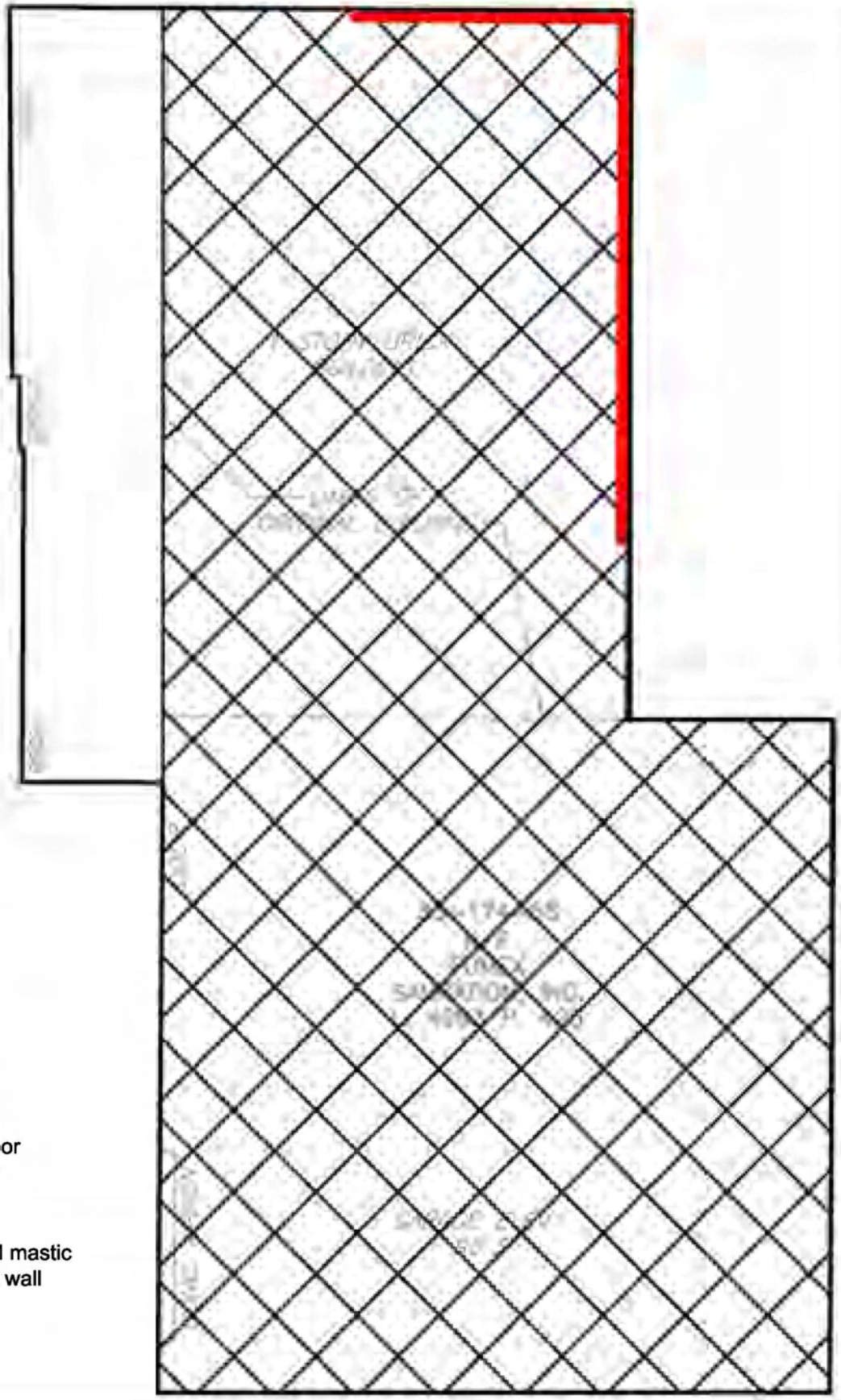
Figure 1
Location Map
Fumex Sanitation
Garden City Park, New York



From CDM Phase II Report, Fumex Site

Figure 2
Study Area Water Table Contour Map
Fumex Sanitation
New Hyde Park New York

CDM Smith



Area of cement floor coated with epoxy

Length of wall with encapsulated ACM mastic beneath sheetrock wall

Not to scale

CDM Smith

Source: Site Remediation Plan
Dvirka and Bartilucci, 2009

Figure 3
Onsite Building Remediation
Fumex Sanitation
Garden City Park, NY

SW-1	
Pesticides (ppm)	
alpha-Chlordane	0.24
Dieldrin	***1.7***
gamma-Chlordane	0.31

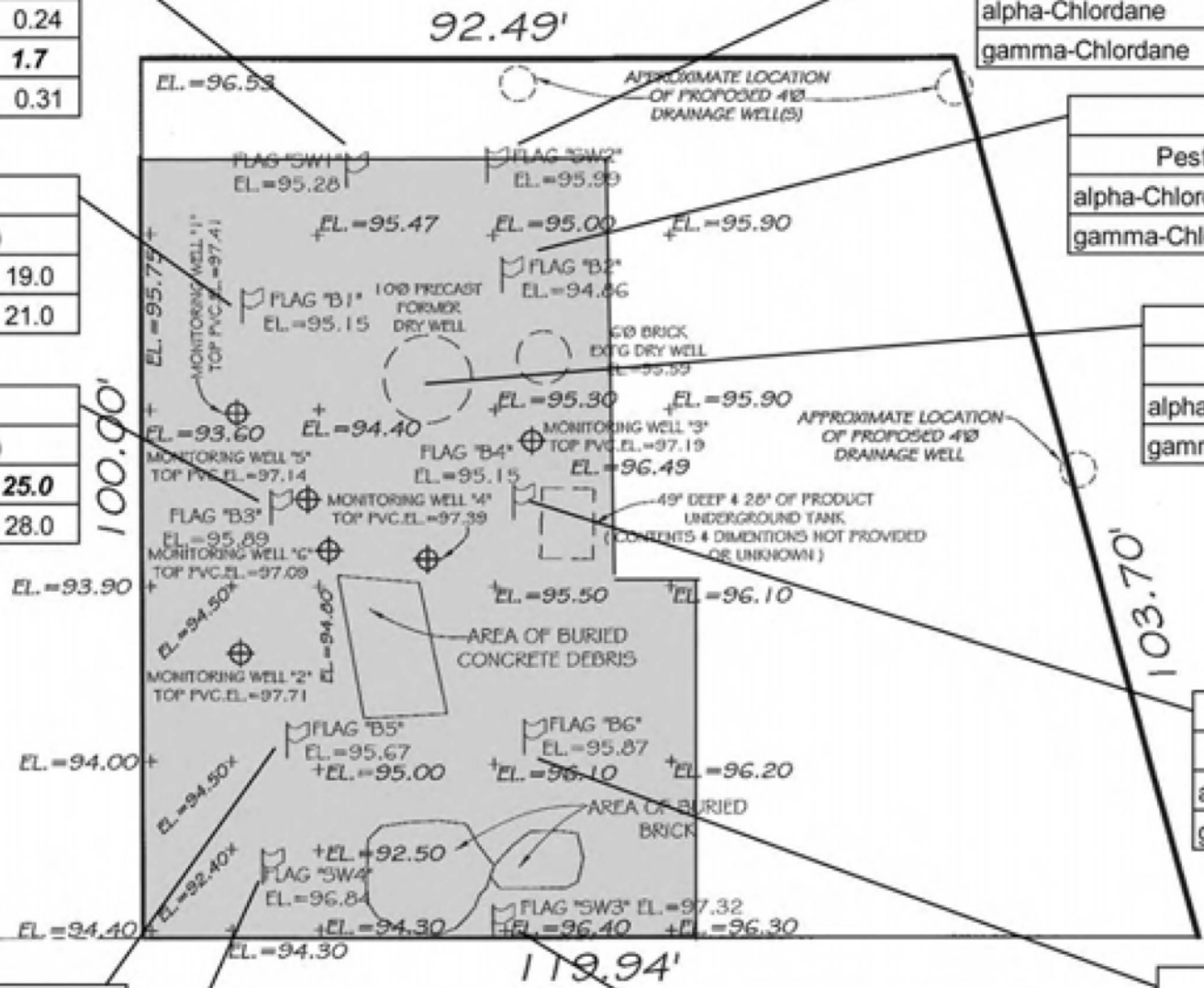
SW-2	
Pesticides (ppm)	
alpha-Chlordane	***520***
gamma-Chlordane	370

B-2	
Pesticides (ppm)	
alpha-Chlordane	24.0
gamma-Chlordane	25.0

B-1	
Pesticides (ppm)	
alpha-Chlordane	19.0
gamma-Chlordane	21.0

DW-1	
Pesticides (ppm)	
alpha-Chlordane	5.8
gamma-Chlordane	6.8

B-3	
Pesticides (ppm)	
alpha-Chlordane	***25.0***
gamma-Chlordane	28.0



B-4	
Pesticides (ppm)	
alpha-Chlordane	6.7
gamma-Chlordane	7.5

NOTES:

1. Shaded area represents location of excavation.
2. Contaminated soils are at depths 15 inches and greater beneath grade level.

B-5	
Pesticides (ppm)	
alpha-Chlordane	***31.0***
gamma-Chlordane	33.0

SW-4	
Pesticides (ppm)	
alpha-Chlordane	1.9
gamma-Chlordane	1.8

SW-3	
Pesticides (ppm)	
alpha-Chlordane	3.0
gamma-Chlordane	3.4

B-6	
Pesticides (ppm)	
alpha-Chlordane	19.0
gamma-Chlordane	21.0

CDM Smith

N

Map Source: Map of Property
Situate at Garden City Park
Town of Hempstead
Nassau County, N.Y.
Island Wide Land Surveyors, 2010

Figure 4
Remaining Contamination
Fumex Sanitation
Garden City Park, NY

Tables

Table 1: Soil Cleanup Objectives

Contaminant	CAS No.	Unrestricted Use SCOs (ppm)	Residential Protection of Public Health SCOs (ppm)	Commercial SCOs (ppm)
4,4'-DDE	72-55-9	0.0033	1.8	62
4,4'-DDT	50-29-3	0.0033	1.7	47
4,4'-DDD	72-54-8	0.0033	2.6	92
Aldrin	309-00-2	0.005	0.019	0.68
alpha-BHC	319-84-6	0.02	0.097	3.4
beta-BHC	319-85-7	0.036	0.072	3
Chlordane (alpha)	5103-71-9	0.094	0.91	24
delta-BHC	319-86-8	0.04	100	500
Dieldrin	60-57-1	0.005	0.039	1.4
Endosulfan I	959-98-8	2.4	4.8	200
Endosulfan II	33213-65-9	2.4	4.8	200
Endosulfan sulfate	1031-07-8	2.4	4.8	200
Endrin	72-20-8	0.014	2.2	89
Heptachlor	76-44-8	0.042	0.42	15
Lindane (gamma-BHC)	58-89-9	0.1	0.28	9.2

Values per Remedial Program Soil Cleanup Objectives (6 NYCRR Subpart 375-6, December 14, 2006)

Table 2: Soil Excavation Endpoint Sample Results

			Sample ID	B-1	B-2	B-3	B-4	B-5	B-6	SW-1	SW-2	SW-3	SW-4
			Sampling Date	12/10/2010	12/10/2010	12/10/2010	12/10/2010	12/10/2010	12/10/2010	12/10/2010	12/10/2010	12/10/2010	12/10/2010
Compound	CAS #	Units	Commercial SCO										
4,4-DDD	72-54-8	µg/kg	92000	1900 U	1800 U	2000 U	900 U	2000 U	1800 U	21 U	1900 U	420 U	180 U
4,4-DDE	72-55-9	µg/kg	62000	1900 U	1800 U	2000 U	900 U	2000 U	1800 U	21 U	1900 U	420 U	180 U
4,4-DDT	50-29-3	µg/kg	47000	1900 U	1800 U	2000 U	900 U	2000 U	1800 U	21 U	1900 U	420 U	180 U
Aldrin	309-00-2	µg/kg	680	1900 U	1800 U	2000 U	900 U	2000 U	1800 U	21 U	1900 U	420 U	180 U
alpha-BHC	319-84-6	µg/kg	3400	1900 U	1800 U	2000 U	900 U	2000 U	1800 U	21 U	1900 U	420 U	180 U
alpha-Chlordane	5103-71-9	µg/kg	24000	19000 P	24000 P	25000 P	6700 P	31000 P	19000 P	240 P	520000 EP	3000 P	1900 P
beta-BHC	319-85-7	µg/kg	3000	1900 U	1800 U	2000 U	900 U	2000 U	1800 U	21 U	1900 U	420 U	180 U
delta-BHC	319-86-8	µg/kg	500000	1900 U	1800 U	2000 U	900 U	2000 U	1800 U	21 U	1900 U	420 U	180 U
Dieldrin	60-57-1	µg/kg	1400	1900 U	1800 U	2000 U	900 U	2000 U	1800 U	1700 EP	1900 U	420 U	180 U
Endosulfan I	959-98-8	µg/kg	200000	1900 U	1800 U	2000 U	900 U	2000 U	1800 U	21 U	1900 U	420 U	180 U
Endosulfan II	33213-65-9	µg/kg	200000	1900 U	1800 U	2000 U	900 U	2000 U	1800 U	21 U	1900 U	420 U	180 U
Endosulfan Sulfate	1031-07-8	µg/kg	200000	1900 U	1800 U	2000 U	900 U	2000 U	1800 U	21 U	1900 U	420 U	180 U
Endrin	72-20-8	µg/kg	89000	1900 U	1800 U	2000 U	900 U	2000 U	1800 U	21 U	1900 U	420 U	180 U
Endrin aldehyde	7421-93-4	µg/kg	N/A	1900 U	1800 U	2000 U	900 U	2000 U	1800 U	21 U	1900 U	420 U	180 U
Endrin ketone	53494-70-5	µg/kg	N/A	1900 U	1800 U	2000 U	900 U	2000 U	1800 U	21 U	1900 U	420 U	180 U
gamma-BHC	58-89-9	µg/kg	9200	1900 U	1800 U	2000 U	900 U	2000 U	1800 U	21 U	1900 U	420 U	180 U
gamma-Chlordane	5103-74-2	µg/kg	N/A	21000 P	25000 P	28000 P	7500 P	33000 P	21000 P	310 P	370000 E	3400 P	1800 P
Heptachlor	76-44-8	µg/kg	15000	1900 U	1800 U	2000 U	900 U	2000 U	1800 U	21 U	1900 U	420 U	180 U
Heptachlor epoxide	1024-57-3	µg/kg	N/A	1900 U	1800 U	2000 U	900 U	2000 U	1800 U	21 U	1900 U	420 U	180 U
Methoxychlor	72-43-5	µg/kg	N/A	1900 U	1800 U	2000 U	900 U	2000 U	1800 U	21 U	1900 U	420 U	180 U
Toxaphene	8001-35-2	µg/kg	N/A	19000 U	18000 U	20000 U	9000 U	20000 U	18000 U	210 U	19000 U	4200 U	1800 U

Notes

1. Values highlighted in orange exceed the commerical Remedial Program Soil Cleanup Objectives (6 NYCRR Subpart 375-6, December 14, 2006)

Qualifiers

U - The compound was not detected at the indicated concentration.

P - For dual column analysis, the percent difference between the quantitated concentrations on the two columns is greater than 40%.

E - Indicates the analyte 's concentration exceeds the calibrated range of the instrument for that specific analysis.

D - The reported value is from a secondary analysis with a dilution factor. The original analysis exceeded the calibration range.

Table 3: Drywell Endpoint Results

			Sample ID	DW-1	
			Sampling Date	12/10/2010	
COMPOUND	CAS #	Units	Commerical SCO		
Volatile Organic Compounds					
1,1,1-Trichloroethane	71-55-6	µg/kg	500000	6.2	U
1,1,2,2-Tetrachloroethane	79-34-5	µg/kg	#N/A	6.2	U
1,1,2-Trichloroethane	79-00-5	µg/kg	#N/A	6.2	U
1,1,2-Trichlorotrifluoroethane	76-13-1	µg/kg	#N/A	6.2	U
1,1-Dichloroethane	75-34-3	µg/kg	240000	6.2	U
1,1-Dichloroethene	75-35-4	µg/kg	500000	6.2	U
1,2,4-Trichlorobenzene	120-82-1	µg/kg	#N/A	6.2	U
1,2-Dibromo-3-Chloropropane	96-12-8	µg/kg	#N/A	6.2	U
1,2-Dibromoethane	106-93-4	µg/kg	#N/A	6.2	U
1,2-Dichlorobenzene	95-50-1	µg/kg	500000	6.2	U
1,2-Dichloroethane	107-06-2	µg/kg	30000	6.2	U
1,2-Dichloropropane	78-87-5	µg/kg	#N/A	6.2	U
1,3-Dichlorobenzene	541-73-1	µg/kg	280000	6.2	U
1,4-Dichlorobenzene	106-46-7	µg/kg	130000	6.2	U
2-Butanone	78-93-3	µg/kg	500000	43	
2-Hexanone	591-78-6	µg/kg	#N/A	31	U
4-Methyl-2-Pentanone	108-10-1	µg/kg	#N/A	31	U
Acetone	67-64-1	µg/kg	500000	150	
Benzene	71-43-2	µg/kg	44000	6.2	U
Bromodichloromethane	75-27-4	µg/kg	#N/A	6.2	U
Bromoform	75-25-2	µg/kg	#N/A	6.2	U
Bromomethane	74-83-9	µg/kg	#N/A	6.2	U
Carbon Disulfide	75-15-0	µg/kg	#N/A	3.7	J
Carbon Tetrachloride	56-23-5	µg/kg	22000	6.2	U
Chlorobenzene	108-90-7	µg/kg	500000	6.2	U
Chloroethane	75-00-3	µg/kg	#N/A	6.2	U
Chloroform	67-66-3	µg/kg	350000	6.2	U
Chloromethane	74-87-3	µg/kg	#N/A	6.2	U
cis-1,2-Dichloroethene	156-59-2	µg/kg	500000	6.2	U
cis-1,3-Dichloropropene	10061-01-5	µg/kg	#N/A	6.2	U
Cyclohexane	110-82-7	µg/kg	#N/A	6.2	U
Dibromochloromethane	124-48-1	µg/kg	#N/A	6.2	U
Dichlorodifluoromethane	75-71-8	µg/kg	#N/A	6.2	U
Ethyl Benzene	100-41-4	µg/kg	390000	2.8	J
Isopropylbenzene	98-82-8	µg/kg	#N/A	6.2	U
m/p-Xylenes	179601-23-1	µg/kg	#N/A	2.8	J
Methyl Acetate	79-20-9	µg/kg	#N/A	6.2	U
Methyl tert-butyl Ether	1634-04-4	µg/kg	500000	6.2	U
Methylcyclohexane	108-87-2	µg/kg	#N/A	6.2	U
Methylene Chloride	75-09-2	µg/kg	500000	6.2	U
o-Xylene	95-47-6	µg/kg	#N/A	2.5	J
Styrene	100-42-5	µg/kg	#N/A	6.2	U
t-1,3-Dichloropropene	10061-02-6	µg/kg	#N/A	6.2	U
Tetrachloroethene	127-18-4	µg/kg	150000	6.2	U
Toluene	108-88-3	µg/kg	500000	6.2	U
trans-1,2-Dichloroethene	156-60-5	µg/kg	500000	6.2	U
Trichloroethene	79-01-6	µg/kg	200000	3	J
Trichlorofluoromethane	75-69-4	µg/kg	#N/A	6.2	U
Vinyl Chloride	75-01-4	µg/kg	13000	6.2	U

Table 3: Drywell Endpoint Results

			Sample ID	DW-1	
			Sampling Date	12/10/2010	
COMPOUND	CAS #	Units	Commerical SCO		
Semi-volatile Organic Compounds					
1,1-Biphenyl	92-52-4	µg/kg	#N/A	2100	U
2,2-oxybis(1-Chloropropane)	108-60-1	µg/kg	#N/A	2100	U
2,4,5-Trichlorophenol	95-95-4	µg/kg	#N/A	2100	U
2,4,6-Trichlorophenol	88-06-2	µg/kg	#N/A	2100	U
2,4-Dichlorophenol	120-83-2	µg/kg	#N/A	2100	U
2,4-Dimethylphenol	105-67-9	µg/kg	#N/A	2100	U
2,4-Dinitrophenol	51-28-5	µg/kg	#N/A	2100	U
2,4-Dinitrotoluene	121-14-2	µg/kg	#N/A	2100	U
2,6-Dinitrotoluene	606-20-2	µg/kg	#N/A	2100	U
2-Chloronaphthalene	91-58-7	µg/kg	#N/A	2100	U
2-Chlorophenol	95-57-8	µg/kg	#N/A	2100	U
2-Methylnaphthalene	91-57-6	µg/kg	#N/A	2100	U
2-Methylphenol	95-48-7	µg/kg	500000	2100	U
2-Nitroaniline	88-74-4	µg/kg	#N/A	2100	U
2-Nitrophenol	88-75-5	µg/kg	#N/A	2100	U
3,3-Dichlorobenzidine	91-94-1	µg/kg	#N/A	2100	U
3+4-Methylphenols	65794-96-9	µg/kg	#N/A	2100	U
3-Nitroaniline	99-09-2	µg/kg	#N/A	2100	U
4,6-Dinitro-2-methylphenol	534-52-1	µg/kg	#N/A	2100	U
4-Bromophenyl-phenylether	101-55-3	µg/kg	#N/A	2100	U
4-Chloro-3-methylphenol	59-50-7	µg/kg	#N/A	2100	U
4-Chloroaniline	106-47-8	µg/kg	#N/A	2100	U
4-Chlorophenyl-phenylether	7005-72-3	µg/kg	#N/A	2100	U
4-Nitroaniline	100-01-6	µg/kg	#N/A	2100	U
4-Nitrophenol	100-02-7	µg/kg	#N/A	2100	U
Acenaphthene	83-32-9	µg/kg	500000	580	J
Acenaphthylene	208-96-8	µg/kg	500000	2100	U
Acetophenone	98-86-2	µg/kg	#N/A	2100	U
Anthracene	120-12-7	µg/kg	500000	840	J
Atrazine	1912-24-9	µg/kg	#N/A	2100	U
Benzaldehyde	100-52-7	µg/kg	#N/A	2100	U
Benzo(a)anthracene	56-55-3	µg/kg	5600	4700	
Benzo(a)pyrene	50-32-8	µg/kg	1000	4600	
Benzo(b)fluoranthene	205-99-2	µg/kg	5600	6800	
Benzo(g,h,i)perylene	191-24-2	µg/kg	500000	3200	
Benzo(k)fluoranthene	207-08-9	µg/kg	56000	2700	
bis(2-Chloroethoxy)methane	111-91-1	µg/kg	#N/A	2100	U
bis(2-Chloroethyl)ether	111-44-4	µg/kg	#N/A	2100	U
bis(2-Ethylhexyl)phthalate	117-81-7	µg/kg	#N/A	1100	JB
Butylbenzylphthalate	85-68-7	µg/kg	#N/A	1200	J
Caprolactam	105-60-2	µg/kg	#N/A	2100	U
Carbazole	86-74-8	µg/kg	#N/A	1000	J
Chrysene	218-01-9	µg/kg	56000	6100	
Dibenz(a,h)anthracene	53-70-3	µg/kg	560	660	J
Dibenzofuran	132-64-9	µg/kg	350000	300	J
Diethylphthalate	84-66-2	µg/kg	#N/A	2100	U
Dimethylphthalate	131-11-3	µg/kg	#N/A	570	JB
Di-n-butylphthalate	84-74-2	µg/kg	#N/A	2100	U
Di-n-octyl phthalate	117-84-0	µg/kg	#N/A	2100	U
Fluoranthene	206-44-0	µg/kg	500000	13000	
Fluorene	86-73-7	µg/kg	500000	500	J
Hexachlorobenzene	118-74-1	µg/kg	6000	2100	U
Hexachlorobutadiene	87-68-3	µg/kg	#N/A	2100	U
Hexachlorocyclopentadiene	77-47-4	µg/kg	#N/A	2100	U

Table 3: Drywell Endpoint Results

			Sample ID	DW-1	
			Sampling Date	12/10/2010	
COMPOUND	CAS #	Units	Commerical SCO		
Hexachloroethane	67-72-1	µg/kg	#N/A	2100	U
Indeno(1,2,3-cd)pyrene	193-39-5	µg/kg	5600	3100	
Isophorone	78-59-1	µg/kg	#N/A	2100	U
Naphthalene	91-20-3	µg/kg	500000	2100	U
Nitrobenzene	98-95-3	µg/kg	#N/A	2100	U
N-Nitroso-di-n-propylamine	621-64-7	µg/kg	#N/A	2100	U
N-Nitrosodiphenylamine	86-30-6	µg/kg	#N/A	2100	U
Pentachlorophenol	87-86-5	µg/kg	6700	2100	U
Phenanthrene	85-01-8	µg/kg	500000	6900	
Phenol	108-95-2	µg/kg	500000	2100	U
Pyrene	129-00-0	µg/kg	500000	11000	
Pesticides					
4,4-DDD	72-54-8	µg/kg	92000	1100	U
4,4-DDE	72-55-9	µg/kg	62000	1100	U
4,4-DDT	50-29-3	µg/kg	47000	1100	U
Aldrin	309-00-2	µg/kg	680	1100	U
alpha-BHC	319-84-6	µg/kg	3400	1100	U
alpha-Chlordane	5103-71-9	µg/kg	24000	5800	P
beta-BHC	319-85-7	µg/kg	3000	1100	U
delta-BHC	319-86-8	µg/kg	500000	1100	U
Dieldrin	60-57-1	µg/kg	1400	1100	U
Endosulfan I	959-98-8	µg/kg	200000	1100	U
Endosulfan II	33213-65-9	µg/kg	200000	1100	U
Endosulfan Sulfate	1031-07-8	µg/kg	200000	1100	U
Endrin	72-20-8	µg/kg	89000	1100	U
Endrin aldehyde	7421-93-4	µg/kg	#N/A	1100	U
Endrin ketone	53494-70-5	µg/kg	#N/A	1100	U
gamma-BHC	58-89-9	µg/kg	9200	1100	U
gamma-Chlordane	5103-74-2	µg/kg	#N/A	6800	P
Heptachlor	76-44-8	µg/kg	15000	1100	U
Heptachlor epoxide	1024-57-3	µg/kg	#N/A	1100	U
Methoxychlor	72-43-5	µg/kg	#N/A	1100	U
Toxaphene	8001-35-2	µg/kg	#N/A	11000	U
Metals					
Arsenic	7440-38-2	mg/kg	16	10.6	
Barium	7440-39-3	mg/kg	400	31.9	
Cadmium	7440-43-9	mg/kg	9.3	0.64	
Chromium	7440-47-3	mg/kg	#N/A	11.8	
Lead	7439-92-1	mg/kg	1000	65.9	
Mercury	7439-97-6	mg/kg	#N/A	0.112	
Selenium	7782-49-2	mg/kg	1500	1.15	J
Silver	7440-22-4	mg/kg	1500	0.61	J
Petroleum Hydrocarbons					
Petroleum Hydrocarbons		µg/kg	#N/A	862582	

Table 4: Residential Property Soil Excavation Endpoint Sample Results

		Sample ID	EP-1(18")	EP-2(18")	EP-3(18")	EP-4(18")	EP-4B(2')
		Sampling Date	8/30/2011	8/30/2011	8/30/2011	8/30/2011	9/2/2011
		Sample Type	Grab	Grab	Grab	Grab	Composite
Compound	Units	Residential SCO					
Chlordane	mg/kg	0.91[2]	0.031	0.034	0.091	1.0	0.18 B

Notes

1. SCOs per Remedial Program Soil Cleanup Objectives (6 NYCRR Subpart 375-6, December 14, 2006)
2. Value is for alpha-Chlordane

Qualifiers

B - The analyte was found in an associated blank, as well as in the sample.

Table 5 - Indoor Concrete Surface Composite Sample Results

	Sample ID	Concrete Composite #1	Concrete Composite #2	Concrete Composite #3
	Sampling Date	8/23/2011	8/23/2011	8/23/2011
Compound	Units			
4,4'-DDD	mg/kg	14 U	3.5	2.9 J
4,4'-DDE	mg/kg	6.4 J	1.8 J	3 J
4,4'-DDT	mg/kg	14 U	2.7 U	7 U
Aldrin	mg/kg	7 U	0.29 Jp	1.4 Jp
alpha-BHC	mg/kg	7 U	1.4 U	3.6 U
beta-BHC	mg/kg	7 U*	1.4 U*	3.6 U*
alpha-Chlordane	mg/kg	17 B	12 pB	8.9 pB
delta-BHC	mg/kg	7 U	1.4 U	3.6 U
Dieldrin	mg/kg	14 U	3	18
Endosulfan I	mg/kg	7 U	1.4 U	3.6 U
Endosulfan II	mg/kg	14 U	2.7 U	7 U
Endosulfan sulfate	mg/kg	14 U	2.7 U	7 U
Endrin	mg/kg	14 U	2.7 U	7 U
Heptachlor	mg/kg	5.8 J	0.8 J	1.1 J
gamma-BHC (Lindane)	mg/kg	7 U	1.4 U	3.6 U
Endrin ketone	mg/kg	14 U	2.7 U	7 U
Endrin aldehyde	mg/kg	14 U	2.7 U	7 U
gamma-Chlordane	mg/kg	14 B	15 B	9.6 B
Toxaphene	mg/kg	340 U	68 U	170 U
Methoxychlor	mg/kg	70 U	14 U	36 U
Heptachlor epoxide	mg/kg	7 U	0.63 J	3.6 U

Qualifiers

U - Analyzed for but not detected.

* - Duplicate RPD exceeds control limits

J - Indicates an estimated value.

p - The %RPD between the primary and confirmation column/detector is >40%. The lower value has been reported.

B - The analyte was found in an associated blank, as well as in the sample.