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COMPLETED INTERIM REMEDIAL MEASURES REPORT
FORMER RED DEVIL PAINT FACILITY
30 NORTH WEST STREET
MOUNT VERNON, NEW YORK
BCP INDEX #W3-1079-05-09
SITE #3-60-031

Prepared For

SUSA Mt. Vernon, LLC

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TABLE OF CONTENTS

Page

TABLE OF CONTENTS
(continued)

APPENDICES

LIST OF TABLES
(at end of report)

LIST OF TABLES
(at end of report)
(continued)

Table

LIST OF TABLES
(at end of report)
(continued)

LIST OF TABLES
(at end of report)
(continued)

Table

LIST OF FIGURES
(at end of report)

Figure

LIST OF FIGURES
(at end of report)
(continued)

LIST OF APPENDICES
(included on CD)

Appendix

COMPLETED INTERIM REMEDIAL MEASURES REPORT
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BCP INDEX #W3-1079-05-09
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EXECUTIVE SUMMARY

The following Interim Remedial Measures Report (IRMR) for the Former Red Devil Paint Facility site (the Site) located at 30 North West Street, the City of Mount Vernon, New York was prepared by LBG Engineering Services, Inc./Leggette, Brashears & Graham, Inc. (LBG) on behalf of SUSA Mt. Vernon, LLC. The Site is currently included in the Brownfield Cleanup Program (BCP) as Index #W3-1079-05-09, Site #C360031. All environmental activities performed at the Site subsequent to its acceptance into the program were performed as required under the Brownfield Cleanup Agreement (BCA) between the owner and the New York State Department of Environmental Conservation (NYSDEC).

The Site has a long history of industrial manufacturing activities related to the manufacture and distribution of paints and lacquers.[1] The materials used in conjunction with these activities, the onsite storage for chemicals used in the manufacturing processes, improper historical waste disposal and housekeeping practices, and, failure of the onsite chemical storage systems contributed to the contamination of the subsurface beneath the Site and extended downgradient offsite.

The IRM activities were completed between 2006 and 2008 in conjunction with the Remedial Investigation activities performed at the Site (which consisted of subsurface environmental investigation to delineate the extent and concentration of soil, groundwater and soil vapor/indoor air contamination present at the Site). The IRM activities implemented at the Site were completed in conjunction with several pilot studies for evaluating future remedial technologies.

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[1] From 1959 to 1971, Red Devil Paints & Chemicals, Inc. operated a paint facility, which blended and manufactured paints and varnishes. From 1971 to 1989, Red Devil was operated as a division of Insilco Corporation. In 1990 the paint facility ended its operations at the Site.

As a result of the subsurface investigation activities as well as the IRM acti formed at the Site, the Site has been comprehensively characterized. The Site characterizatio has defined the extent of soil vapor/indoor air, soil and groundwater contamination in the subsurface.

Mitigation activities were performed in Areas A, B, C and D. In Area A, this activity consisted of removal of an asphalt cap, underground storage tank (UST) closure activities and excavation/removal of contaminated soil within the parking lot. In Areas B, C and D, the mitigation activities consisted of: removal of the slab on grade; UST closure activities; excavation/removal of contaminated soil and free-phase product; backfill with a highly permeable gravel (the first floor of Area B and the majority of the basement of Area C and all of Area D); the installation of a sub-slab depressurization piping system within the gravel layer; and installation of new reinforced concrete slab. These sub-slab depressurization pipes are currently passively venting to the atmosphere via a roof-mounted wind turbine.

The installation of the passive sub-slab depressurization provides a means to address soil vapor beneath the Site. This system can be converted to an active system by connecting the sub-slab depressurization pipes to vacuum blowers. Additionally, although not the direct objective, an active sub-slab depressurization would provide active remediation of contamination within unsaturated soils.

The IRM activities consisted of: removal of sixteen (16) bulk storage tanks and their residual contents from the Site; removal of approximately 2,550 tons of non-hazardous soil from the Site and disposal at offsite approved/licensed facilities; removal of approximately 11 tons of hazardous wood from the Site and disposal at an offsite approved/licensed facility; and, removal of approximately 224 tons of hazardous contaminated soil and disposal at offsite approved/licensed facilities.

The pilot tests and pumping tests completed in conjunction with the IRMs performed at the Site were effective in removing a significant volume of contaminated material from the subsurface as well as providing information for evaluating the potential remedial alternatives at the Site based on the site specific geology. The results of the groundwater pumping test revealed that due to the limited available saturated thickness and the low transmissivity of the subsurface soils, vertical groundwater wells are not a feasible remedial alternative for removal of contaminated groundwater and/or free-phase product (NAPL) at the Site. The resul soil-vapor extraction pilot test with a vertical well revealed that due to the nature of the subsurface soils, neither high or low vacuum from a vertical soil-vapor extraction well would induce a significant radius of influence to effectively remediate residual soil contamination. Lastly, based on the grout injection pilot test, a hydraulic barrier (using multiple injection points along the downgradient perimeter of the Site) was ruled out as a method for preventing the offsite migration of free-phase product (NAPL).

Although several potential remedial alternatives were determined not to be feasible for use at the Site, several alternatives were determined to be viable for the Site. The results of the horizontal wells HEW-1 and HEW-2 pumping tests demonstrated that groundwater pumping from a horizontal well had the potential to remove groundwater with dissolved phase volatile organic compounds (VOCs) and free-phase product from the subsurface, and to act as a hydraulic barrier for offsite migration of free-phase product. The drawdown versus time data showed that the drawdown around the horizontal well screens increased in a linear fashion during both pumping tests. The tests indicated that continuous pumping would remove both free-phase product and impacted groundwater from the subsurface and induce a cone of depression sufficient to control further migration of both free-phase product (NAPL) and groundwater with dissolved VOCs. The pumping test results concluded that groundwater extraction from an aquifer with low permeability can be effectively achieved through the use of horizontal extraction well(s). Accordingly, it is feasible for the groundwater remediation and free-phase product removal at the Site to be accomplished by the pump and treat technology utilizing horizontal groundwater/product extraction wells in conjunction with periodic product removal from vertical monitoring/delineation/extraction wells.

The pilot test of horizontal soil-vapor extraction well HSVE-1 demonstrated a substantial vacuum influence throughout the subsurface resulting from the increase in screened area provided by the horizontal well. As a result of this pilot test, it was determined that a horizontal soil-vapor extraction well(s) is effective in removing vapor phase contamination from the subsurface of the Site. Additionally, operation of a horizontal soil vapor extraction well will act as an additional preventative measure reducing any potential for indoor intrusion of soil vapor.

In conclusion, the major subsurface contamination beneath the Site is present as dissolved phase in groundwater system. As a result of the contaminant concentrations remaining at the Site, additional remedial action(s) are required to actively remediate the groundwater, control offsite contaminant migration and to achieve compliance while reducing the risk to the environment. As such, an additional IRM Work Plan and subsequent remedial alternatives analysis will be prepared and submitted to the NYSDEC.

1.0 INTRODUCTION

The following Interim Remedial Measures Report (IRMR) for the Former Red Devil Paint Facility site (the Site) located at 30 North West Street, the City of Mount Vernon, New York was prepared by LBG Engineering Services, Inc./Leggette, Brashears & Graham, Inc. (LBG) on behalf of SUSA Mt. Vernon, LLC. SUSA has entered into the Brownfield Cleanup Program (BCP) with the New York State Department of Environmental Conservation (NYSDEC). The Site is listed as BCP Index Number W3-1079-05-09 and Site ID #3-60-031. This IRMR summarizes the results of the interim remedial measures implemented at the Site by LBG concurrent with the remedial investigation activities related to removal of USTs from 2006 to 2008.

The primary site characterization information used to complete the USTs removal and IRM activities was outlined in the Remedial Investigation Report prepared by LBG and submitted to the NYSDEC in March 2009.

The IRMs were conducted in order to control, reduce and/or eliminate the source of soil and groundwater contamination offsite and onsite. The offsite IRM was implemented by installing and maintaining a containment boom on the adjacent Bronx River. The purpose of the boom system was to contain the free-phase product leachate observed along portions of the eastern bank of the Bronx River.

The onsite IRMs were designed to remove the existing sources of soil and groundwater contamination and to reduce the concentrations of contaminants in soil and groundwater. These IRMs included the following:

- removal of all abandoned USTs from beneath the building slab and adjacent exterior areas;
- removal of an out of service above-ground storage tank (AST) from the Site;
- removal and offsite disposal of contaminated soil from the UST excavations; and,
- removal and offsite disposal of contaminated soil from the ‘hot spot’ excavation in Area D.

Several work plans were implemented during the performance of the IRM activities by LBG. All activities performed in association with the IRMs complied with the NYSDEC approved Site specific Health and Safety Plan (HASP), which includes the Community Air Monitoring Plan (CAMP). The HASP is included as Appendix I on the attached CD. A Quality Assurance/Quality Control (QA/QC) Plan was also prepared and is included as Appendix II on the attached CD.

2.0 SITE DESCRIPTION AND HISTORY

The Site, presently an Extra Space Storage self-storage facility, is located at 30 North West Street in the City of Mount Vernon, Westchester County, New York. The location of the Site, as shown on figure 1, is at 40°54'54" north latitude and 73°51'35" west longitude. The property is approximately 50,000 sq. ft. (square feet) in area, 73 percent (37,035 sq. ft.) of which is developed. The developed portion of the Site is improved with several buildings constructed at various times and combined into one composite unit (the 'Building"). The components of the Building are referenced as Area A, Area B, Area C and Area D. These areas are shown on figure 2, Site Plan.

The Site is located in an industrial area that dates back at least 75 years. A chronology of Site owners and/or operators is as follows:

•	SUSA Mt. Vernon, LLC	1991-present
•	Insilco	1989-1991
•	Red Devil Paint Division of Insilco	1971-1989
•	Red Devil Paints & Chemicals, Inc.	1959-1971
•	Technical Color and Chemical Works, Inc.	1955-1963
•	Continental Bakery Corporation	1926-1940
•	Bakery Services Corporation	1927-1930
•	Shults Bread Company	1911-1915
•	Egler and Sons Baking Company	1908

The available records indicate that most of the construction on the Site was completed by the Red Devil Paints and Chemicals, Inc. The core of the facility which consisted of the production area, the packing and the garage areas (Areas C and D) was probably built in 1915. A paint remover building was built in 1956 (historically in the parking lot adjacent to Area A) however it has since been razed. The storage/machine shop (Area B) was constructed in 1963. In 1966 the packing and mixing room was completed as an addition to Area C (currently the western portion of Area C). The final office structure (the building on the southern portion of Area A) was completed in 1987.

In 1991 the property and the Building was sold by Insilco to SUSA Mt. Vernon, LLC. Since 1991, SUSA utilized as a commercial self-storage facility.

2.1 Local Land Usage

The surrounding area within a one mile radius of the Site is urban with mixed residential and industrial/commercial development. The Site is bordered on the northwest by Metro North Railroad tracks, on the northeast by Oak Street, on the southeast by North West Street and to the southwest by a small furniture outlet store, a grocery market and a taxi dispatching service. The Bronx River is located approximately 115 feet northwest of the Site.

The property is described by the City of Mount Vernon tax assessor as Section 164.68, Block 1056, Lots 11 and 12. A copy of the tax map is attached as figure 3.

3.0 BACKGROUND

The Site has been characterized by multiple remedial investigations. Additionally, several IRMs have been implemented at the Site to mitigate onsite and offsite impacts of subsurface contamination. The IRM activities performed at the Site (both past and present) reduced the subsurface contamination of soil and groundwater beneath the Site. A summary of the historical investigation and remedial activities performed at the Site was presented in the Remedial Investigation Report submitted to the NYSDEC in September 2009.

4.0 OFFSITE INTERIM REMEDIAL MEASURES

4.1 Bronx River Boom Maintenance

In addition to the Remedial Investigation activities and onsite IRM activities, the volunteer, SUSA Mt. Vernon, LLC conducted voluntary routine maintenance of a boom system located along the bank of the Bronx River. The Bronx River boom system, consisting of an inner sorbent boom and an outer hard boom, prevents leachate seeping from the riverbank from entering the main flow of the Bronx River. Once trapped, the leachate then solidifies on the water's surface and is periodically removed for disposal. Since the beginning of the RI, five (5) separate boom maintenance rounds have been performed. The first boom maintenance round was performed on September 22, 2006. This round removed boom material which had been present since the NYSDEC last performed a maintenance round. The second boom maintenance round was performed on April 3, 2007. The third boom maintenance round was performed on June 20, 2007. The fourth boom maintenance round was performed on April 18, 2008. The fifth (and most recent) boom maintenance round was performed on November 3, 2008. All of the waste sorbent boom material and solidified seep material generated during the change-out activities was placed in plastic garbage bags, drummed and disposed of as non-hazardous waste. All of the non-hazardous boom waste was disposed of at Vexor Technology, Inc. located in Medina, Ohio. The US EPA ID number for this facility is OHD077772895. The manifests for the waste sorbent boom material are attached in Appendix III on the attached CD.

Following the June 20, 2007 boom maintenance round (performed in response to flooding of the Bronx River, an upriver spill (soybean oil from a salad dressing manufacturer) occurred on June 22, 2007. Upon request from the onsite personnel consisting of the Mount Vernon Fire Department and the Westchester County Department of Health, the boom system was used to contain the spill in the river. The waste sorbent boom material from this maintenance round was placed in plastic garbage bags, drummed and the spiller was responsible for disposal. Additionally, the spiller incurred the cost for the boom change-out activities as well as for the replacement sorbent boom material. The manifest for the waste sorbent boom material from the upriver spill is attached in Appendix III on the attached CD.

On November 3, 2008, the most recent maintenance round of the Bronx River boom system was performed. Again, this round consisted of replacement of the sorbent boom as well as re-positioning the hard boom to ensure it properly contains any seep material that may not be contained/absorbed by the sorbent boom. All of the waste sorbent boom material and solidified seep material generated during the change-out activities was placed in plastic garbage bags, drummed and disposed of as non-hazardous waste. The manifest for the waste sorbent boom material is attached in Appendix III on the attached CD. The next boom maintenance round is anticipated to be performed in January/February 2009 unless conditions require earlier or later action.

Future maintenance of the Bronx River boom system is scheduled to be performed periodically by the NYSDEC and/or their contractor, with maintenance rounds being scheduled in response to observed field conditions. It should be noted that the amount of leachate observed along the banks of the Bronx River has decreased since September 2006.

5.0 ONSITE INTERIM REMEDIAL MEASURES

An interim remedial measure (IRM) is conducted at a site when a source of contamination or exposure pathway can be effectively addressed before completion of the remedial investigation and alternatives analysis. The IRMs implemented at the Site were performed to address residual source and/or suspected source material in the subsurface (i.e.-contaminated/NAPL saturated soil and USTs) to minimize the amount of future in-situ remediation required at the Site. Additionally, a pilot study was performed to evaluate the effectiveness of a chemical oxidation material for in-situ remediation of dissolved phase VOC contamination.

Cleaning up the Site will require meeting NYSDEC soil and groundwater standards. The standards will be based on future commercial use. The Brownfield Program establishes four cleanup "tracks":

- **Track 1** is designed to permit any future use without reliance on institutional or engineering controls for soil contamination. For groundwater, there is an allowance for volunteers to qualify if the quantity of groundwater contamination has been reduced to "asymptotic levels" and long-term engineering or institutional controls to restrict groundwater use are proposed. This clean-up track is not applicable to the Site.
- **Track 2** aims to achieve cleanup levels set forth in the NYSDEC tables for reasonably anticipated site use without reliance on institutional controls for soil. However, institutional controls may be used to satisfy groundwater cleanup standards.

- **Track 3** sites will be permitted to use site-specific characteristics (e.g., depth to groundwater) instead of tables to establish cleanup levels.
- **Track 4** will allow site-specific risk assessments for determining soil cleanup criteria. Institutional or engineering controls can be used. Additionally, the top two feet of soil for residential uses and top one foot of soil for nonresidential uses must comply with the Track 2-Restricted Use Soil Cleanup Objectives tables. These tables are presented in Appendix IV on the attached CD.

The IRMs conducted at the Site during the performance of the remedial investigation included: closure activities for USTs and ASTs remaining onsite; excavation and removal of impacted site soils; and application of a chemical oxidation compound to address dissolved phase contamination in Area D. Due to the presence of residual contamination at the Site, Track 1 (unrestricted use) is not a valid cleanup track for the Site.

Therefore, assuming the proposed future Site usage is to remain commercial (self-storage facility), and due to the fact that residual soil and groundwater contamination was detected at the Site, the remedial approach used during the implementation of onsite IRMs was a combination of Track 2 and Track 4.

5.1 UST/AST Closure Activities

In order to confirm and verify the tank closure activities performed at the Site prior to LBG work and to conduct removal of several of the tanks abandoned onsite, tank closure activities were performed. The tank closure activities consisted of:

- collection of soil and groundwater samples from the area of previously removed USTs;
- determination if additional USTs were present beneath the site;
- removal of the 10,000-gallon aboveground fuel oil storage tank from the basement of Area B;
- removal of several USTs listed as historically closed in-place from Areas B, C and D; and,

- removal of several USTs which were not identified during the previous IRM and/or investigations.

The former locations of tanks within Area A, Area B, Area C and Area D are presented on figure 4, figure 5, figure 6 and figure 7, respectively. The tank closure activities are summarized below by each Area.

5.1.1 Area A

Available site records indicate that the following tanks were present in Area A: six 1,500-gallon USTs along the northeast portion of the parking lot (listed as having been removed by ERM and designated as UST-1A, UST-2A, UST-3A, UST-4A, UST-5A and UST-6A); three USTs of unknown size located beneath the Area A corridor connecting Area A and Area B (removed prior to ERMs involvement in the original project and heretofore designated as UST-7A, UST-8A and UST-9A); and two USTs of unknown size in the southern portion of the parking lot (recorded as having been removed prior to ERMs involvement in the original project and heretofore designated as UST-10A and UST-11A). The former locations of tanks within Area A are presented on figure 4.

In 2007, LBG performed soil excavation activities to verify that tanks UST-1A, UST-2A, UST-3A, UST-4A, UST-5A and UST-6A had been removed as conflicting records by ERM stated that these six tanks had been abandoned in-place. The excavation activities revealed that the six 1,500-gallon USTs had been removed and a filter fabric liner had been installed marking the extent of the old excavation. The exploratory trenching excavation was then backfilled.

Confirmation soil sampling was performed at the former locations of the eleven USTs in Area A. The confirmation soil sampling consisted of performing GeoProbe soil borings: at the approximate center of the former location of each of UST-1A to UST-6A (GP-1A to GP-6A); one GeoProbe boring at the former locations of UST-7A, UST-8A and UST-9A in the loading dock area (GP-USTPR-3); and two GeoProbe borings between the former locations of UST-10A and UST-11A (GP-USTPR-1 and GP-USTPR-2). These sample locations are presented on figure 8. Of note, the locations for GeoProbe sampling in the loading dock were limited due to the presence of electrical panels in the area.

In addition to the UST closure GeoProbe soil borings, one GeoProbe boring was advanced between UST-1A and UST-2A (GP-LBG-HP6), which was the previous sample location HP-6 from the ERM investigation. In addition to the tank closure sampling, one GeoProbe boring was advanced in the onsite drywell (GP-Drywell) located in the southwest corner of the parking lot. This boring was performed to determine if this drywell is or has historically been a preferential pathway for surface contaminant spills to the subsurface. All of the confirmation GeoProbe soil boring locations in Area A are shown on figure 8.

For each GeoProbe boring, continuous soil samples were collected from grade to the boring terminus. All of the soil samples were described on a geologic log and screened with a PID for the presence of VOCs. For each GeoProbe boring location, soil samples were collected (for submission to the laboratory analysis) from the following depths within the boring: one from approximately 0-2 feet below the estimated elevation of the bottom of the tank and one from the depth where the highest PID reading was obtained. Additionally, two groundwater samples were collected from the boring for laboratory analysis. The soil and groundwater samples were collected in laboratory supplied containers and submitted to the laboratory for analysis of VOCs, semivolatile organic compounds (SVOCs) and total metals.

In addition to the UST GeoProbe investigation, the drywell formerly present in the southwest corner of the parking lot was cleaned out with a "guzzler" vacuum truck to remove refuse/leaves/detritus and increase its efficiency for storm-water drainage. While cleaning it out, it was observed that the "drywell" was constructed of bricks extending approximately 1.5 feet into the subsurface. Additionally, during the cleaning activity of the drywell, a pipe was uncovered which bisected the side of the drywell. The drywell was excavated; exposing a 3,000-gallon UST. This UST, referred to as UST-P, was observed to have been cut open and filled with concrete slurry. Although an odor was observed in the soil surrounding the tank, the concrete within the tank did not exhibit any off-gas VOCs when screened with a PID. The concrete was broken apart using an excavator mounted jackhammer and taken offsite for recycling. The tank was observed to be in good condition with no observed pitting or corrosion holes. On the western side of the UST (in the location of the drywell), stained soil was observed and some soil surrounding the tank exhibited hydrocarbon odors. The contaminated soil was primarily detected adjacent to the pipe fittings on the tank. The soil surrounding and beneath UST-P was excavated and stockpiled onsite for offsite disposal. In order to facilitate the excavation and due to limited space in the parking lot, some of the soil was transferred to the Area D commercial space for stockpiling prior to offsite disposal. The extent of the excavation was limited based on the presence of building foundations in the area. After the excavation was completed; two bottom samples (B-1 and B-2), two south sidewall samples (S-1 and S-2) and one east sidewall sample (E-1) were collected from the tank excavation. Additionally, one bottom sample was collected from the excavation in the area of the former drywell (DWB-1). These endpoint sample locations are presented on figure 9. All endpoint samples were submitted to laboratory for analysis of VOCs, SVOCs and total metals.

According to historical documents, the parking lot was historically improved with a paint removal building. This building was constructed in 1956 (in connection with Technical Color & Chemical Works, Inc.) and was later demolished to its foundation (date not known). The continued presence of the foundation is illustrated in figures prepared and submitted by ERM (the previous environmental consultant for the Site) as part of their environmental investigations of the Site. Additionally, review of blueprints obtained from Fuller & D'Angelo, P.C. (the architects for Area A building) showed the location of the former 1-story paint removal building. Based on the October 2006 and March 2007 soil vapor sampling rounds performed at the Site, the highest concentration of PCE detected in soil vapor was detected in Area A (15,000 ug/m^3 [micrograms per cubic meter] in SVP-2 in October 2006). Based on the documented historical presence of USTs within this former building, the parking lot area was excavated and the building foundation was demolished/removed. The foundation consisted of concrete slab (which was not continuous) and rock walls running from the street to the Area A/Area B corridor. During the excavation activities, product delineation well DW-3A was destroyed. This well was subsequently replaced with a stainless steel replacement product delineation well R-3A. The extent of the Area A parking lot excavation is shown on figure 10. The soil excavated from the parking lot was stockpiled onsite and disposed offsite as non-hazardous petroleum contaminated soil (based on waste characterization). On April 21, 2008, a total of 516.49 tons (generated in association with the UST-P closure and parking lot exploratory excavation activities) was taken offsite by Innovative and disposed of at Soil Safe, Inc. - Bridgeport located in Logan Township, New Jersey. Copies of the disposal manifests for the parking lot excavated soil are included in Appendix III on the attached CD.

As a result of the excavation work performed in the parking lot of Area A, it was confirmed that no additional USTs were present in the subsurface beneath the former paint remover building foundation. After the excavation was completed to a final depth of approximately 11-12 ft bg, it was backfilled with RCA fill to eliminate the presence of an open excavation pending installation of the drywells and construction of the final parking lot.

Considering the removal of the former "drywell" from the parking lot, the City of Mount Vernon required that a new drywell system be installed in the parking lot. This new drywell was required because the maximum projected stormwater load exceeded the capacity of the stormwater drain pipe which discharges to the main storm sewer located on Oak Street. On November 14, 2008, an area in the center of the parking lot was excavated for the installation of four drywells. The excavation encompassed the area previously excavated in association with the foundation removal activities. The extent of the area excavated is shown in figure 10. The soil and fill excavated in association with the installation of the drywells was segregated; separating the fill material from soil not previously excavated. All material was stockpiled onsite and disposed of offsite as non-hazardous petroleum contaminated soil (based on waste characterization). On November 26, 2008, a total of 205.68 tons (generated in association with drywell installation activities) was taken offsite by Innovative and disposed of at Soil Safe, Inc. - Bridgeport located in Logan Township, New Jersey. Copies of the disposal manifests for the parking lot excavated soil are included in Appendix III on the attached CD. After completing the excavation required for the installation of the drywells, two bottom samples were collected from the area (Parking Lot B-1 and Parking Lot B-2). These endpoint sample locations are shown on figure 9. All endpoint samples were collected in laboratory supplied containers and submitted to the laboratory for analysis of VOCs, SVOCs and total metals.

The drywells were installed and the excavation was backfilled with a minimum of 1 foot of 1 1/2-inch gravel surrounding each drywell to approximately 2 ft bg. The remainder of the parking lot was re-graded with the segregated RCA backfill material and final grade (in preparation for the asphalt) was graded with Item 4 stone. The parking lot was then paved with a 4-inch thick asphalt cap.

5.1.2 Area B

Based on available records, four (4) USTs were historically present beneath the first floor of Area B and nine (9) vaulted ASTs were historically present in the basement of Area B. The four USTs were recorded as being located beneath the concrete slab of the first floor (eastern portion) of Area B while the ASTs were recorded as being located in the basement (western portion) of Area B. The former locations of tanks historically within Area B are presented on figure 5. Past ERM reports state that the four USTs (UST-E, UST-F, UST-G and UST-H) were cleaned out, inspected and abandoned in place after the tanks were filled with inert foam. Eight of the nine ASTs were previously removed (AST-1 through AST-8) from the Site and one AST (AST-9) was left in place because it was used to store fuel oil for the operation of the boilers.

First Floor USTs

On August 23-24, 2006, fourteen GeoProbe borings (GP-1 to GP-14) were drilled in the first floor of Area B. The locations of these GeoProbe borings were selected based on previous environmental reports for the Site and were located in an area assumed to be downgradient of the abandoned USTs. For each GeoProbe boring, continuous soil samples were collected from grade to the boring terminus. All of the soil samples were described on a geologic log and screened with a PID for the presence of VOCs. The soil sample from each boring that exhibited the highest PID headspace-vapor concentration was collected for laboratory analysis. In the absence of headspace-vapor readings, the sample collected closest to the groundwater level was submitted to the laboratory for analysis for VOCs and SVOCs. It should be noted that none of the soil samples screened in the field during the GeoProbe sampling activities exhibited a PID concentration over 20 parts per million (ppm). In addition to the soil sampling, groundwater samples were collected from GP-2, GP-6, GP-9 and GP-12 using temporary piezometers installed in the boring. Groundwater samples were then collected from the piezometers using a peristaltic pump and polyethylene tubing. The groundwater samples were collected in laboratory supplied containers and submitted to the laboratory for analysis for VOCs and SVOCs. The locations of GeoProbe borings are shown on figure 11.

On August 2007 to October 2007, the first floor of Area B was excavated to expose the USTs (UST-E, UST-F, UST-G and UST-H) which were reported as abandoned in-place in ERM reports. The historically documented locations of these USTs in Area B are shown on figure 5.

Following the removal of the concrete slab, the entire area was excavated to expose the abandoned tanks. Based on the excavation activities, it was determined that only three abandoned tanks were present in this area. All three USTs were verified to be 3,000-gallon tanks; contrary to ERM reports stating that UST-E, UST-F and UST-G were 3,500-gallons, 4,000-gallons and 3,000-gallons, respectively. During the tank closure activities, an occupant from an adjacent property stated that he remembered "some time ago" that there was a large tank removed from the area and taken away from the Site. This second hand report provides an explanation why UST-H was not located during the tank closure activities. The USTs that were confirmed to have been abandoned in place (UST-E, UST-F and UST-G) were observed to have been cut open, cleaned and filled with inert foam (as listed in the ERM reports). These tanks were subsequently: cut open to expose the entire inside; the foam was removed from the tanks (and stored in an onsite roll-off dumpster pending offsite disposal); the tanks were removed from their excavations; and the tanks were cut into pieces. Prior to cutting the tanks, they were inspected and observed to be in good condition with no corrosion holes and/or pitting (with the exception of the access holes cut into them by ERM for the abandonment activities). The tank pieces were then taken to Pascap Co., Inc., in Bronx, New York for recycling.

After the tanks were cleaned and removed from the excavations, endpoint confirmation samples were collected. The endpoint confirmation samples consisted of: two bottom samples from beneath each tank excavation (EB-1 and EB-2, FB-1 and FB-2 and GB-1 and GB-2); two west sidewall samples from the UST-E excavation (EW-1 and EW-2); one north sidewall sample from each tank excavation (EN-1, FN-1 and GN-1); one south sidewall sample from each tank excavation (ES-1, FS-1 and GS-1); and, two east sidewall samples from the UST-G excavation (GE-1 and GE-2). The extent of excavation, as well as the sidewall sample locations for Area B, are shown on figure 12. All endpoint samples were submitted to the laboratory for analysis of VOCs, SVOCs and total metals.

After UST-E, UST-F and UST-G were removed, the remainder of the first floor area slab was removed and exploratory test pits were excavated to verify that UST-H was not present in a location other that was listed in historical documents. The entire first floor area was excavated to a depth of approximately 10 feet below grade. The results of the exploratory test-pits revealed that UST-H was no longer present in the subsurface of the first floor of Area B. The extent of the exploratory excavations completed in Area B are shown on figure 13.

The resulting excavations in the first floor of Area B were backfilled with excavated soil (screened in the field) and the entire area was re-graded to approximately one (1) foot below final grade elevation. A total of approximately 100 tons of soil was removed as a result of the re-grading activities. This soil was combined with the topsoil removed from Area C and Area D. Based on waste classification, this soil was disposed offsite as non-hazardous petroleum-impacted soil. From September to December 2007, the excavated Area B/C/D soil was taken offsite by Innovative and disposed at Clean Earth of Carteret, Inc., located in Carteret, New Jersey. Copies of the disposal manifests for the excavated Area B/C/D topsoil are included in Appendix III on the attached CD.

An 8-inch layer of gravel was then placed above the backfilled area. A 2-inch diameter sub-slab passive ventilation pipe was installed within the gravel layer down the center of the room. The location of sub-slab ventilation piping is shown on figure 14. After the gravel layer was leveled, polyethylene sheeting was installed to cover the gravel. The seams were folded and double taped. Lastly, a 4-inch thick concrete slab (reinforced with welded wire mesh) was poured over the polyethylene. Expansion joints were saw-cut into the concrete slab. Following a 28-day cure time, the concrete slab was finished with an epoxy/paint covering. The passive ventilation pipe was piped to the roof of the building along a brick supporting column and vented to the roof. The end of the pipe on the roof was completed with a wind-powered turbine to provide a minimal vacuum on the sub-slab passive ventilation pipe. A diagram of the sub-slab passive vent system is shown on figure 15.

Basement ASTs

To confirm that the subsurface was not negatively impacted by the historical presence of the ASTs in the basement of Area B, several GeoProbe borings were advanced in the historical locations of the tanks. As part of these subsurface sampling activities, both soil and groundwater samples were collected.

On September 6 and 7, 2006, ten GeoProbe borings (GP-AST-1, GP-AST-2, GP-AST-3, GP-AST-4A, GP-AST-4B, GP-AST-5A, GP-AST-5B, GP-AST-6, GP-AST-7 and GP-AST-8) were advanced at locations of the previously removed ASTs. These boring locations are shown on figure 11. Prior to drilling, the area was visually inspected to identify any potential spill areas. No staining was observed on the concrete in the areas where the ASTs were historically located. For each GeoProbe boring, continuous soil samples were collected from grade to the boring terminus. All of the soil samples were described on a geologic log and screened with a PID for the presence of VOCs. The soil sample from each boring that exhibited the highest headspace-vapor concentration was collected for laboratory analysis. In the absence of PID headspace-vapor readings, the sample collected closest to the groundwater level was submitted to the laboratory for analysis for VOCs and SVOCs. Additionally, groundwater samples were collected from GP-AST-1, GP-AST-2, GP-AST-3, GP-AST-6 and GP-AST-7 using temporary piezometers installed in the completed boring. Groundwater samples were then collected from the piezometers using a peristaltic pump and polyethylene tubing. The groundwater samples were collected in laboratory supplied containers and submitted to the laboratory for analysis for VOCs and SVOCs. The groundwater quality laboratory results are included in Appendix X on the Attached CD.

Between November 18 and 30, 2006, closure activities were performed on the remaining AST in Area B (AST-9). AST-9 was a 10,000-gallon single wall steel tank which was most recently used to store fuel oil for the boiler. Prior to closure activities, the area surrounding the tank was sealed off with a polyethylene sheeting barrier and a carbon filtration air ventilation system was set-up for handling vapors. After an access hole was cut into the tank, AST-9 was purged of vapors and cut open, the residual contents of AST-9 were removed, and the interior of the tank was cleaned. After the tank was cleaned it was cut into pieces and removed from the area. For several days during the closure of this tank, NYSDEC representatives were onsite observing the activities. Prior to cutting the tank, it was inspected and observed to be in good condition with no corrosion holes and/or pitting. Additionally, there were no signs of leaking or spills observed beneath and/or surrounding the AST. The contents of the tank were removed and stored in 55-gallon drums for offsite disposal. On February 7, 2007, nine drums of non-hazardous waste (generated from cleaning AST-9, as well as oil soaked sorbents and debris from cleaning tanks UST-D, UST-A, UST-B and UST-10) was taken to Clean Earth of North Jersey in South Kearney, New Jersey for disposal. The USEPA ID Number for the Clean Earth of North Jersey disposal facility is NJD991291105. A copy of the disposal manifest for the above listed waste is included in Appendix III on the attached CD. The cleaned and cut tank pieces were taken to Pascap Co., Inc. in Bronx, New York for recycling.

In addition to the tanks that were recorded as historically being present at the Site, pipes were identified beneath the slab in the boiler room. A pipe was located in an adjacent room to the boiler room and upon inspection it was determined to have residual oil in it. On June 8, 2007, LBG supervised the removal of the residual fuel oil from this pipe with a high vacuum operation. After the residual oil was vacuumed from the pipe, the concrete was removed from this area (boiler room and trench). After the concrete slab was removed, the pipe was traced and it was determined that the pipe stick-up which contained the residual oil was the termination point. This pipe appears to have been connected to the boiler and to one of the ASTs in the basement of Area B.

After the concrete slab was removed from the boiler room, the four pipes which penetrated the northern wall of the boiler room into Area C were uncovered. It was determined that these pipes were historically connected to the USTs beneath the first floor slab in Area B (UST-E, UST-F, UST-G and UST-H). As such, the pipes were removed and on November 16, 2007 a grab soil sample was collected from the pipe trench beneath the piping run (Boiler Room Pipe Trench Bottom) and submitted to the laboratory for analysis of VOCs, SVOCs and total metals. The location of this grab soil sample is shown on figure 11.

On September 10, 2007, a GeoProbe boring (GP-BR-1) was advanced in the boiler room to characterize the soil in this area. The location of this boring is shown on figure 11. For this GeoProbe boring, continuous soil samples were collected from grade to the boring terminus. All of the soil samples were described on a geologic log and screened with a PID for the presence of VOCs. The soil sample that exhibited the highest PID headspace vapor concentration was collected in laboratory supplied containers and submitted to the laboratory for analysis for VOCs and SVOCs. The soil laboratory analysis results are in Appendix VIII on the attached CD.

Following completion of the sampling activities in the boiler room, the excavation was backfilled with clean fill and the entire area was re-graded to approximately one (1) foot below final grade elevation. A 2-inch layer of gravel was then placed above the backfilled area. After the gravel layer was leveled, polyethylene sheeting was installed to cover the top of the gravel. The seams of the polyethylene sheeting were folded and double taped. Lastly, a 4-inch thick concrete slab (reinforced with welded wire mesh) was poured over the polyethylene sheeting.

5.1.3 Area C

Four vaulted ASTs (AST-13, AST-15, AST-16 and AST-19) and one UST (UST-D) were previously identified by ERM as being located in Area C. ERM reports state that the four ASTs (historically located in the vault area under the sidewalk) were cleaned and removed from the Site. Also according to ERM reports, UST-D was abandoned in place because it was in the vicinity of a foundation wall. Additionally, some of the ERM figures showed an additional UST (referred to in this report as UST-W) in the basement of Area C adjacent to the former location of the vaulted ASTs.

LBG performed subsequent tank closure activities within Area C. These activities consisted of: removal of UST-D and collection of endpoint samples from the excavation; tracing of suspect stick-up pipes; subsequent identification of four (4) additional USTs (UST-W, UST-X, UST-Y and UST-Z); removal of UST-W, UST-X, UST-Y and UST-Z; collection of endpoint confirmation samples from the excavations; and attempting to collect closure samples from beneath the slab where the vaulted ASTs were historically located. The former locations of all tanks historically within Area C are shown on figure 6.

In November 2006, UST-D was uncovered and found to be a 4,000-gallon single-wall steel UST, which was contrary to past ERM reports stating that UST-D was a 7,500-gallon UST. The tank was observed to have previously been cut open and abandoned with inert foam; however, the headspace within the UST had elevated VOC readings when screened with the PID. Following waste characterization of the foam and the residual water/sludge from the UST, on December 4, 2006 the waste material was removed from the tank by TradeWinds using a vacuum truck and then transported for disposal offsite. On December 6, 2006, 1,754 gallons of non-hazardous waste were taken to Clean Water of New York in Staten Island, New York for disposal. The USEPA ID Number for the Clean Water of New York disposal facility is NYD000968545. A copy of the disposal manifest is included in Appendix III on the attached CD. After the tank was cleaned it was inspected and observed to be in good condition with no corrosion holes or major pitting. It was then cut into pieces and removed from the excavation. The cleaned and cut tank pieces were taken to Pascap Co., Inc., in Bronx, New York for recycling. After the UST was removed from the excavation, four sidewall endpoint confirmation samples (N-1, S-1, E-1 and W-1) and two bottom endpoint confirmation samples (B-1 and B-2) were collected. The soil samples were screened in the field with a PID. The bottom sample PID concentrations were all below 20 ppm while the sidewall soil sample PID concentrations were all below 225 ppm. The locations and sample depths for the endpoint confirmation soil samples, as well as the extent of the excavation for UST-D are shown on figure 16. The endpoint soil samples were collected in laboratory supplied containers and submitted to the laboratory for analysis for VOCs and SVOCs and total metals.

Based on the results of the utility tracing activities performed on July 3, 2007, a suspect UST was identified in the eastern portion of Area C. As a result of this anomaly, the concrete floor slab and wood floor was removed in this area; exposing the subsurface soils. Based on the waste characterization analytical results for the wood, it was disposed of as hazardous waste due to elevated concentrations of xylenes and lead (F003 [spent non-halogenated solvents] and D008 [lead]). A total of 70 cubic yards of contaminated wood debris/waste was take offsite as hazardous waste for disposal at Stablex Canada, Inc. located in Blainville, Quebec. The USEPA ID Number for the Stablex Canada, Inc. disposal facility is NYD980756415. Copies of the disposal manifests for the contaminated wood are included in Appendix V on the attached CD. The concrete was taken offsite for recycling. Of note, headspace analyses performed on multiple crushed concrete samples showed no observable PID readings.

After removing parts of the concrete slab and wood floor, and upon exposing the subsurface in Area C, it was verified that an UST was present in the area where the anomaly was detected by the utility tracing activities. This tank was subsequently labeled as UST-W. In July 2007, after the tank was exposed, it was revealed that this tank (a 3,000-gallon single-wall steel UST) had been previously closed in place and was filled with clean sand. In preparation for the excavation activities, a polyethylene barrier was erected surrounding the presumed extent of the UST. The sand was then removed from the UST-W. After the tank was cleaned it was inspected and observed to have 4 corrosion holes approximately 1/4-inch in diameter in the tank. It was then cut into pieces and removed from the excavation. The cleaned and cut tank pieces were taken to Pascap Co., Inc., in Bronx, New York for recycling. PID measurements confirmed that there were no VOCs in the sand, which was stockpiled onsite for later reuse as backfill. While UST-W was being excavated, stained, discolored soil was identified along the northeastern sidewall of the tank area (in the location of the piping connection to the tank). This soil was adjacent to a structural supporting column which limited the extent of the excavation. During and after the removal of the UST-W, several soil samples were collected from the excavation and screened for the presence of petroleum components. All soil screened had PID readings below 75 ppm and all endpoint sample PID readings were below 55 ppm. After UST-W was removed and accessible soil was excavated (to the extent possible with the equipment which could fit in the space), endpoint soil samples were collected. Five sidewall and two bottom endpoint confirmation samples were collected. One endpoint sample (WS-2) was collected from adjacent to the structural supporting column where the contamination was observed. All endpoint soil samples were collected in laboratory supplied containers and submitted to the laboratory for analysis for VOCs and SVOCs and total metals.

Following the closure of UST-W, the second anomaly identified in Area C (adjacent to UST-W) was confirmed to be an additional UST (UST-X). This tank was previously unidentified on any historical reports and/or Site documents and was observed to be a 3,000-gallon single-walled steel UST. While UST-W had been previously abandoned in place, UST-X had only had the fill and vent pipes cut and no closure activities had been performed prior to covering the tank with a concrete slab. As such, UST-X was purged of vapors and cut open. After an access hole was cut into the tank, the residual contents of UST-X were removed from the tank and the interior of the tank was cleaned. After the tank was cleaned it was inspected and observed to be in good condition with no corrosion holes or major pitting. It was then cut into pieces and removed from the excavation. The cleaned and cut tank pieces were taken to Pascap Co., Inc., in Bronx, New York for recycling. During and after the removal of the UST-X, several soil samples were collected from the excavation and screened for the presence of petroleum components. The PID readings ranged from 0.0 ppm to 20 ppm, with the exception of the western sidewall area (where the piping was connected to the tank) where the final endpoint PID concentration was 1,350 ppm. Once the UST was cleared from the excavation, six sidewall endpoint confirmation samples (XN-1, XN-2, XS-1, XS-2, XW-1, and XE-1) and two bottom endpoint confirmation samples (XB-1 and XB-2) were collected. The locations and sample depths for the endpoint confirmation soil samples, as well as the extent of the excavation for UST-W, are shown on figure 16. The endpoint soil samples were collected in laboratory supplied containers and submitted to the laboratory for analysis for VOCs and SVOCs and total metals.

Following the closure of UST-W, the excavation was extended to the south upon observing disrupted soil adjacent to the excavation sidewall. Once the excavation was extended, piping associated with another UST was discovered, and further excavation revealed an additional UST (UST-Y) to be present. This tank was previously unidentified on any historical reports and/or Site documents and was observed to be a 3,000-gallon single-walled steel UST. Similar to UST-X, UST-Y had only had the fill and vent pipes cut and no closure activities had been performed prior to covering the tank with a concrete slab. UST-Y had a small amount of residual sludge within it. As such, UST-Y was purged of vapors and cut open. After an access hole was cut into the tank, the residual contents of UST-Y were removed from the tank and the interior of the tank was cleaned. After the tank was cleaned it was inspected and observed to be in good condition with no corrosion holes or major pitting. UST-Y was then cut into pieces and removed from the excavation. The cleaned and cut tank pieces were taken to Pascap Co., Inc., in Bronx, New York for recycling. During and after the removal of the UST-Y, several soil samples were collected from the excavation and screened for the presence of petroleum components. The PID readings for the soil surrounding the tank were all below 40 ppm with the exception of one bottom sample (YB-3) which had a PID concentration of 300 ppm. Once the UST was cleared from the excavation, five sidewall endpoint confirmation samples (YN-1, YN-2, YS-1, YS-2, and YE-1) and three bottom endpoint confirmation samples (YB-1, YB-2 and YB-3) were collected. All endpoint sample locations were approved by the onsite NYSDEC representative (Ms. Kathy Eastman). The locations and sample depths for the endpoint confirmation soil samples, as well as the extent of the excavation for UST-Y, are shown on figure 16. The endpoint soil samples were collected in laboratory supplied containers and submitted to the laboratory for analysis for VOCs and SVOCs and total metals.

Following the closure of UST-Y, the excavation was extended to the south upon observing disrupted soil adjacent to the excavation sidewall. Once the excavation was extended, piping associated with another UST was discovered, and further excavation revealed an additional UST (UST-Z) to be present. This tank was previously unidentified on any historical reports and/or Site documents and was observed to be a 3,000-gallon single-walled steel UST. Similar to UST-X and UST-Y, UST-Z had only had the fill and vent pipes cut and no closure activities had been performed prior to covering the tank with a concrete slab. The soil adjacent to the tank (where the pipes were observed) was visibly contaminated and when screened exhibited PID concentrations ranging from 800 to 1,100 ppm. Additionally, UST-Z had approximately one to two inches of sludge in the bottom. As such, UST-Z was purged of vapors and cut open. After an access hole was cut into the tank, the residual contents of UST-Z were removed from the tank, the interior of the tank was cleaned and the tank was removed from the excavation in one piece. After the tank was removed from the excavation it was inspected and observed to be in good condition with no corrosion holes and only minimal pitting. It was then cut into pieces and removed from the excavation. The cleaned and cut tank pieces were taken to Pascap Co., Inc., in Bronx, New York for recycling. During and after the removal of the UST-Z, several soil samples were collected from the excavation and screened for the presence of VOCs. The PID readings ranged from 0.0 ppm to 1,500 ppm. Once the UST was cleared from the excavation, five sidewall endpoint confirmation samples (ZN-1, ZN-2, ZS-1, ZS-2 and ZW-1) and two bottom endpoint confirmation samples (ZB-1 and ZB-2) were collected. All endpoint sample locations were approved by the onsite NYSDEC representative (Ms. Kathy Eastman). The locations and sample depths for the endpoint confirmation soil samples, as well as the extent of the excavation for UST-Z, are shown on figure 16. The endpoint soil samples were collected in laboratory supplied containers and submitted to the laboratory for analysis for VOCs and SVOCs and total metals.

All accessible contaminated soil, limited to structural footings, was excavated from around UST-W, UST-X, UST-Y and UST-Z. This soil (approximately 5 cubic yards) was stockpiled in the Area D commercial space, was characterized and was then subsequently disposed as hazardous waste along with the soil excavated from the Area D hot spot excavation.

In September 2007, during the closure activities for UST-W, UST-X, UST-Y and UST-Z, the vaulted area beneath the sidewalk and North West Street was accessed. The vault was filled with refuse and was subsequently cleared out and additional access areas were opened (cinder block walls were removed). After the vault was cleaned out, the floor and walls were visually inspected. Based on this inspection, no areas of staining were observed in or around the areas where the vaulted ASTs were historically located. On September 10, 2007, soil borings were attempted through the concrete slab where the vaulted ASTs (AST-13, AST-15, AST-16 and AST-19) were historically located. The borings were attempted with a limited-access track-mounted GeoProbe rig; however, in each of the four locations (GP-AST13, GP-AST15 GP-AST16 and GP-AST19), refusal was encountered within the first 1 to 3 feet of the boring. Figure 17 shows the location of GeoProbe borings in Area C. Throughout the vaulted area, the concrete slab thickness and hardness prevented the GeoProbe rig from penetrating the slab and reaching the subsurface soils. No soil and/or groundwater samples could be collected for analysis; the concrete slab in this area was observed to be in good condition with no evidence of spills and/or gross contamination.

Following the removal of the remainder of the concrete floor and wood floor in the main section of Area C, an attempt was also made to remove the concrete slab from the vault area using excavating equipment. The concrete was removed from the vault area where possible (in some cases the concrete was approximately 2 to 3 feet thick); however, the majority of the slab could not be removed. All underlying soil that was exposed and crushed concrete was screened with a PID. No elevated PID readings were identified in the headspace from crushed concrete and/or the underlying soil (where it was accessible) from this area where the former ASTs were located. All apparent subsurface impacts in the area near the historical locations of the vaulted ASTs could be attributed to the adjacent USTs (UST-W, UST-X, UST-Y and UST-Z). Based on the field observations and the thickness of the concrete in this area, the ASTs historically located in the vault area have not impacted the subsurface soil and/or groundwater.

Following the tank closure activities, the tank excavations were backfilled with clean fill that was compacted on 1-foot lifts. After backfilling the excavations, the remainder of the concrete in Area C (east of the dividing wall which runs along the western side of the elevator) was broken apart using excavators and track-mounted breakers and removed from the Site. The concrete was taken offsite for recycling. Headspace analyses performed on multiple crushed concrete samples showed no observable PID readings. After the concrete was removed, the top layer of soil (approximately 2 feet thick) was excavated from the entire area. Additionally, multiple exploratory excavations were completed throughout Area C to determine if additional USTs were present. The extent of the excavation activities performed in Area C area are shown on figure 18. All excavated topsoil was temporarily stockpiled in the Area D commercial space pending waste classification and offsite disposal. A total of 702.04 tons of soil was removed as a result of the re-grading activities (which included approximately 100 tons of soil generated from the Area B UST excavation). Based on waste classification, this soil was disposed offsite as non-hazardous petroleum impacted soil. From September to December 2007, the excavated Area B/C/D topsoil was taken offsite by Innovative and disposed at Clean Earth of Carteret, Inc. located in Carteret, New Jersey. Copies of the disposal manifests for the excavated Area B/C/D top layer of soil are included in Appendix III on the attached CD.

After all of the top layer of soil in Area C was excavated and the area re-graded to approximately 16 inches below final grade elevation, a 12-inch layer of washed 3/4-inch gravel was then added above the backfilled area. Six (6) 2-inch diameter passive sub-slab ventilation pipes were installed within the gravel layer down the center of the room. The locations of these passive sub-slab depressurization pipes are shown on figure 14. After the gravel layer was leveled, polyethylene sheeting was placed to cover the top of the gravel. The polyethylene seams were folded and double taped. A 4-inch thick concrete slab (reinforced with welded wire mesh) was poured in the area. Expansion joints were installed/saw-cut in the concrete slab.

5.1.4 Area D

5.1.4.1 Alley

Historical ERM investigations identified three USTs (UST-A, UST-B and UST-10) located in the alley of Area D. ERM reports state that UST-A and UST-B were left in place at the Site as they were used for storm-water control during heavy rain events. UST-10 was identified as being historically used for storage of waste solvents. ERM reports state that this tank was cleaned, filled with inert foam and abandoned in place. The former locations of all tanks historically within Area D are shown on figure 7.

During the winter 2006-2007, LBG performed subsequent tank closure activities in the alleyway consisting of removal of UST-A, UST-B and UST-10. The concrete throughout the alleyway (the majority of which was 1-foot thick and reinforced with rebar) was broken apart and taken offsite for recycling. Of note, headspace analyses performed on multiple crushed concrete samples showed no detectable PID readings.

After the concrete was removed, UST-A and UST-B were uncovered and were both observed to be 3,500-gallon single-wall steel USTs. The tops of both UST-A and UST-B were exposed and both tanks were observed to be intact (not previously abandoned). Both tanks contained water. The associated fill and vent pipes were cut off adjacent to each tank. Additionally, neither UST-A or UST-B were connected to the storm-water drains at the entrance to the alleyway.

Both tanks contained water and sludge. Both UST-A and UST-B were purged of vapors and cut open. Once they were cut open, it was revealed that both tanks contained residual sludge/still bottoms (presumably from past manufacturing activities) much of which appeared to be hardened paint and varnish. After an access hole was cut into each tank, the residual contents were removed from both tanks and the interiors of both tanks were cleaned. All of the residual sludge were stored in 55-gallon steel drums for offsite disposal. After the tanks were cleaned they were inspected and observed to be in good condition with no corrosion holes or major pitting. Each UST was then cut into pieces and removed from the excavation. The cleaned and cut tank pieces were taken to Pascap Co., Inc., in Bronx, New York for recycling. At the request of the NYSDEC, the waste generated from each tank was characterized separately. The UST-A waste contaminants consisted of VOCs including benzene, toluene, ethylbenzene, xylenes (BTEX), as well as n-propylbenzene, 1,2,4-trimethylbenzene, 1,3,5-trimethylbenzene, sec-butylbenzene, tert-butylbenzene and 4-isopropyltoluene. UST-B contained the same contaminants (at higher concentrations) and also contained methylene chloride and several SVOCs (naphthalene, 2-methylnaphthalene, di-n-butyl phthalate and bis(2-ethylhexyl)phthalate). Copies of the analytical reports are included in Appendix VI on the attached CD.

During and after the removal of UST-A, several soil samples were collected from the excavation and screened for the presence of VOCs. Following the removal of UST-A, the excavation extent was limited by the building to the south and east. Three sidewall endpoint confirmation samples (N-1, S-1 and W-1) and two bottom endpoint confirmation samples (B-1 and B-2) were collected. The locations of these endpoint confirmation samples are shown on figure 19. The endpoint soil samples were collected in laboratory supplied containers and submitted to the laboratory for analysis for VOCs and SVOCs and total metals. After the endpoint confirmation samples were collected, the excavation was backfilled with clean fill (compacted on 1-foot lifts) to stabilize the area to ensure the building foundation was not impacted/undermined.

Ms. Kathy Eastman, Project Manager for the NYSDEC, was onsite during the cleaning and removal of UST-B. During and after the removal of UST-B, several soil samples were collected from the excavation and screened for the presence of VOCs. The PID readings from screening the UST-B excavation were all 0.0 ppm. Once UST-B was removed from the excavation, four sidewall endpoint confirmation samples (north sidewall, south sidewall east sidewall and west sidewall) and three bottom endpoint confirmation samples (Bottom 1, Bottom 2 and Bottom 3) were collected. The locations of these endpoint confirmation samples are shown on figure 19. The endpoint soil samples were collected in laboratory supplied containers and submitted to the laboratory for analysis for VOCs and SVOCs and total metals. After the endpoint confirmation samples were collected, the excavation was backfilled with clean fill (compacted on 1-foot lifts) to stabilize the area to ensure the building foundation was not impacted/undermined.

UST-10, a 10,000-gallon single-wall tank, was abandoned onsite and filled with an inert foam. After UST-10 was uncovered and cut open a sample of the foam was collected in a laboratory supplied container and submitted to the laboratory for waste characterization analysis. The foam (contaminated with VOCs) was subsequently removed from UST-10 and disposed of offsite prior to removing the tank. Approximately 20 cubic yards of waste foam was transported to Republic Environmental in Hatfield, Pennsylvania for disposal. After the foam was removed from the tank, 437 gallons of contaminated water were also evacuated from the tank. This water (non-hazardous waste based on laboratory analysis) was transported offsite and disposed at Clean Water located at 3249 Richmond Terrace in Staten Island, New York. Copies of the disposal manifests for the UST-10 foam and waste water are included in Appendix III on the attached CD.

After the foam was removed from the tank, the interior was cleaned. Once cleaned, the tank was inspected and observed to be in good condition with no corrosion holes or major pitting. It was then cut into pieces and removed from the excavation. The cleaned and cut tank pieces were taken to Pascap Co., Inc., in Bronx, New York for recycling.

During and after the removal of UST-10, several soil samples were collected from the excavation and screened for the presence of VOCs. The PID readings ranged from 0.0 ppm to 10 ppm. All endpoint confirmation soil samples screened in the field had PID concentrations of 0.0 ppm with the exceptions of B-1 and B-2, which had PID concentrations of 0.5 ppm and 0.6 ppm, respectively. The excavation extent of UST-10 was limited by the building to the east and the retaining wall to the west. After the excavation was completed, seven sidewall endpoint confirmation samples (NS-1, NS-2, NS-3, SS-1, SS-2, SS-3 and ES-1) and five bottom endpoint confirmation samples (B-1, B-2, B-3, B-4 and B-5) were collected. The locations of these endpoint confirmation samples are shown on figure 19. No sidewall soil sample was collected on the side adjacent to UST-B because the soil between the two tanks was removed to facilitate the excavation activities. The endpoint soil samples were collected in laboratory supplied containers and submitted to the laboratory for analysis for VOCs and SVOCs and total metals. After the endpoint confirmation samples were collected, the excavation was backfilled with clean fill (compacted on 1-foot lifts) to stabilize the area to ensure the building foundation was not impacted/undermined.

Following removal of the USTs from the alley area, and in addition to the endpoint confirmation samples, soil and groundwater samples were collected from the area of each tank. This confirmation sampling consisted of drilling GeoProbe soil borings at the approximate center of the former location of the USTs. The locations of these GeoProbe borings are shown on figure 20. For each GeoProbe boring location, soil samples were collected (for submission to the laboratory for analysis) from the following depths within the boring: one from approximately 12 to 16 ft bg which was the estimated position below the bottom of each tank and one from the termination point of the boring (refusal). Additionally, two groundwater samples were collected from each boring; one from the water table and one from the termination of the boring. These soil and groundwater samples were submitted to laboratory for analysis for VOCs, SVOCs and total metals.

The sludge cleaned from UST-A, UST-B and UST-10 was stored in steel 55-gallon drums pending offsite disposal. A total of nine (9) 55-gallon drums of sludge were generated during the closure of these USTs. Samples of the waste generated from the tank closure activities were submitted to AMRO for waste classification. Based on the analytical results of the waste, it was disposed of as hazardous waste due to elevated concentrations of xylenes, 1,2,4-trimethylbenzene and 1,3,5-trimethylbenzene (F003, F005 [spent solvent waste]). Following receipt of the laboratory analysis, the waste was removed from the Site by Innovative

Recycling Technologies, Inc. (Innovative) of Lindenhurst, New York. On June 22, 2007, the waste was transported and disposed under the Site's USEPA ID Number NYD056301971. The waste was disposed as hazardous soil based on the laboratory analysis. The waste was disposed of at Chemtron under their disposal facility USEPA ID Number of OHD066060609. Copies of the disposal manifests for the waste are included in Appendix V on the attached CD.

In 2008, during the excavation activities performed in the Area D (former commercial space), suspected fill pipes and vent pipes were discovered running along the western wall of the commercial space (see Commercial Space and Adjacent Room section below). The concrete floor for the former remediation room in the alleyway was jack-hammered to allow access to the subsurface. Once the concrete was removed, the soil was dug out by hand and the top of an additional tank was discovered (heretofore referred to as UST-U). This tank was observed to be a 3,000-gallon single-wall steel UST. The former location of UST-U is shown on figure 7. Because this tank was located beneath the former remediation room, the room had to be demolished to remove the tank. This situation presented a logistical problem as the south wall of the room served as a structural support for the fire escape serving the 2nd and 3rd floors of the building. A temporary brace was installed to support the fire escape while UST-U was removed. Following the removal of the former remediation room and the remaining concrete slab, UST-U was uncovered. While uncovering UST-U, another UST was discovered adjacent to the north. This tank (referred to as UST-T) was located beneath the bathroom connected to the southwest corner of the commercial space. The former location of UST-T is shown on figure 7. On May 22, 2008, a vacuum truck operated by TradeWinds was used to remove 789 gallons of contaminated water and waste oil from UST-T and UST-U. Based on the analytical results of the waste, it was disposed of as hazardous waste due to residual material detected in UST-U (D001 [mineral spirits]). The waste was disposed as hazardous waste at Norlite Corporation of Cohoes, New York under their disposal facility USEPA ID Number of NYD080469935. A copy of the disposal manifest for the waste is included in Appendix V on the attached CD.

Because tanks UST-T and UST-U were not able to be immediately removed from the subsurface (due to the continued presence of the fire escape), the access ports collected rainwater as a result of a subsequent storm event. Again on June 16, 2008, a vacuum truck operated by TradeWinds was used to remove 522 gallons of contaminated rainwater from UST-T and UST-U.

On June 17, 2008, UST-U was removed from the excavation and verified to be a 3,000-gallon single-wall steel UST. UST-U was inspected and observed to be in good condition with no corrosion holes or major pitting. UST-U was then cut open, revealing that the tank contained residual material presumably from past manufacturing activities; much of which appeared to be hardened paint and varnish. After an access hole was cut into the tank, the residual contents were removed from the tank and the interior was cleaned. A total of three drums of tank sludge and one drum of tank bottoms were cleaned out of UST-U. Based on the nature of the hardened varnish, it was not able to be removed from the tank interior by hand. As such, the tank was cut open and the material was scraped off of the interior of the tank using the excavator. Six drums of dried product were scraped from the interior of UST-U. All of the residual waste from UST-U was stored in ten 55-gallon steel drums for offsite disposal. On November 6, 2008, the ten drums of waste generated from the cleaning of UST-U were disposed as hazardous waste based on the laboratory analysis (D018 [benzene] and F002, F003 and F005 [spent solvent waste]). The waste was disposed at Chemtron under their disposal facility USEPA ID Number of OHD066060609. A copy of the disposal manifest for the waste is included in Appendix V on the attached CD.

After UST-U was removed from the excavation, the excavator was able to be positioned so that UST-T could be pulled from beneath the bathroom wall. On June 20, 2008, UST-T was removed from beneath the bathroom and observed to be an approximately 500-gallon single-wall riveted steel UST. UST-T was then cut open, revealing that the tank contained residual sludge/tank bottoms. After an access hole was cut into the tank, the residual contents were removed from the tank and the interior was cleaned. A total of two 55-gallon steel drums of sludge/tank bottoms were cleaned out of UST-T. On November 6, 2008, the two drums of waste generated from the cleaning of UST-T were disposed as hazardous waste due to elevated concentrations of toluene and xylenes as shown in the laboratory analysis (D018 [benzene] and F002, F003 and F005 [spent solvent waste]). The waste was disposed at Chemtron under their disposal facility USEPA ID Number of OHD066060609. A copy of the disposal manifest for the waste is included in Appendix V on the attached CD.

After both UST-U and UST-T were removed, contaminated soil was observed adjacent and beneath both tanks. As such, soil was excavated as far as possible without undermining the building foundations. Five sidewall endpoint confirmation samples (AT-1, AT-2, AT-3, AT-4 and AT-5) were collected, all of which had PID readings of 0.0 ppm. The bottom of the excavation was visibly impacted with red and purple stained soil. As such, the excavation was benched down to facilitate reaching the maximum depth of the excavation. Soil was screened continuously with a PID, with PID readings ranging from approximately 1,000 ppm to 5,000 ppm. All excavated soil was stockpiled in the commercial space (on poly sheeting) pending offsite disposal. After reaching a total depth of 13 feet below grade (approximate elevation of the groundwater table), bottom endpoint confirmation samples (AT-6, AT-7, AT-8 and AT-9) were collected. The locations of these endpoint confirmation samples are shown on figure 19. The endpoint soil samples were collected in laboratory supplied containers and submitted to the laboratory for analysis for VOCs, SVOCs and total metals. After the endpoint confirmation samples were collected, the excavation was backfilled with clean fill (compacted at 1-foot lifts) to stabilize the area and to ensure that the building foundation was not impacted or undermined.

On July 25, 2008, 95.22 tons of soil removed from the UST-U and UST-T excavation were disposed offsite as hazardous waste due to elevated concentrations of toluene and xylenes (D001 [mineral spirits]). The waste soil was disposed at Chemtron under their disposal facility USEPA ID Number of OHD066060609. Copies of the disposal manifests for the waste are included in Appendix V on the attached CD. After both tanks were cleaned they were inspected and observed to be in good condition with no corrosion holes or major pitting. The cleaned and cut tank pieces were taken to Pascap Co., Inc. in Bronx, New York for recycling.

Following the tank closure activities, the temporary brace was replaced with a permanent fire escape structural support. A plan showing the extent of the temporary brace as well as the permanent fire escape structural support is shown on figure 21.

5.1.4.2 Commercial Space and Adjacent Room

Hot Spot Excavation

After the concrete slab/wood floor was broken and removed from Area C, the same activity was performed in Area D to provide access to the subsurface. The primary reason for this activity was to facilitate the performance of exploratory trenching to determine if previously unidentified USTs were present and, if so, if they were active sources impacting the subsurface.

On October 22, 2007, following the removal of the overlying concrete slab, soil excavation was completed in the room adjacent to the commercial space (the southern portion of Area D). No additional USTs were located in this room. Following the exploratory trenching, preparations were made to excavate the grossly contaminated soil in this area. The excavation activities were performed in this area based on the evaluation of historical fluid level measurements. These measurements revealed that the free-phase product was localized in this area (southern portion of Area D). As such, it was suspected that an unidentified tank may be present in the subsurface in this area. Additionally, this is the area where past product removal efforts performed by ERM were unsuccessful due to the high viscosity of the product. Considering all of these factors, this excavation (referred to as the "hot spot' excavation) was performed in the area where the greatest thicknesses of free-phase product (NAPL) had been historically observed (in the area of the former product delineation well DW-13D, see figure 22).

After several feet of overlying soil (which was not was not impacted based on field screening) was excavated from the area, the excavation of hot spot soil was performed. At approximately 10 ft bg, visually impacted soil was encountered within the excavation. All soil from 10 ft bg to the termination of the excavation at approximately 18 ft bg was segregated from other soil onsite and stockpiled in the commercial space (on poly sheeting). A total of 129.015 metric tons of hazardous contaminated soil was removed and disposed offsite in association with the "hot spot" excavation. Of note, much of the soil removed from this excavation was saturated with free-phase product (NAPL). This NAPL was the polyurethane previously documented in the area. The excavation was expanded laterally to the limitations of the excavating equipment and/or the presence of building structural components. A replacement groundwater/product extraction well (EW-1D) was installed in the center of the completed excavation and the resulting excavation was backfilled with washed gravel to approximately 2 to 3 feet above the top of screen around the riser pipe. The gravel was then covered with a polyethylene liner and the resulting excavation was re-graded with clean soil (originally from the same area from approximately 1 to 5 ft bg). A final one-foot layer of pea gravel was installed to 4 inches below grade and the sub-slab piping (from Area C as well as this room) was trenched to the commercial space. The pea gravel was covered with a polyethylene liner that was overlapped and taped at all seams, and then a 4-inch thick concrete slab was poured over the liner.

Commercial Space Excavation

Historical ERM investigations identified UST-34, UST-35, UST-36 and UST-C within the commercial space of Area D. These USTs (4,000-gallon, 4,000-gallon, 4,000-gallon and 1,500-gallon respectively) were found by ERM to contain fluids and sludge. After the fluids and sludge were removed, the tanks were cut open and disposed offsite. Approximately 30 cubic yards of contaminated soils were removed from this area as part of the ERM tank closure activities. The locations of these tanks are shown on figure 7. No additional work was reported to have been done to address residual soil contamination in this area by ERM.

Considering the lack of closure documentation for UST-34, UST-35, UST-36 and UST-C, LBG conducted a subsurface investigation and collected soil and groundwater samples at the location of these tanks. The confirmation sampling consisted of performing GeoProbe soil borings at the approximate center of the former location of the USTs. For each GeoProbe boring, continuous soil samples were collected from grade to the boring terminus. For each GeoProbe boring location, soil samples were collected (for submission to the laboratory) from the following depths within the boring: one from approximately 0 to 2 feet below the estimated elevation of the bottom of the tank and one from the location where the highest PID reading was obtained. Additionally, two groundwater samples were collected from each boring; one from the water table and one from the termination of the boring. These samples were submitted to laboratory for analysis for VOCs, SVOCs and total metals. Laboratory analytical results of the LBG GeoProbe tank closure samples for UST-34, UST-35, UST-36 and UST-C indicated that soil and groundwater in the area contained concentrations of VOCs and total metals exceeding the applicable NYSDEC standards. As such, the concrete slab was removed from the commercial space of Area D to provide access to the subsurface for excavation of contaminated soil.

Following the removal of the concrete slab, exploratory trenching was performed to determine if any tanks (listed as previously removed or unidentified) were present in the area. During these excavation activities, a previously undiscovered UST (referred as UST-V) was discovered along the southern wall of the commercial space. UST-V was observed to be an "old" (based on riveted construction) 275-gallon steel tank. On January 9, 2008, UST-V was removed from the Area D commercial space and verified to be a 275-gallon single-wall riveted steel UST. The tank was in good condition with no visual corrosion holes or pitting. UST-V was then cut open, revealing that the tank contained residual sludge/tank bottoms. After an access hole was cut into the tank, the residual contents were removed from the tank and the interior was cleaned. A total of one 55-gallon drum of waste was removed from UST-V. After UST-V was removed from the excavation, the soil surrounding the tank was excavated to the maximum extent possible (limited based on the building foundation). The UST excavation was then backfilled with clean fill (compacted on 1-foot lifts) to prevent undermining of the foundation wall. On November 6, 2008, one drum of waste generated from the cleaning of UST-V was disposed as hazardous based on the laboratory analysis (D018 [benzene] and F002, F003 and F005 [spent solvent waste]). The waste was disposed at Chemtron under their disposal facility USEPA ID Number of OHD066060609. A copy of the disposal manifest for the waste is included in Appendix V on the attached CD.

Following the removal of UST-V, the soil excavation was expanded to remove all accessible contaminated soil from the subsurface beneath the historical locations of UST-34, UST-35, UST-36 and UST-C. The extent of the excavation, as well as the location of the endpoint confirmation soil samples, is shown as figure 23. The extent of the excavation was limited by the presence of the building foundations (south and west) and by the confined space which limited the size of the excavator. As shown on figure 23, the excavation was completed to a depth of approximately 13 ft bg.

A total of 1,128.20 tons of contaminated soil was excavated from the subsurface in the area beneath/surrounding the former locations of UST-34, UST-35, UST-36 and UST-C and disposed as non-hazardous petroleum contaminated soil (based on laboratory analysis). As a result of the excavation activities, several of the product delineation wells previously installed in the commercial space by ERM (DW-4D, DW-5D, DW-6D, DW-7D, DW-8D, DW-9D and DW-10D) and monitor well MW-4D were destroyed. Two replacement delineation wells (R-4D and R-5D) were installed in the commercial space to provide future groundwater characterization information.

All soil excavated from the Area D commercial space was taken offsite under manifest by Innovative and disposed at Soil Safe, Inc. - Bridgeport located in Logan Township, New Jersey. Copies of the disposal manifests for the parking lot excavated soil are included in Appendix III on the attached CD. Upon reaching the limits of excavation, PID readings during the field screening of <50.0 ppm or physical obstructions), the excavation was terminated. Excavation endpoint confirmation samples were collected from the termination points of the excavation and submitted to the laboratory for analysis for VOCs, SVOCs and total metals. The extent of the excavation, as well as the locations of the endpoint confirmation samples, are shown on figure 23.

Following the completion of soil removal activities, the resulting excavation was backfilled with clean 1/2 inch highly permeable pea stone compacted on 1-foot lifts. This material was selected to facilitate future sub-slab depressurization activities as well as the application of a chemical oxidization compound (for a pilot test and for potential future application events). The purpose of chemical oxidation application is to enhance in-situ remediation of the residual contamination. The groundwater monitor wells, product delineation wells and soil-vapor extraction well present in the area will also facilitate future applications of the chemical oxidization compound if deemed to be effective.

5.2 Chemical Oxidation Application Area D Excavation

Following the tank closure activities in the Area D commercial space, LBG performed a field pilot study to determine the Site feasibility for the use of chemical oxidization technology to remediate soil and groundwater contamination. The Chemical Oxidation Application activities in the Area D excavation were performed according to the work plan submitted to the NYSDEC in July 2008.

The objectives of the Chemical Oxidation Application activities were:

- to determine the effect of the chemical oxidization compound applied to the subsurface, as facilitated by a former excavation backfilled with more permeable material; and,
- to monitor the chemical oxidization efficiency for reducing concentrations of dissolved phase VOCs in the groundwater, as determined by quarterly groundwater monitoring.

The selected chemical oxidant used was RegenOx™. RegenOx™ (manufactured by Regenesis [http://www.regenesis.com/products/chemOx/regenOx/]) is an advanced chemical oxidation technology that destroys contaminants through powerful, yet controlled chemical reactions and not through biological means. This product maximizes in-situ performance while using a solid alkaline oxidant that employs a sodium percarbonate complex with a multi-part catalytic formula. RegenOx™ directly oxidizes contaminants while its unique catalytic component generates a range of highly oxidizing free radicals that rapidly and effectively destroy a range of target contaminants.

The RegenOx™ application is designed to remove significant amounts of contamination from the subsurface. The application process enables the two part (Part A and Part B) product to be combined just prior to use. Part A is the oxidizer powder and Part B is the liquid activator. Part A consists of a mixture of sodium percarbonate [$2Na_2CO_3$- $3H_2O_2$], sodium carbonate [Na_2CO_3], sodium silicate and silica gel. Part B consists of a mixture of sodium silicate solution, silica gel and ferrous sulfate. Both parts of the product were packaged and shipped to the Site in 30 lb. 5-gallon PVC buckets (approximately 3 gallons of material per bucket).

Two typical application methods may be employed at the Site: direct application to an exposed surface of a soil excavation and direct-injection techniques (into existing wells onsite). The first application method, direct application to the completed excavation, was employed at the Site in the Area D commercial space. RegenOx™ was applied to the completed excavation area to target the impacted groundwater beneath the source area. As previously stated, the excavation was backfilled with clean 1/2-inch highly permeable pea stone. This material was selected to allow the RegenOx™ solution to percolate directly to the water table during the application activities. Volume and density application rates for RegenOx™ were based on the manufacturer's recommendations. A RegenOx™ Summary Page outlining the summary of the RegenOx™ totals (recommended dosage rates) provided by the manufacturer is included in Appendix VII on the attached CD.

The application was performed from October 14 to 18, 2008. The application activities consisted of mixing a total of 4,020 pounds of the two part RegenOx™ with water at a mix ratio of 30 pounds of Part A and 30 pounds of Part B to 60 gallons of water to create a 5% solution as per the manufacturer's recommendation. The solution was mixed between 30 to 60 minutes to dissolve all of the Parts A and B and to ensure all material was mixed into solution. The RegenOx™ applications were applied to three trenches in the southwest corner of the Area D commercial space. The locations of the application trenches are shown on figure 24. Future groundwater monitoring rounds will be used to evaluate the effectiveness of the chemical oxidation applications for in-situ remediation.

A second application method would involve using direct-injection techniques into existing onsite wells. The injection method of RegenOx™ may be performed at the Site after evaluation of the data collected from groundwater monitoring subsequent to the first application and the effectiveness of the first application is evaluated.

6.0 NATURE AND EXTENT OF SOIL CONTAMINATION

6.1 Area A (Including Parking Lot)

Based on remedial investigation activities conducted in 2007 and 2008, subsurface soil quality was characterized in Area A. The soil samples collected from GeoProbe drilling in conjunction with LBG USTs closure activities for the previously removed USTs were used to evaluate soil quality in Area A. Closure sampling for UST-P, sampling of the former drywell located in the southwest corner of the parking lot, installation of additional delineation well DW-4, sampling following the exploratory excavation activities in the existing parking area, and collection of bottom samples following the excavation activities for the installation of the required replacement drywells were also used to define soil quality. The locations of soil sample(s) submitted for laboratory analysis based on the highest observed PID reading and/or the most visibly contaminated sample at a sampling location in Area A are presented in figures 8 and 9.

6.1.1 Volatile Organic Compounds (VOCs)

Initially, the highest concentrations of VOCs in Area A were detected at the GP-Dry Well sampling location. This soil sample, collected from 22 to 26 ft bg, exhibited concentrations of toluene (17,000 ug/kg), xylenes (7,400 ug/kg) and 1,2,4-trimethylbenzene (21,000 ug/kg).

The initial sampling prompted additional investigation activities for the former dry well. The resulting investigation identified UST-P; which was removed as an IRM during this RIWP. After the removal of UST-P, the highest level of VOC contamination detected in Area A was in the soil samples collected from the two bottom endpoint confirmation samples (B-1 and B-2), with elevated VOCs also detected in the south sidewall endpoint confirmation sample (S-1). UST-P endpoints B-1, B-2 and S-1 all had toluene concentrations exceeding Part 375 Protection of Groundwater Restricted Use Soil Clean-up Objectives (RUSCOs), with the highest concentration (65,000 ug/kg) detected in B-2 at 10 ft bg. The B-2 endpoint sample location is adjacent to where the GP-Dry Well boring was previously advanced. The only other VOC detected above Part 375 Protection of Groundwater RUSCOs was in the UST-P endpoint samples was benzene, which was detected at a concentration of 220 ug/kg in the S-1 sidewall sample.

The two soil samples Parking Lot B-1 and Parking Lot B-2, which were collected from the bottom of the excavation in the center of the parking lot, had concentrations of VOCs exceeding Part 375 Protection of Groundwater RUSCOs. Parking Lot B-1 contained acetone (2,100 ug/kg), benzene (350 ug/kg), toluene (11,000 ug/kg) and methylene chloride (7,600 ug/kg) in concentrations exceeding Part 375 Protection of Groundwater RUSCOs. Parking Lot B-2 contained benzene (71 ug/kg), toluene (2,700 ug/kg) and methylene chloride (480 ug/kg) in concentrations exceeding Part 375 Protection of Groundwater RUSCOs.

Methylene chloride was detected at concentrations exceeding Part 375 Protection of Groundwater RUSCOs in GP-1A to GP-6A, GP-UST-PR-1 and GP-UST-PR-3. Additional VOCs detected above Part 375 Protection of Groundwater RUSCOs included GeoProbe soil sample GP-UST-PR-3 (10 to 15 ft bg), which had elevated concentrations of benzene and toluene; GP-UST-PR-3 (35 to 39.5 ft bg) which had acetone and GP-4A (4 to 8 ft bg), which had a concentration of methylene chloride of 120 ug/kg. The only other VOC detected above Part 375 Protection of Groundwater RUSCOs was PCE which was detected in the GP-4A sample (4 to 8 ft bg). The remainder of the samples collected had no VOC concentrations exceeding Part 375 Protection of Groundwater RUSCOs.

The soil sample collected from delineation well DW-4A showed no detectable VOCs. This soil sample, which was collected during the installation of this well, was used to laterally delineate the onsite contamination on the southern perimeter of the Site.

Another area where no detectable VOCs were observed included the samples OTB-1 and OTB-2 which were collected from beneath approximately 12 ft bg in the former location of tanks UST-1A to UST-6A. Summary tables for VOCs detected in soil for Area A are presented on tables 1 to 4.

Figure 25 presents the distribution of total VOCs detected in soil samples collected from Area A. As a result of this distribution of soil contamination in Area A, the excavation and resulting soil disposal activities were focused on the center of the parking lot as well as the southwest corner (the removal of UST-P and the former drywell). A total of 722.17 tons of non-hazardous soil was excavated from Area A and disposed offsite at an approved and licensed disposal facility. Excavation extents were limited due to the presence of the building foundations. It should be noted that all VOC concentrations in Area A were below Part 375 Protection of Public Health (Commercial) Restricted Use Soil Cleanup Objectives.

6.1.2 Semivolatile Organic Compounds (SVOC)

The only SVOCs detected in Area A soils consisted of benzo(a)anthracene, chrysene, benzo(b)fluoranthene, benzo(k)fluoraenthene and benzo(a)pyrene. The soil samples where these concentrations exceeded Part 375 RUSCOs were all from the shallow depths of 4 to 8 ft bg. This contamination may be attributed to the fill material previously placed beneath the asphalt which consisted of primarily ash and waste demolition debris. Subsequently, the area where there was the highest concentration of SVOCs exceeding Part 375 RUSCOs (the former location of tanks UST-1A to UST-6A) was later excavated to a depth of approximately 12 ft bg during the exploratory excavation activities in the Area A parking lot (former paint remover building) and the installation of the replacement drywells. The resulting endpoint confirmation sample OTB-1 contained no detectable concentrations of SVOCs while OTB-2 showed significantly reduced SVOC concentrations.

The above listed SVOCs were also detected in the endpoint confirmation samples collected from the UST-P excavation, the former dry well excavation bottom (DWB-1), as well as the confirmation closure samples collected for previously removed tanks UST-10 and UST-11 (samples GP-UST PR-1 and GP-UST PR-2).

All other soil samples collected from Area A had SVOCs at concentrations below the Part 375 RUSCOs, including DW-4A (35 ft bg) along the southern property boundary.

The elevated SVOC concentrations in the subsurface may be attributed the historical operations at the Site. Polycyclic aromatic hydrocarbons (PAHs), specifically those detected in Area A, are associated with coal combustion. Assuming that the ash and debris used as backfill on the Site was from the historical operations at the Site (a former bakery) or imported to the Site, then this would explain the elevated SVOC concentrations in the soil. Additionally, the removal of the fill material overlying the native soil should be an effective remedy against additional SVOCs leaching into the subsurface native soils. A summary of SVOCs detected in soil samples collected from Area A is listed on tables 5 to 8.

6.1.3 Metals

Total metals analysis performed on the GeoProbe confirmation soil samples collected from Area A show elevated concentrations (exceeding Part 375 RUSCOs) of lead and mercury in only 2 samples. These compounds exceeded Part 375 RUSCOs for soil samples: GP-4A (4 to 8 ft bg) [lead at 870 mg/kg], and GP-6A (12 to 16 ft bg) [mercury at 1.17 mg/kg].

Total metals analysis performed on Area A excavation endpoint samples showed elevated concentrations (exceeding Part 375 RUSCOs) of arsenic and lead in only 3 confirmation soil samples. These compounds exceeded Part 375 RUSCOs for soil samples: B-1 (10 ft bg) [arsenic at 20.8 mg/kg]; B-2 (10 ft bg) [arsenic at 17.9 mg/kg]; and, Parking Lot B-2 (11 ft bg) [lead at 824 mg/kg]. This fill material was excavated (down to native soil) from the parking lot area. These elevated metals concentrations are attributed to the fill material previously present in the subsurface. However; the elevated metals concentrations in the subsurface may also be attributed to regional site background concentrations resulting from the surrounding area.

Soil quality data for metal concentrations for Area A are presented on tables 9 to 12.

Additionally, copies of the Category B Deliverables laboratory analytical reports are presented in Appendix VIII on the attached CD.

6.2 Area B

Soil quality data for Area B were evaluated from GeoProbe samples collected in 2006 and 2007; in conjunction with the closure sampling of the previously removed ASTs, a perimeter sampling from in-place USTs, and post-excavation endpoint sampling performed following the removal of USTs from the first floor area. In addition, split-spoon soil samples collected from a GeoProbe soil boring in the boiler room and surface soil sample (collected from the pipe trench) were also used for soil quality characterization in this area. The soil sample(s) with the highest observed PID concentration and/or the most visible contamination were submitted for laboratory analysis. Soil sampling locations for Area B are shown on figures 11 and 12.

6.2.1 VOCs

The first floor portion of Area B and basement of Area B was initially characterized using GeoProbe soil sampling (GP-1 to GP-14 and GP-AST-1 to GP-AST-8, respectively). These sample locations are shown on figure 11. The highest level of VOC contamination observed in the Area B GeoProbe soil samples consisted of methylene chloride (just exceeding Part 375 RUSCOs in thirteen sample locations. Of note, all UST and AST GeoProbe soil samples had VOC concentrations below Part 375 RUSCOs for Protection of Public Health (Commercial). A summary of the VOCs detected in the first floor GeoProbe soil samples and the basement GeoProbe soil samples is presented on table 13 and table 14, respectively.

In September 2007, an additional GeoProbe boring was advanced at the entrance to the boiler room in Area B. BR-1 (16 to 20 ft bg) had VOC concentrations all below Part 375

RUSCOs. A summary of the VOCs detected in the boiler room GeoProbe soil sample is presented on table 15.

The pipe trench bottom sample was collected from the eastern wall (where the pipes ran from the Area B/C partition wall to the first floor of Area B) of the boiler room. This sample (collected after the pipes were removed) had VOC concentrations all below the laboratory detection limit. A summary of the VOCs detected in the boiler room pipe trench bottom sample is presented on table 16.

The soil sample collected from delineation Well DW-21B (installed immediately upgradient from the former locations of UST-E, UST-F and UST-G) showed no detectable VOCs. This soil sample was used to laterally delineate the onsite contamination on the eastern perimeter of the Site in Area B. A summary of the VOCs detected in the soil for the DW-21B sampling location is presented on table 4.

After the first floor USTs were removed, the excavation endpoint confirmation samples were collected. These sample locations are shown on figure 12. Laboratory analyses from sidewall and bottom samples show that only methylene chloride was detected over the Part 375 RUSCOs. Methylene chloride was detected over the Part 375 RUSCOs for Protection of Groundwater in all but the south sidewall samples (ES-1, FS-1 and GS-1) and the east side wall for UST-G (GE-1). A summary of the VOCs detected in the soil for the UST-E/UST-F/UST-G excavation endpoints is presented on table 17.

Figure 26 presents the distribution of total VOCs detected in all soil samples collected from Area B. Based on an evaluation of the total VOC distribution and concentrations, no significant VOC soil contamination is present in Area B.

6.2.2 SVOCs

Similar to Area A, the only SVOCs detected in Area B soils above the Part 375 RUSCOs consist of benzo(a)anthracene, chrysene, benzo(b)fluoranthene, benzo(k)fluoraenthene, and benzo(a)pyrene; with the addition of indeno (1,2,3-cd) pyrene.

All SVOCs from the first floor GeoProbe soil sampling locations (GP-1 to GP-14) were detected at concentrations below the Part 375 RUSCOs. A summary of the SVOCs detected at the first floor GeoProbe soil sampling locations is presented on table 18.

All SVOC concentrations in the soil collected from DW-21B (33 to 35 ft bg) were below the laboratory detection limit. A summary of the SVOCs analytical results for the DW-21B soil sampling location is presented on table 8.

The soil sample from the additional GeoProbe boring advanced in the entrance to the boiler room in Area B (BR-1 16 to 20 ft bg) had SVOC concentrations all below the laboratory detection limit. A summary of the SVOCs analytical results for the boiler room GeoProbe soil sample is presented on table 19.

The highest SVOC concentrations in Area B were detected in the soil samples collected from the shallow depths (0 to 4 ft bg) of the basement AST GeoProbe soil samples. All of the deep samples collected in this area had no SVOCs at concentrations exceeding the laboratory detection limit. As such, these elevated SVOC concentrations are likely reflecting contamination related to the fill material beneath the concrete slab. This area of the basement was one of the areas where the concrete slab was not removed due to the limited access in the area. It should be noted that the concrete slab in the basement of Area B (where the ASTs were historically located) was observed to be in good condition with minimal sign of wear, degradation, cracking or other conditions which would create/have created a preferential pathway for spills to the subsurface. A summary of the SVOCs detected in the basement GeoProbe soil sampling locations is presented on table 20.

No SVOCs were detected at concentrations exceeding Part 375 RUSCOs for the UST-E/UST-F/UST-G excavation endpoint soil samples. A summary of the SVOCs detected in the soil for the UST-E/UST-F/UST-G excavation endpoints is presented on table 21.

The only SVOCs detected above the Part 375 RUSCOs for the boiler room pipe trench bottom soil sample were benzo(a)anthracene, chrysene and benzo(a)pyrene. All other SVOCs detected in the boiler room pipe trench bottom soil sample were below Part 375 RUSCOs. A summary of the SVOCs detected in the boiler room pipe trench bottom soil sample is presented on table 22.

6.2.3 Metals

Total metals analysis performed on Area B UST-E/UST-F/UST-G excavation endpoint samples showed elevated concentrations (exceeding Part 375 RUSCOs) for arsenic and barium (table 23). Soil was excavated to the bottom of the tanks (to facilitate tank removal) however the majority of it was left in place. The excavation extent was regulated in the field based on readings obtained by screening the material with a PID.

The boiler room pipe trench bottom soil sample contains no metals with concentrations exceeding the Part 375 RUSCOs. A summary of the metals detected in the boiler room pipe trench bottom soil sample is presented on table 24.

The elevated metals concentrations in the subsurface are most likely attributed to a combination of factors, including the historic use of coal ash and urban fill as backfill material as well as regional background concentrations. Similar to the fill observed in Area A, the fill material beneath the slab consisted of primarily ash and waste demolition debris. The elevated metals concentrations reflective of the UST-E/UST-F/UST-G excavation endpoint soil samples and the pipe trench bottom soil sample are believed to be associated with this historical fill. However, considering the depth of the soil sample collected from DW-21B (33 to 35 ft bg), the fact that it contained a slightly elevated concentration of chromium (17.4 mg/kg) suggests that the exceedance is attributable to regional background concentrations resulting from the surrounding area history (table 12).

Additionally, copies of the Category B Deliverables laboratory analytical reports are presented in Appendix VIII on the attached CD.

6.3 Area C

Based on the performed remedial investigation activities, sub-surface soil quality was characterized in Area C. The soil samples consisted of GeoProbe samples (collected after the removal of UST-D from the water table and from the top of bedrock) as well as post-excavation endpoint samples collected following the removal of UST-D, UST-W, UST-X, UST-Y and UST-Z. Additionally, soil quality analysis was obtained from samples collected during the installation of the groundwater monitor/product delineation wells and during the drilling of the hydraulic barrier investigation GeoProbe borings. Following the removal of the tanks from Area C, the excavations were extended to the maximum possible depth. The lateral extents of the excavation were primarily limited by structural components of the building (support pillars and perimeter walls) and the excavation depths were limited by the size of the excavating equipment that was able to fit inside of the building interior; resulting in a maximum excavation depth of approximately 8 ft bg. For all sample locations, the soil sample(s) collected for laboratory analysis represent the soil with the highest observed PID concentration and/or the most visibly contaminated endpoint location available. Soil sampling locations for Area C are shown on figures 16 and 17.

6.3.1 VOCs

The post-excavation endpoint samples collected from the UST-D excavation indicated that no VOCs exceeded the Part 375 RUSCOs. However, analysis of the GeoProbe soil sample collected from the former area of UST-D (GP- Tank D [15 to 20 ft bg]) showed that toluene was the only VOC detected above the Part 375 RUSCO for Protection of Groundwater at a concentration of 5,000 ug/kg. This concentration exceeds the established Part 375 RUSCO for Protection of Groundwater for toluene of 700 ug/kg. Of note, this sample was collected near the groundwater table, at a depth which was beyond the limit of the excavation equipment. Summaries of the VOCs detected in the UST-D post-excavation endpoint samples and the GP-Tank D GeoProbe soil samples are presented on tables 25 and 26, respectively.

The soil samples collected from both DW-18C (installed on the northern edge of Area C) and DW-20B (installed on the southwestern edge of Area C but previously identified to be located in Area B) showed concentrations of VOCs exceeding the Part 375 RUSCOs for ethylbenzene, xylenes, n-propylbenzene, 1,2,4-trimethylbenzene, 1,3,5-trimethylbenzene, sec-butylbenzene and naphthalene. DW-18C is located adjacent to Area D, where historical investigations have shown the majority of the free-phase NAPL exists onsite. The data suggest that soil in this area may have been impacted from contamination migrating from Area D. All VOC concentrations in the soil sample collected from DW-19C (installed on the southern edge of Area C) were below the Part 375 RUSCOs with the exception of methylene chloride. A summary of the VOCs detected in the soil samples collected during the installation of DW-20B, DW-18C and DW-19C is presented on table 4.

VOC concentrations in all endpoint soil samples collected from excavations UST-D, UST-W, UST-X, UST-Y and UST-Z were below Part 375 RUSCOs for Protection of Public Health (Commercial). Post-excavation samples for UST-D and UST-Y indicated that no VOCs exceeded the Part 375 RUSCOs for Protection of Groundwater. Post-excavation samples for UST-W had several VOCs (xylene, acetone, 1,2,4-trimethylbenzene, 1,3,5-trimethylbenzene and sec-butylbenzene detected at concentrations that exceed their respective Part 375 RUSCOs for Protection of Groundwater. Post-excavation samples for UST-X had two VOCs (acetone and methylene chloride) detected at concentrations that exceed Part 375 RUSCOs for Protection of Groundwater. Post-excavation bottom sample ZB-1 for UST-Z had 1,2,4-trimethylbenzene and 1,3,5-trimethylbenzene detected at concentrations exceeding their respective Part 375 RUSCOs for Protection of Groundwater. The high concentrations of xylene, 1,2,4-trimethylbenzene, 1,3,5-trimethylbenzene, sec-butylbenzene and 4-isopropyltoluene detected in the completed UST-W excavation were located on the south sidewall sample located adjacent to a foundation footer which prevented additional soil from being excavated. The acetone and methylene chloride concentrations detected in excavation endpoints were only slightly above Part 375 RUSCOs for Protection of Groundwater of 50 ug/kg. As was the case for all four tanks (UST-W, UST-X, UST-Y and UST-Z), the excavations were expanded to their limits as defined by the presence of interior building structural footings. A summary of the VOCs detected in the UST-W, UST-X, UST-Y and UST-Z excavation endpoint confirmation soil samples is presented on table 25.

The soil samples were collected in Area C for subsurface evaluation of the feasibility of installation of a hydraulic barrier (GP-HB-2, GP-HB-4, GP-HB-5, GP-HB-6 and GP-HB-7). Several of these sampling locations (GP-HB-2 10 to 15 ft bg, GP-HB-4 10 to 15 ft bg, and GP-HB-6 25 to 27 ft bg) have concentrations of VOCs in exceedance of the Part 375 RUSCOs. The sample from boring GP-HB-2, which is located approximately 15 feet north of the UST-D excavation, has concentrations of toluene (2,600 ug/kg), xylenes (7,000 ug/kg), 1,2,4-trimethylbenzene (28,000 ug/kg) and 1,3,5-trimethylbenzene (12,000 ug/kg) which exceed the Part 375 RUSCOs. The samples from borings GP-HB-4 and GP-HB-6 have concentrations of ethylbenzene, xylenes, 1,2,4-trimethylbenzene, 1,3,5-trimethylbenzene, n-propylbenzene and n-butylbenzene which exceed the Part 375 RUSCOs. Overall, the highest VOC concentrations appear to be present in the shallow sample interval for the GeoProbe borings (which encompasses the soil/groundwater interface). A summary of the VOCs detected in the hydraulic barrier sampling location soil samples is presented on table 27.

Figure 27 presents the distribution of total VOCs detected in all soil samples collected from Area C. The distribution of VOC soil contamination in Area C indicates the highest levels of total VOCs along the western perimeter of Area C with localized soil contamination in the area of former USTs UST-W and UST-Z as well as MW-18C (on the northern perimeter of Area C). An important factor to mention, the highest concentrations of total VOC soil contamination along the western perimeter of Area C were observed in soil samples collected from the soil/groundwater interface. As such, the high concentrations of total VOCs can be attributed to free-phase product (NAPL) and/or dissolved phase VOCs. Additionally, excavation extents were limited in the area of the former USTs due to the presence of the building foundations and/or support pillars.

6.3.2 SVOCs

Both the post-excavation endpoint samples collected from the UST-D excavation and the GeoProbe soil samples collected from the UST-D excavation indicated that no SVOCs exceeded the Part 375 RUSCOs. Summary tables of the SVOC concentrations for the UST-D post-excavation endpoint samples and the GP- Tank D GeoProbe soil samples are presented on table 28 and table 29, respectively.

The post-excavation endpoint samples collected from the UST-W, UST-X, UST-Y and UST-Z excavations indicated that no SVOCs exceeded the Part 375 RUSCOs. A summary of the SVOCs concentrations for the UST-W, UST-X, UST-Y and UST-Z excavation endpoint confirmation soil samples is presented on table 28.

The hydraulic barrier GeoProbe soil samples GP-HB-2, GP-HB-4, GP-HB-5, GP-HB-6 and GP-HB-7 indicate that no SVOCs exceeded the Part 375 RUSCOs. A summary of the SVOCs concentrations for the hydraulic barrier GeoProbe soil samples GP-HB-2, GP-HB-4, GP-HB-5, GP-HB-6 and GP-HB-7 is presented on table 30.

6.3.3 Metals

Analysis of total metals for the endpoint samples collected from the Tank D excavation indicated that only one compound (mercury) was detected in one location (bottom sample B-2) at a concentration exceeding the Part 375 RUSCO for Protection of Groundwater

(0.73 mg/kg). This sample location is shown on figure 16. Additionally, the GeoProbe soil samples collected from the Tank D excavation area (15 to 20 ft bg and 25 to 29.5 ft bg) indicated that all metals concentrations were below Part 375 RUSCOs. The metals concentrations for the UST-D post-excavation endpoint samples and the GP-Tank D GeoProbe soil samples are summarized on table 31 and table 32, respectively.

The post-excavation endpoint samples collected from the UST-W, UST-X, UST-Y and UST-Z excavations indicated that total metals concentrations were below Part 375 RUSCOs for all endpoint samples collected from the excavations except one; YE-1. YE-1 had an arsenic concentration (17.0 mg/kg) which exceeded the Part 375 RUSCO of 16 mg/kg. A summary of the metals concentrations for the UST-W, UST-X, UST-Y and UST-Z excavation endpoint confirmation soil samples is presented on table 31.

The hydraulic barrier GeoProbe soil samples GP-HB-2, GP-HB-4, GP-HB-5, GP-HB-6 and GP-HB-7 indicate that all total metals concentrations were below Part 375 RUSCOs. A summary of the metals concentrations for the hydraulic barrier GeoProbe soil samples GP-HB-2, GP-HB-4, GP-HB-5, GP-HB-6 and GP-HB-7 is presented on table 33.

Additionally, copies of the laboratory analytical reports that meet Category B Deliverable requirements are presented in Appendix VIII on the attached CD.

6.4 Area D (Including Alley)

Based on the remedial investigation activities, the sub-surface soil quality was characterized throughout Area D. The soil samples collected by GeoProbe drilling in conjunction with the closure sampling of the previously removed USTs and post-excavation endpoint sampling obtained following the removal of UST-A UST-B, UST-C, UST-10, UST-34, UST-35, UST-36, UST-T, UST-U and UST-V were used to evaluate soil quality in Area D and alley area. Additionally, analysis of soil samples collected during the installation of the groundwater monitor/product delineation wells and endpoint soil samples from excavations were also used to evaluate soil quality in this area. The soil sample(s) collected for laboratory analysis represent the soil with the highest observed PID concentration and/or the most visibly contaminated samples from available endpoint locations. Soil sampling locations for Area D are shown on figures 19 and 20.

6.4.1 VOCs

Following the removal of UST-A and UST-B located in the alley area, analysis of the endpoint confirmation soil samples showed that all VOCs were below the Part 375 RUSCOs with the exception of UST-A endpoint N-1 (methylene chloride) and UST-B Endpoint East Sidewall (toluene). Analysis of the endpoint confirmation soil samples following the removal of UST-10 (in the alley) and UST-V (in the commercial space) showed that all VOCs were below the Part 375 RUSCOs with the exception of methylene chloride. A summary of the VOCs detected in the UST-A, UST-B, UST-10 and UST-V endpoint confirmation soil samples is presented on table 34.

The excavation endpoint soil samples collected following the removal of UST-T and UST-U represent the highest concentrations of VOCs detected in the soil at the Site. The soil sample locations (AT-1 to AT-9) are presented on figure 19. These soil samples were collected following the removal of approximately 80 cubic yards of soil down to the water table. The locations in the excavation where the highest VOCs concentrations were detected are the bottom samples for UST-T (AT-6 and AT-7) and the bottom samples for UST-U (AT-8 and AT-9). AT-6 and AT-7 (collected from beneath the former waste oil tank UST-T) contained the highest concentrations of benzene (AT-6 at 5,400 ug/kg), toluene (AT-6 at 5,700,000 ug/kg), ethylbenzene (AT-7 at 140,000 ug/kg), xylene (AT-7 at 459,000 ug/kg), tetrachloroethene (AT-7 at 8,000 ug/kg), 1,1,1-trichloroethane (AT-6 at 22,000 ug/kg), isopropyltoluene (AT-6 at 4,300 ug/kg), n-propylbenzene (AT-6 at 9,200 ug/kg), 1,2,4-trimethylbenzene (AT-6 at 25,000 ug/kg) and 1,3,5-trimethylbenzene (AT-6 at 61,000 ug/kg). The bottom sample AT-8 from UST-U also contained toluene, ethylbenzene and xylenes at some of the highest concentrations present at the Site. Of note, the bottom samples collected from the UST-T/UST-U excavation are the only endpoint soil samples to have VOC concentrations (toluene, ethylbenzene and xylene) exceeding Part 375 RUSCOs for Protection of Public Health (Commercial). A summary of the VOCs detected in the UST-T and UST-U endpoint confirmation soil samples is presented on table 34.

Following the removal of UST-A, UST-B and UST-10, GeoProbe soil samples were also collected from the former areas of the tanks. These samples were collected from depths which were beyond the reach of the excavating equipment (the groundwater table and bedrock/the confining layer). The GeoProbe soil samples (GP-Tank 10 WT [12 to 16 ft bg], GP-Tank 10 CL [20 to 24 ft bg], GP-Tank A WT [10 to 15 ft bg], GP-Tank B WT [12 to 16 ft bg] and GP-Tank B CL [24 to 27 ft bg]) all contained concentrations of VOCs in exceedance of Part 375 RUSCOs. These VOCs include toluene, ethylbenzene, xylene, n-propylbenzene, 1,2,4-trimethylbenzene and 1,3,5-trimethylbenzene. Only soil sample GP-Tank A CL [25 to 27 ft bg] had concentrations below the Part 375 RUSCOs for all VOCs. A summary of the VOCs detected in the UST-A , UST-B and UST-10 GeoProbe soil samples is presented on table 35.

In order to verify the closure activities of UST-34, UST-35, UST-36 and UST-C (completed by ERM), GeoProbe soil samples were collected from the former areas of these tanks. The results of the sampling indicated VOC concentrations in the subsurface beneath the former locations of UST-36 and UST-C are all below the Part 375 RUSCOs with the exception of GP-Tank-C (4 to 8 ft bg) which had methylene chloride at a concentration of 77 ug/kg. However, the soil samples collected from beneath the former locations of UST-34 and UST-35 indicated that significant contamination remains in the subsurface. The VOCs detected above Part 375 RUSCOs in these samples include ethylbenzene, xylene, methylene chloride, isopropylbenzene, n-propylbenzene, 1,2,4-trimethylbenzene, 1,3,5-trimethylbenzene, sec-butylbenzene, 4-isopropyltoluene and naphthalene. A summary of the VOCs detected in the UST-34, UST-35, UST-36 and UST-C GeoProbe soil samples is presented on table 36.

The initial GeoProbe soil sampling for UST-34, UST-35, UST-36 and UST-C prompted additional investigation activities in the commercial space. The resulting investigation identified that significant contaminated soil remained in place at the Site (presumable related to these tanks). After the hot spot excavation activities were completed in the Area D adjacent room, the excavation was continued into the commercial space. Following the completion of the commercial space excavation to a depth of 13 ft bg (which is below the water table), endpoint confirmation soil samples were collected from several locations. The locations of these endpoint soil samples (B-1, B-2, B-3, B-4, B-6, B-7, S-1, S-2, S-3, S-4, S-7 and S-8) are shown on figure 19. The highest levels of VOC contamination observed in this excavation were detected in the soil samples collected from the bottom of the excavation and from the southwestern corner of the commercial space. This area is immediately downgradient from the former locations of UST-34 and UST-35. Similarly, the VOCs exceeding Part 375 RUSCOs, include ethylbenzene, xylene, isopropylbenzene, 1,2,4-trimethylbenzene, 1,3,5-trimethylbenzene and sec butylbenzene from sample locations B-1, B-2, B-3, B-4, B-6, B-7, S-3 and S-4. The locations within the excavation where these VOCs were detected at the highest concentrations are: ethylbenzene detected in B-2 (2,600 ug/kg); xylene detected in B-2 (23,400 ug/kg); isopropylbenzene detected in B-4 (18,000 ug/kg); 1,2,4-trimethylbenzene detected in B-4 (85,000 ug/kg); 1,3,5-trimethylbenzene detected in B-4 (490,000 ug/kg) and sec butylbenzene detected in B-2 (6,900 ug/kg). The excavation in this area was advanced as far as was possible while maintaining the structural integrity of the building foundation. All remaining VOCs detected in the excavation endpoint samples were below the Part 375 RUSCOs. A summary of the VOCs detected in the commercial space excavation endpoint confirmation soil samples is presented on table 37.

Four soil samples were collected in Area D for subsurface evaluation of the feasibility of installation of a hydraulic barrier (GP-HB-1, GP-HB-3, GP-HB-8 and GP-HB-9). Several of the samples from these locations (GP-HB-1 15 to 20 ft bg, GP-HB-3 20 to 25 ft bg, and GP-HB-8 15 to 20 ft bg, GP-HB-9 15 to 20 ft bg, and GP-HB-9 20 to 25 ft bg) have concentrations of VOCs in exceedance of the Part 375 RUSCOs for Protection of Groundwater. The sample from GP-HB-1, which is located approximately 20 feet west of the UST-A and UST-B excavations, exceeds Part 375 RUSCOs for toluene (21,000 ug/kg), ethylbenzene (1,100 ug/kg), xylenes (6,800 ug/kg) and 1,2,4-trimethylbenzene (20,000 ug/kg). GP-HB-3 20 to 25 ft bg (from the boring advanced and sampled prior to the installation of DW-16D) exceeds Part 375 RUSCOs for ethylbenzene (1,400 ug/kg), xylenes (6,500 ug/kg) and 1,2,4-trimethylbenzene (24,000 ug/kg) and 1,3,5-trimethylbenzene (10,000 ug/kg). GP-HB-8 and GP-HB-9 were advanced along the northern perimeter of the Site. GP-HB-8 15 to 20 ft bg, from the boring advanced and sampled prior to the installation of DW-17D, only exceeds Part 375 RUSCOs for xylenes (1,700 ug/kg), 1,3,5 trimethylbenzene (10,000 ug/kg), and 1,2,4-trimethylbenzene (5,800 ug/kg). GP-HB-9 15 to 20 ft bg exceeds Part 375 RUSCOs for xylenes (2,500 ug/kg) and 1,2,4-trimethylbenzene (18,000 ug/kg). GP-HB-9 20 to 25 ft bg exceeds Part 375 RUSCOs for ethylbenzene (1,100 ug/kg), xylenes (11,000 ug/kg), n-propylbenzene (7,400 ug/kg), 1,2,4-trimethylbenzene (54,000 ug/kg) and 1,3,5-trimethylbenzene (23,000 ug/kg). Overall, the highest VOC concentrations detected in the Area D hydraulic barrier soil samples appear to be present in the shallow sample interval for the GeoProbe borings (which is closest to the soil/groundwater interface) with the exception of GP-HB-9. A summary of the VOCs detected in the hydraulic barrier sampling location soil samples is presented on table 27.

Nine wells were installed in Area D during the remedial investigation: EW-1 (later replaced with EW-1D); SVE-1 (later excavated out and installed in pea gravel backfill); DW-16D; DW-17D; DW-21D; DW-22D; DW-23D; R-4D and R-5D. The soil samples collected from DW-23D (installed adjacent to UST-A in the alley) contained benzene (610 ug/kg) and toluene (180,000 ug/kg) at concentrations which exceed the Part 375 RUSCOs. EW-1 and DW-21D were both installed in the room adjacent to the south of the commercial space. This is where historically the majority of the free-phase NAPL (thickness and lateral extent) has been observed in the subsurface. Both EW-1 and DW-21D contain several VOCs (ethylbenzene, xylene, methylene chloride, n-propylbenzene, 1,2,4-trimethylbenzene, 1,3,5-trimethylbenzene, and naphthalene) which exceed the Part 375 RUSCOs. This area was subsequently excavated (adjacent to DW-21D but encompassing EW-1) to approximately 18 ft bg as the hot spot excavation. The four remaining Area D wells (SVE-1, DW-22D, R-4D and R-5D) were all installed in the commercial space. Soil samples collected from these four sampling locations contained ethylbenzene, xylene, n-propylbenzene, 1,2,4-trimethylbenzene, 1,3,5-trimethylbenzene sec-butylbenzene and naphthalene at concentrations exceeding the Part 375 RUSCOs. For all samples the highest contaminant compound is 1,2,4-trimethylbenzene with the exception of DW-23D which is toluene. A summary of the VOCs detected in the soil samples collected during the installation of EW-1, SVE-1, DW-21D, DW-22D, DW-23D, R-4D and R-5D is presented on table 4.

Figure 28 presents the distribution of total VOCs detected in all soil samples collected from Area D. The distribution of total VOC soil contamination in Area D indicates that the highest concentrations of total VOCs are in the west/southwestern portion of Area D. The highest concentrations of total VOC soil contamination were detected in the endpoint samples collected beneath the former USTs UST-T and UST-U. A total of 95.22 tons of hazardous soil was excavated from the UST-T/ UST-U area of the Site and disposed offsite at an approved and licensed disposal facility. High concentrations of total VOC soil contamination were detected in soil samples collected from the southern portion of Area D (the 'hot spot' area) and the commercial space. A total of 129.015 tons of hazardous soil was excavated from the 'hot spot' area and a total of 1,128.2 tons of non-hazardous soil was excavated from commercial space at the Site and disposed offsite at an approved and licensed disposal facility. All excavation extents were limited due to the presence of the building foundations. Similar to the observations in Area C, the highest concentrations of total VOC soil contamination were detected in soil samples collected from the soil/groundwater interface. As such, the high concentrations of total VOCs can be attributed to free-phase product (NAPL) and/or dissolved phase VOCs.

6.4.2 SVOCs

Laboratory analysis for excavation sidewall and bottom endpoint confirmation soil samples collected from the UST-10, UST-T, UST-U and UST-V excavations showed that all SVOCs were below the Part 375 RUSCOs. Additionally, all bottom endpoint confirmation soil samples collected from the UST-A and UST-B excavations showed that all SVOCs were below the Part 375 RUSCOs. However, five SVOCs (benzo(a)anthracene, chrysene, benzo(b)fluoranthene, benzo(k)fluoraenthene, benzo(a)pyrene) were detected at concentrations exceeding Part 375 RUSCOs for sidewall samples collected from the UST-A and UST-B excavations. The locations where one or more of the listed compounds were detected in exceedance of Part 375 RUSCOs are: UST-A sidewalls N-1, S-1 and W-1; and UST-B sidewalls North Sidewall and East Sidewall. These endpoint confirmation soil sample locations are shown on figure 19. A summary of the SVOCs detected in the UST-10, UST-T, UST-U, UST-V, UST-A and UST-B endpoint confirmation soil samples is presented on table 38.

The UST-A, UST-B and UST-10 closure confirmation GeoProbe soil samples were collected in the former locations of the tanks. These soil samples were collected from depths which were beyond the reach of the excavating equipment (the groundwater table and bedrock/the confining layer). All GeoProbe soil samples (GP-Tank 10 WT [12 to 16 ft bg], GP-Tank 10 CL [20 to 24 ft bg], GP-Tank A WT [10 to 15 ft bg], GP-Tank B WT [12 to 16 ft bg] and GP-Tank B CL [24 to 27 ft bg]) contained concentrations of SVOCs in concentrations below the Part 375 RUSCOs. A summary of the SVOCs detected in the UST-A, UST-B and UST-10 GeoProbe soil samples is presented on table 39.

In order to verify the closure activities of UST-34, UST-35, UST-36 and UST-C (closed by ERM), GeoProbe soil samples were collected from the former locations of these tanks (as per historical documents). The results of the sampling indicated SVOC concentrations in the subsurface beneath the former locations of UST-34, UST-35, UST-36 and UST-C were all below the Part 375 RUSCOs in the deep soil samples. Several SVOCs exceeded the Part 375 RUSCOs in the shallow (4 to 8 ft bg) soil samples collected from GP-Tank 36 however, this soil was subsequently excavated and disposed offsite as part of the commercial space excavation. A summary of the SVOCs detected in the UST-34, UST-35, UST-36 and UST-C GeoProbe soil samples is presented on table 40.

Of the nine wells installed in Area D throughout the course of the remedial investigation, samples only from R-4D and R-5D were analyzed for SVOCs. DW-16D and DW-17D soil characterization is summarized using soil samples collected from GP-HB-3 and GP-HB-8 borings. R-4D and R-5D were both installed in the commercial space. All SVOC concentrations detected in both R-4D and R-5D were below Part 375 RUSCOs. A summary of the SVOCs detected in the soil samples collected during the installation of R-4D and R-5D is presented on table 8.

Four soil samples were collected in Area D for subsurface evaluation of the feasibility of installation of a hydraulic barrier (GP-HB-1, GP-HB-3, GP-HB-8 and GP-HB-9). All soil samples collected from these soil borings for laboratory analysis (both shallow and deep) contain SVOCs at concentrations below the Part 375 RUSCOs. A summary of the SVOCs detected in the Area D hydraulic barrier sampling location soil samples is presented on table 30.

Once the commercial space excavation was completed to a depth of 13 ft bg (below the water table), endpoint confirmation soil samples were collected from several locations. The locations of these endpoint soil samples (B-1, B-2, B-3, B-4, B-6, B-7, S-1, S-2, S-3, S-4, S-7 and S-8) are shown on figure 19. Soil samples from all of the endpoints contained SVOCs in concentrations below the Part 375 RUSCOs with the exception of S-2. Excavation endpoint soil sample S-2 contained benzo(a)anthracene, chrysene and benzo(a)pyrene at concentrations slightly exceeding Part 375 RUSCOs. A summary of the SVOCs detected in the commercial space excavation endpoint confirmation soil samples is presented on table 41.

6.4.3 Metals

The laboratory results of the soil samples collected from Area D indicate that metals contamination (arsenic, barium, mercury and selenium) remains in the soil in concentrations which exceed the Part 375 RUSCOs.

Multiple endpoint soil samples were collected from the completed Area D UST excavations for UST-A, UST-B, UST-T and UST-U. Total metals concentrations exceeding the applicable Part 375 RUSCOs include: arsenic (UST-B, UST-T and UST-U); barium (UST-U); and mercury (UST-A and UST-V). A summary of the total metals detected in the Area D UST excavation endpoint confirmation soil samples is presented on table 42.

The UST-A, UST-B and UST-10 closure confirmation GeoProbe soil samples (collected from the groundwater table and bedrock/the confining layer) were analyzed for total metals. The results of the laboratory analyses indicate that no metals were detected at concentrations exceeding Part 375 RUSCOs. A summary of the metals detected in the UST-A, UST-B and UST-10 GeoProbe soil samples is presented on table 43.

Laboratory analysis for the GeoProbe soil samples collected for UST-34, UST-35 and UST-C (closed by ERM), indicated that all metals concentrations are below Part 375 RUSCOs. Additionally, the deep GeoProbe soil sample collected UST-36 (GP-Tank 36 [28 to 29.5]), had metals below Part 375 RUSCOs. Only the shallow GeoProbe soil sample collected for UST-36 (GP-Tank 36 [4 to 8]) contained metals (arsenic, barium and lead) at concentrations exceeding Part 375 RUSCOs. Of note, this soil was removed as part of the commercial space excavation. The remaining metals concentrations were all below the Part 375 RUSCOs. A summary of the total metals detected in the UST-34, UST-35, UST-36 and UST-C GeoProbe soil samples is presented on table 44.

Once the commercial space excavation was completed to a depth of 13 ft bg, endpoint confirmation soil samples were collected from several locations and submitted to the laboratory for analysis of total metals. The locations of these endpoint soil samples (B-1, B-2, B-3, B-4, B-6, B-7, S-1, S-2, S-3, S-4, S-7 and S-8) are shown on figure 19. The laboratory analytical results indicated that all metals concentrations in the endpoint soil samples were below Part 375 RUSCOs with the exception of selenium in B-2. A summary of the total metals detected in the commercial space excavation endpoint confirmation soil samples is presented on table 45.

Of the nine wells installed in Area D throughout the course of the remedial investigation, only samples from R-4D and R-5D were analyzed for total metals. DW-16D and DW-17D soil characterization is summarized using soil samples collected from GP-HB-3 and GP-HB-8 borings. R-4D and R-5D were both installed in the commercial space. All metals concentrations detected in R-4D and R-5D were below Part 375 RUSCOs. A summary of the total metals detected in the soil samples collected during the installation of R-4D and R-5D is presented on table 12.

Four soil samples were collected in Area D for subsurface evaluation of the feasibility of installation of a hydraulic barrier (GP-HB-1, GP-HB-3, GP-HB-8 and GP-HB-9). All metals concentrations in the soil samples collected from these soil borings were below Part 375 RUSCOs. A summary of the total metals detected in the Area D hydraulic barrier sampling location soil samples is presented on table 33.

Additionally, copies of the Category B Deliverables laboratory analytical reports are presented in Appendix VIII on the attached CD.

7.0 COMPARISON WITH STANDARDS, CRITERIA, AND GUIDANCE

To determine whether the soil, groundwater and soil vapor and indoor air contain contamination at concentrations of concern, data from the investigation were compared to the following SCGs:

- groundwater SCGs are based on NYSDEC "Ambient Water Quality Standards and Guidance Values";
- soil SCGs are based on the Department's Cleanup Objectives 6 NYCRR Subpart 375-6 - Remedial Program Restricted Use Soil Cleanup Objectives; and,

- soil vapor and indoor air SCGs are based on the NYSDOH Center for Environmental Health, Bureau of Environmental Exposure Investigation "Guidance for Evaluating Soil Vapor Intrusion in the State of New York, October 2006".

All respective groundwater quality standards, soil cleanup objectives and indoor air quality standards (if established), are presented in Appendix IV on the attached CD. Additionally, summary tables presenting the laboratory analytical data compare contaminant concentrations to one of the above listed standards.

8.0 DATA USABILITY

QA/QC procedures were utilized throughout the project to ensure reliable data. AMRO, a NYSDOH - Environmental Laboratory Approval Program (ELAP) No. 11278 certified laboratory and Lancaster Laboratories, a NYSDOH - ELAP, No. PA00009 certified laboratory performed all analyses. Analytical methods used included Contract Laboratory Protocol methodologies. All analytical results are reported with Category B deliverables where required. Data Usability Summary Reports (DUSRs) were prepared for some of the Category B deliverables analytical results by Ms. Lori A. Beyer of L.A.B. Validation Corporation located in East Northpoint, New York. Copies of the Category B deliverables packages are included in Appendix IX (soil vapor, indoor air and ambient air quality), Appendix VIII (soil quality) and Appendix X (groundwater quality) on the attached CD. Additionally, DUSRs prepared for the laboratory reports are included in Appendix XI on the attached CD.

Based on past sampling completed on the Site, the primary contaminants are VOCs, SVOCs and metals. Accordingly, soil, groundwater, soil gas and ambient air samples were analyzed for VOCs and soil and groundwater were additionally analyzed for SVOCs and metals. Both soil and groundwater were analyzed by EPA Methods 8260, 8270 and total metals. Soil gas and ambient air samples were analyzed by EPA Method TO-15. Sampling methods, sample preservation requirements, sampling handling times and decontamination procedures for field equipment were conducted in accordance with NYSDEC and USEPA standard operating procedures and industry standards. All samples collected were maintained under chain-of custody procedures until delivery to the analyzing laboratory.

9.0 SUMMARY AND CONCLUSIONS

The Site has a long history of industrial manufacturing activities related to the manufacture and distribution of paints and lacquers.[2] As a result of several factors including, but not limited to: the nature of the materials used in conjunction with these activities; the means of onsite storage for chemicals used in the manufacturing processes; improper historical waste disposal and housekeeping practices exercised by manufacturing personnel; and failure of the onsite chemical storage systems. The result of these combined factors is residual contamination of the subsurface beneath the Site and extending offsite downgradient of the Site.

The Remedial Investigation activities completed at the Site consisted of subsurface characterization activities throughout the Site to delineate the extent and concentration of soil, groundwater and soil vapor/indoor air contamination. In addition to site characterization activities, Interim Remedial Measures implemented at the Site and multiple remedial alternative pilot studies were performed to evaluate potential future remedial technologies.

As a result of the subsurface investigation activities as well as the IRM activities performed at the Site, the Site has been comprehensively characterized. This Site characterization has defined the extent of soil vapor/indoor air, soil and groundwater contamination in the subsurface beneath the Site.

out

The results of the onsite soil-vapor intrusion sampling rounds (performed prior to onsite IRM activities) indicated that soil vapor VOC concentrations beneath the Site are minimal. Additionally, none of the indoor air samples contained concentrations of PCE, TCE and/or methylene chloride (the only compounds with established indoor air guidance values) above the established NYSDOH air guidance values. Based on the NYSDOH Soil Vapor/Indoor Air Matrices (which correlate soil-vapor concentrations and indoor air), the most conservative recommended courses of action for the Site (for the two sampling rounds) were:

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[2] From 1959 to 1971, Red Devil Paints & Chemicals, Inc. operated a paint facility, which blended and manufactured paints and varnishes. From 1971 to 1989, Red Devil was operated as a division of Insilco Corporation. In 1990 the paint facility ended its operations at the Site.

out out

Monitor/Mitigate in Area A; Monitor/Mitigate in Area B; Monitor in Area C; and take reasonable and practical actions to identify source(s) and reduce exposures in Area D. Following the soil-vapor intrusion sampling rounds, mitigation activities were performed in Areas A, B, C and D. In Area A, this activity consisted of removal of an asphalt cap, UST closure activities and excavation/removal of contaminated soil within the parking lot. In Areas B, C and D, the mitigation activities consisted of: removal of the slab on grade; UST closure activities; excavation/removal of contaminated soil and free-phase product; backfill with a highly permeable gravel (the first floor of Area B and the majority of the basement of Area C and all of Area D); the installation of several sub-slab depressurization pipes within the gravel layer; and installation of new reinforced concrete slab. These sub-slab depressurization pipes are currently passively venting to the atmosphere via a roof-mounted wind turbine (producing minimal vacuum).

out

Although not required (based on NYSDOH requirements), the installation of this infrastructure for sub-slab depressurization also provides a means to address soil vapor beneath the Site, should it be necessary in the future as a result of onsite and/or offsite impacts. To that end, this system can be converted to an active system by connecting the pipes to vacuum blowers, thereby controlling soil vapor issues. Additionally, although not the direct objective, an active sub-slab depressurization system would provide active remediation of contamination within unsaturated soils.

The results of the onsite soil sampling activities (consisting of hollow-stem auger split-spoon sampling, GeoProbe macro-core sampling and excavation endpoint sampling), indicate that residual soil contamination exists in the subsurface throughout the Site. Based on the subsurface investigation, the areas at the Site where the high concentrations and distribution of VOC-impacted soil are present include: the location of the former drywell in the parking lot of Area A; the western perimeter of Area C and the northeastern corner of the former UST-W excavation in Area C; and in the south/southwestern portion of Area D where the highest concentration of VOC contamination was detected. This is the area of the Site where the majority of the soil excavation/disposal activities were focused. The elevated metals concentrations in the subsurface soils (where detected) are most likely attributed to a combination of factors including the historic use of coal ash and urban fill as backfill material, as well as regional background concentrations. However; considering the depth of several soil samples containing metals at concentrations exceeding Part 375 RUSCOs, the exceedance of metals throughout the Site can also be attributable to regional background concentrations resulting from the surrounding area history.

Although residual soil contamination remains beneath the Site, based on the fact that the entire Site is capped with asphalt/concrete the potential for exposure due to dermal contact or ingestion is insignificant. Additionally, engineering controls (in addition to the concrete and asphalt cap and sub-slab depressurization piping) can be utilized at the Site to remediate the residual soil contamination.

The results of the onsite groundwater sampling activities (GeoProbe sampling and groundwater monitor well and product delineation well sampling), indicate that groundwater contamination exists in the subsurface throughout the Site. Based on the subsurface investigation, the areas at the Site where high concentrations and distribution of VOC-impacted groundwater are present include: the location of the former drywell in the parking lot of Area A (R-3A); the western perimeter of Area C; and in the southwestern portion of Area D (DW-23D), where the highest concentration of VOC contamination was detected. These are the areas of the Site where the majority of the soil excavation/disposal activities were focused, thereby eliminating a significant volume of source material as well as free-phase product (NAPL). The results of the laboratory analysis indicated that nearly all SVOC concentrations in groundwater samples collected from the Site are below the NYSDEC TOGS guidance values (with the exception of naphthalene in several locations). The results of the laboratory analysis indicated that the majority of the metals concentrations in groundwater samples collected from the Site are below the NYSDEC TOGS guidance values. Exceptions include arsenic, barium, chromium, mercury and selenium in Area A, and chromium in two locations in Area C and three locations in Area D.

Although residual groundwater contamination remains beneath the Site, groundwater in the vicinity of the Site is not utilized as a source of potential drinking water. Because the entire Site is capped with asphalt/concrete and the groundwater is a minimum of approximately 12 feet below ground surface, the potential for exposure via dermal contact or ingestion of contaminated groundwater is insignificant. Additionally, engineering controls (in addition to the concrete and asphalt cap and sub-slab depressurization piping) can be utilized at the Site to remediate the residual groundwater contamination as well as free-phase product (NAPL).

The IRMs performed at the Site, were effective in removing a significant volume of contaminated material from the subsurface, as well as ruling out the feasibility of potential future remedial alternatives at the Site based on the site specific geology. As a result of the on-site UST/AST closure activities and soil excavation activities: sixteen (16) bulk storage tanks and their residual contents were removed from the Site; more than 2,550 tons of non-hazardous soil was removed from the Site (disposed offsite at approved/licensed facilities); more than 11 tons of hazardous wood was removed from the Site (disposed offsite at an approved/licensed facility); and more than 224 tons of hazardous contaminated soil was removed from the Site (disposed offsite at approved/licensed facilities).

In conclusion, subsurface residual contamination remains beneath the Site, primarily in dissolved phase (VOCs). As a result of the contaminant concentrations remaining at the Site, additional remedial action(s) are required at the Site to actively remediate the onsite groundwater as well as to control offsite contaminant migration. As such, an additional IRM Work Plan and/or remedial alternatives analysis will be prepared and submitted to the NYSDEC.

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