# FINAL ENGINEERING REPORT
# FOR
# ATLAS PARK SITE – PARCEL A
# GLENDALE, QUEENS

*Prepared For:*

**ATLAS PARK LLC**
**8000 Cooper Avenue**
**Glendale, NY 11385**

*Prepared By:*

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Joel B. Lander, P.E.

*December 7, 2005*
*5555107*

LANGAN
ENGINEERING & ENVIRONMENTAL SERVICES

## ENGINEERING CERTIFICATIONS

In accordance with the Environmental Conservation Law Title 14 Brownfield Cleanup Program certification requirements, I, Joel B. Landes, Professional Engineer licenced in the State of New York, hereby certify that all remedial elements described in this Final Engineering Report were completed in accordance with the approved Interim Remedial Measures (IRM) Work Plan and the approved Remedial Action Work Plan. Modifications/supplements made to the IRM Work Plan and Remedial Action Work Plan were based on specific conditions at the Site that were provided to NYSDEC during the remedial action activities, and other agreements reached with NYSDEC, and standard engineering practices.

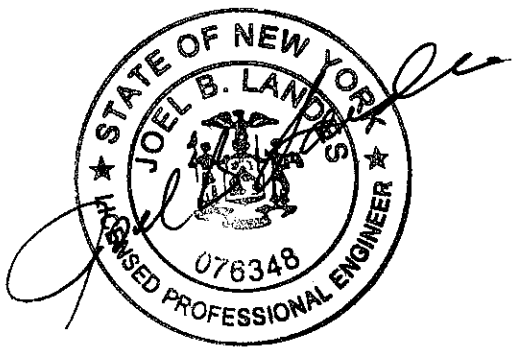
Specifically, I certify the following:

- All export including transport and disposal of soil, fill, water, or other material from the property was performed in accordance with the approved Remedial Action Work Plan, and were disposed at facilities licensed to accept this material in full compliance with all federal, state, and local laws;
- All remedial work conformed to the terms defined in the approved Remedial Action Work Plan;
- All import of soil from off site, including source approval and sampling, was performed in a manner that is consistent with the methodology defined in the Remedial Action Work Plan and the Soil Management Plan set forth in the Remedial Action Work Plan. Imported materials used for backfill met the TAGM 4046 RSCOs (Appendix H contains the Due Diligence conducted by Langan on the various import material facilities, analytical results, and weight tickets associated with the imported materials);
- All invasive work during the remediation and all invasive development work were conducted in accordance with dust and odor suppression methodologies defined in the Remedial Action Work Plan;
- The data submitted to the NYSDEC demonstrates that the remediation requirements set forth in the approved Remedial Action Work Plan and any other relevant provisions of this title have been achieved in accordance with the time frames established in such work plan; and
- Any deviations from the approved Remedial Action Work Plan are fully described in this Final Engineering Report.

## ENGINEERING CERTIFICATIONS (CONTINUED)

I also acknowledge the following certifications specifically required by ECL Title 14 Section 27-1419 and certify that these are **NOT APPLICABLE** to this project:

- Any 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 to title thirty-six of article seventy-one of ECL and that any affected local governments, as defined in title thirty-six of article seventy-one of ECL have been notified that such easement has been recorded;
- An operation and maintenance plan has been submitted by the applicant for the continual and proper operation, maintenance, and monitoring of any engineering controls employed at the site including the proper maintenance of any remaining monitoring wells, and that such plan has been approved by the NYSDEC; and
- Any financial assurance mechanisms required by the NYSDEC pursuant to this title have been executed.




Joel B. Landes, P.E.

Associate, Project Remediation Engineer

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## LIST OF ACRONYMS

| Acronym | Definition |
|---|---|
| AOC | Area of Concern |
| AST | Aboveground Storage Tank |
| AWQS | Ambient Water Quality Standards |
| BCA | Brownfield Clean-up Agreement |
| BCP | Brownfield Clean-up Program |
| bgs | below grade surface |
| C&D | Construction and Demolition |
| CAMP | Community Air Monitoring Plan |
| CFR | Code of Federal Regulations |
| CPP | Community Participation Plan |
| CQAP | Construction Quality Assurance Plan |
| DER | Division of Environmental Remediation |
| DRO | Diesel Range Organics |
| ELAP | Environmental Laboratory Accreditation Program |
| FER | Final Engineering Report |
| FSP | Field Sampling Plan |
| GRO | Gasoline Range Organics |
| HASP | Health and Safety Plan |
| HDPE | High-Density Polyethylene |
| IRM | Interim Remedial Measures |
| LIRR | Long Island Rail Road |
| msl | mean seal level |
| MTBE | methyl tertiary butyl ether |
| NYCRR | NY State Codes, Rules, and Regulations |
| NYSDEC | New York State Department of Environmental Conservation |
| NYCDEP | New York City Department of Environmental Protection |
| NYSDOH | New York State Department of Health |
| NYSDOT | New York State Department of Transportation |

## LIST OF ACRONYMS
## (CONTINUED)

| Acronym | Definition |
|---|---|
| OSHA | Occupational Safety and Health Administration |
| PBS | Petroleum Bulk Storage |
| PCB | Polychlorinated Biphenyls |
| PID | Photoionization detector |
| ppb | parts per billion |
| PPE | Personal Protective Equipment |
| ppm | parts per million |
| SCG | Standards, Criteria, and Guidelines |
| SI | Site Investigation |
| SIR | Site Investigation Report |
| SMP | Soil Management Plan |
| SOP | Site Operations Plan |
| SVOC | Semi-Volatile Organic Compound |
| TAGM | Technical Administrative Guidance Memorandum (NYSDEC) |
| TCL | Target Compound List |
| TCLP | Toxicity Characteristic Leaching Procedure |
| TPH | Total Petroleum Hydrocarbons |
| TSDF | Treatment, Storage, and Disposal Facility |
| UST | Underground Storage Tank |
| VOC | Volatile Organic Compound |

## 1.0 INTRODUCTION

Atlas Park, LLC (hereafter referred to as the Developer) entered into a Brownfield Cleanup Agreement (BCA) Index No. W2-0984-04-02, Site No. C241045 with the New York State Department of Environmental Conservation (NYSDEC) on March 5, 2004. This BCA required the Developer, as a "Participant", to investigate and remediate contaminated soil and groundwater at a 12-acre portion of the former Atlas Terminals industrial park, which is located in Glendale, Queens County, New York (See Figure 1). A new, mixed-use project, The Shops at Atlas Park, was proposed for the 12-acre parcel. When completed, The Shops at Atlas Park will include nearly 400,000 square feet of shopping, entertainment, dining, and office space. Refer to the Brownfield Cleanup Program (BCP) application for development details. A boundary map is attached to the BCA Amendment to satisfy the requirements of ECL Title 14 Section 27-1419.

In January 2004, an Interim Remedial Measures Work Plan (IRM Work Plan) for the portion of the property that is known as Parcel A, and a Remedial Investigation Work Plan (RI Work Plan) for the entire 12-acre property (Parcels A and B), were submitted to NYSDEC and the New York State Department of Health (NYSDOH). The BCP Agreement, and the IRM and RI Work Plan were officially sent out for public review in March 2004. No public comments were received within the subsequent 30-day comment period. After suggested revisions by the Department, the Work Plans were re-submitted on May 14, 2004, and were approved by NYSDEC on June 10, 2004.

The IRM Work Plan addressed the remedial activities and planned excavation and major earthwork on Parcel A for new construction of underground parking garages, foundations for two buildings with basement levels, stormwater detention basins, and utilities, as well as excavation for the sole purpose of remediation outside of the footprints of these structures (See Figure 1 for a Site Location Map and Figure 2 for the proposed development). The RI Work Plan addressed remedial investigation activities conducted on Parcel B, as well as a site-wide groundwater investigation of the entire 12-acre property.

As noted above, the original BCA covered the entire 12-acre parcel. However, the 12-acre parcel was formally separated into two distinct areas: Parcel A (formerly known as the "IRM Area") and Parcel B (formerly known as the "RI Area"). Parcel A (hereafter referred to as the "Site") consists of an 8.474-acre portion of the 12-acre parcel, which is the subject of this report and where the remedy involved demolition of all structures and extensive subsurface excavation work. With concurrence from NYSDEC during a meeting on April 18, 2005, the

Developer completed the administrative process of separating Parcels A and B into separate Brownfield Cleanup Agreements. Due to the planned renovation of existing structures on Parcel B, the remedy for Parcel B shall be different from the remedy that was completed on Parcel A; therefore, all parties agreed that separation of the parcels was justified.

The original BCA was amended to reflect the IRM Area as Parcel A, and the RI Area as Parcel B. As noted above, the amendment document was executed by NYSDEC. Parcel A is still subject to the original BCA index No. W2-0984-04-02, Site No. C241045. The Amendment clarifies that the original BCA now relates to Parcel A exclusively. As of the date of execution, Parcel B is subject to a new BCA index No. W2-1070-05-06 Site No. C241088. A Final Engineering Report will be submitted for each parcel. This report represents the Final Engineering Report for Parcel A.

This Final Engineering Report (FER) was prepared by Langan Engineering and Environmental Services, PC (Langan), a New York State Professional Engineering firm. The FER documents the remedial measures that were implemented at Parcel A as detailed in the Metes and Bounds description included in Appendix A.

The remedial activities were conducted in accordance with the NYSDEC-approved IRM Work Plan and the approved Remedial Action Work Plan (RAWP) for Parcel A (the two documents are collectively referred to hereafter as "the RAWP").

The RAWP was implemented in conjunction with construction of the new development. The goal of implementing the RAWP was to remediate the Site to Track 1 cleanup standards for unrestricted future use. It was understood throughout this project that because the NYSDEC has not yet promulgated into law specific Track 1 cleanup levels pursuant to Section 27-1415 of the Brownfield Cleanup Law (Environmental Conservation Law Article 27, Title 14), the current NYSDEC Technical Administrative Guidance Memorandum (TAGM) 4046 Recommended Soil Cleanup Objectives (RSCOs) will serve as Track 1 objectives for this project. During the implementation of the RAWP, contaminated soil exceeding the TAGM 4046 RSCOs was removed and disposed off the Site to achieve Track 1 objectives, as the confirmatory post-excavation (bottom and sidewall) endpoint soil sampling data presented herein demonstrate. The data substantiate and support that Track 1 objectives were met, and no further remediation of soil is warranted at the Site.

In addition, based on all the data collected during site investigation activities and implementation of the RAWP, it was concluded that the former on-site soil was not a source of volatile organic compounds (VOCs) detected in the groundwater aquifer located approximately

55 feet below the Site specifically trichloroethene (TCE) and tetrachloroethene (PCE). Soil vapor sampling conducted within the Site footprint (following removal of the contaminated soil) indicated the presence of elevated TCE and PCE soil vapors. These vapors are addressed in Section 6.0 of this Final Engineering Report. The soil, groundwater, and soil vapor sampling data collected in Parcel A do not indicate the presence of an on-site source of TCE and PCE. However, the ongoing investigation within Parcel B identified the presence of one specific source (floor drain) and two additional potential sources of TCE and PCE. A remedial plan to address the confirmed source area on Parcel B is being prepared and submitted to NYSDEC.

This FER is organized as follows:

- Section 2.0 – Provides the project background including a description of the Site history, use, and prior environmental investigations; a summary of several pre-IRM investigations and remedial activities that were completed under the BCP; and the Technical Approach of the Remedial Action.

- Section 3.0 – Describes the mobilization and general site management and controls implemented during the remedial activities.

- Section 4.0 – Presents the soil/waste management plan, including descriptions of the various categories of soil/waste, and procedures for handling, stockpiling, waste characterization, transport, and disposal.

- Section 5.0 – Describes the remedial activities conducted relative to the five separate areas of construction on Parcel A.

- Section 6.0 - Describes the soil vapor investigation completed within the footprints for two new buildings (Buildings No. 4 and 6) being constructed on Parcel A.

- Section 7.0 – Presents a summary of the Data Usability Summary Reports (DUSRs)

- Section 8.0 – Presents the summary and conclusions of this Final Engineering Report.

To facilitate the presentation and discussion of the Remedial Action conducted and documented in this Final Engineering Report, the Site is presented as five separate construction areas as illustrated on Figure 3.

# 2.0 PROJECT BACKGROUND

## 2.1 SUMMARY OF SITE HISTORY AND USE

Historical former commercial and light industrial site uses for the entire Atlas Terminals 18-acre property were summarized and presented in a Phase I Environmental Site Assessment (ESA), completed by Ambient Group, Inc. (Ambient) in March 2001. The report was provided as an attachment in the BCP Application submitted on December 11, 2003 to NYSDEC. According to the report, in 1867, the property was owned by the Folk family and consisted primarily of farmland. Based on a review of Sanborn maps as part of Ambient's report, several buildings occupied the property prior to 1922, although their historical use is unknown. In 1922, the approximately 18-acre property was sold to the Hemmerdinger Corporation and the property became known as Atlas Terminals. The Hemmerdinger Corporation leased portions of the property to various manufacturing and processing companies from 1922 to the present. Some of these interests remain on the 6-acres of the Atlas Terminals Parcel that is not part of the current 12-acre Shops at Atlas Park development project.

In 2002, a 12-acre portion of the Atlas Terminals property was transferred to the Developer with the intent to redevelop the 12-acre parcel into the proposed "The Shops at Atlas Park" development project. The 12-acre parcel was subdivided into two distinct areas: Parcel A (8.474-acres), formerly known as the IRM Area and which would be substantially excavated for subsurface parking, utilities and foundations of new buildings; and Parcel B (3.526-acres), formerly known as the RI Area now BCA Site No. C241088, which houses pre-existing buildings that will be substantially renovated.

## 2.2 RELEVANT HISTORICAL REPORTS AND SUBMISSIONS

There were two reports generated from the Phase I and Phase II investigations originally conducted at the entire 18-acre Atlas Terminals Site. Subsequently, on Parcels A and B (comprising 12 acres) after this parcel was subdivided from the remaining 6-acre Atlas Terminals Site, a number of additional site investigation and remedial action reports were generated. The following is the full list of reports relevant to the project Site and completed remedial activities.

| Relevant Report | Consultant | Date Submitted to NYSDEC |
|---|---|---|
| Phase I Environmental Site Assessment | Ambient Group Inc. | March 2001 |
| Phase II Environmental Site Assessment | Metcalf & Eddy | March 2002 |
| UST Tank Closure Report | Langan Engineering | January 26, 2004 |
| Citizen Participation Plan | Langan Engineering | March 31, 2004 |
| Interim Remedial Measure Site Investigation Report | Langan Engineering | April 2004 |
| RI/IRM Work Plan | Langan Engineering | May 2004 |
| Remedial Investigation Work Plan Addendum #1 | Langan Engineering | May 2004 |
| Pre-IRM Field Investigation Findings, IRM Status, and Proposed Addendum #2 to RI/IRM Work Plan | Langan Engineering | September 2004 |
| Occurrence of Chlorinated Volatile Organic Compounds | Langan Engineering | July 2005 |

The above reports are located in Appendix K in electronic format (CD) with the exception of the final report, Occurrence of Chlorinated Volatile Organic Compounds, which is provided in hardcopy format in Appendix J.

## 2.3 PHASE II ENVIRONMENTAL SITE INVESTIGATION

Metcalf & Eddy completed a Phase II Environmental Site Investigation (ESI) was completed in March 2002. This report is an attachment in the BCP Application submitted December 11, 2003 to NYSDEC (Appendix K). The findings of the Phase II are summarized as follows:

- Groundwater lies at a depth greater than 40 feet below ground surface (bgs), the maximum drilled depth with no groundwater encountered at any boring locations.

- Two underground storage tank (UST) areas were identified. One suspected 2,000-gallon heating oil UST east of Building 20 and two suspected 6,000-gallon gasoline USTs south of/adjacent to Building 16 (reported former gas station). In the fall of 2003, Langan addressed the closure of these tank areas in a UST Closure Report submitted to the NYSDEC PBS Unit and the BCP Project Manager. This is discussed in Section 2.4.4.

- No evidence of petroleum or chemical spills was observed in the soil samples collected from the Site.

- Distinct ash/cinder or mixed ash/cinder/soil fill layers were present in thicknesses ranging from 0.1 to 3 feet within a fill stratum that has an average depth of 3 to 4 feet underling most of the Site.

- The ash/cinder component found within the fill contains some regulated semi-volatile organic compounds (SVOCs) and metals at concentrations greater than the NYSDEC TAGM 4046 RSCOs. SVOCs were generally not detected or were detected below the TAGM levels in fill not containing visible ash or cinders.

- It was concluded that most of the elevated metal concentrations were likely naturally occurring due to the concentrations found and the lack of ash/cinder at the locations where the metals were found.

## 2.4 IRM SITE INVESTIGATION

Langan conducted a subsurface environmental and geotechnical investigation throughout Parcel A in 2003 and 2004 in preparation for the remedial activities and subsequent construction activities. The objectives of the environmental investigation were to evaluate impacts associated with potential areas of concern (AOCs) that were identified during previous investigative activities and to characterize the nature and extent of the material that would be removed during the remedial activities. (See Figure 4 for an illustration of the previously identified AOCs). AOCs for Parcel A were discussed further in the IRM Site Investigation Report (SIR), submitted to NYSDEC on April 23, 2004, and in the approved RAWP for Parcel A. Implementation of remedial activities uncovered additional AOCs, which are discussed in this FER.

The initial IRM Site Investigation of Parcel A consisted of the collection and testing of 114 soil samples from 39 soil borings, 1 soil gas sample to evaluate the presence of VOCs below a future planned building, and the installation of 4 groundwater monitoring wells to determine

groundwater quality and flow direction beneath the Site. The investigation work was conducted in accordance with the approved IRM Work Plan. The samples were tested for the complete TAGM parameter list of analytes, specifically the Target Compound List (TCL) VOCs, SVOCs, and pesticides/herbicides, Target Analyte List (TAL) metals, and PCBs. The IRM SI Report's relevant conclusions are summarized below.

- Site stratigraphy is composed of fill material ranging in depth from ground surface to 16 feet bgs, followed by native sands with intermittent silt and clay lenses, ranging in depth from ground surface to the base of the deepest boring (77 feet bgs).

- Groundwater is between 55 and 67 feet bgs and will not be encountered during the proposed development excavation (approximately 18 feet bgs).

- The presence of ash and cinders in the fill material in localized areas was confirmed. Nineteen borings contained some form of ash/cinder material, either a distinct layer or a mixture of soil and ash/cinder. Ash/cinder was observed at a maximum depth of 9 feet bgs.

- SVOCs and metals exceeding TAGM 4046 RSCOs were delineated to depths as deep as 13 feet bgs and 11 feet bgs, respectively, and were limited to the fill material overlying the natural soil.

- No other detected constituents exceeded any TAGM 4046 RSCOs during this investigation.

- There were sporadic exceedances of the TAGM RSCOs for the metals calcium, magnesium, nickel, and zinc in the native soil underlying the fill that are due to naturally-occurring conditions. As such, these metals would not be considered in determining what soil would be removed to attain Track 1 objectives.

Based on the results of the IRM SI Report, further evaluation of groundwater quality was deferred to the scheduled RI work at the adjacent RI Area (Parcel B).

## 2.5 PRE-IRM IMPLEMENTATION INVESTIGATIONS

Based on the IRM SI Report, NYSDEC required the Developer to:

1. Investigate the locations of previous soil borings completed by others (pre-BCP) where VOCs were detected in soil (but below the TAGM RSCOs),

2. Screen soil below the existing buildings at the Site following demolition, and

Remediate any "hot spots" identified to close out these areas and allow construction to proceed simultaneously.

The following three subsections address the investigations conducted to satisfy NYSDEC's request. The Pre-IRM Field Investigation Findings, IRM Status, and Proposed Addendum #2 to the Work Plan, dated September 22, 2004 ("Pre-IRM Field Investigation Report"), present the findings of these investigations.

### 2.5.1 Test Pit Investigations of Potential "Hot Spots"

Langan completed test pits and soil sampling at four prior soil-boring locations (Metcalf & Eddy) where VOCs were detected in soil below the TAGM RSCOs, specifically perchloroethylene (PCE), trichloroethylene (TCE) and/or Methyl Ethyl Ketone (MEK), at SB-4, SB-12, SB-17, and SB-19. Langan conducted similar investigation and sampling at four additional IRM soil-boring locations where similar VOCs and levels were detected in soil (B-26, B-32, B-39, and B-44).

Langan completed three or four test pits were completed at each boring location to characterize and delineate any hot spots uncovered. Excavation commenced at the prior boring location to the sampling depth where VOCs were previously detected. The test pit excavation was extended radially from the boring location a distance of approximately 30 feet. Excavated soil samples were collected from multiple depths and horizontal spacing along each test pit, and screened with the photoionization detector (PID) for total organic vapors. In general, approximately 12-16 soil samples per test pit were bagged and screened in this manner. Endpoint soil samples were collected at the base of each excavation. No VOCs in the endpoint soil samples exceeded TAGM RSCOs.

The field soil screening and the endpoint sampling identified no source areas of VOCs. Based on these results, there was no need for hot spot remediation at these prior boring locations before implementing the remedial activities.

### 2.5.2 Building Demolition and Sub-Slab PID Screening

Langan visually inspected and screened with a PID soil exposed beneath the slab of each building as the buildings were demolished. As documented in the Pre-IRM Field Investigation Report, the data did not substantiate any source areas of VOCs at the Site. The highest PID readings were associated with the center of the Site where test pits were previously completed, but notably, all VOCs detected in the soil were below TAGM RSCOs (see preceding Subsection 2.4.1). PID readings performed as part of the sub-slab screening are summarized in and illustrated in Figure 5.

Based on the sub-slab screening, there was no need for hot spot remediation within any of the former building footprints prior to commencement of the remedial activities. See Figure 4 for the sub-slab VOC screening of Buildings within Parcel A.

### 2.5.3 Delineation Test Pit Investigation

Prior to commencement of the remedial activities, the Developer elected to conduct exploratory test pits and soil sampling at four additional IRM SI boring locations; B-4, B-21, B-31, and B-41. The objectives of the test pits were to attempt to confirm some of the IRM SI findings at these locations that appeared as potential anomalies, and if confirmed, to delineate the contaminated soil. At three of these locations (B-21, B-31, and B-41), TAGM RSCO exceedances were observed for relatively deep soil samples compared to surrounding locations, or the TAGM RSCO exceedances were marginal or limited to only a few regulated compounds that were considered potentially anomalous. At the fourth location (B-4), there were no TAGM RSCO exceedances but only observations of trace coal "particles" in the soil/fill.

The findings suggested that the volume of soil associated with the compounds found in the original samples was limited, but it was not practical to attempt to segregate the clean from contaminated materials. Therefore, the contaminated soil represented by the soil data discussed above was excavated and disposed off the Site.

### 2.5.4 Underground Storage Tank Removals from Buildings 16 and 20

Prior to implementation of the remedial activities, four USTs were decommissioned and removed from the west side of former Building 16, and two USTs were removed from the east side of former Building 20, along with some associated piping. There was no evidence of leakage during this work. The Building 16 USTs were contained within concrete vaults. The Building 20 USTs were not contained within vaults, but a bottom slab was present. The USTs

at both buildings were removed. Due to the potential for collapse of the buildings during excavation, demolition and removal of the vaults, bottom slab, and some remaining piping was postponed until after the buildings were demolished. A tank closure report covering the work was prepared and submitted to NYSDEC's Petroleum Bulk Storage (PBS) office and to NYSDEC's Division of Environmental Remediation on January 26, 2004.

Subsequently, in March 2004, following demolition of Building 16, the tank vault and additional remaining piping were removed, and endpoint soil samples were collected to demonstrate tank closure and that Track 1 objectives were met. Documentation of this activity is provided in Appendix B, including photo-documentation, endpoint sample results, and sub-slab soil screening results following the building demolition. There was no evidence observed of past leakage from these tanks beneath the vault or piping.

In May 2004, following demolition of Building 20, the remaining piping was removed and endpoint samples were collected. Since the layer of shallow fill needed to be excavated, removal of the bottom slab was deferred and the slab was removed during the implementation of subsequent remedial activities. The Building 20 endpoint sample results are provided in Appendix B. There was no evidence observed of past leakage from these tanks beneath the vault or piping.

## 2.6 GROUNDWATER INVESTIGATION

### 2.6.1 On-Site and RI Area (Parcel B) Groundwater Sampling Programs

During the IRM SI, four (4) groundwater monitoring wells were installed on the Site and initially sampled in February and March 2004, and two (2) were sampled again during the early phase of the remedial activities prior to their abandonment (MW-12 and MW-56). As part of the RI on Parcel B, and prior to the start of the remedial activities, six (6) additional groundwater monitoring wells were installed on Parcel B and groundwater samples were collected in August 2004.

The wells were installed and sampled in accordance with procedures set forth in the Work Plan. Neither a sheen nor free product was observed in any of the wells. Groundwater levels were measured during these field investigations on several occasions in the wells, as documented in the IRM SIR (for Parcel A) and the RI Report (for Parcel B) that were submitted to NYSDEC. Depth to groundwater is between 55 and 67 feet bgs across the Site.

### 2.6.2 Groundwater Quality

There were sporadic detections of three (3) pesticides and one (1) SVOC, in the groundwater above their respective NYSDEC Division of Water, Technical and Operational Guidance Series Ambient Water Quality Standards and Guidance Values (AWQS). No herbicides or PCBs were detected. In addition, there were exceedances for two VOCs and several metals. The VOCs and metals results are described below.

Volatile Organic Compounds (VOCs).

Relatively low levels of two VOCs, TCE, and PCE were detected in the groundwater samples. The specific VOC groundwater findings are summarized below:

- TCE was detected in an upgradient well at twice the maximum concentration than the on-site and downgradient wells. The concentration in the upgradient well was 20 micrograms per liter (ug/L) compared to a range of 6 ug/L to 10 ug/L in the wells located downgradient of Parcels A and B. The AWQS for TCE is 5 ug/L.

- PCE was detected in three monitoring wells above the AWQS of 5 ug/L, ranging from 23 ug/L in an on-site well to 96 ug/L in a well located downgradient of Parcels A and B. PCE was also detected in an upgradient well at 4 ug/L, below the AWQS.

No other VOCs were detected in the groundwater above NYSDEC's AWQS.

The extensive dataset for Parcel A indicates that on-site soil is not the source of these compounds in groundwater. Throughout the investigation and remedial activities on Parcel A, there were no TAGM RSCO exceedances for TCE or PCE in on-site soil. Both compounds either were detected at concentrations below their respective RSCO (maximum TCE concentration of 120 micrograms per kilogram [ug/kg], and maximum PCE concentration of 361 ug/kg) or were undetected. In addition, there were no identified "hot spots" that contained these compounds during the pre-IRM site investigations or during the remedial activities. See Appendix J for the July 2005 Occurrence of Chlorinated Volatile Organic Compounds Report, and Section 2.6.5 below for a summary of the findings of this report.

Metals

The AWQSs for iron, magnesium, manganese, and sodium were exceeded in at least one groundwater sample. However, the analytical data are consistent with and substantiate

background soil conditions at the Site, and therefore, the detected metals are indicative of background conditions and not related to any site-related impacts.

### 2.6.3 Groundwater Flow

Water level measurements were collected from both the on-site wells and wells located in Parcel B. The depth to groundwater ranges from approximately 55 to 67 feet bgs, or at an approximate elevation of 14 to 15 feet relative to the Queens Borough President Datum (QBPD).

The groundwater elevation contours were plotted from synoptic water levels collected on October 22, 2004 utilizing the SURFER contouring program. The constructed groundwater contour map is provided in Appendix C. Note that this contour map was revised and supersedes the contour map previously submitted in the RI Report for Parcel B. The configuration of the groundwater table is generally consistent with the regional west-southwest to southwest groundwater flow direction as documented in the RI Report. However, more localized variations are evident including: 1) an apparent water table high in the southeast portion of the Site centered on well MW-12, and 2) a localized area of west-northwesterly flow in the northwest corner of the Site.

### 2.6.4 Assessment of Groundwater Quality

TCE and/or were detected in two wells located downgradient of Parcels A and B at levels above the respective groundwater standards. An evaluation of PCE was conducted with respect to potential impacts to downgradient public drinking water supply wells. It should be noted that based on the investigative activities and the complete remedial excavation of contaminated soil conducted on Parcel A, no sources of TCE and PCEwere discovered. However, the ongoing investigation within Parcel B identified the presence of one specific source (floor drain) and two additional potential sources of TCE and PCE. A remedial plan to address the confirmed source area on Parcel B is being prepared and submitted to NYSDEC.

Both TCE and PCE are subject to attenuation by naturally-occurring processes, including advection, dispersion, sorption, volatilization, and biological degradation. Both compounds are microbially degraded through a process known as reductive dehalogenation, which is most prevalent under anaerobic conditions. The RI data indicate that groundwater conditions are slightly anaerobic, or reducing. Stabilized pH measurements ranged between about 6.1 and 7.0 for the wells that were installed during implementation of the RI.

Calculations were completed to simulate the degradation/attenuation of the PCE. The nearest drinking water supply well is approximately 1.9 miles away. Based on these calculations, PCE concentrations are estimated to attenuate to undetectable levels within a maximum distance of about 1,000 feet from the Site boundary, or 1/10 the distance from the Site to the nearest public supply well. Consequently, PCE is not expected to impact groundwater quality at the public water supply wellheads.

### 2.6.5 Lack of TCE/PCE Source Area on Parcel A

In support of the contention that Parcel A was not the source of historic TCE and PCE detections in groundwater, Langan compiled all of the TCE and PCE data collected within Parcel A into tables and several figures for presentation to NYSDEC. The data and drawings were submitted to NYSDEC on July 1, 2005. Data were compiled from the following:

- Phase II Site Investigation by Metcalf and Eddy
- IRM Site Investigation by Langan
- Pre-IRM "Hot Spot" test pit investigation by Langan, and
- Remedial activities by Langan as presented in this Final Engineering Report for Parcel A.

Based on a review of the historical distribution and occurrence of TCE and PCE, Langan concluded that:

- Although PCE, TCE, and several degradation products were detected in soil samples, none of the detected concentrations exceeded their respective NYSDEC TAGM 4046 Recommended Soil Cleanup Objective.
- There was no correlation between the detected chlorinated VOCs in the soil and the occurrence of VOCs in the soil vapor or groundwater samples.
- There was no evidence indicating the presence of a historical or current source of chlorinated VOCs within Parcel A.

For all supporting documentation and figures, refer to Appendix J.

## 2.7 SUMMARY OF REMEDIAL ACTION APPROACH

The Remedial Action Objectives (RAO) were:

- Protect on-site workers and the surrounding community from exposure to site-related contaminants during the planned remedial excavation and construction work that is part of the site remedy.
- Establish guidelines for the proper management and disposal of soil, water, and other wastes generated during implementation of the proposed remedy.
- Achieve NYSDEC's Track 1 unrestricted use criteria (i.e., achieve TAGM RSCOs) such that, pursuant to Title 14 of Article 27 of the New York State Environmental Conservation Law, no institutional or engineering controls will be required.

The remedial program for the Site was selected after due consideration of the following factors listed in the BCP law, and presented in detail relative to the Site in the Engineering Evaluation of the Remedy section of the Work Plan:

- Protection of human health and the environment;
- Compliance with standards, criteria, and guidance (SCGs);
- Short-term effectiveness and impacts;
- Long-term effectiveness and permanence;
- Reduction of toxicity, mobility, or volume of contaminated materials;
- Implementability;
- Cost effectiveness;
- Community Acceptance; and
- Land use.

To meet the project objectives, the remedial activities included excavation and off-site disposal of ash, ash-impacted fill, and other contaminated fill/soil exceeding TAGM RSCOs, located within the Site's boundary.

Prior investigations indicated that the ash and ash-impacted fill was present within the shallow fill layer generally within 4 feet bgs but as deep as 9 feet bgs, and SVOCs and metals exceeding TAGM 4046 RSCOs to depths as great as 13 feet bgs in certain locations. The depth of excavation required for new sub-grade structures ranged from approximately 6-15 feet bgs throughout 70-80 percent of the Site, during which the historic fill material was removed and excavation extended into native, clean soil to confirm achievement of Track 1 cleanup objectives. Within the remaining 20-30 percent of the Site, even though deep excavation was not required for new sub-grade structures, excavation activities progressed to remove the contaminated fill layer, as well as any discovered hot spots, in order to achieve Track 1 objectives throughout Parcel A.

Soil excavation was completed above the water table, which is at a minimum approximately 55 bgs. Therefore, dewatering of soil prior to or during excavation was not required. Post-excavation soil samples were collected at the endpoint (bottom and sidewalls) of the excavation to demonstrate that contaminated soil and ash were removed and that Track 1 objectives were attained. In addition, soil samples were collected from soil borings completed during the IRM SI activities. The soil samples from these borings were collected from below the fill layer, and based on laboratory analyses, the soil met Track 1 objectives. Therefore, with NYSDEC's concurrence these selected soil boring samples served as supplemental IRM end-point samples.

Contaminated fill/soil removed during excavation was ultimately disposed as a regulated waste at permitted, approved disposal facilities.

# 3.0 MOBILIZATION, GENERAL SITE MANAGEMENT, AND SITE CONTROL

## 3.1 INTRODUCTION

The mobilization/site preparation, and general site management and site control activities completed prior to and during the remedial activities are described in this section. This discussion is preceded by a brief description of the pre-mobilization activities that were completed prior to the Developer's entry into the BCP.

## 3.2 PRE-MOBILIZATION ACTIVITIES

Pre-mobilization included demolition of the existing buildings, slabs and foundations, and removal and closure assessments for several existing USTs, UST vaults, and piping as described in Section 2.4.4. At the time mobilization for the remedial activities started, the buildings at the Site was demolished with the exception of Buildings 3, 4, and part of Building 28, which were later demolished during the initial remedial activities. Demolition included abatement of hazardous building materials, specifically asbestos-containing materials, and polychlorinated biphenyl (PCB) transformers.

## 3.3 MOBILIZATION/SITE PREPARATION ACTIVITIES

Mobilization and site preparation activities completed prior to the remedial activities at the Site included:

1. Preparation/review of pre-remediation contractor submittals;
2. General mobilization activities;
3. Construction of entrance/exit roadways, truck wash, and truck scale;
4. Construction of soil stockpile areas;
5. Installation of erosion control measures and perimeter security fencing; and
6. Setup of air monitoring stations.

A description of each of these activities is presented below.

### 3.3.1 Pre-IRM Submittals

With assistance from their Construction Manager, Plaza Construction Corp. (Plaza), and Remediation Engineer, Langan, the Developer procured a qualified, experienced Remediation

Contractor with experience at contaminated urban sites to implement the soil excavation work: Earth Technology, Inc. (ETI). The Remediation Contractor maintained a full staff and complement of equipment to conduct not only the mass excavation, but also remediation of the AOCs that were uncovered.

As the Remediation Engineer, Langan reviewed and approved the contractor submittals required under the BCP project, and thereby, was responsible for ensuring that the contractor documents for remedial work conformed to the Work Plan. The initial required submittals included:

1. Site Operations Plan (SOP);
2. Site Specific Health and Safety Plan (HASP);
3. Construction Quality Assurance Plan (CQAP);
4. Soil Management Plan (SMP);
5. Stormwater Pollution Prevention Plan; and
6. Documentation for proposed waste disposal facilities, testing requirements, permits/approvals, and commitments from the facilities to receive the waste generated during the remedial activities.

### 3.3.2 General Mobilization Activities

General mobilization activities included:

1. Identifying aboveground and underground utilities (e.g., power, gas, water, sewer, telephone, etc.), equipment, and structures;
2. Mobilizing necessary remediation personnel, equipment, and materials to the Site;
3. Clearing the areas that could obstruct/limit the soil excavation activities; and
4. Kickoff health and safety training briefings with the Developer's representatives, the Remediation Contractor, and Remediation Engineer.

### 3.3.3 Stabilized Construction Entrance/Exit and Truck Wash

Under Langan's supervision, the Remediation Contractor constructed stabilized construction entrances and exits of clean gravel roadways off Cooper Avenue. The public roadways in front of the Site were cleaned periodically and as needed with a street sweeper. An engineered truck wash/decontamination pad was constructed in the northeast corner of the Site near the

truck exit roadway from the Site. The tires and undercarriages of the trucks along with equipment departing the Site were pressure washed. The decontamination pad was constructed of an asphalt pad and concrete side barriers. The decontamination pad was sloped to a collection sump to contain and collect wash waters, which were periodically pumped into a "frac" tank. Wash waters were removed using a vacuum truck and were properly disposed off the Site.

It should be noted that there were two isolated non-conformance issues in connection with truck washing. During one occasion last winter, truck washing was temporarily suspended due to water freezing in the wash lines. Truck washing resumed after the wash lines were thawed out. On another occasion, a complaint was reported to the NYSDEC that Cooper Avenue was dusty. This was mitigated through stepped-up sweeping and washing of Cooper Avenue.

Erosion and sedimentation control measures were constructed and maintained in the decontamination area in accordance with the provisions of the Soil Erosion and Stormwater Pollution Prevention Plan presented in the Work Plan (See Section 3.3.5).

### 3.3.4 Construction of Soil Stockpile Areas

Under Langan's supervision, the Remediation Contractor constructed and maintained, a stockpile area for the staging of Category 3 clean soil in the northwest corner of the Site. As the remedial activities progressed, separate stockpile areas were constructed and maintained for the Category 1 (historic fill) and Category 2 (unknown) materials, as warranted. Figure 3 illustrates the configuration of the temporary stockpile areas at the Site during the remediation. Stockpile areas met the following minimum requirements:

1. The base consisted of a double layer of 10-mil plastic sheeting.
2. Equipment and procedures were used to place and remove the soil to minimize the potential for tearing the liner.
3. Stockpiles were covered at the end of each workday, with the exception of the Category 3 stockpiles that were not covered due to their large size and clean nature.
4. Each stockpile area was encircled with silt fences, at a minimum, and hay bales.

Within each stockpile area, the Remediation Contractor stockpiled the soil in separate piles. Due to space constraints and the large volume of clean soil that was excavated for construction, the Category 3 clean soil stockpiles were constructed of four adjoining cells created by discrete lifts of soil totaling about 2,000 cubic yards per discrete lift. A cell

contained as many as four discrete lifts of clean soil at any time. A more detailed description of the clean soil stockpiles is included in Section 4.7.3.

### 3.3.5 Erosion Control Measures and Site Perimeter Security Fencing

Stormwater pollution prevention and erosion control measures were implemented in conformance with the Work Plan, and included:

1. Frequent watering of the roadways, excavation and fill areas;
2. Maintenance of the perimeter and soil stockpile silt fencing;
3. Excavation of temporary ditches and sediment basins and construction of berms to divert stormwater away from the perimeter; and
4. Construction and maintenance of stabilized construction entrance/exit pads.

Stormwater runoff and the wash waters from the truck wash area were conveyed into a collection sump, then pumped into a "frac" tank and ultimately to a vacuum truck and disposed at an off-site treatment facility. Stormwater runoff was contained on the Site. The stabilized construction entrance and exit to the Site were inspected on a daily for evidence of off-site sediment tracking. The existing conditions of the adjacent city streets were maintained and cleaned with a street sweeper as needed.

### 3.3.6 Air Monitoring Stations

As part of the Community Air Monitoring Program, fixed air monitoring stations were established at three locations along the perimeter to monitor for particulates (dust) using direct-reading and recordable instruments. The air monitoring stations were operational during the remedial activities. The locations were adjusted as wind conditions changed to monitor both the upwind and downwind perimeters. See Figure 3 for monitoring station locations.

## 3.4 GENERAL SITE MANAGEMENT AND CONTROL ACTIVITIES

The general site management and controls conducted during the remedial activities included:

- Truck traffic control;
- Maintenance of site security;
- Air monitoring;
- Dust suppression;

- Groundwater monitoring well abandonment; and
- Equipment decontamination and residual waste management.

A description of each of the activities listed above is presented below.

### 3.4.1 Truck Traffic Control

The truck route between the Site and the nearest major highway (Long Island Expressway) as presented in the Work Plan was followed. Due to relatively large size of the Site and coordinated sequencing of excavation, soil loading and hauling by the Construction Manager avoided the need to queue trucks along the adjacent public roadways.

### 3.4.2 Site Security

The Site was secured during the remedial activities with the use of:

1. Perimeter security fencing and access gates with locks installed at the boundary of the Site to prevent access by unauthorized persons;
2. Warning tape and/or barricades placed around open excavations, hot spots/AOCs in the process of remediation, and other potentially dangerous areas as determined by the Health and Safety Coordinator;
3. Sign-In/Sign-Out Sheets were maintained at the site trailer; and
4. Safe Work Practices included::
    - Parking heavy equipment in a designated area each night and removing keys;
    - Maintaining an organized work area, including the proper storage of tools, equipment, and fuels;
    - Conducting regular health and safety meetings; and
    - Maintaining on-site access roads, covers on staging areas, and stormwater collection sumps.

### 3.4.3 Air Monitoring

The Remediation Engineer implemented an air-monitoring program in accordance with the approved RAWP for the duration of remedial activities to protect the health and safety of site workers and the surrounding community, and to address potential nuisance dust and/or odors.

Monitoring was conducted within and around the work areas using PIDs for total organic vapor monitoring, and visible monitoring for dust. Perimeter monitoring was completed using hand-held PIDs for total organic vapors and fixed stations for monitoring for dust (See Section 3.3.6). The dust monitoring station data are provided in Appendix D.

### 3.4.4 Dust Suppression

The Remediation Engineer and Construction Manager monitored the remediation and construction activities for dust generation and the need for dust suppression. Nuisance dust was controlled with engineering controls, as required (e.g., use of water trucks and tarping of stockpiled soil). Preventative measures for dust generation included maintenance of the stabilized construction entrance and truck wash area, covering soil stockpiles, and limiting vehicle speeds.

### 3.4.5 Groundwater Monitoring Well Abandonment

Four (4) groundwater monitoring wells located within the areas of excavation were abandoned following the appropriate NYSDEC requirements, by tremie-grouting the full depth of the well casing and screen up to ground surface. The wells included wells MW-1, MW-28, MW-12 and MW-56, as shown on the groundwater contour map provided in Appendix C.

Monitoring wells MW-13 and MW-20 were inadvertently demolished prior to remedial activities during the demolition of above ground structures and building floor slabs.

### 3.4.6 Equipment Decontamination and Waste Management

Equipment Decontamination

Vehicle and equipment cleaning was conducted on the decontamination pad in the truck wash area. Each transport vehicle was manually scrubbed, pressure washed, and inspected prior to leaving the Site.

Miscellaneous Wastes

Miscellaneous waste generated during the remedial activities, including general refuse, used construction equipment and excess materials, perimeter and temporary fencing, used disposable sampling equipment, and personal protective equipment (PPE), were managed and disposed as a non-hazardous, solid waste. One drum containing PPE and soil resulting from the Hazardous Lead (AOC 2B) area, was disposed of at Clean Earth of North Jersey as hazardous materials.

Unanticipated Subsurface Structures/Conditions

Unanticipated subsurface structures/conditions such as USTs, vaults, and concrete debris were handled in accordance with applicable federal, state, and local ordinances and regulations. Visually clean debris was transported per 6 NYCRR Part 360-7 to a licensed construction and demolition (C&D) facility. Three (3) USTs were encountered during excavation as described in Section 5.0. The tanks were decommissioned and removed in accordance with the applicable NYSDEC tank closure regulations.

## 3.5 SCHEDULE

Implementation of the remedial activities commenced in October 2004, and they were completed on May 25, 2005. Remediation of soil on Parcel A was completed within an 8-month time period that is consistent with the range of potential completion dates included in the RAWP (i.e., 6 to 9 month completion timeframe). As such, potential impacts on the community were minimized.

## 3.6 PROGRESS REPORTS

Weekly, and as situations dictated, progress reports were submitted to NYSDEC and NYSDOH by electronic media during the remedial activities. Monthly or bi-monthly progress reports were also submitted. The progress reports generally included a description of the following:

- Specific site remedial activities during the reporting period and those anticipated for the next reporting period;
- Description of approved modifications to the work scope and/or schedule;
- Sampling results received following internal data review and validation, as applicable; and
- Update of schedule including percentage of project completion, unresolved delays encountered or anticipated that could affect the future schedule, and efforts made to mitigate such delays.

Any unanticipated conditions at the Site were promptly communicated to NYSDEC's and NYSDOH's project managers. Necessary modifications to the work scope and additional remedial plans developed to address specific conditions encountered at the Site were communicated verbally and via e-mail with NYSDEC, and NYSDEC concurrence was obtained as appropriate. In addition, during implementation of the Remedial Action three (3) site

meetings were held and attended by NYSDEC, the Developer and the Remediation Engineer, and three (3) project status meetings were held at NYSDEC's office in Long Island City.

# 4.0 SOIL/WASTE MANAGEMENT

## 4.1 INTRODUCTION

This section presents the general soil and waste management methodologies followed during site remediation, from initial screening upon breaking ground in an area, through handling, stockpiling, characterizing, and ultimately transporting and disposing or beneficially reusing the excavated material. Section 5.0 presents this information in specific detail for the five separate areas of construction on the Site (See Figure 3). The Remediation Engineer provided representatives for full-time oversight of all remedial activities performed under the approved RAWP.

## 4.2 SOIL/WASTE CATEGORIES

The Remediation Contractor divided the excavated materials into three categories (Category 1, 2 and 3) depending on known or suspected levels of the contaminants of concern. The three categories of material were separately managed and stockpiled to avoid co-mingling of potentially contaminated and contaminated materials with clean soil, and to handle, characterize, and off-load the contaminated materials. The three categories are described below.

### 4.2.1 Category 1 – Soil/Historic Fill

Some areas of the shallow on-site fill were documented to contain contaminants above TAGM RSCOs. These materials were identified as Category 1, or "Contaminated Fill", based on prior field sampling conducted during the IRM SI and subsequent investigations (See Section 2.2). In most cases, the contaminated fill was associated with ash and cinders, mixed in with the sand fill or present as thin layers. The Category 1 layer was mapped to exist throughout Parcel A based on the IRM SI data. During the remedial excavation, the actual thickness of this layer was found to vary considerably in certain areas from the originally mapped thickness. Consequently, a larger volume of Category 1 soil/fill was removed and disposed off the Site than was originally anticipated.

### 4.2.2 Category 2 – Soil/Waste

Category 2 was a holder category for suspected contaminated soil/fill with characteristics that could not be disposed at the current Category 1 disposal facilities. The Category 2 material required special testing to determine disposal requirements. At the outset of the project, no

Category 2 material was known to exist on the Site. A number of Category 2 waste streams were uncovered, handled and disposed appropriately, as described in detail in Section 5.0.

#### 4.2.3 Category 3 – Clean Soil

Portions of the fill and most of the underlying native soil were classified as Category 3, "TAGM-clean" material. Category 3 soil did not contain ash/cinders and met Track 1 objectives, with the possible exception of four naturally-occurring metals, specifically magnesium, calcium, nickel, and zinc, which were detected at concentrations above their respective TAGM RSCOs. It was demonstrated in the IRM SI Report that the occurrence of these metals are naturally occurring in the native soil, with which the NYSDEC concurred. Therefore, these metals were not considered relative to compliance with Track 1 objectives in the post-excavation (bottom and sidewall) endpoint soil samples. As with the Category 1 material, the Category 3 soil was also mapped. The boundary between the Category 3 soil and the overlying Category 1 (or 2) soil/fill (the "green line") was determined during the IRM SI.

### 4.3 SOIL EXCAVATION

Soil was excavated from the entire footprint of the Site, to remove Category 1 materials (and later discovered Category 2 materials) that required off-site disposal to meet Track 1 objectives, and for simultaneous construction of sub-grade structures. Excavation reached depths of 6 to 15 feet bgs using conventional hydraulic excavation equipment (excavators, backhoes, bulldozers, etc.). Depending on the designated category, soil was either dynamically loaded for direct transport off the Site, or was excavated and transported to the appropriate stockpile area for waste characterization.

In general, excavation proceeded as follows, and as outlined in the RAWP:

- Excavation and direct loading of Category 1 soil/fill for off-site transport and disposal; some Category 1 soil/fill was stockpiled before off-site transport and disposal.

- Field determination that the green line (i.e., boundary between Category 1 and Category 3 materials) was reached based on visual and olfactory observations and PID screening, followed by confirmatory post-excavation (bottom and sidewall) endpoint soil sampling.

- Proceed with construction once the endpoint (bottom and sidewall) sample results were received and confirmed that Track 1 objectives were met. The area was either backfilled and compacted, or excavation of the clean soil continued for construction.

In the latter case, the Category 3 soil was relocated to the clean stockpile area for staging and further testing.

Langan was responsible for providing direction in the field to the Remediation Contractor for identifying the depth of the green line, categorizing the excavated material (Categories 1, 2, or 3), selecting samples for waste characterization, and reviewing the waste profiles for the off-site disposal facilities. The progress across the Site was monitored and communicated to NYSDEC relative to the established 50-foot site grid. All non-hazardous historic fill taken off the Site was handled as municipal solid waste as per 6 NYCRR Part 360-1.2 and was treated as contaminated material.

The final depth of the remedial excavation was generally below the observed green line, by at least one foot at a minimum, because as a matter of course as digging proceeds, in general, the excavation sidewalls fall to the bottom of the excavated area resulting in the need for additional digging to "clean out" the bottom of the excavation. This condition is unavoidable and actually was beneficial by ensuring that no contaminated materials were inadvertently left behind and the Track 1 remedial objectives were met.

## 4.4 SUBSURFACE SCREENING

Field screening was completed during invasive work and following removal of existing buildings. Section 2.4.2 described the sub-slab soil screening completed following building demolition and before commencing with the remedial activities. Buildings 3, 4 and part of 28 were demolished during the early phase of the Remedial Action. During removal of the slabs, the exposed soil was screened in a similar manner and with similar ranges in PID readings recorded as the other buildings previously demolished at the Site. See Figure 5 for sub-slab screening of demolished Parcel A buildings.

The Remediation Engineer continuously inspected and field screened excavated soil for ash, cinders, odors and staining. The PID readings were obtained from soil contained within the excavator bucket and directly from the endpoint (bottom and sidewalls) of the excavation. The excavated material was handled accordingly based on the results of this screening.

## 4.5 HOT SPOT/AREA OF CONCERN (AOC) REMEDIATION

When a hot spot/AOC was uncovered, the contaminated materials were removed, characterized, and disposed in a controlled manner under direction of the Remediation Engineer, and the area was closed out through collecting confirmatory post-excavation (bottom and sidewall) endpoint samples. Section 5.0 discusses the remediation of hot spots/AOCs in

detail. Exploratory test pits were excavated prior to removal, where required, to assess the nature and extent of the hot spot and to assist with developing a remedial plan. Contaminated soil that was excavated from hot spots/AOCs was stockpiled in a separate area from the stockpiled Category 1 and 3 materials.

When a hot spot/AOC was uncovered, the bulk remedial excavation operation was immediately halted in the area and diverted to another portion of the Site until the hot spot was remediated. NYSDEC was notified via electronic mail and telephone. When appropriate, spills were reported to the NYSDEC petroleum spills hotline during on-site operations. The following two spills were registered during this project, covering the noted AOCs:

- Spill No. 0410523, December 22, 2004 – AOCs Drum Area, 2E, and 2F.
- Spill No. 0500862, April 20, 2005 – AOC 2L.

Pending mobilization of the required crew/equipment and/or consultation and agreement with NYSDEC on the specific remedial plan, the contaminated area was covered with plastic sheeting and the area was cordoned off until further direction from the Remediation Engineer.

## 4.6 SHORING AND SLOPING

Installation of shoring was required to support the excavation walls along the south property line and around the water storage tank in the southwest corner of the Site. The shoring was required to accommodate the South Parking Garage that abuts the Site's boundary in these areas (See Figures 3 and 7). Shoring consisted of soldier piles and lagging, and was cut down to a depth of about 4 feet below grade following construction as per the structural engineers' design requirements. Across the remainder of the Site, sloping of the excavation sides was sufficient to maintain the integrity of the excavation sidewalls.

## 4.7 SOIL/WASTE MANAGEMENT AND STOCKPILING

This section describes the general soil/waste handling and stockpiling procedures. Stockpile areas were constructed and maintained as discussed in Section 3.3.4, and they are shown on Figure 3.

### 4.7.1 Category 1

The general procedure for managing the Category 1/contaminated fill layer consisted of, whenever possible, dynamically loading this material for direct transport off the Site and

disposal at the approved disposal facility. Under some circumstances, it was necessary to stockpile Category 1 material on the Site pending the scheduling of truck trips, additional waste characterization required by the facility, or other reasons preventing the direct loading of waste for off-site transport. In this case, the Category 1 soil/fill was temporarily stockpiled in an area that was designated as Stockpile Area 1.

On one occasion, a Category 1 soil stockpile was unintentionally left uncovered overnight. This occurred when a round of trucks arrived late after the end of the regular workday for load out of soil, and after the Remediation Contractor's laborers left for the day.

### 4.7.2 Category 2

In most cases, the Category 2 material was entirely excavated and transported to Stockpile Area 2 for characterization and waste classification, then later off-loaded into trucks for off-site disposal. In general, dynamic loading was not employed for Category 2 materials. However, in some instances the material was characterized either in-situ or by excavating, stockpiling and sampling a limited volume of the in-place material. In these cases, once approval was granted by the NYSDEC and the disposal facility, the remaining in-place Category 2 material was excavated and directly loaded.

Category 2 stockpile areas consisted of a double layer of 8-mil polyethylene surrounded by silt fencing with the silt fence fabric installed a minimum of 12 inches beneath the ground surface. The stockpiles of soil were covered and secured with weight/stones when not in use.

### 4.7.3 Category 3

Category 3 soil was stockpiled on the Site on a double layer of polyethylene sheeting in a series of cells in an area that was designated as Stockpile Area 3. Stockpile Area 3 was located in a portion of the Site that was anticipated to require minimal excavation of Category 1 material that only marginally-exceeded the TAGM RSCOs (e.g., benzo[a]pyrene), based on the pre-IRM investigations.

Each cell was constructed in discrete lifts of approximately 2,000 cubic yards of soil. As this volume was reached in a particular cell, a five-point composite sample was first collected and tested for the TAGM parameter list of analytes. Only after the lab results were received and showed that Track 1 objectives were met could another discrete lift be added to the top. The discrete lifts were separated by plastic sheeting to serve as general marker boundaries. If a sample showed that Track 1 objectives were not met, that discrete lift was either removed and

relocated to the Category 1 stockpile area or directly loaded for off-site transport to the Category 1 disposal facility.

## 4.8 SOIL/WASTE CHARACTERIZATION

### 4.8.1 General

The Remediation Engineer performed appropriate waste characterization sampling and analysis according to the disposal facility's permit requirements. Samples for waste characterization were collected in-situ via soil borings (using Geoprobe direct-push methodologies), and test pits, or from stockpiled materials. The analytical tests run typically included the following parameters:

- Total petroleum hydrocarbons (TPH) by gas chromatograph/photoionization device (GC/PID);
- VOCs by Method 8260;
- SVOCs by Method 8270;
- PCBs by Method 8082;
- Metals by Method 6010B/7161;
- Ignitability, corrosivity, and reactivity;
- Toxic Characteristics Leaching Procedure (TCLP) VOCs, SVOCs, metals and/or pesticides and herbicides; and
- Diesel Range Organics (DRO) or Gasoline Range Organics (GRO).

The Remediation Engineer submitted the waste characterization samples to an ELAP-approved laboratory for quantitative analyses. The laboratory results are available in CD-ROM format, accompanying this report for reference. Tables 1A (Category 1), 1B (Category 2) and 1C (Category 3) are sample inventory tables that summarize the waste characterization sample identification numbers, sampling dates, sampling analyses, and ultimate disposal facility used for the material. See Tables 2A to 2P for a summary of all waste characterization results. Table 5 presents a summary of the waste characterization findings by AOC.

Appropriate field and laboratory QA procedures were observed and maintained as outlined in the Quality Assurance Project Plan (QAPP), with the exception that field duplicates, rinse

blanks, and matrix spike and duplicate samples were not collected for the waste characterization samples. Samples were collected using disposable sampling tools into clean, laboratory-supplied glassware. Sampling personnel donned appropriate PPE as per the HASP.

### 4.8.2 Category 1

The Category 1 soil/fill was initially characterized in-situ during the IRM SI via the extensive soil boring and soil-sampling program. These data partially satisfied the disposal facility's requirements at the outset of the project (FDP Intermodal Transport Facility Development Project).

Over the course of the remedial activities, the Category 1 material was characterized in several other ways to satisfy the disposal facilities and to obtain characterization data for certain areas in advance of excavation, specifically: 1) via test pits excavated in the market plaza/park area, 2) from stockpiled materials, and 3) in-situ within the proposed Building 4 footprint and North Parking Garage Area. Table 1A provides information on the waste characterization samples collected for the Category 1 material. Table 2A summarizes the Category 1 soil characterization results.

### 4.8.3 Category 2

The Category 2 wastes were generally characterized by either sampling the stockpiled materials or in-situ. Table 1B provides information on the waste characterization samples collected for the various AOCs uncovered during excavation activities. Tables 2A to 2P summarize the waste characterization data for all AOCs discovered during the remediation of Parcel A.

### 4.8.4 Category 3

The first test for determining when Category 3 material (the green line) was reached after excavating the Categories 1 and 2 materials involved screening the in-place soil for visible ash/cinders, staining, odors, or PID readings above background levels. In the absence of these conditions, the excavation was terminated at the depth required for construction and the presumed clean soil was then excavated and transported to Stockpile Area 3 for confirmatory testing pursuant to the TAGM parameter list of analytes.

As noted in Section 4.7.3, five-point composite samples were collected from the approximately 2,000 cubic yard discrete lifts and tested for the TAGM parameter list of analytes. Discrete lifts that both met Track 1 objectives and contained no solid waste either were reused on the Site

for backfill or grade restoration, or were transported off the Site for beneficial reuse at the Ferry Point Park golf course development site, Bronx, New York. Additional testing for leachable metals was required by Ferry Point Park. The data reports are included on CDs included in Appendix I as noted on Table 1C. The Category 3 data were validated; the Data Usability Summary Reports (DUSRs) are provided in Appendix E.

If a sample exceeded TAGM RSCOs (i.e., Track 1 objectives), the discrete lift was either removed and relocated to the Category 1 stockpile area or directly loaded for off-site transport to the Category 1 disposal facility. There were only limited instances where a sample of potential Category 3 material exceeded specific TAGM RSCOs, and therefore, the material was handled as Category 1 material.

### 4.8.5 Liquids

Various liquids that required specialized handling and disposal were encountered during the remediation of Parcel A. These included equipment/truck decontamination wastewater, contaminated stormwater, and unknown liquids found in USTs. Samples of liquids encountered within USTs associated with AOC 2L (See Section 5.0) on the Site were collected by Langan and submitted to the laboratory for waste characterization and GC/FID fingerprint analysis prior to transport and disposal at Bridgeport Recycling, in Bridgeport, Connecticut. The Bridgeport facility conducted additional testing of the UST liquids upon entry to their facility. Testing of decontamination water and contaminated stormwater was conducted at the Bridgeport Recycling facility upon receipt of the liquid. These results are located in Appendix G. AOC waste characterization summary Table 2Q contains an inventory of and data for liquids encountered at a particular AOC. (See Section 5 for AOC discussions).

## 4.9 SOIL/WASTE TRANSPORT AND DISPOSAL OR BENEFICIAL REUSE

### 4.9.1 General

Under Langan's supervision, the Remedial Contractor arranged for transportation of Category 1 and 2 soil, fill and solid waste for off-site disposal in accordance with applicable federal, state, and local regulations, such as New York City DOT road permit procedures. Only 6 NYCRR Part 364-permitted transporters were used to haul the excavated soil to the designated treatment/disposal facilities. Copies of the permit for the transporters that were utilized are included in Appendix F.

Under Langan's supervision, the Remedial Contractor arranged for transportation of confirmed-clean, Category 3 soil off the Site for beneficial reuse at the Ferry Point Park site. Category 3

soil that was not beneficially reused off-site was reused as construction fill on the Site. Table 3 summarizes the categorized soil and waste quantities transported and disposed off the Site and the various disposal facilities used.

The Remediation Engineer inspected the load-out of excavated materials. Once the loading of any container, dump truck, or trailer was completed, the material was immediately transported to the off-site disposal facility. Transport of materials was performed by licensed haulers in accordance with appropriate local, state, and federal regulations. Loaded vehicles leaving the Site were securely covered, manifested, and placarded in accordance with appropriate federal, state, local, and New York State Department of Transportation (NYSDOT) requirements. Egress points for truck and equipment transport from the Site were kept clean of dirt and other materials during remediation and development of the Site.

Measures to mitigate dust during loading and transport are summarized in Section 3.4.4 of this report, and presented in detail in the dust suppression plan included in the Work Plan and RAWP. In accordance with the dust suppression plan, the Remediation Engineer was responsible for ensuring that the trucks and equipment leaving the Site were pressure washed at the truck wash to remove contaminated soil from the tires and undercarriage.

### 4.9.2 Category 1

Category 1 material was transported off the Site by permitted haulers to one of three end use disposal facilities approved to accept the material, specifically:

- The FDP Intermodal Transport Facility in Jersey City, New Jersey (used from October 13 to December 10, 2004; resumed and used exclusively between February 18 through March 24, 2005, with the exception of one day's load of materials sent to Clean Earth of Carteret .

- The OENJ Bayonne Landfill Redevelopment site in Bayonne, New Jersey via the Interstate Materials Corporation transfer facility Staten Island, New York (used concurrently with FDP from November 23 to December 10, and then used a sole primary facility thereafter until January 26, 2005).

- The Clean Earth of Carteret Facility, Carteret, New Jersey (used briefly on March 30, 2005 for approximately 311 tons); as Shown on Table 3, a limited volume of PCB-contaminated Category 1 soil (6.92 tons) was also taken to Clean Earth of Carteret's "fixed based" bioremediation facility.

As shown on Table 3, 110,681 tons of Category 1 soil/fill was disposed off the Site, 78,965.45 tons at the FDP Intermodal facility, 31,405.16 tons at OENJ-Bayonne and 311.16 tons at Clean Earth of Carteret. The FDP number presented here is higher than the number provided to the NYSDEC in an April 13 submittal because FDP was used again instead of Clean Earth. The April 13 submittal addressed various questions posed by the NYSDEC regarding the disposal of soil at the OENJ Bayonne facility. Material was stockpiled on the Site for several weeks after March 30, 2005 and then sent to FDP again after the April 13 submittal. The Category 1 facility permits, load summaries, representative manifests, and approval letters are included in Appendix G.

All non-hazardous historic fill taken off the Site was handled as municipal solid waste as per 6 NYCRR Part 360-1.2 and was treated as contaminated material. As shown on Table 3, approximately 125 tons of Category 1 soil/fill was used to fill the UST excavations on Parcel B, pursuant to NYSDEC's approval (email correspondence) of Langan's April 14, 2005 Building 7 Underground Storage Tank Closure Plan.

### 4.9.3 Category 2

Under Langan's supervison, the Remediation Contractor arranged for transportation and off-site disposal of Category 2 material to one of two permitted, approved facilities, specifically Clean Earth of North Jersey in Kearny, New Jersey, and Clean Earth of Philadelphia, PA. Table 3 presents the quantity of various Category 2 materials disposed off the Site and the facilities used, by Area of Concern. The Category 2 facility permits, load summaries, manifests, and approval letters are included in Appendix G.

### 4.9.4 Category 3

Confirmed-clean Category 3 soil was reused on the Site or was transported off the Site for beneficial reuse at the Ferry Point Park golf course development site, which is located in Bronx, NY. Langan and NYSDEC, Division of Solid Waste, representatives met to discuss beneficial reuse determination (BUD) of the Site's excess clean soil for the Ferry Point Park site. NYSDEC approved the Site's BUD Petition in letter documentation dated January 24, 2005. Subsequently, approximately 4,335 tons of confirmed-clean Category 3 soil was transported to Ferry Point Park from the Site as noted in Table 3. Ferry Point Park's solid waste-disposal facility permit, load summaries, and bills of ladings are included in Appendix G.

The Category 3 soil was used on the Site for backfilling around the new building foundations and to bring grade up in areas where excavation to remove the Category 1 materials extended

below construction grade (e.g., Plaza/Park Area). Any Category 3 soil that contained organic matter (wood, roots, stumps, etc.) or other solid waste was not reused on the Site. Additionally, contaminated fill was not reused as backfill material on the Site

### 4.9.5 Soil Disposed of at OENJ Bayonne Via Interstate Materials Corporation Transfer Facility

Interstate Materials Corporation (Interstate), a NYSDEC-registered transfer station, was temporarily utilized by the Remediation Contractor (i.e., ETI) to transfer 31,405.16 tons of Category 1 soil to the OENJ Bayonne Landfill golf course redevelopment project in Bayonne, New Jersey. In an email from Dan Walsh of NYSDEC, the issue was raised that Interstate was not permitted by New York State to accept the Category 1 materials. In response to NYSDEC, the Developer and Langan compiled for NYSDEC review, the Interstate State of New York and New York City Department of Sanitation (DOS) permits on which it relied to approve the use of this transfer facility, as well as all data submitted to Interstate and OENJ regarding the Category 1 material these facilities accepted, approvals from OENJ for Category 1 material acceptance, and representative waste manifests indicating the ultimate disposal location of the Category 1 material transferred from Interstate to the OENJ Bayonne disposal facility.

Despite the inadvertent use of the registered Interstate transfer facility by the Developer's Remediation Contractor, since the Category 1 material met the acceptance criteria of the ultimate disposal facility (OENJ Bayonne), the material was properly disposed of at an approved facility in accordance with the RAWP. All documentation related to this matter is contained in three separate submittals to NYSDEC, dated February 4, April 13, and May 18, 2005 respectively. To this end, all non-hazardous historic fill taken off the Site was handled as municipal solid waste as per 6 NYCRR Part 360-1.2 and was treated as contaminated material.

### 4.9.6 Liquids Disposal at Bridgeport, Connecticut

All liquids encountered within Parcel A were transported by ETI to the Bridgeport Recycling facility in Bridgeport, Connecticut for ultimate treatment/disposal. See Appendix G for waste manifests, volumes, approvals, etc. Table 2Q contains an inventory of the liquids removed from the Site during remedial activities on Parcel A.

## 4.10 POST-EXCAVATION (BOTTOM AND SIDEWALL) ENDPOINT SAMPLING METHODOLOGIES

### 4.10.1 General

Post-excavation (bottom and sidewall) endpoint samples were collected within each of the five construction areas as shown on Figures 6 through 10 to demonstrate that Track 1 objectives were satisfied. Post-excavation samples were collected at the endpoint (bottom and sidewalls) of the excavation at individual AOCs and Area-wide locations. Tables 4A through 4E are sample inventory tables of the post-excavation sampling that was conducted, by construction area and AOC, during the remedial activities. These tables list the sample identification numbers and sampling dates, and cross-reference the tables within this report that contain the tabulated data, cross-reference the appendices that contain the laboratory analytical reports. The samples were tested predominantly for the complete TAGM parameter list of analytes, specifically the TCL VOCs, SVOCs, and pesticides/herbicides, TAL metals, and PCBs.

The Area-wide post-excavation sampling results are tabulated in Tables 6A and 6B. The post-excavation results for the individual AOCs are tabulated in Tables 7A through 7R, and the results are discussed in Section 5.0 relative to the five separate construction areas.

Appropriate field and laboratory QA procedures were observed and maintained as outlined in the QAPP, with the exception that rinse blanks were not collected because only dedicated, disposable sampling tools were used to transfer the samples into clean, laboratory-supplied glassware. Sampling personnel donned appropriate PPE as per the HASP.

### 4.10.2 Area-Wide Post-Excavation (Bottom and Sidewall) Endpoint Sampling

Bottom Endpoint Sampling Methodologies

During the Remediation of Parcel A, Area-wide post-excavation bottom endpoint samples were collected. For approximately the first half of the excavation, and as specified in the Work Plan, the bottom endpoint samples were collected at the final construction grade. Within the Building 6 and South Parking Garage areas, the final construction grade, hence the sampling depth was below the green line elevation (i.e., the line marking the lower extent of TAGM exceedances revealed though sampling results). During the December 16, 2004 meeting at the Site, NYSDEC expressed their preference that future bottom endpoint samples be collected at the green line rather than the final construction depth. Therefore, subsequent bottom endpoint samples were collected at the green line. The post-excavation sample locations are presented

on Figures 6 through 10 and are discussed in Section 5.0 relative to the five separate construction areas.

In addition, during the IRM SI, extensive soil characterization was conducted throughout the Site. At each of 39 soil-boring locations, discrete samples were collected at three separate depths to provide analytical profiles of the in-place soil. Thirty-nine (39) samples (i.e., one from each boring) were collected at the approximate final construction grade elevation. These samples were collected to characterize and document the anticipated bottom endpoint conditions and to demonstrate that Track 1 objectives would be met upon future excavation to construction grade. As per agreement with NYSDEC, these samples supplement the post-excavation bottom endpoint soil sampling requirements for the excavation. The IRM SI soil boring sampling results are discussed in Section 5.0 relative to the five separate construction areas.

Sidewall Endpoint Sampling Methodologies

Post-excavation sidewall endpoint samples were collected upon reaching the Site's boundary, and were analyzed for the TAGM parameter list of analytes. The general sampling frequency was approximately every 100 feet. Samples were biased to the shallow fill soil and visibly discolored or stained material. In areas where shoring was installed (south end of the Site and around the water storage tank), the sidewall samples were collected from just outside the shoring by cutting a hole through the lagging and sampling the exposed sidewall material. The sidewall sampling locations are presented on Figures 6 through 10. The results are discussed in Section 5.0 separately for each of the five separate construction areas.

### 4.10.3 AOC-Specific Post-Excavation Sampling

Post-excavation soil samples were collected at AOCs as described in detail in the following Section 5.0, and shown on Figures 6 through 10. The samples were tested for the TAGM parameter list of analytes or an abbreviated parameter list specific to the suspected contaminants of concern. Sampling was completed generally in accordance with DER-10 requirements. The results are discussed in Section 5.0 separately for each of the five separate construction areas.

## 4.11 IMPORT OF SOIL FOR BACKFILL

Two types of construction aggregate were imported onto the Site and were used as roadway and building slab sub-grade. Documentation of the materials is provided in Appendix H. The materials consisted of:

- Virgin crushed #4 quarry stone was used for road and building slab sub-base material, and for stabilizing some of the Category 3 soil that failed compaction testing. Approximately 5,600 cubic yards of this stone were imported onto the Site.
- Recycled Concrete Aggregate (RCA) was utilized as road base throughout the Site. Approximately 1,350 cubic yards were imported to the Site.

Two types of materials were imported to Parcel A for use as backfill and top cover. Documentation of these materials is presented in Appendix H. The materials consisted of:

- Approximately 15,000 cubic yards of clean graded sand were imported to the Site and used as select backfill material.
- Approximately 850 cubic yards of clean topsoil were imported to the Site for cover in landscaped areas.

Otherwise, sufficient excess, TAGM-clean Category 3 soil was generated during the remedial activities for backfilling the new building foundations and grade restoration.

Appendix H contains documentation of Langan's due diligence on the imported material facilities and TAGM 4046 results on the soil utilized for backfill purposes.

# 5.0 DESCRIPTION OF REMEDIAL ACTIVITIES BY CONSTRUCTION AREA

## 5.1 INTRODUCTION

The preceding Section 4.0 described the general soil excavation, management, characterization, stockpiling, transport, and disposal procedures followed during implementation of the remedial activities. To facilitate the presentation and discussion of the remedial activities conducted and documented in this Final Engineering Report, the Site is discussed as five separate construction areas as illustrated on Figure 3. The individual construction areas are presented on Figures 6 through 10, and cross-sections through the Site are included on Figure 12 (Figure 11 is the cross-section key map).

This section describes in detail the specific remedial activities that were completed within each of the five separate construction areas, including the general progression of excavation, hot spot/AOC remediation, and post-excavation (bottom and sidewall) endpoint sampling conducted in order to meet Track 1 objectives. Table 5 contains an inventory of the AOCs encountered across the Site and a summary of the waste characterization findings. The raw analytical laboratory data reports containing the data referenced below are provided on CD2 in Appendix I, and under separate cover in a series of labeled boxes (Data 1 to Data 21) submitted to NYSDEC as part of this Final Engineering Report.

The Remediation Engineer provided representatives for full-time oversight of all remedial activities performed under the approved RAWP. Remedial Activities commenced on October 13, 2004 in the Building 6 Area (Figure 3 and 6), and they were completed for the entire Site on May 25, 2005. Figure 13 illustrates the approximate final excavation grade prior to commencing construction activities.

There were four instances where an initial endpoint sample exceeded TAGM 4046 RSCOs thereby requiring additional excavation followed by endpoint re-sampling for the TAGM parameters. The four instances are discussed by area where they occurred (i.e., Building 6, Plaza/Park, and North Parking Garage). In all cases, the TAGM 4046 RSCOs were met in the supplemental sample following additional excavation in each area. Analytical results for the initial and supplemental endpoint soil samples are presented in the referenced data tables. The supplemental sample represents the final endpoint sample that meets TAGM 4046 RSCOs.

## 5.2 BUILDING 6 AREA

### 5.2.1 General Progression and Summary of Excavation/Remediation

The Building 6 Area was the first construction area remediated. Remedial activities began on October 13, 2004 in the southwest portion of the Building 6 footprint and progressed towards the east and north. The Building 6 footprint (shown on Figure 6 with a light gray outline) was excavated below the green line elevation, to the construction elevation of 62 feet QBPD to facilitate the building footing and foundation construction. The areas outside of the building footprint were excavated to the green line, followed by post-excavation sampling, and backfilled to construction grade. An average thickness of 7 feet of Category 1 soil was removed from this area. Remedial activities in the Building 6 area were completed by the week of 21 January 2005.

The Category 1 soil/fill from the Building 6 Area was disposed at FDP Intermodal Facility and the OENJ Bayonne facility. Category 2 soil was disposed at one of the two approved facilities. The handling and final disposition of Category 2 soil is further discussed in the following subsections according to specific AOC area. Any excess Category 3 soil generated from the building foundation excavation (see Figure 12) was stockpiled in the Category 3 Area for testing and ultimate reuse (See Table 8 for the tabulated Category 3 soil analytical results).

Approximately 40,000 tons of Category 1 soil/fill were removed from the area and disposed at the FDP Intermodal and OENJ Bayonne facilities. The disposal facilities for the Category 2 soil/waste removed from this area are noted in the individual AOC-specific sections that follow.

Seven (7) discrete AOC areas were encountered and remediated as excavation progressed through this area, as described in the following Section 5.2.2. Nineteen (19) AOC endpoint samples were collected at these AOC locations.

Six (6) Area-wide endpoint samples and six (6) Area-wide sidewall samples were collected in the Building 6 Area (see Figure 6 and Table 6A) to demonstrate that Track 1 objectives were met. Twelve (12) IRM SI soil-boring samples that were previously collected also were utilized to demonstrate that Track 1 objectives were met (see Table 9).

### 5.2.2 Hot Spot/AOC Remediation

AOC 2A

AOC 2A was discovered on 25 October 2004, when excavating Category 1 soil from within the Building 6 footprint. An 8-inch cast iron pipe was discovered with sewage-like organic odors noted in soil around the pipe. PID readings of the soil were recorded at less than 5.0 parts per million (ppm). The affected soil was excavated and stockpiled, and waste characterization soil samples were collected and analyzed for the compounds listed on Table 1B; the lab reports are provided in Appendix I. AOC 2A soil met the OENJ-Bayonne facility disposal criteria as noted in Table 3 and were sent to that facility based on the data results and facility approvals. Waste characterization data of this soil is summarized in Table 2B.

To demonstrate that the Track 1 objectives were met, Three (3) post-excavation samples were collected upon removing the contaminated soil, and analyzed for the TAGM parameter list of compounds. There were no TAGM RSCO exceedances in these samples, and therefore, Track 1 objectives were met at this AOC. The results are presented in Table 7A.

AOC 2B – Lead-Hazardous Fill Layer

On October 27, 2004, a series of test pits were excavated in three 50 by 50 foot grids (I5, I6 and J5) for exploratory purposes and to pre-characterize soil for disposal. One composite sample of the full thickness of fill material from each grid was collected for waste characterization. The unique AOC 2B fill layer was not encountered in these test pits. Langan received the results of the three composite samples collected on October 27, 2005 on November 3, 2005. The composite sample from I6 identified TCLP lead at a concentration of 17.4 mg/L. Observation in this test pit included scrap metal and other demolition type debris.

On October 28, 2004, excavation uncovered the presence of an unusual rubber-like material at grid G6, off the southeast corner of existing Building 28. For approximately one week, excavation proceeded and the rubber-like material and surrounding fill was were stockpiled as potential Category 2 waste in Stockpile Area 2 (Figure 3). At that time, there were no technical or physical connections made between the previously sampled soil from the I5, I6 and J5 grids.

A stockpile soil sample was collected on November 4, 2004 for further waste characterization analyses (See Table 1B, 2C and Appendix I). On November 11, 2004, these results were received and the data sent to the disposal facility. An elevated total lead value of 2,440 mg/kg

was flagged by the potential disposal facility (Clean Earth of North Jersey), and re-analysis of the material was conducted. This TCLP analysis, received on December 10, 2004, indicated a lead concentration of 14.3 mg/L.

A meeting was held at the Site on December 16, 2004 with representatives of NYSDEC. At the December 16 meeting, NYSDEC verbally requested development of a remedial work plan. In response, work in this area was placed on hold, and excavation activities were diverted to other areas of the Site until a remedial plan was developed and discussed with NYSDEC.

The difficulty of separating localized pockets of the gray clayey and rubber-like materials from surrounding soil matrix was discussed, and it was agreed that there were two alternatives:. Either the entire area should be disposed of as hazardous waste, or conduct additional delineation testing and prepare a work plan outlining procedures to segregate the suspected hazardous material from non-hazardous material, and to collect endpoint samples.

Following the meeting, additional characterization samples of this material were completed via test trenches on December 16-17, 2004 (Table 1B, 2C, and Appendix I). Through this investigation, Langan determined that the presence of the AOC 2B material appeared to correlate to the footprint of the former building that had extended onto the Site, and had since been demolished.

Discrete samples of the rubber-like material were collected for TCLP analysis. However, due to the sporadic and isolated nature of the suspected material causing the lead-hazardous condition (i.e., rubber-like and clayey material), it was determined to be impractical to attempt to segregate out and dispose only the suspect material and meet the construction schedule. Therefore, the decision was made to excavate the entire layer containing the rubber-like material, and other fill, and dispose of this material as hazardous waste.

Excavation and disposal began on December 23, 2004 under the assumption that the rubber-like containing material, which was discretely sampled on December 17, 2005 for TCLP analysis, was the source of lead at hazardous concentrations. TCLP results received on January 5, 2005 confirmed that the rubber- like material dispersed throughout the fill layer was in fact the source of hazardous lead. Excavation, stockpiling, and disposal of the rubber- like material and associated soil as hazardous materials commenced between December 23, 2004 and January 13, 2005.

A total of 3,004.54 tons of this material was excavated and transported to Clean Earth of North Jersey for disposal as hazardous waste (See April 13, 2005 submittal, Table 3, and Appendix G

for the waste manifests).) The last load of this material was removed from the Site on May 4, 2005. The hazardous wastes identified on the Site were stored, transported, and disposed in full compliance with applicable local, state, and federal regulations.

A post-excavation sampling plan was submitted to NYSDEC on January 10, 2005 and was approved on January 12, 2005. Seventeen (17) endpoint soil samples were collected from below the suspect layer after its removal, and analyzed specifically for TCLP lead as per the plan agreed with NYSDEC (see Figure 6 and Table 7B). There were no lead exceedances of the RCRA standard for lead in any of these samples. These soil samples were supplemented with four (4) Area-wide post-excavation bottom endpoint samples collected from within the area where the layer was found and analyzed for the TAGM parameter list of analytes (see Table 6A, and 7B for tabulated analytical results) in order to meet Track 1 objectives. There were no TAGM RSCO exceedances at this AOC (Table 7B), and therefore, Track 1 objectives were met.

AOC 2C

AOC 2C was encountered during the week of October 28, 2004 while excavating Category 1 soil. Odors and PID readings in excess of 100 parts per million (ppm) were observed in a small localized area in grid H9 (see Figure 6). The contaminated soil was excavated, stockpiled, and sampled for waste characterization for the parameters listed in Table 1B. The results are summarized in Table 2D. Waste characterization results indicated the presence of elevated xylene concentrations in the soil, but below TAGM RSCOs. Lead was identified above its TAGM RSCO in a stockpile of the AOC 2C material. These two waste streams were subsequently disposed of separately.

AOC 2C soil was ultimately disposed at the OENJ Bayonne Facility as Category 1 materials (elevated PID readings and containing xylene but below the TAGM cleanup levels), and at Clean Earth of North Jersey as Category 2 materials (non-hazardous, lead-contaminated soil) (See Appendix G for the waste manifests. To demonstrate that the Track 1 objectives were met, one (1) post-excavation sample was collected upon removing the affected soil, and analyzed for the TAGM parameter list of compounds. There were no TAGM RSCO exceedances in this sample, and therefore, Track 1 objectives were met at this AOC. The results are presented in Table 7C. The area was excavated to meet TAGM 4046 cleanup levels and accommodate construction grade.

AOC 2D

AOC 2D was encountered the week of 28 October 2004 while excavating Category 1 soil from the southeast portion of the Building 6 footprint. During removal of an 8-inch diameter cast iron sanitary pipe, residual liquids with a sewage-like organic odor drained from the pipe into some adjacent soil. PID readings of this material were less than 5 ppm. All affected soil was excavated, stockpiled, sampled for waste characterization as outlined in Table 1B, and disposed at the OENJ Bayonne facility since the material met the facility's waste disposal criteria. See Appendix G for the waste manifests. The tabulated waste characterization results can be found in Table 2E.

To demonstrate that the Track 1 objectives were met, one (1) post-excavation sample was collected upon removing the affected soil, and analyzed for the TAGM parameter list of compounds. There were no TAGM RSCO exceedances in this sample, and therefore, Track 1 objectives were met at this AOC. The results are presented in Table 7D. The area was excavated to construction grade (el. 62 feet QBPD) below the green line elevation.

AOC UST F9

A 550-gallon UST was encountered in grid F9 the week of October 28, 2004 while excavating Category 1 soil in the central part of the Building 6 footprint (Figure 6). Unknowingly, the tank was ensconced within the foundation wall of a previously existing building. Excavation activities continued around the sidewalls of the tank prior to its actual discovery. When the tank was discovered, it was intact and contained water and soil. No PID readings were detected in the tank and the adjacent soil. The liquid in the tank was evacuated with a vacuum truck and disposed of at Bridgeport Recycling, Bridgeport, Connecticut. Sampling of the liquid within the tank occurred at the Bridgeport, CT disposal facility. Based on the results, which can be found in Appendix G, the contents were comprised of water and sediment. The tank was then cleaned and cut for scrap metal. The liquid waste disposal bill of lading and tank disposal receipt is provided in Appendix G. Surrounding soil was disposed as Category 1 materials at the FDP and OENJ facilities.

For the purposes of tank closure, one post-excavation soil sample was collected from under the UST and analyzed for the STARS VOCs and SVOCs parameter lists, respectively. For the purposes of meeting Track 1 objectives, one post-excavation sample was also collected from under the UST and analyzed for the TAGM parameter list of analytes. There were no TAGM RSCO exceedances in either one of the samples, and therefore, Track 1 objectives were met at this AOC. The results are presented in Table 7E. The area was subsequently excavated

deeper to construction grade (el. 62 feet QBPD). It was not possible to collect any sidewall samples because the soil around the tank was already excavated and disposed off the Site prior to its actual discovery.

AOC B29

AOC B29 corresponds to a volume of soil removed from around IRM SI boring B29 located in grid H8 (Figure 6). Based on the IRM SIR findings, NYSDEC identified this location as a potential hot spot due to elevated lead detected in a sample collected at a depth of three to five feet below original grade.

On February 14, 2005, a 15-foot–by-15-foot square area was excavated to a depth of six feet below grade. Soil was stockpiled, sampled, and analyzed for the parameters listed in Table 1B. Table 2F contains a summary of the waste characterization results. AOC B29 soil was disposed at the Clean Earth of Philadelphia facility (See Appendix G for the waste manifests). Post-excavation soil samples were collected and analyzed as presented in Table 7F and shown on Figure 6. A southern sidewall sample was not collected since excavation proceeded northward into the area, and therefore, the sidewall did not exist. The area was subsequently excavated deeper to construction grade (el. 62 feet QBPD). There were no TAGM RSCO exceedances in any of the post-excavation samples, and therefore, Track 1 objectives were met at this AOC.

AOC B30

AOC B30 corresponds to a volume of soil removed from around IRM SI boring B30 located in grid I9 (see Figure 6). Based on the IRM SI findings, NYSDEC identified this location as a potential hot spot due to elevated chromium detected in a sample collected at a depth of nine to eleven feet below original grade.

On February 18, 2005, a 15-foot-by-15-foot square area was excavated to remediate this AOC. The upper eight feet of soil was removed as Category 1 soil. The soil from eight to twelve feet below grade was removed and stockpiled with the AOC B29 stockpile for sampling and disposal. The soil was analyzed for the parameters listed in Table 1B with waste characterization results summarized in Table 2F. AOC B30 soil was disposed at the FDP Intermodal facility as Category 1 materials, and at the Clean Earth of Philadelphia facility as Category 2 materials with the AOC B29 soil (See Appendix G for the waste manifests). Post-excavation soil samples were collected and analyzed as indicated in Table 7G and shown on

Figure 6. There were no TAGM RSCO exceedances in any of the post-excavation samples, and therefore, Track 1 objectives were met at this AOC.

### 5.2.3 Area-Wide Post-Excavation (Bottom and Sidewall) Endpoint Sample Results

Six (6) Area-wide bottom endpoint samples and six (6) Area-wide sidewall endpoint samples were collected from the Building 6 Area and analyzed for the TAGM parameter list of analytes in order to demonstrate that Track 1 objectives were met. Figure 6 illustrates the sampling locations, and Tables 6A and 6B, respectively, include the detected compounds in the bottom and sidewall endpoint samples. Additionally, twelve (12) IRM SI boring soil samples that were previously collected from this area supplement the Track 1 objectives (Table 9). There were no TAGM RSCO exceedances in any of these samples within the boundaries of Parcel A, and therefore, Track 1 objectives were met in this area.

There were two instances where an initial endpoint sample exceeded the TAGM 4046 RSCOs requiring additional excavation followed by endpoint re-sampling for the TAGM parameters. This occurred at endpoint sample locations EP-G6 and EP-H5. Results for the initial and supplemental endpoint samples are presented in the data tables. The supplemental sample represents the final endpoint sample that meets TAGM 4046 RSCOs.

## 5.3 SOUTH PARKING GARAGE AREA

### 5.3.1 General Progression and Summary of Excavation/Remediation

The South Parking Garage Area was the second construction area remediated. Initial excavation activities began on October 19, 2004 in the northwest portion of the garage and worked west to east and north to south. Concurrent with the early work in this area was the demolition of Buildings 3 and 4 and sub-slab soil screening (See Figure 5). Shoring (soldier piles and lagging) was installed along the southern boundary of the garage and around the water storage tank following the building demolitions. An average thickness of six to seven feet of Category 1 soil was removed from this area. Remedial activities in the Southern Garage Area were completed the week of 18 February 2005.

The garage footprint (Figure 7) was excavated below the green line elevation to facilitate the foundation construction. The areas outside of the garage footprint to the west and east were excavated to the green line, followed by Area-wide endpoint sampling to demonstrate that Track 1 objectives were met, and backfilled to construction grade with confirmed clean Category 3 soil.

Approximately 30,000 tons of Category 1 soil/fill were removed from the area and disposed at the FDP Intermodal and OENJ Bayonne facilities. Volumes and disposal facilities for the Category 2 soil/waste removed from this area are noted in the individual AOC-specific sections that follow. Excess Category 3 soil was generated from the garage excavation that was stockpiled in the Category 3 Area for testing and ultimate beneficial reuse.

Five (5) distinct AOCs were uncovered and remediated as excavation progressed through this area, as described in the following Section 5.3.2. Six (6) AOC endpoint samples were collected at these AOC locations.

Five (5) Area-wide bottom endpoint samples and eight (8) Area-wide sidewall endpoint samples were collected in the Southern Garage Area (see Figure 7 and Table 6A) to demonstrate that Track 1 objectives were met. Eight (8) IRM SI soil-boring samples that were previously collected also were utilized to demonstrate that Track 1 objectives were met (see Table 9).

### 5.3.2 Hot Spot/AOC Remediation

AOC UST-D11

AOC UST-D11 was a continuation of a UST closure initiated previously prior to Remedial activities. Two USTs that formerly existed and rested on a concrete slab at this location were removed and a closure report was submitted to NYSDEC's Petroleum Bulk Storage Office and to the Division of Environmental Remediation (DER) (Langan, 2004). It was decided that removal of the concrete slab and endpoint sampling would be deferred until the remedial phase. The slab was removed as part of the Category 1 layer excavation during the remedial activities. Based on visual and olfactory observation of the surrounding and underlying soil, no evidence of petroleum impacts was noted. The concrete slab was disposed of as non-contaminated recyclable material at an approved facility. Soil in the vicinity was disposed of as Category 1 materials at FDP Intermodal and OENJ-Bayonne facilities.

One AOC endpoint soil sample was collected beneath the center of the pad footprint and analyzed for the STARS VOCs and SVOCs. There were no exceedances of the TAGM RSCOs in this sample (Table 7H), and therefore, Track 1 objectives were met at this AOC.

AOC Drum Area

On November 9, 2004, three 55-gallon drums containing a black, viscous, tar-like material were uncovered south of former Building 3 (Figure 7). Work in the area was immediately halted until a plan could be developed and the proper workers and equipment mobilized. On November 18,

2004, ETI mobilized roll-off containers and worked to delineate the drum nest. On November 19, 2004, ETI mobilized a HAZMAT team, and removed 12 drums and placed them into lined, covered roll-off containers for sampling and future disposal. A spill was reported to the NYSDEC petroleum spills hotline (Spill No. 0410523). On November 24, 2004, additional contaminated soil and one drum were removed and placed into a roll-off container. Activities then ceased until a disposal facility was arranged, with the suspicion that there were potentially additional drums in the ground in this area.

At the December 16, 2004 meeting at the Site with NYSDEC, it was agreed that additional ("fingerprint") testing of the drummed waste would be completed, and that the conditions warranted submitting a formal AOC-specific remedial work plan to NYSDEC. Remedial activities in this AOC were halted and the area was fenced off and covered with poly to protect workers on the Site and area residents from potential exposure to odors and total organic vapors. The AOC work plan was submitted to NYSDEC on December 27, 2004. NYSDEC responded on December 28, 2004 with their approval to proceed with remedial activities according to the plan.

Remediation proceeded with the excavation of contaminated soil in a rectangular area (20 feet by 40 feet) around the area where drums were removed previously. Soil was removed to a depth of approximately six feet below existing grade, and was placed into lined roll-off containers and sampled for waste characterization (See Table 1B, 2G, and Appendix I). A GC/FID fingerprint analysis was run on this material by Meta Laboratories Inc. (Meta). Meta confirmed that the source material was comprised of mineral spirits (see Appendix I for the Meta report).

Two (2) roll-offs (about 30 tons each) containing drummed product, and used poly sheets were transported from the Site under hazardous waste manifests, to Clean Earth of North Jersey. Six (6) other roll-offs containing drummed soil were transported to Clean Earth of North Jersey under non-hazardous waste manifests. An additional volume of non-hazardous soil was dynamically excavated and transported to the Clean Earth of North Jersey facility for disposal.

Excavation in the area was deemed complete when soil appeared visually clean and there were no odors or PID readings in the remaining in-place soil. At this point, bottom and sidewall endpoint soil samples were collected as per DER-10 and analyzed for the STARS VOCs and SVOCs. There were no exceedances of the TAGM RSCOs in the bottom or sidewall endpoint samples with the exception of the south sidewall sample that corresponded to the southern property line (See Figure 7 and Table 7I). Excavation of soil further to the south was not possible due to the presence of shoring and potential to undermine the adjacent, off-site

commercial building. Track 1 objectives were met at this AOC and remediation was completed the week of January 3, 2005. A copy of the letter petitioning the NYSDEC case manager to close this spill is provided in Appendix O.

AOC 2E

AOC 2E was discovered on December 9, 2004, in grids A9 and B9 (Figure 7). Soil with noticeable odors and PID readings between 5 and 10 ppm was encountered. Approximately 60 cubic yards of material was removed from the area at this time and stockpiled in a separate Category 2 stockpile. Excavation was then diverted to another area until a remedial plan could be devised. A call was made to the NYSDEC Spills Hotline and the existing spill was amended to include this discovery. On December 27, 2004, Langan submitted a plan to NYSDEC for remediation of this AOC (joint plan with the above Drum AOC plan). The plan was approved on December 28, 2004.

An area of approximately 35 feet by 20 feet was excavated to a depth of approximately 8 feet below grade. The extent of odors and visual impacts was vertically delineated and horizontally delineated on three of the four sides, with the exception of the west sidewall. Further excavation along the west sidewall was not possible due to the threat of undermining the water tower footing. Permanent shoring was subsequently installed along the west sidewall for construction purposes.

Soil excavated from the area was tested for the waste characterization parameters listed on Table 1B, then transported to the Clean Earth of Philadelphia facility (Appendix G). Summary of the waste characterization results can be found in Table 2H.

Three sidewall and one bottom post-excavation endpoint samples were collected from this AOC. There were no TAGM RSCO exceedances in any of the post-excavation samples from this AOC (See Figure 7 and Table 7J), and therefore, Track 1 objectives were met at this AOC. A copy of the letter petitioning the NYSDEC case manager to close this spill is provided in Appendix O.

AOC 2F – Oil Cistern

As Category 1 and construction excavation progressed to the northeastern portion of the garage in the week of January 3, 2005, an area of wet, stained soil was uncovered in grid E14. Although the material displayed odors, the PID readings were less than 5.0 ppm. Excavation activities were immediately diverted from the area until NYSDEC was consulted and a plan developed. On the same date, NYSDEC was notified by telephone of the discovery.

Remediation was proposed for the area in the same manner as the Drum Area described above. NYSDEC concurred with the remediation plan, and recommended contacting NYSDEC's Spills Hotline to report the spill. A call was made to the NYSDEC Spills Hotline and the existing spill was amended to include this discovery (Spill No. 0410523). A copy of the letter petitioning the NYSDEC case manager to close this spill is provided in Appendix O.

On January 17, 2005, excavation and delineation of the contaminated soil within AOC 2F commenced under Langan's supervision. A black oil/water emulsion was encountered at a depth of approximately three feet below grade (approx. el 68 ft). This material appeared was contained in a cobblestone well/cistern structure. Excavation was stopped until a vacuum truck could be mobilized to remove the liquid emulsion.

On January 20, 2004, a vacuum truck evacuated the liquid from the cistern, followed by excavation of stained soil from below and adjacent to the cistern. The final excavation measured approximately 20 feet in diameter by 25 feet deep in the center (approximate el. 48 ft). Soil was stockpiled on poly and sampled for the waste characterization parameters listed on Table 1B. The liquid waste was transported via vacuum truck to Bridgeport Recycling for disposal (See Appendix G). A GC/FID fingerprint analysis was completed by Meta Labs, and concluded that this material was a No. 2 fuel oil (See Appendix I for the Meta report). See Table 2I for waste characterization results of AOC 2F material.

A post-excavation bottom endpoint sample was collected with the use of an excavator. Storm runoff from heavy rains then filled the 25-foot deep excavation preventing the collection of dry sidewall samples. Consequently, the sidewall endpoint samples were collected with a Geoprobe rig by driving the probe rods at an angle into the sidewalls. Four sidewall samples were collected under Langan's supervision on February 17, 2005 (See Figure 7 and Table 7K). There were no exceedances of the TAGM RSCOs in the bottom or sidewall endpoint samples from this AOC, and therefore, Track 1 objectives were met at this AOC. The excavation was subsequently backfilled with one of the approved, imported aggregates (Section 4.11).

Petroleum-contaminated materials were removed from this AOC under a non-hazardous waste manifest and transported to the Clean Earth of Philadelphia facility (see Appendix G).

AOC 2G

AOC 2G was encountered on January 19, 2005, in the vicinity of grid B8 during the excavation of Category 1 soil and soldier pile and lagging operations (Figure 7). While excavating soil between two pile supports, noticeable organic odors and PID readings in excess of 20 ppm

were observed. Soil excavated was diverted to a separate Category 2 stockpile area for waste characterization sampling for the parameters listed on Table 1B. Construction activities were terminated in this area until the conditions were fully delineated and remediated. Contaminated soil was removed and stockpiled for sampling and disposal.

Table 2J contains a summary of the waste characterization results. These did not indicate the presence of any regulated compounds. However, due to elevated PID readings and noticeable odors, the material was transported to a Category 2 facility for disposal. An area of approximately 10 feet by 12 feet was excavated to a depth of approximately 6 feet below grade or at an approximate elevation of 65 feet QBPD.

One bottom and five sidewall post-excavation endpoint samples were collected and analyzed for TCL VOCs (See Table 7L for the results). One (1) sidewall sample collected at this location (EP-SW-B8-012105, Table 7L) corresponded to the location of a proposed sidewall sample to demonstrate that Track 1 objectives were met. Thus, the sample served as both an AOC and an endpoint sample for demonstrating that Track 1 objectives were met. There were no exceedances of the TAGM RSCOs for VOCs in these samples, and therefore, Track 1 objectives were met at this AOC.

Material from this AOC was transported to the Clean Earth of Philadelphia facility for disposal as non-hazardous waste (Appendix G).

### 5.3.3 Post-Excavation (Bottom and Sidewall) Endpoint Sample Results

Five (5) Area-wide bottom endpoint samples and eight (8) Area-wide sidewall endpoint samples were collected and analyzed for the TAGM parameter list of analytes from the South Parking Garage Area to demonstrate that Track 1 objectives were met. Figure 7 illustrates the sampling locations, and Tables 6A and 6B include a summary of the detected compounds. Additionally, with NYSDEC concurrence, soil samples collected at eight (8) of the previous IRM SI boring locations from this area also served to demonstrate that Track 1 objectives were met (see Table 9). There were no TAGM RSCO exceedances in any of these samples within the boundaries of Parcel A for the tested compounds, and therefore, Track 1 objectives were met in this area.

## 5.4 PLAZA/PARK AREA

### 5.4.1 General Progression and Summary of Excavation/Remediation

The Plaza/Park Area was the third construction area remediated. Initial excavation activities began on December 9, 2004, in the central portion. An average thickness of 4 to 6 feet of Category 1 soil was removed from this area to reach the green line. Category 1 soil extended to greater depths on the western portion of the Plaza/Park Area, as illustrated on the cross-sections through the Site shown on Figures 11 and 12. Remedial activities in the Plaza/Park Area were completed by the week of March 18, 2005.

The west half of the area (not including 80th Drive West) was excavated to el 69 for construction of stormwater detention basins, which corresponded approximately to the depth of Category 1 soil in this area, followed by post-excavation sampling. The detention basins consisted of a field of parallel-laid, 5-foot diameter interconnected high-density polyethylene (HDPE) piping, wrapped in filter fabric, and backfilled with one of the approved, imported aggregates.

The east half of the area was excavated to remove Category 1 soil/fill only followed by post-excavation sampling. There were no sub-grade structures proposed for constructionexcept the plaza fountain and foundation for another small structure. Following confirmation that Track 1 objectives were met, the area was dynamically backfilled using Category 3 certified clean soil excavated from the Building 4 footprint to the north (See Section 5.5), and imported TAGM clean sand (See Section 4.11).

Approximately 25,000 tons of Category 1 soil/fill were removed from the area and disposed at the FDP Intermodal and OENJ Bayonne facilities. The approximate volumes and disposal facilities for the Category 2 soil/waste removed from this area are noted in the individual AOC-specific sections that follow. Four (4) discrete AOCs were uncovered and remediated as excavation progressed through this area, as described in the following Section 5.4.2. Four (4) AOC endpoint samples were collected at these AOC locations.

Eight (8) Area-wide bottom endpoint samples and six (6) Area-wide sidewall endpoint samples were collected in the Plaza/Park Area (see Figure 8 and Table 4C) to demonstrate that Track 1 objectives were met. Six (6) IRM SI soil-boring samples previously collected, were also utilized to demonstrate that Track 1 objectives were met (Table 9).

### 5.4.2 Hot Spot/AOC Remediation

AOC 2H/2I

AOC 2H/2I was discovered on January 13, 2005, while excavating Category 1 soil when gasoline-like odors and PID readings were noted. There was no visible evidence of soil staining or product of any kind. Contaminated material was excavated until detectable odors and PID readings in the soil were no longer evident. The soil was removed from the area and stockpiled on poly for waste characterization sampling (Table 1B and 2K), then disposed at the Clean Earth of Philadelphia facility. Waste characterization results indicated the presence of diesel and benzo(a)pyrene. See Appendix G for disposal documentation.

One AOC endpoint soil sample was collected and analyzed for STARS VOCs and SVOCs. There were no TAGM RSCO exceedances in this sample (See Table 7M), and therefore, Track 1 objectives were met at this AOC.

AOC B41

AOC B41 corresponds to a volume of soil removed from around IRM SI boring B-41 located in grid K13 (Figure 8). Based on the IRM SI findings, NYSDEC identified this location as a potential hot spot due to elevated SVOCs and metals detected in a sample collected at a depth of seven to nine feet below ground surface.

On February 28, 2005, a 20 by 20 foot square area centered on the B-41 location was excavated to a depth of 13.5 feet below grade. Soil appeared to contain ash in the upper 4 feet of the excavation. The lower 9.5 feet of soil was not impacted. Soil was stockpiled, sampled, and analyzed for the parameters listed in Table 1B then disposed at the FDP Intermodal facility. Summary of the waste characterization results is located in Table 2L.

Five (5) post-excavation endpoint samples were collected (one bottom and four sidewalls) and analyzed for SVOCs and metals (the same compounds for which there were TAGM RSCO exceedances in the original B-41 sample). There were no TAGM RSCO exceedances in the AOC B41 bottom or sidewall endpoint samples (See Table 7N), therefore, Track 1 objectives were met at this AOC.

AOC 2J – Petroleum-Contaminated Soil

On March 2, 2005, stained soil was encountered in grid L13 (Figure 8) while excavating Category 1 soil. The soil contained a black, petroleum-based product exhibiting odors and PID readings in excess of 3,000 ppm. Three truckloads of contaminated soil were stockpiled on poly and covered. Excavation and construction activities were immediately halted in the area. Langan contacted NYSDEC and both agreed to a plan to address this area in the same manner as the previous areas where petroleum was discovered in the subsurface (e.g., AOC-2F, Drum Area, etc.).

On March 3, 2005, AOC 2J was fully delineated with the excavator (approximately a 30 by 30 by 8 foot deep excavation). Potentially contaminated soil was identified by visual and PID screening, and stockpiled on poly for waste characterization analyses, then transported to Clean Earth of Philadelphia for treatment and disposal as non-hazardous petroleum waste (Appendix G). See Table 2G for a summary of waste characterization results. A GC/FID Fingerprint analysis was conducted and the material consisted of used motor oil or unknown lubricant. (See Appendix I for GC/FID Fingerprint results).

One AOC bottom and four sidewall endpoint samples were collected from the AOC 2J excavation and analyzed for the parameters listed in Table 1B. There were no TAGM RSCO exceedances in the AOC 2J bottom/sidewall endpoint samples (See Table 7O), and therefore, Track 1 objectives were met at this AOC. The excavation was subsequently backfilled with TAGM clean, Category 3 soil.

AOC 2J2 – Sewage-Contaminated Soil

On March 8, 2005, during the excavation of Category 1 soil in grid M13, an active sanitary sewer line was accidentally broken and began to leak into the adjacent soil. Remedial excavation activities were diverted from the area to allow for pipe repair.

The flow through the pipe was cut off and the broken pipe was fixed on March 16, 2005, at which time visually-contaminated soil was excavated and stockpiled for waste characterization and disposal. The final excavation measured approximately 30 by 30 by 6 feet deep, and soil from this AOC was transported to Clean Earth of Philadelphia for disposal. See Table 2N for a summary of waste characterization results.

One AOC bottom and four sidewall endpoint samples were collected and analyzed for the parameters listed in Table 1B. This area was located within the active access road to the Site

at the time. In order to allow construction to proceed while the endpoint samples were being analyzed at the laboratory, the excavation was backfilled with Category 3 soil. On March 25, 2005, AOC 2J2 soil samples were received indicating the north sidewall sample contained SVOCs above the TAGM RSCOs (Table 7P). Consequently, on May 23, 2005, AOC 2J2 was re-excavated to the north removing the contaminated soil represented by soil sample 2J2-NSW-031805. The excavation was extended to approximately 4 feet beyond the original excavation of AOC 2J2. Following additional excavation, a supplemental soil sample was collected from the northern sidewall of the excavation and analyzed for the TAGM 4046 parameter list. There were no TAGM exceedances in the supplemental soil sample (See Table 7P). The single acetone exceedance is attributed to laboratory analytical method and does not reflect conditions in the soil on the Site.

Ultimately, the AOC 2J2 bottom and sidewall endpoint soil samples did not exceed TAGM RSCOs and therefore Track 1 objectives were met.

### 5.4.3 Endpoint Sample Results

Eight (8) Area-wide bottom endpoint samples and six (6) Area-wide sidewall endpoint samples were collected from the Plaza/Park Area and analyzed for the TAGM parameter list of analytes to demonstrate that Track 1 objectives were met (See Tables 6A and 6B for the tabulated detected compounds). Additionally, soil samples collected at six (6) of the prior IRM SI boring locations from this area also served to demonstrate that Track 1 objectives were met (see Table 9). There were no TAGM RSCO exceedances in any of these samples for the tested compounds, and therefore, Track 1 objectives were met at this area.

## 5.5 BUILDING 4 AREA

### 5.5.1 General Progression and Summary of Excavation/Remediation

The Building 4 Area was the fourth construction area remediated. Remedial excavation of Category 1 soil in the Building 4 Area began on February 28, 2005, and progressed from east to west. An average thickness of 6 to 7 feet of Category 1 soil was removed from this area. Remedial activities in the Building 4 Area were completed on May 25, 2004.

The Building 4 footprint (Figure 9) was excavated below the green line to the construction elevation of 62 feet QBPD, to facilitate the building foundation construction and to achieve Track 1 objectives. The areas outside of the building footprint to the west and east were excavated to the green line, followed by endpoint sampling to demonstrate that Track 1 objectives were met, and backfill to construction grade with confirmed clean Category 3 soil.

When remedial activities in the Building 4 Area were about to commence, over 60 percent of the Site was excavated and was in the construction phase. In addition, no AOCs were previously identified in the Building 4 Area other than the Category 1 soil. There was insufficient space to stockpile the Category 1 soil for waste characterization analyses and the Category 3 soil to determine if it was TAGM-clean. At the same time, there was a need for a large volume of clean soil to backfill the Park/Plaza Area after the Category 1 material there was removed.

A proposal was made to NYSDEC on April 6, 2005 for in-situ characterization of the Category 3 soil underlying the Building 4 footprint to confirm that the soil was TAGM-clean, and after removing the Category 1 layer, to dynamically load and transport the Category 3 soil to the Park/Plaza Area for grade restoration. In-situ characterization was completed using the Geoprobe sampling methodologies. NYSDEC verbally agreed with this plan via telephone conversation on this same date. Clean, in-situ soil samples would also serve as additional Area-wide endpoint samples to demonstrate that Track 1 objectives were met. A secondary objective of the Geoprobe sampling was to collect additional characterization data required by the disposal facility for the Category 1 material, which would allow dynamic loading of this material.

Twenty-four (24) Geoprobe borings were completed within the Building 4 footprint. At ten (10) of the Geoprobe locations, soil samples were collected of the presumed Category 3 materials from three separate depth intervals: at the suspected green line depth, 3 feet below the green line depth, and 5 feet below the green line depth. In this manner, if the first sample indicated that the soil was not TAGM-clean, the lab would be directed to analyze the next deeper sample to test until results were obtained that demonstrated the soil was TAGM-clean. Soil below the TAGM-clean sample depth would be considered Category 3 soil and could be reused as backfill on the Site without further testing. Figure 9 illustrates the locations of the Geoprobe borings where the Category 3 in-situ samples were collected. Table 8 presents the Category 3 soil sampling results for this area.

At the remaining 14 Geoprobe locations, only samples for Category 1 waste characterization were collected. These samples were tested for the FDP Intermodal Facility protocol. The location of these Geoprobe borings is shown on the figures included in the Occurrence of Volatile Organic Compounds report in Appendix J

Approximately 6,000 tons of Category 1 soil/fill was removed from the Building 4 Area and disposed at the FDP Intermodal and OENJ Bayonne facilities. Approximately 125 tons of Category 1 soil from the Building 4 footprint was relocated, per NYSDEC approval to backfill the

remediated UST vault and open excavation in the Parcel B area, where a Track 4 level cleanup is anticipated. There was no Category 2 soil encountered in this area. The confirmed-clean Category 3 soil was used to backfill the Plaza/Park Area and the AOC 2J and AOC 2J2 excavations in this area.

One (1) AOC was uncovered and remediated as excavation progressed through this area, as described in the following Section 5.5.2. One (1) AOC endpoint sample was collected at this location.

Ten (10) Area-wide bottom endpoint samples and two (2) Area-wide sidewall endpoint samples were collected in the Building 4 Area (Figure 9 and Table 4D). Five (5) IRM SI soil-boring samples that were previously collected were utilized to demonstrate that the Track 1 objectives were met (see Table 9).

### 5.5.2 Hot Spot/AOC Remediation

AOC B35

AOC B35 corresponds to a volume of soil removed from around IRM SI soil boring B-35, located in grid M9 (Figure 4), which NYSDEC identified as a potential hot spot due to elevated mercury concentrations detected at three to five feet below ground surface. Given the lack of available stockpile room, this potential hot spot could not be selectively excavated, stockpiled, and disposed in the same manner as the earlier DEC-identified hot spots. Instead, the disposal facility (FDP) was consulted, and FDP determined that the soil met their disposal criteria and they could accept the soil from this AOC based on the existing Category 1 stockpile waste characterization data for samples collected from soil in the surrounding area. Therefore, the soil excavated from this area was disposed as Category 1 material. See Table 2A for Category 1 waste characterization results generated as required by the prospective disposal facility. To confirm the endpoint conditions at AOC B35, an endpoint sample was collected in-situ during the Building 4 Geoprobe investigation discussed above. Geoprobe soil sample Bldg4-H (7)-033105 was collected at the former IRM SI boring B-35 location at a depth of two (2) feet below the location of the initial sample that exhibited a TAGM RSCO exceedance for mercury (See Tables 6A and 9). There were no TAGM RSCO exceedances in this sample, and therefore, Track 1 objectives were met at this AOC.

### 5.5.3 Post-Excavation (Bottom and Sidewall) Endpoint Sample Results

Ten (10) Area-wide bottom endpoint samples and two (2) Area-wide sidewall endpoint samples were collected and analyzed for the TAGM parameter list of analytes from the Building 4 Area

(See Figure 9 for the sampling locations, and Tables 6A and 6B for the tabulated detected compounds). Additionally, soil samples collected at five (5) of the prior IRM SI boring locations from this area also served to demonstrate that Track 1 cleanup objectives were met (see Table 9). There were no TAGM RSCO exceedances in any of these samples within the boundaries of Parcel A, and therefore, Track 1 objectives were met.

## 5.6 NORTH PARKING GARAGE AREA

### 5.6.1 General Progression and Summary of Excavation/Remediation

The Northern Garage Area was the fifth and final area of remediation within Parcel A (See Figure 10). Activities began on April 1, 2005 with in-situ waste characterization sampling utilizing a Geoprobe followed by soil sampling from four (4) test pits excavated in the western portion of the garage footprint. These activities were completed to facilitate dynamic loading of Category 1 soil to the FDP Intermodal facility and to delineate the green line.

Soil excavation activities began on April 6, 2005, in the western portion of the northern garage area and progressed toward the east. Category 1 soil was excavated to the green line, followed by post-excavation soil sampling, and backfilling with TAGM-clean soil. The northern garage footprint will be re-excavated to construction grade at a later date. An average thickness of seven (7) feet of Category 1 soil was removed from this area. Remedial activities in the northern garage area were completed on May 25, 2005.

Approximately 8,000 tons of Category 1 soil/fill from the Northern Garage area was disposed of at the FDP Intermodal Facility. Category 2 soil was disposed of at the Clean Earth of Philadelphia facility and the various liquids encountered were disposed at the Bridgeport United Recycling Facility in Bridgeport, CT. The handling and final disposition of Category 2 soil is further discussed in the following subsections according to specific AOC area. Excess Category 3 may be generated when the Northern Garage structure is excavated. The Northern Garage was characterized in-situ during the Geoprobe and test pit excavation activities completed on April 1, 2005. All soil remaining in-place meets TAGM 4046 RSCOs based on the in-situ and post-excavation endpoint soil sample results (See Tables 6A and 6B for the results). Future excavated Category 3 soil will be re-used as backfill material throughout the Site where required for construction. Any excess excavated Category 3 soil not used on the Site will be transported off the Site either to a NYSDEC-registered transfer facitlity or to an approved BUD facility. Two (2) discrete AOC areas were encountered and remediated as excavation progressed through the area. Two (2) AOC endpoint soil samples were collected at these AOC

locations (See Figure 10 and Table 4E). Waste characterization sample results for the two AOCs can be found in Table 2O and 2P.

### 5.6.2 Hot Spot/AOC Remediation

AOC 2L – Concrete Encased USTs

AOC 2L was discovered on April 20, 2005, when excavating Category 1 soil from the western end of the Northern Garage Area. Two (2) 550-gallon USTs were discovered encased in a concrete block. Liquid was observed seeping from the base of the block and strong petroleum-like odors were present in adjacent soil. PID readings in excess of 900 ppm, within the tanks indicated the presence of volatile organics. The tanks were placed on poly until a plan could be devised. NYSDEC was informed of the discovery and a spill was reported to the NYSDEC Spill Hotline (Spill No. 0500862).

The area was revisited on April 21, 2005, at which time all contaminated soil was removed from the area of discovery. Soil remaining in place was screened with a PID until readings were no longer evident. This soil was stockpiled on poly, sampled for waste characterization, and then covered. The liquid contained within the tanks was sampled for waste characterization and Fingerprint analysis. The contents of the tanks consisted of #2 Fuel Oil (see Table 1B and Appendix G for GC/FID Fingerprint results). See Table 2O for a summary of the waste characterization results related to this AOC.

ETI mobilized a vacuum truck to evacuate and clean the tanks. The liquids were disposed of off the Site at Bridgeport United Recycling in Bridgeport, CT (See Appendix G for documentation). Soil associated with this AOC was disposed at the Clean Earth of Philadelphia facility (See Appendix G for the waste manifests for both soil and liquid waste). The two USTs were subsequently registered with NYSDEC and disposed of as scrap to M&M Scrap.

Post-excavation soil samples were collected and analyzed as indicated in Table 7O and shown on Figure 10. There were no TAGM RSCO exceedances in any of the post-excavation samples, and therefore Track 1 objectives were met at this AOC. A copy of the letter petitioning the NYSDEC case manager to close this spill is provided in Appendix O.

AOC 2N – Toluene-Contaminated Soil

AOC 2N was discovered on May 12, 2005, during the excavation of Category 1 soil from the proposed Atlas Drive East roadway (see Figure 10). Strong odors were encountered along with PID readings in excess of 1000 ppm at the surface of the soil. Excavation activities were diverted from the area until NYSDEC was notified, and the situation properly assessed. A sample of the soil was collected and submitted for waste characterization analyses (see Table 2P for summary of waste characterization results and Appendix G for the waste manifests).

On May 20, 2005, the area was revisited and ETI proceeded with dynamic excavation and disposal of the soil at the Clean Earth of Philadelphia facility. Soil was removed from an area of approximately 30 feet by 10 feet and 5 feet deep. The excavation activities were closely monitored with a PID. Soil was excavated until PID readings were no longer evident on the bottom and four sides of the excavation.

Post-excavation soil samples were collected and analyzed as indicated in Table 4E and shown on Figure 10. There were no TAGM RSCO exceedances in any of the post-excavation samples, and therefore Track 1 objectives were met at this AOC.

### 5.6.3 Post-Excavation (Bottom and Sidewall) Endpoint Sample Results

Ten (10) Area-wide bottom endpoint samples and seven (7) Area-wide sidewall endpoint samples were collected and analyzed for the TAGM parameter list of analytes from the Northern Garage Area (See Figure 10 for the sampling locations, and Tables 4E, 6A and 6B for the tabulated detected compounds). Eight (8) additional soil samples were collected during the Geoprobe and test pit excavation activities that established the elevation of the green line. These samples supplement the Area-wide endpoint soil sampling, along with eight (8) IRM SI soil boring samples that were previously collected to demonstrate compliance with Track 1 objectives (see Table 9). There were no TAGM RSCO exceedances in any of these samples within the boundaries of Parcel A, and therefore, Track 1 objectives were met.

There was one instance where an initial endpoint sample exceeded the TAGM 4046 RSCOs requiring additional excavation followed by endpoint re-sampling for the TAGM parameters. This occurred at endpoint sample location EP-R8. Results for the initial and supplemental endpoint samples are presented in the data tables. The supplemental sample represents the final endpoint sample that meets TAGM 4046 RSCOs.

# 6.0 BUILDING 4 AND BUILDING 6 SOIL VAPOR INVESTIGATION

## 6.1 OBJECTIVES

Five (5) soil vapor samples were collected from the subsurface below the Building 4 and Building 6 footprints once construction grade was reached (Figures 6 and 9). The soil vapor sampling was performed to measure the concentrations of subsurface volatile organic compounds to evaluate potential vapor intrusion into the future buildings. Both of these buildings will include basement level spaces. Three samples were collected from the subsurface beneath Building 6, identified as Bldg #6 – West Side, Center, and East Side on Figure 6. Two samples were collected from the subsurface beneath Building 4, identified as Bldg #4 – West Side and East Side on Figure 9.

## 6.2 SOIL VAPOR PROBE INSTALLATION AND SAMPLING METHODOLOGIES

The soil vapor samples were collected on April 25, 2005 in accordance with the RAWP, as modified based on the recently issued NYSDOH guidance document entitled *Guidance for Evaluating Soil Vapor Intrusion in the State of New York*, February 2005, which is currently under public review.

Specifically, the following steps were implemented to collect the samples:

1. A direct-push Geoprobe 54LT rig was used to create +/- 1.5-inch hole to a depth of 15 ft below the basement subgrade of the future building.
2. A stainless steel Geoprobe screen implant (5/16" diameter, +/- 8-inch length) was threaded to Teflon tubing (0.313-inch diameter) and lowered to the bottom of the hole.
3. The Geoprobe rods were removed from the hole and a +/- 2-foot long sand filter pack was installed around the screen implant by pouring the sand into the annulus. The remainder of the annulus was filled to grade surface with a bentonite slurry seal.
4. The bentonite seal was allowed to set for about one hour
5. A peristaltic purge pump was attached to the Teflon tubing and a volume of air three times that of the tubing and screen setup was purged. The purged soil vapor was monitored with a PID equipped with a 10.6 eV lamp.
6. After purging was completed, a laboratory-supplied, 6-liter Summa canister with a one-hour flow controller (+/- 0.1 L/min) was attached to the Teflon tubing. The summa canisters arrived from the lab with approximately +/- 30 inches of Hg vacuum.
7. Sampling was started by fully opening the canister valve.

8. The start time and stop time (after +/- one hour), ending vacuum pressure and PID readings were recorded on a sample log and the chain of custody.
9. Completed samples were packaged for shipment to Spectrum Analytical, Inc. of Agawam, MA under chain-of-custody protocol, where they were analyzed for VOCs by EPA Method TO-15.

Three quality control samples were collected to support the validity of the sample results. One outdoor air (OA) sample was collected in each building footprint at the same time and adjacent to the samples being collected in that footprint. The OA samples are designed to check for potential influence on the samples from non-site-related, ambient air sources above the subsurface being sampled. One sample was left untouched and was logged and analyzed as the trip blank. The trip blank is designed to check for contamination of the samples by non-site-related influences, from the time the canisters are prepared in the lab until they are analyzed by the lab.

## 6.3 SOIL VAPOR ANALYTICAL RESULTS

Table 12 provides the analytical results for TCE and PCE, the two compounds for which the NYSDOH has proposed soil vapor intrusion guidance, and additionally the only two volatile organic compounds found in groundwater beneath the Site and adjacent areas (upgradient wells and beneath Parcel B) at levels above the New York State standards. Other compounds were detected for which the NYSDOH has not proposed soil-vapor intrusion guidelines. The complete data report can be found in Appendix I.

The soil vapor results show PCE in the soil vapor at concentrations ranging from 20.8 parts per billion by volume (ppbv) (141 micrograms per cubic meter [ug/$m^3$]) to 1,440 ppbv (9,762 ug/$m^3$), above the NYSDOH guideline of 100 ug/$m^3$. TCE concentrations ranged from undetected to 97.3 ppbv (523 ug/$m^3$), with the higher levels above the NYSDOH guideline of 5 ug/$m^3$. Appendix J contains the report titled "Occurrence of Chlorinated Volatile Organic Compounds" submitted to NYSDEC on July 1, 2005, by Langan which illustrates and discusses the TCE/PCE data collected at Parcel A, including the soil vapor data. Figures 14, 14-A, and 14-B illustrate all known occurrences of TCE and PCE encountered within Parcel A, including soil vapor.

## 6.4 SOIL VAPOR SAMPLING CONCLUSIONS

Based on the investigative and remedial activities conducted at Parcel A, no on-site sources of TCE and PCE were encountered in the fill/soil. Contaminated soil and fill material was removed

from the Site during the remedial activities. There were no exceedances of the TAGM RSCOs for any VOCs in soil samples collected on Parcel A during the pre-IRM activities or during the implementation of the remedial activities. However, ongoing investigation in Parcel B identified one confirmed source (floor drain) and two potential additional sources of TCE and PCE. A remedial plan to address the confirmed source area on Parcel B is being prepared and submitted to NYSDEC.

## 7.0 DATA VALIDATION

Severn Trent Laboratories, Inc. of Shelton, CT and Spectrum Analytical Inc. of Agawam, MA conducted laboratory analyses of soil, groundwater and soil vapor samples. Laboratory analyses were conducted in accordance with USEPA SW-846 methods and NYSDEC ASP Category B deliverable format.

Data validation reviews were preformed by Alpha Environmental Consultants, Inc. of Clifton Park, NY; Data Validation Services of North Creek, NY; and Environmental Data Quality, Inc. of Exton, PA. Area-wide and AOC-specific bottom and sidewall endpoint samples and Category 3 clean stock pile sample results were reviewed by the validators in accordance with the USEPA validation and NYSDEC data usability guidelines. Validation included the following:

- Verification of 100% of all QC sample results
- Verification of the identification of 100% of all sample results (both positive hits and non-detects);
- Recalculation of 10% of all investigative sample results

Data Usability Summary Reports (DUSR) were prepared for each sample delivery group that the validators reviewed and are provided in Appendix E. The tabulated data provided in this report includes the data qualifiers added by the data validators.

## 8.0 CONCLUSIONS AND RECOMMENDATIONS

The following conclusions and recommendations are made based on the remedial activities conducted at Parcel A of the The Shops at Atlas Park Site:

- The post-excavation bottom endpoint sampling conducted during the implementation of the remedial activities confirm and document that fill, soil, and localized hot spots with contaminants of concern exceeding TAGM 4046 RSCOs within the Site were removed and properly disposed of in accordance with the approved RAWP.

- The results of post-excavation sampling at the sidewalls of Parcel A, many of which were beyond the property line, confirm and document that neither fill nor soil with contaminants of concern exceeding TAGM 4046 RSCOs remain on Parcel A. See Figure 13 for the sidewall soil samples that were collected outside the boundary of Parcel A and exceeded TAGM 4046 RSCOs.

- The following spills were reported during implementation of the Remedial Action, and were completely remediated, justifying closure of these spills:

  - 0410523, AOCs Drum Area, 2E, and 2F, and
  - 0500862, #2 fuel oil from 2 USTs

  Copies of the letters petitioning the NYSDEC case manager to close these spills are provided in Appendix O.

- Implementation of the RAWP has resulted in complete Track 1 remediation of Parcel A.

- Groundwater underlying the Site contains VOC compounds of concern, specifically TCE and PCE. Although the Site was extensively investigated and excavated as part of remediation, no on-site sources of these materials were found, and we conclude their presence in groundwater is unrelated to former on-site operations at Parcel A.

- On-site soil vapor contains VOC compounds of concern, specifically TCE and PCE. It is believed that this condition is related to migration of vapors from off-site source(s) located on Parcel B. Regardless of the final identified off-site source(s), the

occurrence of TCE and PCE in soil vapor is unrelated to former on-site operations at Parcel A.

- Total costs of Remedial Activities for Parcel A were approximately $10,100,000. See Appendix M for the Cost Summary.

Langan recommends no further action with respect to the subsurface conditions at the Site. The post-excavation (bottom and sidewall) endpoint sample analyses confirm and document that the contaminants of concern in the soil remaining at the Site are below TAGM 4046 recommended cleanup objectives, and that Track 1 objectives were met. Additionally, Langan recommends that NYSDEC issue "No Further Action" determinations for Petroleum Spill Case Numbers 0410523 and 0500862, and that NYSDEC issue a Certificate of Completion for the Site.