APPENDIX C

REMEDIAL INVESTIGATION REPORT

37-88 Review Avenue

Long Island City, Queens, New York

Submitted To: New York State Department of Environmental Conservation
Division of Environmental Remediation
625 Broadway, 11th Floor
Albany, NY 12233-7016

Submitted By: Golder Associates Inc.
200 Century Parkway, Suite C
Mt. Laurel, NJ 08054 USA

November 2014

Project No.13-02414-01

A world of capabilities delivered locally

Golder Associates

November 29, 2014 Project No.: 130-2414

Brian Davidson – Project Manager
NY State Dept. of Environmental Conservation
Division of Environmental Remediation
625 Broadway, 11th Floor
Albany, NY 12233

RE: SUBMITTAL OF REMEDIAL INVESTIGATION REPORT FOR 37-88 REVIEW AVENUE (PHOENIX PROPERTY) LONG ISLAND CITY, QUEENS, NEW YORK

Dear Mr. Davidson:

This Remedial Investigation Report (RI Report) has been prepared by Golder Associates Inc. (Golder) at the request of the New York State Department of Environmental Conservation (NYSDEC) for the property located at 37-88 Review Avenue, Long Island City, Queens, New York (Phoenix Property).

Please do not hesitate to contact Stuart Mitchell at 856-793-2005 should any questions arise from your review of this document.

Very truly yours,

GOLDER ASSOCIATES INC.

Heather Lin
Senior Project Geologist

Stuart D. Mitchell, PG
Principal

HAL/SDM:lrr

cc: S. Selmer, New York State Department of Health

Golder Associates Inc.
200 Century Parkway, Suite C
Mt. Laurel, NJ 08054 USA
Tel: (856) 793-2005 Fax: (856) 793-2006 www.golder.com
Golder Associates: Operations in Africa, Asia, Australasia, Europe, North America and South America

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1.0 INTRODUCTION

This Remedial Investigation (RI) Report has been prepared by Golder Associates Inc. (Golder) to report the results of the RI conducted at the Phoenix Property at the request of the New York State Department of Environmental Conservation (NYSDEC). The RI Report is submitted in accordance with the approved Remedial Investigation/Focused Feasibility Study Work Plan (RI/FFS Work Plan; Golder 2013), finalized on January 7, 2014, and presents the findings of the field investigations conducted in and around the Phoenix Property. The Phoenix Property is located at 37-88 Review Avenue, Long Island City, Queens, New York (Figure 1).

As stated in the RI/FFS Work Plan, the overall objectives of the RI/FSS for the Phoenix Property are as follows:

- Determine the nature and extent of constituents of potential concern (COPC) and potential impacts to the public health, welfare, or the environment caused by the release or potential release of COPC at or from the Phoenix Property by completing a Remedial Investigation.
- Determine and evaluate remaining data gaps, as well as alternatives for remedial action, if any, to prevent, mitigate, or otherwise respond to or remedy a release or potential release of COPC at or from the Phoenix Property by conducting a Focused Feasibility Study.

This RI Report describes the RI activities that were conducted for the Phoenix Property and includes the following key elements:

- A general description of the Phoenix Property including historical operational / environmental activities is presented in Section 2.0
- Remedial Investigation field activities are presented in Section 3.0
- Non RI Field activities (indoor air methane survey) is presented in Section 4.0
- Geologic and hydrogeologic investigation results are presented in Section 5.0
- Summaries of laboratory analysis and data validation are presented in Section 6.0
- Remedial Investigation results are presented in Section 7.0
- A Qualitative Exposure Assessment is presented in Section 8.0
- A Conceptual Site Model is presented in Section 9.0
- A Summary based on the results of the RI is presented in Section 10.0
- References utilized during the preparation of this RI Report are presented in Section 11.0

2.0 GENERAL SITE DESCRIPTION

2.1 General Phoenix Property Description

The Phoenix Property consists of an approximately 1.8 acre parcel within a highly industrialized area of Long Island City, Queens, New York. The Phoenix Property is currently occupied by a multi-story warehouse with a partial mezzanine located in the eastern portion of the parcel, a roof-top parking area with access to offices located on the first and second floors, and a paved drive-way and parking area in the western portion of the parcel. The floor of the warehouse consists of poured concrete, slab on grade (Geosyntec, February 2010) and is approximately 6-inches thick, reinforced with a six-by-six No. 10 wire mesh and is approximately 16.5 feet-above mean sea level (ft MSL). Phoenix Property Site drawings were requested but according to Phoenix Site personnel the drawings were destroyed in a flood.

Figure 1 shows the location of the Phoenix Property on a USGS quadrangle map, and Figure 2 provides an area-wide plan that shows the Phoenix Property in context with surrounding properties. The Site is bounded by Review Avenue followed by Calvary Cemetery to the northeast, a vacant lot used for vehicle parking to the northwest (37-80 Review Avenue), an industrial warehouse to the southeast (38-20 Review Avenue), and the Long Island Railroad (LIRR) to the southwest.

The adjacent property to the northwest of the Phoenix Property (37-80 Review Avenue) is referred to as the Review Avenue Development II (RAD II) property, which is listed as a NYSDEC Class 2 Inactive Hazardous Waste Site and is subject to provisions of the Record of Decision (ROD) dated February 9, 2007. A Brownfield Cleanup Agreement (BCA# C241005) was executed by DMJ Associates, LLC, 37-80 Review Ave. LLC, and Cresswood Environmental Consultants, LLC (Cresswood) for RAD II on December 2, 2005; that BCA includes off-site activities on the Phoenix Property, to the extent caused by releases at the RAD II Property as part of the Remedial Design. The adjacent property to the southeast of the Phoenix Property is 38-20 Review Avenue. The Calvary Cemetery, across Review Avenue to the north, covers roughly 175 acres and has approximately 3,000 feet of frontage along Review Avenue. A facility operated by Waste Management, Inc. is located beyond the LIRR easement to the southwest, followed by Newtown Creek, which is located approximately 350 feet from the Phoenix Property.

The Phoenix Property was historically the northwestern-most portion of the Former Pratt Oil Works (FPOW), which encompassed approximately 18.51 acres on and to the south and east of the Phoenix Property. The Phoenix Property is one parcel of the multi-parcel FPOW, which ExxonMobil Oil Corporation's ("ExxonMobil") predecessor operated. In 2008, ExxonMobil voluntarily entered into an investigation-only Consent Order, No. D2-1002-12-07AM with NYSDEC and is currently implementing investigations and interim remedial measures (IRM) including light non-aqueous phase liquid (LNAPL) recovery relative to the FPOW. To date, the IRM does not include activities on this portion of the FPOW.

2.2 Site Description

2.2.1 Former and Current Operations

The Phoenix Property and surrounding properties have been used for various industrial purposes, including petroleum refineries, chemical manufacturing, warehouse/storage, and waste transfer since the mid-1800's. According to a chain of title search conducted by Kleinfelder (March 2010) Pratt Manufacturing Company operated the FPOW from 1887 until 1892, when it was sold to Standard Oil Company of New York (SOCONY). SOCONY may have utilized the FPOW for the manufacture of wax, lubricating oils, burning oils, grease compounding, and as a cooperage from approximately 1892 through 1949, at which time operations on the FPOW ceased. After 1949, the FPOW was decommissioned and various property sale transactions took place, concluding in 1951 (Kleinfelder, March 2010). Subsequently, the Phoenix Property was owned by various companies, many of which conducted industrial operations, including Branlon Corp. in 1951, Commercial Metals Co. in 1951, New England Transportation Comp. in 1954, Kay Realty in 1955, National Hardware Corp. in 1957, McGuiness Harp Corp. in 1970, and Up from the Ashes since 1984.

The following provides a summary based on review of Sanborn maps for the years 1898, 1915, 1936, and 1975, and aerial photographs for the years 1924, 1949, 1954, 1966 and 1980:

- 1898: The earliest available Sanborn Map, dated 1898, indicates the Phoenix Property had been previously developed and was being operated by the Charles Pratt Oil Refinery, now referred to as the FPOW. Little detail and no process equipment are shown on the map. However, the Phoenix Property is shown within the boundaries of the FPOW.
- 1915: The Sanborn map shows process equipment and buildings located on the Phoenix Property, including a boiler, two Filter Press Houses, Distilling Department, Iron Condensers, a vacant building and 9 round items that appear to be above ground tanks.

  1924: Aerial Photo shows the area of Review Avenue in 1924. The photo can be found at: http://maps.nyc.gov/doitt/nycitymap/?z=8&p=1002170,205969&c=GIS1924&s=a:37-88,REVIEW+AVENUE,QUEENS. The 1924 aerial photo shows what appears to be 2 round above ground storage tanks (ASTs) in the northwest corner of the Phoenix Property, four buildings, and other round objects on the eastern side of the Phoenix Property.
- 1936: The Sanborn map shows process equipment and buildings similar to 1915, except the boiler is not shown and two large oil ASTs are located in the northwest corner of the Phoenix Property where the formerly vacant building was located. The two large ASTs can also be seen in the 1924 aerial photo.
- 1949: The aerial photo shows ASTs and buildings located on the Phoenix Property. Nine ASTs are identified on the aerial photographs.
- 1954: The aerial photo shows that the Phoenix Property and the east adjacent 38-20 Review Avenue Property have been cleared; there appears to be surface debris. Buildings are still in place further east and a tall stack is in place to the east.
- 1966: The aerial photo shows a rectangular structure in the northern portion of the Phoenix Property that appears to be a distribution center with trailer truck parking in its

southern portion. Building permit information indicates that the building was constructed in 1955. The ASTs observed in the 1951 aerial photo were not present.

- 1975: The Sanborn map shows that ASTs and infrastructure previously located at the Phoenix Property had been replaced with the current building labeled "McGuiness Harp Corp." The building appears similar to the present structures, except that the rear dock along LIRR does not appear to have been constructed. Building permits indicate that this building was constructed in 1971.
- 1980: The aerial photo shows the current building, except the loading dock does not appear to have been constructed. The parking lot was being utilized for trailer truck parking.

Based on this review, it appears that the surface structures of the FPOW were removed from the Phoenix Property between 1949 and the time of the 1954 aerial photographs. The Phoenix Property's building was erected in 1971. Up From the Ashes acquired the property in 1984 and has leased the property to Phoenix Beverages, Inc. as a beverage and warehouse distribution center. Currently, space within the warehouse is leased to a number of businesses (e.g.; storage, distribution, electronics separation).

The Phoenix Property has two operational 4000-gallon diesel underground storage tanks (USTs), which are located in the corner along the north-western portion of the building (Figure 3). The USTs are the only tanks currently registered on the NYSDEC bulk storage database. According to Phoenix Property site personnel, the USTs are currently empty and have not been used since 2010. The NYSDEC Spill Incident Database has an entry for a gasoline spill (Spill Number 9412567) of an unknown quantity on December 19, 1994 due to a tank test failure that was subsequently closed on February 28, 2003. No registration records for a gasoline tank were found during the database search. However, according to Phoenix Property site personnel, both gasoline and diesel were stored in USTs. A Plumbing Mechanical Equipment and Tank Installation application was filed on September 2, 1970 by The Guinness Harp Corporation (for an estimated $70,000 worth of work). Another Plumbing Mechanical Equipment and Tank Installation application was filed a few months later on April 26, 1971 by The Guinness-Harp Corporation with the New York City Department of Building for the installation of a 4,000 gallon gasoline tank and pump (for an estimated $2,000). There was no information as to the location of the proposed 4,000 gallon gasoline tank.

2.2.2 Summary of Previous Environmental Investigations

Previous and on-going environmental investigations conducted in the area, both on the Phoenix Property and on adjacent properties, provided information that was used to develop the approved RI/FFS WP. A RI/FS (Remedial Investigation/Feasibility Study; Golder, July 2005) was conducted on RAD I and RAD II Properties immediately adjacent to the northwestern boundary of the Phoenix Property (Figure 2). This RI evaluated the nature and extent of contaminants of concern in soil and groundwater, fate and transport of the constituents, and the nature and extent of LNAPL including: LNAPL distribution, volume, and mobility at the RAD II parcel. As part of the RI, a total of five wells were installed on the Phoenix Property

(GAL-14, GAL-15, and GAL-17 in 2004, and GAL-25 and GAL-26 in 2005). LNAPL samples were collected (where present) and characterized (chemical and physical characterization). Subsequent investigations at the Phoenix Property under the Brownfield Program have included a soil vapor study (Geosyntec, 2010) and the installation of two additional wells (GAL-32 and GAL-33) on the Phoenix Property inside the building in February 2013, as directed by the NYSDEC.

There is an on-going investigation by Kleinfelder in the area that includes characterization of certain parcels within the FPOW. In total, 79 monitoring points (wells) have been installed on the FPOW, excluding the Phoenix Property (Kleinfelder, July 2013). A summary of the environmental data collected from these investigations was presented in the RI/FFS Work Plan.

2.3 Environmental Setting

2.3.1 Phoenix Property Description

The approximately 1.8-acre Phoenix Property is located in a section of Long Island City, Queens, New York that has been highly industrialized for more than a century. There are two remediation sites within a half-mile radius of the Phoenix Property as identified by the NYSDEC Environmental Site Remediation Database which include the neighboring property (RAD II) and the Roehr Chemicals, Inc. site located approximately a quarter mile to the north. Additionally, the FPOW site, which encompasses approximately 18.5 acres, includes the Phoenix Property. The FPOW site, other than the Phoenix Property, is currently being investigated pursuant to a voluntary investigation-only Consent Order between ExxonMobil and the NYSDEC. Interim remedial measures have been implemented at several locations on the FPOW by ExxonMobil. Other than the work described in Section 2.2 above, no investigation of the Phoenix Property had been undertaken pursuant to the Consent Order prior to this RI.

Figure 2 shows an aerial photographic map (February 2012) of the Phoenix Property and surrounding properties and existing monitoring wells. Approximately 20% of the Phoenix Property is covered by asphalt or concrete pavement on the western side. The remainder of the Phoenix Property (eastern side) is occupied by an above-grade multi-story building. Two known 4,000 gallon diesel USTs also exist on the Phoenix Property and according to Phoenix Property site personnel the USTs are reportedly empty and have not been used since 2010.

2.3.2 Phoenix Property Geology and Hydrogeology

Subsurface soils and groundwater conditions in the vicinity of the Phoenix Property had been characterized extensively prior to the RI during previous investigations conducted on the Phoenix Property and on parcels within the FPOW. The geologic and hydrogeologic conditions described below are based on the findings of the previous investigations and the current findings of this RI.

Stratigraphy at the Phoenix Property is generally characterized by urban fill overlying sand deposits with gravel and silt lenses, followed at depth by a clay unit. The material directly underlying the surface cover at the Phoenix Property and surrounding area is largely composed of anthropogenic, urban fill consisting of a mixture of heterogeneous soil intermixed with brick fragments, asphalt, wire, concrete, plastic and other debris, and ranging in thickness from 1 to 20 feet (5 to 20 feet on the Phoenix Property).

Underlying the fill is an upper sand and gravel unit. This unit is composed of unconsolidated glacial and alluvium deposits that consist predominately of interbedded horizons of fine-to-coarse sand with local intervals of fine-to-coarse gravel.

Below the upper sand and gravel deposit lies a discontinuous, shallow silt and silty-clay horizon (0 to 8 feet thick), which have been encountered in previous investigations conducted on the Phoenix Property and on parcels within the FPOW. Below these units is a lower sand and gravel unit (approximately 25 feet thick). The deepest geologic unit encountered during previous investigations consists of laterally continuous clay of the Raritan Formation, which was encountered approximately -45 to -55 feet below mean sea level (MSL) (approximately 65-75 feet below grade).

The Phoenix Property lies between a local topographic high to the northeast and Newtown Creek to the southwest (a tidally influenced regional groundwater discharge area). As presented in the 2005 RI Report (Figures 11 and 12), groundwater flow beneath the RAD II Property (located to the west of the Phoenix Property) was interpreted to flow to the south-southwest. To the east of the Phoenix Property (i.e., the northwestern portion of the FPOW) groundwater flow has been observed to the south-southeast (Figure 6, May 2013 Kleinfelder Supplemental Site Characterization Report). Vertical hydraulic gradients beneath the RAD II Property are generally negligible.

A shallow clay horizon identified just southwest of the Phoenix Property and the RAD II property is believed responsible for the formation of a groundwater mound in the area of the railroad tracks based on the RAD II RI (Golder, June 2005). Despite the presence of this groundwater mound, groundwater is anticipated to flow toward Newtown Creek. Newtown Creek is listed as a Class SD surface water, which is the lowest classification for saline surface water in New York State.

Public drinking and industrial water for Queens County are supplied primarily by the New York City reservoir system; groundwater within the vicinity of the Phoenix Property is not used for potable purposes and likely will not be used in the future as a potable source. Based on the RI conducted for the RAD II site and portions of the FPOW, any groundwater impacts at the Phoenix Property are expected to be confined to a shallow water bearing unit flowing in a generally southerly direction, which would not impact potable water supplies.

2.3.3 Surface Water Hydrology

The Phoenix Property lies approximately 15 to 26 feet above MSL with its highest elevation along Review Avenue sloping downwards to the southwest. Calvary Cemetery, located northeast of the Phoenix Property, on the opposite side of Review Avenue, is a local topographic high with elevations ranging from approximately 50 to over 70 feet MSL. Between the Phoenix Property and Newtown Creek lies the LIRR which runs east/west through the FPOW properties and other industrial properties, which locally affect surface water drainage.

The surface water runoff from the paved drive-way and parking area drains to an existing stormwater sump equipped with submersible pumps. The accumulated stormwater from the sump is pumped to an existing combined sewer system located along Review Avenue.

3.0 SUMMARY OF REMEDIAL INVESTIGATION FIELD ACTIVITIES

The RI field work included activities specified in the approved RI/FFS Work Plan. RI field activities were conducted March-September 2014. In summary, the field work included the following activities[1]:

- A vapor intrusion investigation including a building survey and collection of:
  - two outdoor air samples
  - four indoor air samples
  - eight sub-slab gas samples
  - three soil vapor samples
- Completion of four Laser Induced Fluorescence (LIF) screening borings
- Soil sampling in the unsaturated zone at four locations
- Installation of four new monitoring wells, generally co-located with the LIF borings
- Two synoptic rounds of groundwater and LNAPL gauging from 21 monitoring wells on and off the Phoenix Property
- Collection of one groundwater sample on the Phoenix Property
- Collection of LNAPL samples from 16 wells on and off the Phoenix Property
- Baildown tests in nine wells on the Phoenix Property
- Phoenix Property boundary and well surveys

All field activities were conducted in general accordance with the approved RI/FFS Work Plan, as described in the following sections. Utility clearance activities and surveying services were provided by GEOD Corporation of Newfoundland, NJ. LIF/UVOST services were provided by Columbia Technologies, Inc. of Baltimore, MD. Drilling services were provided by AmeriDrill, Inc. of Levittown, PA.

3.1 Utility Clearance Activities

Two utility clearance techniques were utilized to clear for potential subsurface utilities in all intrusive locations (Figure 3), which include:

- Soil vapor locations (SV-27 through SV-29)
- Sub-slab soil gas sample locations (SSV-1 through SSV-8)
- LIF locations (LIF-34 through LIF-37)
- LNAPL monitoring well locations (GAL-34 through GAL 37)

First, a private utility locating contractor (GEOD Corporation of Newfoundland, NJ) used Ground Penetrating Radar (GPR) and Electro-Magnetic Pipe, Cable, and Box locators (EM) in all of the above referenced locations. GPR was used to scan a 10-foot minimum radius around each location and any

[1] During RI activities samples (LNAPL, soil, sub-slab soil vapor, and groundwater) were collected by other parties.

potential underground utilities and/or anomalies were marked. The utility clearance report is provided in Appendix A.

A portable core drill was then used by the Drilling subcontractor (AmeriDrill) to core through the reinforced concrete slab (indoor locations only), which was approximately 6 inches thick at all locations. A 3-inch diameter core hole was advanced for the LIF locations and an 8-inch diameter core hole was advanced for the LNAPL monitoring well locations.

After soil sampling from 0-2 feet below the concrete was completed with a hand auger (see Section 3.5.1) at GAL-34 through GAL-37, the Drilling subcontractor used a VacMaster high pressure and suction technique to "soft-dig" to approximately five feet below ground surface (ft bgs). Once the boring location was cleared of utilities or anomalies, the boring was advanced and completed with either direct push or hollow stem auger drilling techniques.

3.2 Air Monitoring Activities

Air monitoring was conducted during the RI field activities. Air quality was monitored in the breathing zone, at the top of the borehole/monitoring well and along the perimeter of the work area with a photo-ionization detector (PID) and multi-gas meter (which includes calibration for methane). Background levels were measured prior to starting work. The perimeter of the work zone was surveyed periodically to monitor if volatile organic compounds (VOCs) extended beyond the immediate work area. Exhaust from the Geoprobe during indoor drilling was controlled by an emissions converter device attached to the exhaust outlet point. Air quality during drilling or other intrusive activities did not reach action levels (as identified in the project Health and Safety Plan (HASP) in Appendix A of the RI/FFS Work Plan). During groundwater and LNAPL monitoring, a flame-ionization detector (FID) that was calibrated against methane was also used to monitor air quality at the well heads. At no time during the RI activities were any readings recorded above background along the perimeter and within the breathing zone. Air monitoring records are provided in Appendix B.

3.3 Vapor Intrusion Investigation

The objectives of the vapor intrusion investigation (VII) were to supplement previous VII activities[2] conducted by Geosyntec, on behalf of Cresswood in 2010, by investigating potential VOC impacts from

[2] The 2010 work conducted by Geosyntec included conducting a building survey and to screen for the presence of methane within the building on the Phoenix Property. With respect to methane, Geosyntec concluded "While methane was measured in soil gas at concentrations ranging from 5.3% to 43.6%, methane was not measured above 1 ppm in air samples in the Phoenix Beverages Building, with the exception of low levels (less than 500 ppm) in a sump and floor drains. This indicates that methane vapors are significantly attenuated, which would also be expected to be the case for other hydrocarbon vapors. The attenuation factor based on these data would be expected to be on the order of 0.00001. This is consistent with the visual observations of the integrity of the building foundation and floor slab" (Geosyntec, 2010, Section 9.0).

the soil vapor beneath the building, and determining if a potential VI pathway exists. In accordance with the approved RI/FFS Work Plan (Golder, 2013), the following were conducted as part of the VII activities:

- Building Survey
- Sub-slab soil gas, soil vapor, indoor and ambient air sampling

The following sections detail these field investigation activities.

3.3.1 Building Survey

In preparation for sampling, a building inspection was completed on March 14, 2014 by Golder to evaluate the building use, construction, and other factors that may impact the VII (such as suggesting alternate sampling locations or providing information relevant to interpretation of analytical data). A New York State Department of Health (NYSDOH) Indoor Air Quality Questionnaire and Building Inventory (IAQ form) was completed consistent with the NYSDOH Final Guidance for Evaluating Soil Vapor Intrusion in the State of New York (October 2006; NYSDOH SVI Guidance). One IAQ Form was completed in consultation with the Phoenix Property site representative and various building tenant representatives for the Phoenix Property building and is included in Appendix C. Key information identified during the building inspections included:

- The building is approximately 50,000 square feet and was constructed in 1971 with a poured concrete; slab on grade slab foundation which is approximately 6-inches thick and reinforced. The GEOD survey indicates that the floor is located at approximately 16.5 ft MSL. The majority of the building is one story except the northern portion where a four story office area is situated (footprint approximately 9,300 square feet).
- The building use was observed to be primarily warehousing space, with some commercial activities being conducted (electronics separation, food redistribution)
- Five bay doors exist along the western side of the building which are opened and closed throughout the day as part of normal business operations. These doors were open during RI activities.
- No evidence of cracks, expansion joints or floor penetrations were observed that would suggest potential preferential pathways which would promote soil vapor intrusion. The following were noted:
  - According to the building tenant in the northernmost first floor space along Review Avenue, there is a sump along the northeast building wall. Golder was unable to verify or inspect the sump location and condition due to products stored in this space.
  - A storm water sump was observed in the southwest portion of the building as shown on Figure 3. Golder was unable to verify or inspect the sump location and condition due to products stored in this space.
  - A drain trench was noted extending approximately 180 feet as shown on Figure 3. This trench was filled with debris, but open areas appeared to be competent.
- Chemical usage in the building included:
  - General household cleaners by various tenants (e.g., Lysol, Windex and bleach)

- Shelves where equipment maintenance products are stored are located in the southern part of the building

- Vehicles were observed inside the building loading and unloading inventory
- Tenants were observed smoking within the facility

Planned VII sample locations detailed in the RI/FFS Work Plan were based on initial observations during a property walk conducted on November 14, 2013, on previous VII results, and on the NYSDEC comments. Based on field observations during the March 14, 2014 building inspection, some sample locations were adjusted due to accessibility, current occupancy and use, or at the request of the Phoenix Property site representative. Table 1 details the sample locations, which are shown on Figure 3, along with rationale and tenant use information for each area. In summary, the following samples were collected: four indoor air samples (IA-1 through IA-4), two ambient air samples (OA-1 and OA-2), eight sub-slab soil gas samples (SSV-1 through SSV-8), and three soil vapor samples located outside of the building (SV-27, SV-28, and SV-29). Details regarding the sampling activities are provided in the following sections.

3.3.2 Indoor Air and Ambient Air Sampling

Indoor air samples (IA-1 through IA-4) and ambient air samples (OA-1 and OA-2) were collected on March 24, 2014. Indoor air samples were placed in areas within the Phoenix Property building considered to have a higher continuous occupancy rate (such as offices) and the ambient air samples were placed outside the footprint of the Phoenix Property building. The indoor and ambient air samples were collected using 6-liter Summa canisters with 8-hour flow controllers from a height of approximately 3-feet above the ground surface. The sampling points and sample collection information are summarized in Sample Collection Forms (see Appendix A). Summa canisters were sent under chain-of-custody procedures by overnight courier to TestAmerica for analyses of VOCs by United States Environmental Protection Agency (USEPA) Method TO-15[3], as summarized in Table 5A.

3.3.3 Sub-Slab Soil Gas Sampling

Sub-slab soil gas samples (SSV-1 through SSV-8) were collected on March 25 to 26, 2014 following completion of indoor and ambient air sampling activities. Sub-slab soil gas sample ports were installed following completion of subsurface utility clearances. Sub-slab soil gas probes were installed using the following procedures:

- A 3/8-inch diameter hole was drilled using a rotary hammer drill through the concrete floor slab, and penetrated approximately two inches into the sub-slab soil/fill material to create an open cavity.

[3] In addition, indoor/outdoor air samples were analyzed for carbon tetrachloride, trichloroethene, and vinyl chloride by method TO-15 low level.

- A temporary sub-slab sample port was constructed with 1/4-inch diameter inert tubing (i.e., Teflon®).

  Modeling clay, a non-VOC emitting and non-shrinking sealing material, was used to seal the sampling probe in the hole to prevent migration between indoor air and the sub-slab soil vapor.

After each temporary sub-slab soil gas sampling port was installed, leak testing was performed. Leak testing was conducted using sulfur hexafluoride (SF_6)[4], as previous investigations (Geosyntec, 2010) suggested the possible presence of methane would interfere with helium measurements. Leak testing was performed as follows:

- A shroud was placed and sealed over the temporary sub-slab soil gas sampling port by using a plastic pail equipped with fittings. The pail enclosed the sampling port and isolated it from the atmosphere.
- The space enclosed by the pail was enriched with sulfur hexafluoride (SF_6) gas through one of the fittings until the SF_6 detector (Model GasCheck 3000is) indicated that the SF_6 level of the air enclosed by the pail was at least 95 percent.
- The inert tubing extending from the sealed sub-slab soil gas sampling port was extended through a different fitting on the pail, and air from the sampling port was purged using the SF_6 detector at approximately 200 mL/min.
- Following removal of one to three probe/tubing volumes SF_6 levels were measured and the ports were determined acceptable for sampling if measurements were less than 10 percent SF_6.

The leak testing results are provided on the Sample Collection Forms (see Appendix A). Following leak tracer testing, the sample port was allowed to equilibrate for approximately 2 hours prior to collection of samples. Prior to sampling, each sub-slab port was purged using a low flow air pump at 200 ml/min for 5 minutes. Sub-slab soil gas samples were collected using 6-liter Summa canisters with 8-hour flow controllers. The sampling points and sample collection information are summarized in Sample Collection Forms (see Appendix B). Summa canisters were sent under chain-of-custody procedures by overnight courier to TestAmerica for analyses of VOCs by USEPA Method TO-15, as summarized in Table 5A.

The sub-slab soil gas sampling ports were removed and the surface of the floor slab restored using a non-shrink industrial caulk and/or concrete patch.

3.3.4 Soil Vapor Sampling

Soil vapor samples (SV-27 through SV-29) were collected on April 11, 2014 from locations shown on Figure 3. Soil vapor probes were installed following completion of subsurface utility clearances performed by GEOD (Section 3.1). Soil vapor probes were drilled through the parking lot asphalt surface cover following “Soft Dig” utility clearances. The remainder of the hole (5 to 10 ft bgs) was advanced using direct push methods. At each location a six inch stainless steel screen fitted to 1/4-inch inert tubing was

[4] Helium was specified in approved RI/FFS Work Plan.

installed at approximately 10 feet bgs. The annulus space around the screen and tubing was filled with approximately two feet of glass beads (i.e., Ballotini 60-100 mesh rounded glass beads) to create the sampling zone. An approximate three-foot bentonite slurry seal was placed above the sampling zone to prevent infiltration of ambient air. The remainder of the soil vapor boring was filled with clean sand. Soil vapor probe installation activities were performed by AmeriDrill. Leak testing was performed using methods detailed for sub-slab soil gas ports (Section 3.3.3). Following leak testing, the sample probe was allowed to equilibrate for approximately 2 hours prior to collection of samples. Soil vapor samples were collected using 6-liter Summa canisters with 8-hour flow controllers. The sampling points and sample collection information are summarized in Sample Collection Forms (see Appendix B). Summa canisters were sent under chain-of-custody procedures by overnight courier to TestAmerica for analyses of VOCs by USEPA Method TO-15, as summarized in Table 5A.

Following sample collection, leak testing of the sample port was repeated, the sampling tubing removed and the parking area surface cover restored with asphalt patch.

3.4 LIF/UVOST Screening

Laser Induced Fluorescence (LIF)/Ultraviolet Optical Screening data were collected on April 14, 2014 by Columbia Technologies Inc. ahead of collection of continuous soil cores and well construction. A LIF/UVOST Screening probe was advanced at each location by direct push drilling methods (AmeriDrill) at four locations (LIF-34, LIF-35, LIF-36, and LIF-37). LIF/UVOST data (Appendix D) provided a semi-quantitative measurement regarding the presence of petroleum hydrocarbons in the soil column. A xenon-chloride laser induces fluorescence in certain compounds (such as polycyclic aromatic hydorcarbons) present in petroleum products and the fluorescent intensity is then measured relative to a standard at four wavelengths (350, 400, 450 and 500 nanometers). LIF/UVOST borings LIF-34 through LIF-37 (Figure 3) were advanced to the depth where either no significant response was observed or refusal was encountered:

- LIF-34 to ~21.7 ft bgs (-5.6 MSL) (refusal)
- LIF-35 to ~57 ft bgs (-40.9 ft MSL) (refusal)
- LIF-36 to ~49ft bgs (-32.8 ft MSL)
- LIF-37 to ~49ft bgs (-32.9 ft MSL)

3.5 Soil Sampling

3.5.1 Hand Auger Shallow Soil Sampling

As described in Section 3.1, an 8-inch diameter hole in the concrete floor was cored with a portable core drill machine by the drilling subcontractor. Boreholes GAL-34 through GAL-37 were sampled from 0-2 ft bgs using a decontaminated stainless-steel hand auger. The concrete at all four soil boring locations was 6-inches thick. No rebar or other concrete reinforcement was observed.

Soil samples were logged during drilling activities and classified for physical properties using the Unified Soil Classification System (USCS) and for anthropogenic impacts (staining or odor observations). All recovered soil from hand auger samples was field screened using a PID by slightly scoring the surface of the soil core with a stainless steel knife and immediately running the PID probe along the scored section of the core. Field screening was performed at a location shielded from the wind.

Soil samples were collected in accordance with the approved RI/FFS Work Plan and submitted to Test America for analytical testing, as summarized in Table 5C. Each soil sample was analyzed for Target Compound List (TCL) VOCs, semi-volatile organic compounds (SVOC), polychlorinated biphenyls (PCB), Target Analyte List (TAL) metals, and cyanide.

3.5.2 Direct Push Soil Sampling

Direct push drilling methods were used to collect soil cores below five ft bgs at soil boring/well locations GAL-34, GAL-35, GAL-36 and GAL-37. The soil samples were logged during drilling activities and classified for physical properties using the USCS and for anthropogenic impacts (staining or odor observations) and described in regards to the sample texture, composition, color, consistency, percent recovery and moisture content. Soil characterization of the three to five ft bgs range of each borehole was logged based on visual description of the Fill material removed during soft-dig activities.

Soil samples were collected, in accordance with the approved RI/FFS Work Plan, from the 5-7 ft bgs and 10-12 ft bgs intervals from all samples except GAL-34, which had no recovery from the 10-15 ft bgs interval; due to the poor recovery in the 10-15 ft bgs interval, samples were therefore collected from the 18-20 ft bgs interval in GAL-34[5]. Samples were submitted to Test America for analysis for TCL VOCs, SVOCs, PCBs, TAL metals, and cyanide, as summarized in Table 5C. Soil boring logs are provided in Appendix E.

3.6 LNAPL Well Installation

Following completion of the direct-push soil borings (GAL-34 through GAL-37), 4¼ inch, inner diameter, hollow stem augers were advanced to approximately 28.5 feet bgs in all four monitoring well locations. The final well construction depths were based on the vertical extent of environmental impacts and water table depth observed during the completion of the soil borings. Boring and well installation logs are provided in Appendix C.

3.6.1 LNAPL Well Construction

The monitoring wells were constructed in accordance with the approved RI/FFS Work Plan with 2-inch diameter schedule 40 flush-joint threaded PVC with 0.020 slot screen and solid riser to grade. The

[5] Soil borings were continued at these locations to the same depths as the LIF borings.

approximate mid-points of the well screens were located across the groundwater/LNAPL interface and were screened from 8 to 28 ft bgs, as described in Table 2.

An 8-inch diameter, flush-mount steel manhole cover assembly was installed within a concrete well pad with a Teflon gasket and silicon seal around the perimeter of the assembly after the annular grout had cured for at least 24 hours. A non-expandable well cap and lock were installed at the completion point of each well.

3.7 Groundwater and LNAPL Level Monitoring

Following installation of GAL-34, GAL-35, GAL-36, and GAL-37, an electronic interface probe (EIP) was used to measure apparent LNAPL thickness and the groundwater/LNAPL interface in the following wells:

- Phoenix Property: MW-8, GAL-14, GAL15, GAL-17, GAL-25, GAL-26, GAL-32, GAL-33, GAL-34, GAL-35, GAL-36, and GAL-37
- 38-20 Review Avenue: MW-54, MW-55, and MW-56
- 38-22 Review Avenue: MW-6, MW-6S, MW-1, and MW-38 (MW-37, which had been planned to be sampled in the RI/FFS Work Plan was inaccessible during all field events)
- 37-80 Review Avenue GAL-08 and GAL-16R (GAL-03, which had been planned to be sampled in the RI/FFS Work Plan, was flagged by surveyors but could not be located)

Wells were gauged on August 18, 2014, and again on September 3, 2014[6].

PID, FID, and %LEL readings were taken upon opening each well and readings indicated >100% LEL (calibrated against methane) in the following wells: GAL-08 and GAL-16R on 37-80 Review Avenue; GAL-17, GAL-32, GAL-35, GAL-36, and GAL-37 on the Phoenix Property; MW-1 and MW-6S on 38-22 Review Avenue; and MW-54 and MW-55 on 38-20 Review Avenue. Each of these wells, except MW-1, contained LNAPL. Gauging measurements are provided in Table 3.

3.8 Groundwater Sampling

As per the approved RI/FSS Work Plan, groundwater samples were to be collected only from the Phoenix Property wells that contained no LNAPL and no evidence of LNAPL (sheen). Based on the gauging events only one well, GAL-15, met this criterion. GAL-15 was initially purged using low flow techniques using a decontaminated stainless steel Grundfos Redi-Flo 2 submersible pump. However, due to excessive water level drawdown and very slow recharge, low flow sampling could not be conducted and volume average purging and sampling methods were used per the NYSDEC guidance. The field sampling form is provided in Appendix B. Well GAL-15 was sampled using a Teflon lined, polyethylene bailer and submitted

[6] A significant difference in LNAPL levels was observed in MW-56 in the southern area of 38-20 Review Avenue between the two gauging events. On August 18, 2014, 0.18 ft LNAPL was detected. During the second gauging event of September 3, 2014, 3.40 ft of LNAPL was detected. Golder was informed by Kleinfelder that apparent LNAPL thicknesses in this well have been variable.

to TestAmerica for analytical testing, as summarized in Table 5B. The groundwater samples were analyzed for TCL VOCs, SVOCs and PCBs, TAL metals, and the Natural Attenuation Parameters (NAPs). All water generated during purging was collected and contained in DOT approved 55-gallon drums for disposal off-site in accordance with all applicable state and federal regulations.

3.9 LNAPL Sampling

LNAPL samples were collected on August 18 and 19, 2014 from:

- Phoenix Property: MW-8, GAL-14, GAL-17, GAL-26, GAL-32, GAL-33, GAL-35, GAL-36, and GAL-37
- 38-20 Review Avenue: MW-54, MW-55, and MW-56
- 38-22 Review Avenue: MW-6 and MW-6S
- 37-80 Review Avenue: GAL-08 and GAL-16R

Due to insufficient LNAPL volume for all analyses in MW-54 and MW-56, additional volume was sampled on September 3, 2014. Samples were not collected from GAL-15, MW-1, and MW-38 because no LNAPL was observed. There was insufficient volume for sampling in wells GAL-25 and GAL-34.

Samples were submitted for laboratory analysis for TCL VOCs, TCL SVOCs, TCL PCBs, TAL metals, gasoline, diesel and mineral range organics (GRO/DRO/MRO), chemical fingerprint by gas chromatography (GC) and library search, TOX (total organic halides), %sulfur, %sediment, flash point, British Thermal Units (BTUs), density, viscosity, and surface and interfacial tension, as summarized in Table 5D.

3.10 LNAPL Baildown Testing

Baildown tests were conducted on nine Phoenix Property LNAPL monitoring wells to help assess LNAPL mobility and transmissivity. Pre-test monitoring of fluid levels was conducted on each well selected for baildown testing on August 18, 2014 to evaluate trends in baseline LNAPL apparent thickness. In general, the test at each well included the instantaneous removal of LNAPL from each well using a dedicated bailer. To remove as much LNAPL as possible in as short a period as possible, several bailers were tied together to maximize the volume of LNAPL removed in the 4-inch diameter wells (GAL-14, GAL-17, and GAL-26). A single bailer was used in 2-inch diameter wells (MW-8, GAL-32, GAL-33, GAL-35, GAL-36, and GAL-37). Prior to each test, the air/LNAPL and LNAPL/water interfaces were measured with a Solinst electronic oil/water interface probe. Once a sufficient volume of LNAPL was removed, the air/LNAPL and LNAPL/water interface was measured and monitored throughout the recovery period. The frequency of monitoring was dependent upon recharge rate and changed with each test. In general, the gauging occurred every minute during the initial 10 minutes of the recovery period and decreased over time until sufficient time had passed. Copies of the LNAPL gauging records are included in Appendix F.

Baildown testing was conducted in accordance with the relevant portions of ASTM, Standard E2856-13 and American Petroleum Institute (API) Publication 46xx [pre-publication draft]), September 2012. A minimum apparent LNAPL thickness of 0.5 feet was the threshold for conducting baildown testing (ASTM, 2013). Wells with at least 0.5ft of LNAPL were tested and included:

- GAL-14, GAL, 17, GAL, 26, GAL-32, GAL-33, GAL-35, GAL-36, GAL-37, and MW-8

LNAPL transmissivities were calculated from the American Petroleum Institute's (API) LNAPL Transmissivity Spreadsheet (API, 2012) and are summarized in Table 4. Complete results are presented in Appendix F.

3.11 Surveying

The following survey work was completed by GEOD, a State of New York licensed surveying subcontractor:

- Control Survey – A control survey was performed using NAD 1983 as the horizontal datum and NAVD 1988 as the vertical datum;
- Survey of Environmental Points – All newly installed wells (GAL-34, GAL-35, GAL-36, and GAL-37) and existing wells located on the Phoenix Property were resurveyed.
- Phoenix Property Survey – A survey of the Phoenix Property and buildings was performed.
- GAL-03 was surveyed and the location flagged (well was not found)

3.12 Investigation Derived Waste

Investigation derived Waste (IDW) generated during remedial investigation field activities was containerized in 55-gallon DOT-certified steel open-top drums, labeled, and staged in a secure area on the Phoenix Property as designated by Phoenix Property Management for storage pending off-site disposal in accordance with all applicable state and federal regulations.

Composite samples of the IDW materials were collected for waste characterization on September 4, 2014 and scheduling transportation and off-site disposal is in progress.

4.0 NON-RI FIELD ACTIVITIES – INDOOR AIR METHANE SURVEY, SAMPLING AND RESULTS

At the request of Exxon Mobil and Quanta Resources Corporation Golder completed an indoor air survey of the Phoenix Building for methane on November 5, 2014. The scope of work for this indoor air building survey for methane was similar to the work performed by Geosyntec on January 9, 2010 as described in their February 9, 2010 Report (Phase IIA Soil Vapor Investigation Report: Review Avenue Development II Property). However, the survey conducted on November 5, 2014 also included sampling of the indoor air for quantitative analysis of methane by TestAmerica.

The work performed included use of field-screening instrumentation to evaluate for the presence of methane in addition to the collection of indoor air samples for laboratory analysis of methane. A FID calibrated against methane with an activated charcoal filter (which has a detection limit of 0.5 ppm) and GEM 2000 landfill gas meter (which has a methane detection limit of 500 ppm (1% of the LEL)) were used to measure the levels of methane in the Phoenix Building. Specific field measurements were made at a total of 32 locations throughout the warehouse (ground floor) and office building (1st and 2nd floor) to evaluate occupied areas of the Phoenix building. Readings were collected from identified areas of interest observed at the time of the survey: cracks in the walls and floors, within enclosed spaces, along drainage structures in and out of the Phoenix building, in elevated locations (loft location within the warehouse and on the first and second floor), and in other locations to provide general coverage of occupied areas within the Phoenix building where access was provided.

At the time of the building survey, the Phoenix building use was observed to be primarily warehousing space (ground floor), with some commercial/industrial activities being conducted (electronics separation, food redistribution). Two bay doors exist along the western side of the Phoenix building and two bay doors exist on the northern side of the southern portion of the building. These bay doors are open throughout the day as part of normal business operations and were open during the indoor air survey and sampling activities. No evidence of cracks, expansion joints or floor penetrations was observed, although hair-line cracks were observed. Not all areas of the Phoenix building were accessible; the maintenance room and spaces occupied by several tenants located along the northeast wall of the warehouse portion of the Phoenix building.

Summa Canisters provided by TestAmerica were used to collect grab indoor air samples at 8 representative locations (IA-M1 through IA-M8) within the Phoenix building as described in Appendix G (Table G1 and Figure G1). These samples were sent under chain-of-custody procedures overnight to TestAmerica for analyses of methane by USEPA Method 3C.

Methane was not detected at any location with the GEM 2000 meter. The more sensitive FID meter had low levels detections within the Phoenix building warehouse area. The highest concentration of methane

detected was at a floor drain at a concentration of 370 ppm (less than one-hundredth of the LEL) within the Phoenix building warehouse. The FID reading at a height of approximately 5 feet above the drain was 2.6 ppm. Methane was not detected in samples IA-M1 through IA-M8 above the analytical laboratory reporting limit. The results are provided in Appendix G.

5.0 SUMMARY OF GEOLOGIC AND HYDROGEOLOGIC INVESTIGATION RESULTS

5.1 Site Geology

The Phoenix Property is located approximately 350 feet northeast of Newtown Creek that flows northwest into the East River in the western part of Long Island. The surficial material on the Phoenix Property and in the vicinity of the Phoenix Property are composed of man-made urban fill and reworked natural glacial and alluvium deposits as identified during this RI as well as previous investigations.

Subsurface soils and groundwater conditions in the vicinity of the Phoenix Property have been characterized extensively during previous investigations conducted on the Phoenix Property and on parcels within the FPOW, RADII and RADI. The following geologic interpretation is based on the results of subsurface investigation (drilling) completed as part of the Phoenix Property RI and from of the sources described above. The geologic strata observed at the Phoenix Property (presented from youngest to oldest) are:

- Urban Fill
- Glacial and Alluvium Deposits

A brief description of each geologic unit is provided below and geologic cross sections are presented in Figure 4. Well installation logs/soil boring logs are provided in Appendix C.

5.1.1 Urban Fill

The surficial material beneath the surface cover at the Phoenix Property and surrounding area is largely comprised of anthropogenic, urban fill consisting of a mixture of heterogeneous material primarily consisting of angular to sub angular silty sand and gravel locally intermixed with brick fragments, asphalt, concrete, coal ash fines, plastic and other debris. On the Phoenix Property the urban fill ranges in thickness from 5 feet (GAL-14 and GAL-15) to 20 feet (GAL-34).

5.1.2 Glacial and Alluvium Deposits

The materials underlying the urban fill are a sedimentary sequence composed of alluvial and glacial deposits. The upper portions (roughly 20-30 feet thick) of this stratigraphic unit contain discontinuous peat, silt, silty-sand, silty-clay, and clay horizons, which have been encountered in previous investigations. This sequence was not encountered in boreholes of GAL-34, GAL-36, and GAL-37 on the Phoenix Property. A sandier sequence of material was observed in wells GAL-34, GAL-35, GAL-36, and GAL-37 as illustrated on Cross-Sections A-A' and B-B' on Figure 4. Beneath the shallow peat, silt, silty-sand, silty-clay, and clay horizons is a relatively continuous sequence of sand and gravel deposits that

consist predominately of interbedded horizons of fine-to-medium sand and fine-to-coarse sand with some fine-to-coarse gravel.

5.2 Site Hydrogeology

The Phoenix Property lies between a local topographic high to the northeast and Newtown Creek, a tidally influenced regional groundwater discharge area to the southwest. A synoptic round of LNAPL and groundwater level gauging was conducted on August 18 and September 3, 2014 from appropriately constructed LNAPL monitoring wells on the Phoenix Property, on the FPOW, and on the RAD II Property. The monitoring well gauging data are summarized in Table 3. Depth to groundwater on the Phoenix Property ranged from 12.14 feet below grade at GAL-34 to 19.62 feet below grade GAL-35 (beneath LNAPL). Interpreted groundwater contour maps along with LNAPL observations are presented on Figures 5 and 6. As shown on Figures 5 and 6, relatively higher groundwater elevations are observed at GAL-34 and MW-38. These higher groundwater elevations relative to other nearby wells indicate the presence of a local groundwater mound, consistent with investigations on RAD II. A shallow clay horizon identified just southwest of the Phoenix Property and the RAD II Property may be responsible for the formation of a local groundwater mound in the area of the railroad tracks. The presence of the shallow clay horizon and associated local groundwater mound is based on previous remedial investigation (Golder, June 2005) and the current Phoenix Property RI.

Public drinking and industrial water for Queens County are supplied primarily by the New York City reservoir system; groundwater within the vicinity of the Phoenix Property is not used for potable purposes and likely will not be used in the future as a potable source.

6.0 LABORATORY ANALYSIS AND VALIDATION

All samples were analyzed in accordance with the approved RI/FFS Work Plan and have been reviewed following guidance provided by the USEPA Region II Standard Operating Procedures (SOPs). A data quality review and detailed findings of the data quality assessment are presented in the Data Usability Summary Report (DUSR), included as Appendix F. Groundwater, soil, LNAPL, and vapor samples were analyzed in a fixed laboratory, as summarized in Tables 5A – 5D. LNAPL samples were analyzed for % sulfur, % sediment, flash point, BTUs, density, viscosity, surface tension, and interfacial tension by Texas OilTech Laboratories, L.P. of Houston, TX (TOT). All other analyses were conducted by TestAmerica Laboratories, Inc. Analytical data packages are provided in Appendix H.

Notable observations from the data quality assessment are presented below:

- All indoor air and ambient/outdoor air samples were analyzed by two methods (methods USEPA TO-15 and USEPA TO-15 low level[7]) for carbon tetrachloride, trichloroethene, and vinyl chloride. In order for the data to satisfy project requirements and the laboratory to achieve the lowest possible reporting limits, results from the low level analysis were deemed reportable for these compounds, and results from the standard USEPA TO-15 analysis were deemed non-reportable.
- Certain soil, LNAPL, and groundwater results were rejected when recoveries in the matrix spike / matrix spike duplicate (MS/MSD) samples were non-detect (organic analyses) or less than 30% (inorganic analyses).
- Additional qualifications of the data as estimated (J for detected results, UJ for non-detect results) or non-detect (U) were required for some of the data based on general method conformance, holding times, blank contamination, laboratory control samples, surrogate and spike recoveries, field precision, precision of duplicate measurements, and calibration and instrument performance. Specific qualifications applied to the data are detailed in the DUSR.

In summary, the overall validated data completeness (i.e. the ratio of the amount of valid data obtained to the amount expected, including estimated data (J/UJ)) for soil samples was 99.8%, for LNAPL samples was 98.6%, for groundwater samples was 99.4%, and for vapor samples was 100%.

[7] USEPA Compendium Method TO-15, Determination of Volatile Organic Compounds (VOCs) In Air Collected In Specially Prepared Canisters and Analyzed By Gas Chromatography/Mass Spectrometry (GC/MS) (January 1999), and TO-15 LL (Low-Level) Supplement to EPA Compendium TO-15 – Reduction of Method Detection Limits to Meet Vapor Intrusion Monitoring Needs.

7.0 SUMMARY OF INVESTIGATION RESULTS

7.1 Vapor Intrusion Investigation Results

As presented in the NYSDOH Guidance for Evaluating Soil Vapor Intrusion in the State of New York (October 2006), "The phrase 'soil vapor intrusion' refers to the process by which volatile organic chemicals (VOCs) migrate from the subsurface source into the indoor air of buildings." VII samples collected from the building indoor air, sub-slab soil gas, outdoor air and soil vapor nearby the building were used to determine whether a VI pathway exists from subsurface source(s) to soil gas to indoor air.

7.1.1 Screening Levels

NYSDOH provides indoor air and outdoor air screening levels for the following compounds that were included in the VOC list analyzed: methylene chloride (60 µg/m^3), tetrachloroethene (PCE; 30 µg/m^3), and trichloroethene (TCE; 5 µg/m^3). No indoor air or outdoor air samples exceeded these screening levels. The State of New York does not have any standards, criteria or guidance values for review of other compounds in indoor air or for evaluating sub-slab soil gas or soil vapor data with respect to VI. The NYSDOH SVI Guidance indicates that reasonable and practical actions should be taken to reduce exposures when indoor air levels are above background and in consideration of human health risks. To supplement screening levels provided in the NYSDOH SVI Guidance and evaluate whether a potential for human health risks exists, data were also compared to the following screening levels:

- Indoor air - USEPA Regional Screening Levels for Industrial air (RSLs) (TR = 1.0 x 10-6, HI 0.1) dated May 2014.
- Sub-slab soil gas screening levels (SGSL) were calculated based on the USEPA May 2014 RSLs for industrial air using a conservative attenuation factor (α) of 0.1[8] (indoor air RSLs are multiplied by a factor of 10), as per USEPA draft vapor intrusion guidance (USEPA, 2002). The attenuation factor is a measure of how much subsurface concentrations are reduced when migrating into indoor air spaces.

7.1.2 Results

Indoor air and ambient air sample analysis results are summarized in Table 6 and sub-slab soil gas and soil vapor sample analysis results are summarized in Table 7. Laboratory data packages are provided in Appendix I. No compounds were detected in indoor air samples above the NYSDOH Air Guideline Values or the Occupational Safety and Health Administration Permissible Exposure Limits (OSHA PELs)[9]. VI data were further evaluated to determine whether compounds detected in indoor air above the RSLs for industrial air (or in soil gas above SGSL) are associated with background sources (ambient air

[8] The USEPA Vapor Intrusion Screening Level (VISL) Calculator User's Guide bases generic screening levels on a conservative attenuation factor of 0.1 for the soil gas to indoor air pathway for use as a screening tool.

[9] OSHA PELs are referenced to provide context for review of indoor air data as it pertains to compounds potentially in use at the facility.

or facility operations), or indicate current VI issue (complete pathway) or represent a potential future VI risk. In summary, data generated and evaluated for this VII indicate:

- Near building soil vapor sample locations (i.e., SV-27, SV-28, and SV-29) selected to delineate the extent of 2010 elevated soil vapor results at soil vapor location SV-22 (total VOCs were detected at 114,780 µg/m^3) (Geosyntec, 2010) confirm that the elevated soil vapor levels measured in SV-22 are confined to a small area. Soil vapor levels at SV-27, SV-28, and SV-29 were orders of magnitude lower (total VOC levels of 13,345 µg/m^3, 27,522 µg/m^3, and 60,716 µg/m^3, respectively) than at SV-22.
- The following compounds were detected in sub-slab soil gas above SGSL but were not detected in indoor air: benzyl chloride, chloroform, methyl tert-butyl ether (MTBE)[10], naphthalene, TCE, and vinyl chloride. There is no current complete VI pathway. Butane, cyclohexane, isopropylbenzene, and n-hexane were the primary constituents detected in sub-slab soil gas. A review of vapor intrusion data associated with these compounds indicates:
  - Butane and cyclohexane were not detected above VI screening levels (SGSL and RSL) in sub-slab soil gas or in indoor air.
  - Isopropylbenzene was detected above the SGSL at SSV-03 (3,800 µg/m^3), and n-hexane was detected above its SGSL at SSV-04 (5,100 µg/m^3). Detection of isopropylbenzene and n-hexane above SGSL did not translate to indoor air levels above USEPA RSLs for industrial air in nearby indoor air samples IA-2 (0.48 J µg/m^3 and 8.3 J µg/m^3, respectively) or IA-3 (0.25 J µg/m^3 and 2.6 µg/m^3, respectively). These low level detections in indoor air are likely associated with facility operations (i.e., auto exhaust and gasoline); therefore, there is no current complete VI pathway.
  - The maximum detected level of butane, cyclohexane, isopropylbenzene, and n-hexane in indoor air (all below RSLs for industrial air) were at IA-4 (22 µg/m^3, 4.4 µg/m^3, 1.5 µg/m^3, and 17 µg/m^3, respectively). This location is more than 175 feet away from sub-slab soil gas locations where SGSL were exceeded for isopropylbenzene and n-hexane (SSV-03 and SSV-04, respectively). These indoor air detections are associated with products identified in the vicinity of this sample location and facility operations (i.e. container of butane, spray paints, auto exhaust, and gasoline) and are not indicative of active VI (incomplete VI pathway).
- 1,4-dichlorobenzene was detected in indoor air above its RSL for industrial air (1.1 µg/m^3) but was not detected in any sub-slab soil gas samples. These indoor air detections are attributed to facility operations as no sub-slab source for 1,4-dichlorobenzene was identified (background).
- The following compounds were detected in indoor air above RSLs for industrial air and were also detected in sub-slab soil gas: 1,2,4-trimethylbenzene, benzene, and ethylbenzene were detected at levels above the SGSL in soil-gas; and 1,3-Butadiene, m,p-xylenes, and o-xylene were detected at levels below the SGSL in soil gas. If these indoor air detections were associated with VI, the primary constituents detected in sub-slab soil gas (butane, cyclohexane, isopropylbenzene, and n-hexane) would be detected at higher levels in indoor-air. Therefore, these detections are attributed to facility operations (i.e., automobile exhaust, cigarette smoke and products stored in the building) and not indicative of active VI (background and incomplete VI pathway).

[10] MTBE was detected in SV-27 at 71 ug/m^3 and in SV-28 at 63 ug/m^3 and in SSV-4 at 280 ug/m^3 and SSV-6 at 790 ug/m^3. SV-28 is immediately adjacent to the existing Phoenix Property UST while SSV-04 and SSV-6 are sub-slab soil-gas samples collected from beneath the Phoenix building proximal to Phoenix Property USTs.

Based on these VII data, detections of compounds listed above in indoor air above the RSLs for industrial air are associated with facility operations and not the result of a complete VI pathway to indoor air. These VII data also demonstrate a potential for future VI should there be a change in current Site conditions that creates a pathway.

7.2 LIF Results

As reported by Columbia Technologies, LLC (Appendix D), LIF responses indicating petroleum hydrocarbons were detected at depths as shallow as 2 feet bgs (LIF-35) and as deep as 57.06 feet bgs (LIF-35). Maximum response of 808%RE was observed at location LIF-37, at 15.32 feet bgs. Response above baseline values was observed at all four locations (LIF-34, LIF-35, LIF-36, and LIF-37).

7.3 Groundwater Sample Analytical Results

Groundwater samples were collected from the only shallow well on the Phoenix Property with no evidence of measureable LNAPL or the presence of a sheen (GAL-15). This well is screened across the water table and is located hydraulically upgradient to the other Phoenix Property wells, as shown on Figures 5 and 6. As discussed in Section 3.8, GAL-15 was initially purged using low flow purge techniques but due to slow recharge, the well was purged and sampled using volume average methods with a Teflon lined, polyethylene bailer. Field parameters were monitored upon sampling as follows:

Parameter	initial purging	upon sampling
Dissolved Oxygen (mg/L)	0	2.96
Redox Potential (mV)	-68	+ 40
pH (pH units)	7.05	7.64
Specific Conductance (ms/cm)	3.7	3.11
Temperature (deg C)	21.95	18.02
Turbidity (ntu)	200	110

The groundwater sample was analyzed for TCL VOCs, SVOCs and PCBs, TAL metals, and the Natural Attenuation Parameters (NAPs), as shown in Table 5B.

The laboratory sample analyses results were compared to NYSDEC Technical & Operational Guidance Series (TOGS) 1.1.1 Class GA (groundwater) standards and guidance values, collectively referred to as TOGS 1.1.1 GA criteria. The TOGS 1.1.1 GA criteria include constituents that have a groundwater standard in 6 NYCRR Part 703, as well as constituents that have NYSDEC guidance values. Based on a review of the TOGS 1.1.1 GA criteria documentation, Class GA standards are stated to be based on the protection of the use of groundwater as drinking water. However, groundwater in the near vicinity of the Phoenix Property is not utilized for drinking water purposes. In fact, the nearest groundwater source used

for drinking is expected to lie several miles from the Phoenix Property[11]. Therefore, comparing the Phoenix Property groundwater data to the TOGS 1.1.1 GA criteria is a very conservative screening step since the exposure pathway used to develop the TOGS 1.1.1 GA criteria (groundwater as drinking water) is not applicable to the Phoenix Property. Nonetheless, the groundwater data have been compared to the TOGS 1.1.1 GA criteria.

7.3.1 Groundwater Volatile Organic Compounds (VOCs)

Twenty-four VOCs (including estimated "J" values below reportable quantitation limits) were detected in samples collected from GAL-15. Table 8 presents a summary of VOC detections as well as a comparison of the VOC detections to TOGS 1.1.1 GA criteria. Laboratory data packages are provided in Appendix I. Twelve VOCs were detected at concentrations greater than the TOGS 1.1.1 GA criteria. Of these, three (chloroethane, ethylbenzene, and trichloroethene) were detected at low levels and were only greater than the TOGS 1.1.1 GA criteria in the field duplicate. The remaining VOCs were detected at concentrations that exceeded the TOGS 1.1.1 GA criteria at levels ranging from 5.9 µg/L (1,1-dichloroethene, TOGS 1.1.1 GA criteria = 5 µg/L) to 130 µg/L (cis-1,2-dichloroethene in the field duplicate, TOGS 1.1.1 GA criteria = 5 µg/L) and these VOCs were:

Parameter	TOGS 1.1.1 GA criteria	GAL-15	
		Primary	Field Duplicate
1,1,1-Trichloroethane	5	16 J	30 J
1,1-Dichloroethane	5	29 J	50 J
1,1-Dichloroethene	5	5.9 J	10 J
1,2-Dichlorobenzene	3	6 J	9 J
Benzene	1	77	76
cis-1,2-Dichloroethene	5	70 J	130 J
Freon 113	5	18 J	32 J
Isopropylbenzene	5	8.4	11
Vinyl Chloride	2	11 J	18 J

units are ug/L

Thirteen VOCs were detected in up-gradient wells MW-15 and MW-16, installed as part of the Roehr off-site investigation, when sampled in November 2000 (SMC, Table 4) and six were detected at concentrations equal to or above the TOGS 1.1.1 GA criteria: benzene, ethylbenzene, xylenes, MTBE, cis-1,2-dichloroethene, and trichloroethene. Chlorinated VOCs and BTEX compounds have likewise been detected south of the Phoenix Property in MW-1 (Kleinfelder, 2011). The Roehr up-gradient wells have similar VOCs to GAL-15.

[11] Public drinking water supplies for Queens County are supplied by the New York Reservoir System (New York City 2013 Drinking Water Supply and Quality Report, New York City Department of Environmental Protection).

7.3.2 Semi-Volatile Organic Compounds (SVOCs)

Two SVOCs (including estimated "J" values below reportable quantitation limits) were detected in samples collected from GAL-15. Bis(2-ethylhexyl) phthalate was detected in the primary and the field duplicate sample at levels exceeding the TOGS 1.1.1 GA criteria (16 µg/L and 20 µg/L, respectively, TOGS 1.1.1 GA criteria = 5 µg/L) and pyrene was detected in the primary sample (but not in the field duplicate) at an estimated concentration of 1.9 µg/L (TOGS 1.1.1 GA criteria = 50 µg/L). Table 8 presents a summary of SVOC detections as well as a comparison of the SVOC detections to TOGS 1.1.1 GA criteria.

7.3.3 Polychlorinated Biphenyls (PCBs)

No PCBs were detected as shown in Table 8.

7.3.4 Metals and Cyanide

No cyanide was detected and seventeen metals were detected in the sample collected from GAL-15. Table 8 presents a summary of metal detections as well as a comparison of the metal detections to TOGS 1.1.1 GA criteria. Seven metals were detected in the primary or field duplicate sample at concentrations greater than the TOGS 1.1.1 GA criteria. Antimony was detected at low levels and was only greater than the TOGS 1.1.1 GA criteria in the field duplicate (2.9 µg/L and 3.3 µg/L, TOGS 1.1.1 GA criteria = 3 µg/L). The metals that were detected at concentrations that exceeded the TOGS 1.1.1 GA criteria ranged from an estimated concentration of thallium of 0.77 µg/L (TOGS 1.1.1 GA criteria = 0.5 µg/L) in the primary sample to 267 mg/L of sodium (TOGS 1.1.1 GA criteria = 20 mg/L) and these metals were:

Parameter	TOGS 1.1.1 GA criteria	GAL-15	
		Primary	Field Duplicate
Antimony	3	2.9	3.3
Arsenic	25	33.6	35.9
Iron[5]	300	44800	45200
Magnesium	35000*	43200	44700
Manganese[5]	300	1100	1100
Sodium	20000	259000	267000
Thallium	0.5*	0.77 J	0.95

*Where no standard value has been promulgated and placed into regulation, guidance values provided for a substance in NYSDEC TOGS 1.1.1 are shown and notated by **

units are ug/L

As this well was sampled by bailer using volume average methods, and the analyses represent unfiltered samples, the elevated levels of metals may represent contributions from suspended sediment.

7.3.5 Light Hydrocarbons

No ethene or ethane was detected. Methane was detected at concentrations of 1,100 µg/L and 1,200 µg/L in the primary and the field duplicate, respectively. There is no TOGS 1.1.1 GA criteria for methane.

7.3.6 Natural Attenuation Parameters (NAPs)

Four of eight NAPs considered (chloride, nitrate, sulfate, and total dissolved solids) have TOGS 1.1.1 GA criteria. Chloride exceeded the TOGS 1.1.1 GA criteria with a concentration of 715 mg/L (and 714 mg/L in the field duplicate, TOGS 1.1.1 GA criteria = 250 mg/L) and total dissolved solids exceeded the TOGS 1.1.1 GA criteria with a concentration of 2,320 mg/L (and 2,200 mg/L, TOGS 1.1.1 GA criteria = 500 mg/L). Table 8 presents a summary of detections as well as a comparison to the TOGS 1.1.1 GA criteria, where available.

An evaluation of natural attenuation in groundwater at the site was not possible as only a single well was able to be sampled using bailers and volume average methods due to low recharge.

7.4 Fill/Soil Sample Analytical Results

As discussed in Section 4, fill was encountered in all of the soil borings advanced on the Phoenix Property. The fill thickness ranged from approximately 20 feet at boring GAL-34 to five feet at borings GAL-14, and GAL-15. The geologic cross-sections shown on Figure 4 illustrate the distribution of fill across the Phoenix Property. Due to its widespread distribution, all but one soil sample (GAL-35 from 10-12 feet) at the Phoenix Property were collected within fill material. Depending on the source and date of placement of the fill may or may not contain impacts not associated with historic operations at the Phoenix Property. The presence of fill at the Phoenix Property is typical of the conditions found in many New York metropolitan area sites.

The fill/soil sample analyses results were compared to the Restricted Use Industrial Soil Cleanup Objectives for Public Health (RUSCO-Industrial) as presented in the New York Codes of Rules and Regulation (NYCRR) Subpart 375-6 (Table 6.8(b)) dated December 14, 2006.

Figure 7 summarizes the exceedances of the RUSCO-Industrial guidance values for fill/soil samples collected from borings GAL-34 through GAL-37. The analytical results are summarized in Table 9. Laboratory data packages are provided in Appendix I. All fill/soil samples were analyzed for TCL VOCs, SVOCs, and PCBs, TAL metals and cyanide, as shown in Table 5C. The following discusses the exceedances of the soil guidance values in fill/soil.

7.4.1 Volatile Organic Compounds (VOCs)

Seventeen VOCs (including estimated "J" values below reportable quantification limits) were detected in subsurface fill/soil samples collected at the Phoenix Property. There were no VOCs detected at concentrations exceeding the RUSCO-Industrial guidance values.

7.4.2 Semi-Volatile Organic Compounds (SVOCs)

Eighteen SVOCs (including estimated "J" values below reportable quantification limits) were detected in subsurface fill/soil samples collected of which three SVOCs exceeded the RUSCO-Industrial guidance values.

The following three SVOCs were detected at concentrations exceeding the RUSCO-Industrial guidance values in one or more fill/soil samples:

- Benzo(a)anthracene (RUSCO-Industrial Guidance Value – 11 mg/kg): one exceedance in GAL-34 (18-20 feet) at a concentration of 20 mg/kg
- Benzo[a]pyrene (RUSCO-Industrial Guidance Value – 1.1 mg/kg): 1.4 mg/kg in GAL-35 (5-7 feet) to 12 mg/kg in GAL-34 (18-20 feet)
- Dibenz[a,h]anthracene (RUSCO-Industrial Guidance Value – 1.1 mg/kg): two exceedances in GAL-34 at 5-7 feet and 18-20 feet at concentrations of 1.6 mg/kg and 3.6 mg/kg, respectively

7.4.3 Polychlorinated Biphenyls (PCBs)

There were no PCBs detected in any of the soil samples.

7.4.4 Metals and Cyanide

There were no exceedances of the RUSCO-Industrial guidance values.

7.5 LNAPL Investigation Results

The presence of LNAPL was observed in eleven of the twelve monitoring wells on the Phoenix Property, in the two wells monitored on 37-80 Review Avenue, in the three wells monitored on 38-20 Review Avenue, and in two of the four wells monitored on 38-22 Review Avenue (Table 3, Figures 5 and 6). LNAPL samples were collected from all wells with LNAPL except for GAL-25 and GAL-34, which had insufficient volume for sampling. Samples were collected from MW-54 and MW-56 over two sampling events as there was insufficient volume present in the first sampling event (Table 5D).

This section presents a summary of the LNAPL monitoring measurements and sample analyses results. As there are no published New York State numerical criteria or screening levels for LNAPL, this section focuses on describing the general distribution of LNAPL and the chemical constituents that comprise the LNAPL. LIF profiles were collected (Section 3.4) by Columbia Technologies Inc. (Appendix D) prior to collecting soil borings in an effort to provide a semi-quantitative measure of the presence of petroleum

hydrocarbons in the soil column, if present. Observations made during collection of soil samples are noted on the boring logs provided in Appendix E. Laboratory data packages are provided in Appendix I.

The presence of LNAPL was further assessed through the gauging of wells on August 18 and September 3, 2014 in the eight wells previously installed on the Phoenix Property, the four new wells installed on the Phoenix Property, and in nine wells on adjacent properties (Figures 5 and 6), summarized in Table 3. LNAPL was observed in all wells on the Phoenix Property, except upgradient well GAL-15, but was present only in trace amounts in GAL-25 and GAL-34. Apparent LNAPL thicknesses on the Phoenix Property where LNAPL was observed ranged from 0.01 foot (MW-25 in August 2014) to 6.46 feet (GAL-35 in September 2014). Consistent with previous gauging measurements, LNAPL was present in the two wells monitored on 37-80 Review Avenue (GAL-08 and GAL-16R); in MW-6 and MW-6S but not in MW-1 or MW-38 on 38-22 Review Avenue; and in the three wells monitored on 38-20 Review Avenue (MW-54, MW-55, and MW-56).

7.5.1 Physiochemical Parameters

The LNAPL samples were analyzed for a number of physiochemical parameters by TOT, including:

API gravity
Density
Flash Point
Heat Of Combustion
Interfacial Tension
Specific Gravity
% Sulfur
Surface Tension
% Sediment
Viscosity

Table 10 presents a summary of the analytical results for these parameters. The parameters % sediments, % sulfur, BTU, and flashpoint are useful parameters when evaluating LNAPL recycling and/or disposal options. Specific gravity[12] (the ratio of the density of the LNAPL to that of water) was used to calculate a corrected groundwater elevation (Table 3). Interfacial tension and surface tension can be useful when estimating specific free-product volumes presented.

7.5.2 Chemical Parameters

Total organic halides (TOX) is a useful parameter when evaluating LNAPL recycling and/or disposal options and was only detected at an estimated concentration of 86.7 mg/kg in GAL-17.

[12] API gravity is the specific gravity adjusted for the oil industry.

The VOC content of LNAPL varied across the wells with total VOCs ranging from 50.51 mg/kg in GAL-26 to 1,199 mg/kg in MW-56. The highest VOC concentrations were measured in MW-56, GAL-32, and GAL-08. Table 11 presents a summary of detected VOCs in LNAPL, which is predominantly methyl cyclohexane, cyclohexane, and isopropylbenzene.

The SVOC content of LNAPL varied across the wells with total SVOCs ranging from non-detect (GAL-17 and GAL-33) to 2,533 mg/kg (MW-6S). The highest SVOC concentrations were measured in MW-6S, MW-55, GAL-36, and GAL-08. Table 11 presents a summary of detected SVOCs in LNAPL, which were predominantly PAHs (such as phenanthrene, benzo[a]anthracene, and benzo[a]pyrene).

PCBs (PCB Aroclors) were detected in LNAPL only in GAL-16R on the RAD II Property. Two Aroclors were detected: Aroclor-1248 (4.8 mg/kg) and Aroclor-1260 (3.8 mg/kg). No PCBs were detected in LNAPL collected on the Phoenix Property or otherwise as part of the RI.

Table 11 presents a summary of metals detected in LNAPL. Total metal concentrations ranged from 3.31 mg/kg in GAL-37 to 372.01 mg/kg in MW-6S and the highest concentration of metals was detected in MW-6S and GAL-16R (predominantly calcium, aluminum, and potassium). Cyanide was detected only in MW-6S. Arsenic and chromium were detected in all LNAPL samples.

7.5.3 LNAPL Transmissivity

LNAPL transmissivities for wells on the Phoenix Property with sufficient LNAPL for testing were calculated from the baildown test results (Section 3.10) using the following methods:

- Bouwer & Rice (1976)
- Cooper & Jacob (1946)
- Cooper Bredehoeft & Papadopulos (1967)

Mean LNAPL transmissivities are interpreted to range from 0.73 ft^2/day in GAL-32 to 14.59 ft^2/day in GAL-37 and are summarized in Table 4. The data collected are provided in Appendix F.

8.0 QUALITATIVE EXPOSURE ASSESSMENT

The objective of the qualitative human health exposure assessment (QHHEA) is to identify potential receptors to contaminants that are present or migrating from the Phoenix Property. The identification of the exposure pathway describes the route that the contaminant takes to travel from the source to the receptor. An identified pathway indicates that the *potential* for exposure is present, but does not confirm that exposures to receptors actually occur.

The RI activities completed for the Phoenix Property are sufficient to complete a QHHEA and the sampling results were used in an effort to evaluate if there are any health risks by characterizing the exposure setting, identifying the exposure pathways, and evaluating contaminant fate and transport. This QHHEA was prepared in accordance with Appendix 3B and Section 3.3(b)8 of the NYSDEC DER-10 Technical Guidance for Site Investigation and Remediation.

8.1 Potential Exposure Pathways

An exposure pathway initiates with a source and mechanism of contaminant release followed by the contamination of an environmental media and a potential for contact with a receptor. A complete exposure pathway therefore requires:

- A source of contamination
- A point of potential contact with the environmental media (i.e. exposure point)
- An exposure route. Three potential primary routes exist by which chemicals can enter the body:
  - Ingestion
  - Inhalation of vapors and particulates
  - Dermal contact
- A receptor population

An exposure pathway is considered complete when all of the elements of a complete exposure pathway are documented. If an exposure pathway is not complete because one or more of these elements are absent, then no risk exists.

8.1.1 Nature, Extent, Fate, and Transport of Contaminants

Based on the results of the Phoenix Property RI, the contaminants of concern are:

- Soil:
  - Three PAHs were found in excess of applicable SCOs. The PAHs (benzo(a)anthracene, benzo(a)pyrene, and dibenz(a,h)anthracene) exceed the industrial worker public health protection SCO.

- Groundwater:
  - Concentrations of VOCs, metals, and two SVOCs in excess of TOGS 1.1.1 GA criteria were detected in GAL-15.
- Indoor and Ambient Air:
  - VOCs are detected in indoor air at low concentrations. No detected concentrations of VOCs are in excess of the applicable NYSDOH air guideline values or OSHA PELs.
  - VOCs are detected in ambient air at low concentrations. No detected concentrations of VOCs in ambient air are in excess of the applicable NYSDOH air guideline values or OSHA PELs.
- Sub-Slab Soil Gas:
  - VOCs are detected in sub-slab soil gas

8.1.2 Potential Exposure Points

Groundwater

Concentrations of VOCs and metals were detected in groundwater at concentrations exceeding TOGS 1.1.1 GA criteria. Groundwater flows generally southward across the Phoenix Property. Groundwater in the area is not used as a drinking water supply. Groundwater is anticipated to flow toward Newtown Creek. VOCs are not expected to migrate to soil vapor due to the presence of LNAPL over much of the Phoenix Property.

Soil

Concentrations of some PAHs exceeded the industrial worker public health protection SCOs, and two VOCs, some PAHs, and lead exceeded the protection of groundwater SCOs. Because the Phoenix Property is covered by impermeable surfaces (building and pavement) limiting infiltration, and because of the presence of LNAPL overlying groundwater over much of the Phoenix Property, contaminants in the fill/soil are not expected to move to groundwater. VOCs have the potential to migrate into soil vapor.

LNAPL

The presence of LNAPL was observed in eleven of the twelve monitoring wells on the Phoenix Property. Contaminants in the LNAPL may migrate to groundwater via dissolution, to soils in the smear zone via sorption, and VOCs may migrate to soil vapor via volatilization.

Soil Vapor

Concentrations of VOCs have been detected in soil vapor and sub-slab soil gas. The VII data indicate that there is no complete VI pathway because the air samples collected from inside the Phoenix Building do not exceed applicable standards and guidance values. In addition, the VOCs detected in indoor air samples inside the Phoenix Building appear to be related to indoor sources and not vapor intrusion.

8.2 Receptor Populations

Current Phoenix Property Receptors – The current potential receptors on the Phoenix Property include industrial workers, trespassers, and authorized visitors. Any visitation by authorized visitors would be limited in both frequency and duration, resulting in a limited exposure. While it is possible that an adult or adolescent trespasser could access the Phoenix Property and therefore be considered potential receptors, access to the Phoenix Property is restricted by partial security fencing and continuous operations. Therefore potential trespassers to the Phoenix Property are likely to be deterred, and the frequency of exposure to the potential trespasser scenario would be limited.

Future Phoenix Property Receptors –Additional potential future receptors include construction workers and utility workers performing construction work and/or subsurface maintenance at the Phoenix Property. This work is expected to be completed in accordance with a Site Management Plan, utilizing appropriate safety procedures including air monitoring, dust control, and personal protective equipment to mitigate any potential exposure to the future construction worker and/or utility worker involved with subsurface disturbance or excavation.

Off-Phoenix Property Receptors – Potential receptors within a 0.25-mile radius of the Phoenix Property include industrial, commercial and construction workers, pedestrians, and visitors to the nearby graveyard (Calvary Cemetery).

8.3 Existence of Human Health Exposure

Current – Because the Phoenix Property is covered with pavement and existing structures under current conditions, there are no potential exposure routes for the dermal contact, ingestion, and inhalation via fugitive dust exposure routes for soil. Groundwater is not exposed at the Phoenix Property (and LNAPL overlies groundwater over most of the Phoenix Property), and the Phoenix Property is served by public water supply. There is no potential for exposure to groundwater. LNAPL is not exposed at the Phoenix Property. Low level concentrations of VOCs are present in the ambient air. Low level concentrations of VOCs are present in indoor air and are likely related to materials used in on-going business activities on the Phoenix Property. The Phoenix Property is protected with partial security fencing and continuously operates, which would deter any potential trespassers and limiting any potential exposures. While visitors have the potential to enter the Phoenix Property, this is expected to be a rarely occurring event with limited potential for exposure. No current human health exposure scenario exists related to subsurface contamination at the Phoenix Property.

Future – There is a potential complete exposure pathway from contaminated subslab and subsurface media to construction workers and/or utility workers during any future construction/excavation activities on the Phoenix Property. The construction/utility workers could potentially be exposed subsurface soils, shallow groundwater, and LNAPL via ingestion, dermal contact, and the inhalation of dust and vapors.

However, any potential exposure to construction/utility workers is expected to be mitigated using Site safety procedures, including the appropriate personal protective equipment (PPE), air monitoring and dust control as outlined in a Site Management Plan. An additional exposure is the potential inhalation of VOCs in indoor air in the building on the Phoenix Property via a potential future VI pathway should there be a change in current Site conditions that creates a pathway.

8.4 Overall Human Health Exposure Assessment

Based on this analysis, there are three potential exposure pathways: inhalation of volatiles in indoor air, direct contact with subsurface media during excavation/construction activities, and inhalation of on-property-related dust by off-property receptors during construction activities. The sensitive receptors for each exposure route are discussed below.

For the inhalation of volatiles in air, the receptors include industrial workers, visitors, and trespassers. However, for the visitor, such visits will be rare in nature with limited potentiation for exposure. For trespassers, the presence of security fencing as well as continuous operations on the Phoenix Property would limit the number of trespassing events. In addition, while VOCs have been detected at low levels in indoor air, the presence of these VOCs are attributable to current facility operations at the Phoenix Property. There is no current exposure to vapor intrusion. Therefore, the primary potential exposure pathway for the inhalation of VOCs in indoor air is the potential for future vapor intrusion impacting authorized workers on the Phoenix Property should there be a change in current Site conditions that creates a pathway..

For the direct contact with subsurface soil and groundwater during excavation/construction activities, the sensitive populations include construction workers and utility workers. However, potential exposures to construction/utility workers would be expected to be mitigated using appropriate safety procedures, including PPE, air monitoring, and dust controls. Potential exposures would be expected to be limited due to the short-term nature of excavation and construction activities.

For the inhalation of dust related to the Phoenix Property during future construction/excavation activities, the sensitive populations include off-property industrial, commercial, and construction workers, pedestrians, and visitors to the nearby graveyard. However, off-property exposure to contaminated dust from on-property-related construction/excavation activities on the Phoenix Property would be expected to be addressed through dust controls and the appropriate health and safety plan thereby limiting exposure to off-property receptors.

9.0 CONCEPTUAL SITE MODEL

The Phoenix Property consists of an approximately 1.8 acre parcel within a highly industrialized area of Long Island City, Queens, New York and is approximately 350 feet northeast of Newtown Creek. The entire Phoenix Property and surrounding properties have been used for various industrial purposes, including petroleum refineries, chemical manufacturing, warehouse/storage, and waste transfer since the mid-1800's, and the Phoenix Property was historically the northwestern-most portion of the FPOW, which encompassed approximately 18.51 acres to the south and east of the Phoenix Property.

The surficial material on the Phoenix Property and in the vicinity of the Phoenix Property is composed of man-made urban fill and unconsolidated natural glacial and alluvium deposits underlain by a lower clay of the Upper Cretaceous Raritan Formation. The Phoenix Property lies between a local topographic high to the northeast and Newtown Creek to the south-southwest. Depth to groundwater on the Phoenix Property during the RI ranged from 12.14 feet below grade at GAL-34 to 19.62 feet below grade GAL-35 (under LNAPL) and the general direction of groundwater flow beneath the Phoenix Property is to the south, and relatively higher groundwater elevations were observed at GAL-34 and MW-38. Groundwater is anticipated to flow toward Newtown Creek.

Public drinking and industrial water for Queens County are supplied primarily by the New York City reservoir system; groundwater within the vicinity of the Phoenix Property is not used for potable purposes and likely will not be used in the future as a potable source. While groundwater beneath the Phoenix Property may ultimately discharge in Newtown Creek, the creek has been substantially degraded by approximately a century of past unpermitted discharges upstream and downstream of the Site and has been given a SD classification by the NYSDEC, which is the lowest classification for saline surface water in New York State. One on-property well (GAL-15) could be sampled for groundwater, which indicated impacts for VOCs (primarily chlorinated VOCs and BTEX compounds). Previous sampling in upgradient Roehr wells (MW-15 and MW-16 in November, 2000) and in down and side-gradient well MW-1 (April 2009-January 2011) likewise indicated impacts for chlorinated VOCs and BTEX compounds.

Samples from the soil and fill at the Phoenix Property (all but one of the samples were collected from fill), indicate exceedances of the RUSCO-Industrial guidance values for three PAHs. Exposure to these soils is limited to potential future exposures by construction workers, which may be mitigated by standard construction health and safety practices.

The presence of LNAPL was observed in eleven of the twelve monitoring wells on the Phoenix Property in the two wells monitored on 37-80 Review Avenue, in the three wells monitored on 38-20 Review Avenue, and in two of the four wells monitored on 38-22 Review Avenue (Table 3). LNAPL transmissivities for wells on the Phoenix Property with sufficient LNAPL for testing were calculated from the baildown tests and mean LNAPL transmissivities ranged from 0.73 ft^2/day in GAL-32 to 14.59 ft^2/day in GAL-37. The

VOC content of LNAPL on the Phoenix Property varied from 50.51 mg/kg to 862 mg/kg and the SVOC content of LNAPL ranged from non-detect to 1,331 mg/kg. Total metal concentrations ranged from 3.31 mg/kg to 66.32 mg/kg on the Phoenix Property. Exposure to the LNAPL is limited to potential future exposures by construction workers, which would be mitigated by standard construction health and safety practices.

While there are detections of compounds in the soil gas and vapor above the RSLs for industrial air, there is no current complete VI pathway to indoor air.

10.0 SUMMARY

The RI field work included activities specified in the approved RI/FFS Work Plan. RI field activities were conducted March-September 2014. In summary, the field work included the following activities:

- A vapor intrusion investigation including a building Survey and collection of
  - two outdoor air samples
  - four indoor air samples
  - eight sub-slab vapor samples
  - three soil vapor samples
- Collection of four Laser Induced Fluorescence (LIF) screening borings
- Soil sampling in the unsaturated zone from four soil borings
- Installation of four new monitoring wells
- Two synoptic rounds of groundwater and LNAPL gauging from 21 monitoring wells on and off property
- Collection of one groundwater sample
- Collection of LNAPL samples from 16 wells
- Bail-down tests in nine wells on the Phoenix Property
- Phoenix Property boundary and well surveys
- Indoor air survey and sampling for methane[13].

Overall, the RI has met the objective of determining the nature and extent of COPC and potential impacts to the public health, welfare, or the environment caused by the release or potential release of COPC at or from the Phoenix Property.

Based on the results of the RI, it appears that sufficient data has been collected to prepare a Technical Memorandum to present Remedial Action Objectives and a short-list of potential remedial alternatives prior to completion of the Focused Feasibility Study.

[13] Not conducted as part of the RI. Methane was not detected in any sample above the analytical laboratory reporting limit consistent with the results of the VII.

11.0 REFERENCES

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Table 1
Vapor Intrusion Sample Summary
Phoenix Property
37-88 Review Avenue
Long Island City, Queens, New York

Sample Type	Sample ID	Sample Location	Rationale	Current Tenant Use
Indoor Air	IA-1	Southcentral portion of the building	Assess potential for human exposure in office area	Office area; storage of office supplies (co-located with sub-slab soil gas sample SSV-7)
	IA-2	Northern portion of the building (hallway adjacent to restroom)	Assess potential for human exposure in working area.	Hallway to restroom (co-located with sub-slab soil gas sample SSV-4)
	IA-3	Central portion of the building	Assess general indoor air quality within the building	Storage of theatre props
	IA-4	Southern portion of building	Assess general indoor air quality within the building	Storage of various construction equipment and equiptment maintenance materials
Ambient Air	OA-1 OA-2	Parking area	Assess ambient air background and downwind conditions at the Phoenix Property	Parking of vehicles and trucks
Sub-Slab Soil Gas	SSV-1	Southern portion of building	Investigate sub-slab conditions near railroad tracks in the southern portion of the building. Co-located with GAL-34.	Office desk, storage of cake and dessert products
	SSV-2	Southcentral portion of building	Investigate sub-slab conditions near drainage trench in the southern portion of the building. Co-located with GAL-35.	Storage of various food products
	SSV-3	Northcentral portion of building	Investigate sub-slab conditions near drainage trench in the northern portion of the building.Co-located with GAL-36.	Storage of bottling and maintenance equipment
	SSV-4	Northern portion of the building	Investigate sub-slab conditions near SV-22 and potential impacts from diesel USTs	Hallway to restroom (co-located with indoor air sample IA-2)
	SSV-5	Northern portion of the building	Investigate sub-slab conditions near SV-22 and potential impacts from diesel USTs	Storage of theatre props
	SSV-6	Northcentral portion of building	Investigate sub-slab conditions near SV-22 and potential impacts from diesel USTs	Hallway in front of stairwell to office portion of building
	SSV-7	Southcentral portion of the building	Investigate sub-slab conditions within the office area.	Office area; storage of office supplies (co-located with indoor air sample IA-1)
	SSV-8	Loading Dock	Added to sampling program at request of NYSDEC	Loading of materials from occupied space within building to vehicles for transport
Soil-Vapor	SV-27	Central portion of the parking lot	Delineate soil vapor conditions at SV-22	Parking of vehicles and trucks
	SV-28	Northern portion of the parking lot, adjacent to diesel USTs	Delineate soil vapor conditions at SV-22 and investigate potential impacts from diesel USTs	
	SV-29	Northern portion of parking lot/ramp	Delineate soil vapor conditions at SV-22	

Notes:
Tenant occupancy and use current as of building survey and sampling activities in March and April 2014.
IA - Indoor Air
NYSDEC - New York State Department of Environmental Conservation
OA - Ambient Air
SSV - Sub-Slab Soil Gas
SV - Soil Vapor
USTs - Underground storage tanks

checked by HAL 9/30/14

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TABLE 2
MONITORING WELL CONSTRUCTION INFORMATION
Phoenix Property
37-88 Review Avenue
Long Island City, New York

Monitoring Point ID	Date of Installation	Ground Surface Elevation (FT - MSL)	Reference Elevation[1] (FT - MSL)	Well Diameter & Material	Well Depth (FT-BGS)	Screen Length (FT)	Top of Screen Elevation (FT - MSL)	Bottom of Screen Elevation (FT - MSL)
RADII (37-80 Review Ave)								
GAL-03	*not located*							
GAL-08	11/7/2003	24.99	24.46	4 Inch Schedule 40 PVC	28.00	15.00	11.99	-3.01
GAL-16R	7/18/2008	17.01	18.98	2 Inch Schedule 40 PVC	27.00	16.00	6.01	-9.99
PHOENIX (37-88 Review Ave)								
GAL-14	6/27/2004	16.27	15.85	4 Inch Schedule 40 PVC	30.00	20.00	6.27	-13.73
GAL-15	6/26/2004	21.78	21.43	4 Inch Schedule 40 PVC	28.00	15.00	8.78	-6.22
GAL-17	6/26/2004	16.33	15.82	4 Inch Schedule 40 PVC	27.00	15.00	4.33	-10.67
GAL-25	4/03/2005	16.39	15.76	4 Inch Schedule 40 PVC	27.00	20.00	9.39	-10.61
GAL-26	4/03/2005	15.83	15.55	4 Inch Schedule 40 PVC	28.00	20.00	7.83	-12.17
GAL-32	2/23/2013	14.13	13.77	2 Inch Schedule 40 PVC	25.00	20.00	9.13	-10.87
GAL-33	2/23/2013	16.49	15.74	2 Inch Schedule 40 PVC	28.00	20.00	8.49	-11.51
GAL-34	4/18/2014	16.55	15.98	2 Inch Schedule 40 PVC	28.00	20.00	8.55	-11.45
GAL-35	4/17/2014	16.57	16.00	2 Inch Schedule 40 PVC	28.00	20.00	8.57	-11.43
GAL-36	4/16/2014	16.65	16.28	2 Inch Schedule 40 PVC	28.00	20.00	8.65	-11.35
GAL-37	4/21/2014	16.55	16.21	2 Inch Schedule 40 PVC	28.00	20.00	8.55	-11.45
MW-8	9/12/2000	17.17	16.96	2 Inch Schedule 40 PVC	24.00	15.00	8.17	-6.83
WASTE MANAGEMENT (38-22 Review Ave)								
MW-6[2]	1/09/2008	12.23	11.80	4 Inch Schedule 40 PVC	23.00	5.00	-6.20	-11.20
MW-6S	4/27/2012	12.41	12.15	2 Inch Schedule 40 PVC	14.00	10.00	8.15	-1.85
MW-1[2]	1/06/2009	13.78	13.49	4 Inch Schedule 40 PVC	18.00	12.00	7.49	-4.51
MW-37	*not accessible*							
MW-38	426/2012	14.43	13.97	2 Inch Schedule 40 PVC	20.00	15.00	8.97	-6.03
38-20 Review Ave								
MW-54	6/12/2012	11.29	11.06	4 Inch Schedule 40 PVC	25.00	20.00	6.06	-13.94
MW-55	6/09/2012	11.19	11.06	4 Inch Schedule 40 PVC	25.00	20.00	6.06	-13.94
MW-56	6/09/2012	15.54	15.22	2 Inch Schedule 40 PVC	30.00	20.00	5.22	-14.78

Notes:

[1] - Reference Elevation - top of inner casing. Reference elevation for wells located at 38-22 Review Avenue and 38-20 Review Avenue were obtained from Table 1 from the Site Status Update Report, August to October 2012 prepared by Kleinfelder.

[2] - Information obtained from the Interin Site Characterization Report, August 10, 2009 prepared by Kleinfelder.

FT - BTIC - feet below top of inner casing

FT - MSL - feet mean sea level

Checked by HAL 9/30/14

Table 3
Groundwater and LNAPL Gauging
August and September 2014
Phoenix Property
37-88 Review Avenue
Long Island City, New York

Monitoring Point ID	Date	Reference Elevation[1] (FT. MSL)	Depth to Top of LNAPL (FT. BTIC)	Depth to Groundwater (FT. BTIC)	Apparent LNAPL Thickness (FT)	Specific Gravity (g/cm^3)	Corrected GW Elevation[2] (FT)
RADII (37-80 Review Ave)							
GAL-08	8/18/2014	24.46	18.08	20.05	1.97	0.9045	6.19
	9/03/2014	24.46	18.19	19.95	1.76	0.9045	6.10
GAL-16R	8/18/2014	18.98	16.15	21.65	5.50	0.9004	2.28
	9/03/2014	18.98	16.18	22.65	6.47	0.9004	2.16
GAL-03	*not located*						
PHOENIX (37-88 Review Ave)							
GAL-14	8/18/2014	15.85	13.00	15.85	2.85	0.9030	2.57
	9/03/2014	15.85	12.95	14.97	2.02	0.9030	2.70
GAL-15	8/18/2014	21.43	Not Present	14.50	-	NA	6.93
	9/03/2014	21.43	Not Present	15.48	-	NA	5.95
GAL-17	8/18/2014	15.82	12.79	16.95	4.16	0.9016	2.62
	9/03/2014	15.82	12.86	16.91	4.05	0.9016	2.56
GAL-25[4]	8/18/2014	15.76	13.21	13.22	0.01	0.9044	2.55
	9/03/2014	15.76	Sheen[4]	13.27	-	NA	2.28
GAL-26	8/18/2014	15.55	12.95	16.91	3.96	0.9044	2.22
	9/03/2014	15.55	12.69	16.95	4.26	0.9044	2.45
GAL-32	8/18/2014	13.77	11.25	14.90	3.65	0.9160	2.21
	9/03/2014	13.77	11.35	14.40	3.05	0.9160	2.16
GAL-33	8/18/2014	15.74	12.85	18.92	6.07	0.9008	2.29
	9/03/2014	15.74	12.90	18.82	5.92	0.9008	2.25
GAL-34[3]	8/18/2014	15.98	12.12	12.14	0.02	0.9160	3.86
	9/03/2014	15.98	12.25	12.27	0.02	0.9160	3.73
GAL-35	8/18/2014	16.00	13.17	19.10	5.93	0.9010	2.24
	9/03/2014	16.00	13.16	19.62	6.46	0.9010	2.20
GAL-36	8/18/2014	16.28	13.32	18.42	5.10	0.9015	2.46
	9/03/2014	16.28	13.39	18.60	5.21	0.9015	2.38
GAL-37	8/18/2014	16.21	13.32	15.80	2.48	0.9040	2.65
	9/03/2014	16.21	13.35	16.32	2.97	0.9040	2.57
MW-8	8/18/2014	16.96	14.00	19.54	5.54	0.9021	2.42
	9/03/2014	16.96	14.07	19.25	5.18	0.9021	2.38
WASTE MANAGEMENT (38-22 Review Ave)							
MW-6	8/18/2014	11.80	10.15	10.40	0.25	0.9050	1.63
	9/03/2014	11.80	10.07	10.98	0.91	0.9050	1.64
MW-6S	8/18/2014	12.15	9.60	10.80	1.20	0.9371	2.47
	9/03/2014	12.15	9.77	10.40	0.63	0.9371	2.34
MW-1	8/18/2014	13.49	Not Present	10.74	NA	NA	2.75
	9/03/2014	13.49	Not Present	10.96	NA	NA	2.53
MW-37	*not located*						
MW-38	8/18/2014	13.97	Not Present	10.75	NA	NA	3.22
	9/03/2014	13.97	Not Present	10.86	NA	NA	3.11
38-20 Review Ave							
MW-54	8/18/2014	11.06	9.25	9.65	0.40	0.9042	1.77
	9/03/2014	11.06	9.40	9.85	0.45	0.9042	1.62
MW-55	8/18/2014	11.06	9.44	15.05	5.61	0.8988	1.05
	9/03/2014	11.06	9.48	15.07	5.59	0.8988	1.01
MW-56	8/18/2014	15.22	14.42	14.60	0.18	0.8542	0.77
	9/03/2014	15.22	14.32	17.72	3.4	0.8542	0.40

Notes:

[1] - Reference Elevation - top of inner casing. Reference elevation for wells located at 38-22 Review Avenue and 38-20 Review Avenue were obtained from Table 1 from the Site Status Update Report, August to October 2012 prepared by Kleinfelder.

[2] - Corrected GW Elevation-claculated using the following formula (measuring point elevation - depth to water) + (LNAPL thickness * Specific Gravity)

[3] - Specific gravity value for GAL-25 based on result from surrounding well GAL-37 and GAL-34 based result from surrounding well GAL-32.

[4] - A sheen was observed on the oil/water interface probe.

FT. - BTIC - feet below top of inner casing

FT. - MSL - feet mean sea level

NM - Not Measured

NA- Not Applicable

LNAPL - light non-aqueous phase liquid

August: Checked by JLH: 8/27/2014

September: Checked by HAL: 9/30/14

TABLE 4
Baildown Test Results Summary
Phoenix Property
37-88 Review Avenue
Long Island City, New York

Monitoring Point ID	Test Date	Apparent LNAPL Thickness (FT)	LNAPL Transmissivity - Bouwer & Rice (FT^2/D)	LNAPL Transmissivity - Cooper & Jacob (FT^2/D)	LNAPL Transmissivity - Cooper, Bredehoeft and Papadopulos (FT^2/D)	Mean LNAPL Transmissivity (FT^2/D)
GAL-14	9/08/2014	3.16	2.94	2.36	3.27	2.86
GAL-17	9/04/2014	4.09	12.19[1]	6.89	5.89	6.39
GAL-26	9/08/2014	2.61	0.93	0.64	1.48	1.02
GAL-32	9/03/2014	3.05	0.46	0.27	1.47	0.73
GAL-33	9/04/2014	5.70	3.38	2.90	3.22	3.17
GAL-35	9/04/2014	5.75	3.92	2.78	2.58	3.09
GAL-36	9/05/2014	4.88	5.33	5.06	20.09[1]	5.20
GAL-37	9/04/2014	2.91	10.07	13.05	20.66	14.59
MW-8	9/05/2014	5.36	6.30	6.68	8.73	7.24

Notes:

[1] - Analysis method not included in mean transmissivity

FT - feet

FT^2/D - feet squared per day

LNAPL - light non-aqueous phase liquid

Checked by SDM

TABLE 5A
Indoor/Ambient Soil Vapor/Sub-Slab Air Sampling and Analyses Summary
March-April 2014
Phoenix Property
37-88 Review Avenue
Long Island City, New York

PARAMETERS		
Sample Point ID	Sample date	TCL VOCs
		EPA TO-15
PHOENIX (37-88 Review Ave)		
IA-1	3/24/2014	×
IA-2	3/24/2014	×
IA-3	3/24/2014	×
IA-4	3/24/2014	×
OA-1	3/24/2014	×
OA-2	3/24/2014	×
SSV-01	3/26/2014	×
SSV-07	3/26/2014	×
SSV-03	3/26/2014	×
SSV-04	3/25/2014	×
SSV-05	3/25/2014	×
SSV-06	3/25/2014	×
SSV-02	3/26/2014	×
SSV-08	3/26/2014	×
SV-27	4/11/2014	×
SV-28	4/11/2014	×
SV-29	4/11/2014	×

Abbreviations:

IA - Indoor Air

OA - Outdoor Air

TCL - Target Compound List

VOCs - Volatile Organic Compounds

Checked by: AMZ 9/30/2014

TABLE 5B
Groundwater Sampling and Analyses Summary
August 2014
Phoenix Property
37-88 Review Avenue
Long Island City, New York

Sample Point Well ID	Sample date	PARAMETERS													
		TCL VOCs + 10 TICs	TCL SVOCs + 20 TICs	TCL PCBs	TAL Metals	Cyanide	Alkalinity	TOC	DOC	Nitrate	Sulfate	CO2	Chloride	TDS	MEE
		SW-846 8260C	SW-846 8270D	SW-846 8082	SW-846 6020A/7470A	SW-846 9012B	SM 2320B	SW-846 9060A	SW-846 9060A Diss	EPA 353.2	ASTM D516	SM 4500 CO2 D	SM 4500 Cl E	SM 2540C (Calc)	RSK_175
PHOENIX (37-88 Review Ave)															
GAL-15	8/20/2014	×	×	×	×	×	×	×	×	×	×	×	×	×	×

Abbreviations:
CO2 - Carbon Monoxide
DOC-Dissolved Organic Carbon
MEE-Methane, Ethane, Ethene
PCBs - Polychlorinated Biphenyls
SVOCs - Semivolatile Organic Compounds
TAL - Target Analyte List
TCL - Target Compound List
TDS - Total Dissolved Solids
TICs - Tentatively Identified Compounds
TOC - Total Organic Carbon
TSS-Total Dissolved Solids
VOCs - Volatile Organic Compounds

Checked by: AMZ 9/30/2014

TABLE 5C
Soil Sampling and Analyses Summary
April 2014
Phoenix Property
37-88 Review Avenue
Long Island City, New York

PARAMETERS							
Sample Point Well ID	**Sample date**	**Sample depth**	**TCL VOCs + 10 TICs**	**TCL SVOCs + 20 TICs**	**TCL PCBs**	**TAL Metals**	**Cyanide**
			SW-846 8260C	**SW-846 8270D**	**SW-846 8082**	**SW-846 6010C/7471B**	**SW-846 9012B**
PHOENIX (37-88 Review Ave)							
GAL-34	4/10/2014	0-2 ft bgs	×	×	×	×	×
	4/18/2014	5-7 ft bgs	×	×	×	×	×
	4/18/2014	18-20 ft bgs	×	×	×	×	×
GAL-35	4/10/2014	0-2 ft bgs	×	×	×	×	×
	4/16/2014	5-7 ft bgs	×	×	×	×	×
	4/16/2014	10-12 ft bgs	×	×	×	×	×
GAL-36	4/9/2014	0-2 ft bgs	×	×	×	×	×
	4/16/2014	5-7 ft bgs	×	×	×	×	×
	4/16/2014	10-12 ft bgs	×	×	×	×	×
GAL-37	4/9/2014	0-2 ft bgs	×	×	×	×	×
	4/21/2014	5-7 ft bgs	×	×	×	×	×
	4/21/2014	10-12 ft bgs	×	×	×	×	×

Abbreviations:
PCBs - Polychlorinated Biphenyls
SVOCs - Semivolatile Organic Compounds
TAL - Target Analyte List
TCL - Target Compound List
TICs - Tentatively Identified Compounds
TOC - Total Organic Carbon
VOCs - Volatile Organic Compounds

Checked by: AMZ 9/30/2014

TABLE 5D
LNAPL Sampling and Analyses Summary
August 2014
Phoenix Property
37-88 Review Avenue
Long Island City, New York

Sample Point Well ID	Sample date	TCL VOCs+10 TICs	TCL SVOCs+20 TICs	TCL PCBs	TAL Metals	Cyanide	GRO/DRO/MRO	GC Fingerprint	Conventional Parameters[1]
		SW-846 8260C	SW-846 8270D	SW-846 8082	SW-846 6010C/7471B	SW-846 9012B	SW-846 8015 (modified)	SW-846 8015 (modified)	
PARAMETERS									
RADII (37-80 Review Ave)									
GAL-03[2]	-----	*Not Sampled*							
GAL-08	8/18/2014	×	×	×	×	×	×	×	×
GAL-16R	8/18/2014	×	×	×	×	×	×	×	×
PHOENIX (37-88 Review Ave)									
GAL-14	8/19/2014	×	×	×	×	×	×	×	×
GAL-15[3]	-----	*Not Sampled*							
GAL-17	8/19/2014	×	×	×	×	×	×	×	×
GAL-25[4]	-----	*Not Sampled*							
GAL-26	8/19/2014	×	×	×	×	×	×	×	×
GAL-32	8/19/2014	×	×	×	×	×	×	×	×
GAL-33	8/19/2014	×	×	×	×	×	×	×	×
GAL-34[4]	-----	*Not Sampled*							
GAL-35	8/19/2014	×	×	×	×	×	×	×	×
GAL-36	8/19/2014	×	×	×	×	×	×	×	×
GAL-37	8/19/2014	×	×	×	×	×	×	×	×
MW-8	8/19/2014	×	×	×	×	×	×	×	×
WASTE MANAGEMENT (38-22 Review Ave)									
MW-1[3]	-----	*Not Sampled*							
MW-6	8/19/2014	×	×	×	×	×	×	×	×
MW-6S	8/19/2014	×	×	×	×	×	×	×	×
MW-37[5]	-----	*Not Sampled*							
MW-38[3]	-----	*Not Sampled*							
38-20 Review Ave									
MW-54[6]	8/18/2014						×	×	×
	9/03/2014	×	×	×	×	×			×
MW-55	8/18/2014	×	×	×	×	×	×	×	×
MW-56[6]	8/18/2014						×	×	
	9/03/2014	×	×	×	×	×			×

Notes:

[1] - TOX, % sulfur, % sediment, flash point, BTU, density, viscosity, surface tension, and interfacial tension.
- TOX by SW-846 9023, % Sulfur by ASTM D129/D4294, % Sediment by ASTM D1796, Flash Point by ASTM D92/D93, BTU by ASTM D240, Density/API Gravity by ASTM D1298, Viscosity by ASTM D445, Surface Tension by ASTM D971,and Interfacial Tension by ASTM D971

[2] - GAL-03 could not be located.

[3] - MW-1, GAL-15, and MW-38 had no LNAPL present.

[4] - GAL-25 and GAL-34 had insufficient LNAPL for sampling.

[5] - MW-37 was inaccessible due to activities on property.

[6] - Initial parameters collected on 8/18/14; all remaining conventional parameters collected on 9/3/14 due to sample volume limitations.

Abbreviations:

BTU - British Thermal Unit
CO - Carbon Dioxide
DOC - Dissolved Organic Carbon
DRO - Diesel Range Organics
GC - Gas Chromatogram
GRO - Gasoline Range Organics
MEE - Methane, Ethane, and Ethene
MRO - Medium Range Organics
NS - Not sampled
NP - Not present
PCBs - Polychlorinated Biphenyls
SVOCs - Semivolatile Organic Compounds
TAL - Target Analyte List
TCL - Target Compound List
TICs - Tentatively Identified Compounds
TOC - Total Organic Carbon
TOX - Total Organic Halides
VOCs - Volatile Organic Compounds

Checked by: AMZ 9/30/2014

Table 6
Validated Analytical Detects - Indoor and Ambient Air
Phoenix Property
37-88 Review Avenue
Long Island City, Queens, New York

			Sample Type	Indoor Air											Ambient/Outdoor Air					
			Sample ID	IA-1			IA-2			IA-3			IA-4			OA-1			OA-2		
			Sample Date	3/24/2014			3/24/2014			3/24/2014			3/24/2014			3/24/2014			3/24/2014		
			N=Normal, FD=Field Duplicate	N			N			N			N			N			N		
Parameter	NYSDOH Air Guideline Values[1]	USEPA Industrial Air RSLs[3]	Unit	Result	Qual	RL	Result	Qual	RL	Result	Qual	RL	Result	Qual	RL	Result	Qual	RL	Result	Qual	RL
1,2,4-Trimethylbenzene	NC	3.1	ug/m3	1.1		0.98	4.3	J	1.2	2.7		0.98	5.2		0.98	0.69	J	1.4	1.8		0.98
1,3,5-Trimethylbenzene	NC	NS	ug/m3	0.49	J	0.98	1.4	J	1.2	0.83	J	0.98				0.23	J	1.4	0.54	J	0.98
1,3-Butadiene	NC	0.41	ug/m3	1.1		0.44	0.54	J	0.5	0.56		0.44	0.66		0.44				0.21	J	0.44
1,4-Dichlorobenzene	NC	1.1	ug/m3							0.31	J	1.2	16		1.2						
2,2,4-Trimethylpentane	NC	NC	ug/m3	2.1		0.93	12	J	1.1	3.6		0.93	9.5		0.93	0.67	J	1.3	0.82	J	0.93
2-Butanone	NC	2200	ug/m3	2.9		1.5							1.6		1.5						
4-Ethyltoluene	NC	NC	ug/m3	0.46	J	0.98	1.4	J	1.2	0.81	J	0.98	1.7		0.98	0.21	J	1.4	0.5	J	0.98
Acetone	NC	14000	ug/m3	36		12				8.2	J	12	33		12						
Benzene	NC	1.6	ug/m3	3		0.64	2.8	J	0.8	2		0.64	5.2		0.64	0.83	J	0.9	0.98		0.64
Butane	NC	NC	ug/m3	6.3		1.2	8.5	J	1.4	6.2		1.2	22		1.2	3.4	J	1.7	3.3		1.2
Carbon Tetrachloride	NC	2	ug/m3	0.39		0.06	0.4	J	0.2	0.4		0.06	0.38		0.06	0.44	J	0.2	0.41		0.06
Chlorodifluoromethane	NC	22000	ug/m3	1.1	J	1.8	1.1	J	2.1	1.2	J	1.8	2.8		1.8	0.97	J	2.5	0.9	J	1.8
Chloromethane	NC	39	ug/m3	1.1		1															
Cyclohexane	NC	2600	ug/m3	1.2		0.69	2.4	J	0.8	0.92		0.69	4.4		0.69				0.3	J	0.69
Dichlorodifluoromethane	NC	44	ug/m3	2.4	J	2.5	2.1	J	2.9	2.2	J	2.5	2.4	J	2.5	2.1	J	3.5	2.2	J	2.5
Ethylbenzene	NC	4.9	ug/m3	2.1		0.87	3.7	J	1	2.2		0.87	48		0.87	0.46	J	1.2	0.77	J	0.87
Freon 113	NC	13000	ug/m3	0.49	J	1.5	0.5	J	1.8	0.48	J	1.5	0.5	J	1.5	0.51	J	2.2	0.49	J	1.5
Isopropanol	NC	3100	ug/m3	2.3	J	12				1.5	J	12	2.6	J	12						
Isopropylbenzene	NC	180	ug/m3	0.18	J	0.98	0.48	J	1.2	0.25	J	0.98	1.5		0.98						
m,p-Xylenes	NC	44	ug/m3	6.2		2.2	13	J	2.6	7.1		2.2	180		2.2	1.5	J	3.1	2.6		2.2
Methyl Methacrylate	NC	310	ug/m3	0.51	J	2	1.3	J	2.4	0.49	J	2	1.4	J	2						
Methylene Chloride	60	260	ug/m3	1.6	J	1.7	1.9	J	2	2.1		1.7	2		1.7	1.6	J	2.5	1.5	J	1.7
n-Heptane	NC	NC	ug/m3	2		0.82	6.8	J	1	2.1		0.82	7.4		0.82	0.53	J	1.2	0.65	J	0.82
n-Hexane	NC	310	ug/m3	2.8		0.7	8.3	J	0.8	2.6		0.7	17		0.7	0.71	J	1	0.75		0.7
n-Propylbenzene	NC	440	ug/m3				0.95	J	1.2	0.57	J	0.98									
o-Xylene	NC	44	ug/m3	2.2		0.87	4.1	J	1	2.5		0.87	76		0.87	0.5	J	1.2	0.97		0.87
Styrene	NC	440	ug/m3				0.18	J	1	0.13	J	0.85	0.43	J	0.85						
Tetrachloroethene	30[2]	18	ug/m3	0.56	J	1.4	0.61	J	1.6	0.77	J	1.4	0.67	J	1.4	0.39	J	1.9	0.7	J	1.4
Toluene	NC	2200	ug/m3	7.9		0.75	13	J	0.9	6.2		0.75	23		0.75	2	J	1.1	2.3		0.75
Trichloroethene	5	0.88	ug/m3																0.065		0.05
Trichlorofluoromethane	NC	310	ug/m3	1.6		1.1	1.6	J	1.3	2.6		1.1	3.3		1.1	1.3	J	1.6	1.3		1.1
Xylenes, Total	NC	44	ug/m3	8.3		0.87	17	J	1	9.4		0.87	260		0.87	2	J	1.2	3.6		0.87

Notes:
1. NYSDOH Air Guideline Values, Guidance for Evaluating Soil Vapor Intrusion in the State of New York, Table 3.1, October 2006. No results exceeded the NYSDOH Air Guideline Values.
2. NYSDOH's new guideline for tetrachloroethene is 30 ug/m^3, per the September 2013 Fact Sheet.
3. USEPA Regional Screening Levels (RSLs) for Industrial Air, TR=1E-06, THQ=0.1, May 2014. The lower of the carcinogenic or noncarcinogenic screening level is shown. Results which exceeded the RSLs are shaded.

Abbreviations:
NC - no criteria available
Qual - interpreted qualifier
RL - reporting limit
ug/m3 - micrograms per cubic meter
NYSDOH - New York State Department of Health
USEPA - United States Environmental Protection Agency

Qualifiers:
J - estimated result

Checked by: JTC 5/7/2014 and EG 9/25/2014

Table 7
Validated Analytical Detects - Sub-Slab and Soil Vapor
Phoenix Property
37-88 Review Avenue
Long Island City, Queens, New York

		Sample Type	Sub-Slab Vapor																										
		Sample ID	SSV-01			SSV-02			SSV-03			SSV-04			SSV-05			SSV-06			SSV-07			SSV-08			SSV-08		
		Sample Date	3/26/2014			3/26/2014			3/26/2014			3/25/2014			3/25/2014			3/25/2014			3/26/2014			3/26/2014			3/26/2014		
		N=Normal, FD=Field Duplicate	N			N			N			N			N			N			N			N			FD		
Parameter	Soil Gas Screening Levels[1]	Unit	Result	Qual	RL	Result	Qual	RL	Result	Qual	RL	Result	Qual	RL	Result	Qual	RL	Result	Qual	RL	Result	Qual	RL	Result	Qual	RL	Result	Qual	RL
1,1-Dichloroethane	77	ug/m3										33	J	68				28	J	96				0.85	J	2.8	0.85	J	3.2
1,2,4-Trimethylbenzene	31	ug/m3	0.26	J	0.98	5		2.5							0.89	J	1.5				8.3	J	46	57		3.5	73		3.9
1,2-Dichloroethene, Total	NC	ug/m3																											
1,3,5-Trimethylbenzene	NC	ug/m3				1.5	J	2.5							0.27	J	1.5							24		3.5	32		3.9
1,3-Butadiene	4.1	ug/m3	0.27	J	0.44																								
1,4-Dichlorobenzene	11	ug/m3																											
2,2,4-Trimethylpentane	NC	ug/m3	0.69	J	0.93	6.5		2.3	100		49	230		79				1300		110	330		43	130		3.3	140		3.7
2-Butanone	22000	ug/m3	1.6		1.5	7.4		3.7							2.3		2.2							7.3		5.2	6.5		5.9
4-Ethyltoluene	NC	ug/m3				2	J	2.5							0.25	J	1.5							15		3.5	18		3.9
Acetone	140000	ug/m3	37		12	79		30							58		18				520	J	550	140		42	170		48
Benzene	16	ug/m3	1.2		0.64	1.9		1.6	24	J	34	120		54	0.67	J	0.96				11	J	30	3.7		2.2	4.1		2.6
Benzyl Chloride	2.5	ug/m3							310		55																		
Butane	NC	ug/m3	6.2		1.2	51		3	2800		63	5400		100	2.6		1.8	8500		140	1600		55	130		4.2	140		4.8
Carbon Disulfide	3100	ug/m3				3	J	3.9																8.6		5.5	11		6.2
Carbon Tetrachloride	20	ug/m3	0.36	J	1.3	0.36	J	3.1																					
Chlorodifluoromethane	220000	ug/m3	13		1.8	0.81	J	4.4							1.1	J	2.7												
Chloroethane	44000	ug/m3										890		110				38	J	160									
Chloroform	5.3	ug/m3				13		2.4							3		1.5												
cis-1,2-Dichloroethene	NC	ug/m3																											
Cyclohexane	26000	ug/m3				19		1.7	2000		36	2400		58	1.7		1	950		82	2100		32	170		2.4	170		2.8
Cymene	NC	ug/m3																						17		3.9	20		4.4
Dichlorodifluoromethane	440	ug/m3	2.4	J	2.5	1.9	J	6.2							2	J	3.7							1.9	J	8.7	1.9	J	9.9
Ethylbenzene	49	ug/m3	0.61	J	0.87	41		2.2	350		46	28	J	73	2.2		1.3				66		40	17		3	16		3.5
Freon 113	130000	ug/m3													0.7	J	2.3												
Isopropanol	31000	ug/m3	6	J	12										4.3	J	18							9.5	J	43	11	J	49
Isopropylbenzene	1800	ug/m3							3800		52	150		83							150		46	23		3.5	23		3.9
m,p-Xylenes	440	ug/m3	1.9	J	2.2	27		5.4	110	J	110				3.2	J	3.3				40	J	100	14		7.6	16		8.7
Methyl Methacrylate	3100	ug/m3																											
Methyl tert-Butyl Ether	470	ug/m3				3.8		1.8				280		61				790		86	66		33						
Methylene Chloride	2600	ug/m3	2.2		1.7	2.4	J	4.3							2.3	J	2.6												
Naphthalene	3.6	ug/m3							1200		140													14		9.2	14		10
n-Heptane	NC	ug/m3	0.44	J	0.82	5.5		2	190		43	640		69				410		98	820		38	35		2.9	36		3.3
n-Hexane	3100	ug/m3	1.1		0.7	30		1.8	2400		37	5100		59	3		1.1	2500		84	1300		33	70		2.5	72		2.8
n-Propylbenzene	4400	ug/m3				1.7	J	2.5																22		3.5	22		3.9
o-Xylene	440	ug/m3	0.69	J	0.87	13		2.2	110		46	11	J	73	1.4		1.3				40	J	40	6.6		3	6.9		3.5
sec-Butylbenzene	NC	ug/m3																						17		3.9	21		4.4
Styrene	4400	ug/m3				6.2		2.1							0.43	J	1.3							1.8	J	3	1.6	J	3.4
tert-Butyl Alcohol	NC	ug/m3	1.9	J	15																								
Tetrachloroethene	180	ug/m3	0.37	J	1.4	0.77	J	3.4							3.5		2							0.67	J	4.8	0.77	J	5.4
Toluene	22000	ug/m3	2.4		0.75	130		1.9	57		40	38	J	63	11		1.1	26	J	90	210		35	48		2.6	44		3
trans-1,2-Dichloroethene	NC	ug/m3																											
Trichloroethene	8.8	ug/m3	0.24	J	1.1										0.3	J	1.6	25	J	130							1.8	J	4.3
Trichlorofluoromethane	3100	ug/m3	23		1.1	1.7	J	2.8							2.6		1.7												
Vinyl Chloride	28	ug/m3										41	J	43				12	J	61									
Xylenes, Total	440	ug/m3	2.6		0.87	40		2.2	210		46				4.6		1.3				79		40	21		3	23		3.5

Notes:
1. Soil gas screening levels were calculated by dividing the indoor air screening levels (i.e., USEPA Regional Screening Levels for Industrial Air, TR=1E-06, THQ=0.1, May 2014) by an attenuation factor of (α) 0.1. Results which exceeded the soil gas screening levels are shaded.

Abbreviations:
NC - no criteria available
Qual - interpreted qualifier
RL - reporting limit
ug/m^3 - micrograms per cubic meter
USEPA - United States Environmental Protection Agency

Qualifiers:
J - estimated result

Checked by: JTC 5/7/2014 and EG 9/25/2014

Table 7
Validated Analytical Detects - Sub-Slab and Soil Vapor
Phoenix Property
37-88 Review Avenue
Long Island City, Queens, New York

			Sample Type	Soil Vapor								
			Sample ID	SV-27			SV-28			SV-29		
			Sample Date	4/11/2014			4/11/2014			4/11/2014		
			N=Normal, FD=Field Duplicate	N			N			N		
Parameter	Soil Gas Screening Levels[1]	Unit		Result	Qual	RL	Result	Qual	RL	Result	Qual	RL
1,1-Dichloroethane	77	ug/m3					65		17			
1,2,4-Trimethylbenzene	31	ug/m3		7.3	J	7.9	9.7	J	20	13	J	40
1,2-Dichloroethene, Total	NC	ug/m3					21		16			
1,3,5-Trimethylbenzene	NC	ug/m3		2.6	J	7.9	6	J	20			
1,3-Butadiene	4.1	ug/m3		25		3.5	11		9	39		18
1,4-Dichlorobenzene	11	ug/m3								9.2	J	48
2,2,4-Trimethylpentane	NC	ug/m3		370		7.5	180		19	990		38
2-Butanone	22000	ug/m3		17		12	30		30			
4-Ethyltoluene	NC	ug/m3		3.4	J	7.9	7.7	J	20			
Acetone	140000	ug/m3		110		95	150	J	240			
Benzene	16	ug/m3		49		5.1	350		13	560		26
Benzyl Chloride	2.5	ug/m3										
Butane	NC	ug/m3		7700		180	12000		270	11000		380
Carbon Disulfide	3100	ug/m3		54		12	55		32	120		63
Carbon Tetrachloride	20	ug/m3										
Chlorodifluoromethane	220000	ug/m3										
Chloroethane	44000	ug/m3		3	J	11	64		27	12	J	53
Chloroform	5.3	ug/m3										
cis-1,2-Dichloroethene	NC	ug/m3					21		16			
Cyclohexane	26000	ug/m3		1400		100	2600		14	15000		220
Cymene	NC	ug/m3										
Dichlorodifluoromethane	440	ug/m3										
Ethylbenzene	49	ug/m3		9.2		6.9	18		18	27	J	35
Freon 113	130000	ug/m3					26	J	31	14	J	62
Isopropanol	31000	ug/m3		11	J	98						
Isopropylbenzene	1800	ug/m3		5.3	J	7.9	20		20	40		40
m,p-Xylenes	440	ug/m3		12	J	17	29	J	44	34	J	87
Methyl Methacrylate	3100	ug/m3		700		16	1200		42	2300		82
Methyl tert-Butyl Ether	470	ug/m3		71		5.8	63		15			
Methylene Chloride	2600	ug/m3					59		35	46	J	70
Naphthalene	3.6	ug/m3										
n-Heptane	NC	ug/m3		340		6.6	1700		17	2300		33
n-Hexane	3100	ug/m3		2400		110	8700		160	28000		230
n-Propylbenzene	4400	ug/m3		3.8	J	7.9	9.4	J	20	40		40
o-Xylene	440	ug/m3		6.4	J	6.9	23		18	29	J	35
sec-Butylbenzene	NC	ug/m3										
Styrene	4400	ug/m3										
tert-Butyl Alcohol	NC	ug/m3										
Tetrachloroethene	180	ug/m3					4.6	J	28			
Toluene	22000	ug/m3		22		6	26		15	58		30
trans-1,2-Dichloroethene	NC	ug/m3		1.3	J	6.3						
Trichloroethene	8.8	ug/m3										
Trichlorofluoromethane	3100	ug/m3										
Vinyl Chloride	28	ug/m3		4		4.1	22		10	22		21
Xylenes, Total	440	ug/m3		18		6.9	52		18	63		35

Notes:
1. Soil gas screening levels were calculated by dividing the indoor air screening levels (i.e., USEPA Regional Screening Levels for Industrial Air, TR=1E-06, THQ=0.1, May 2014) by an attenuation factor of (α) 0.1. Results which exceeded the soil gas screening levels are shaded.

Abbreviations:
NC - no criteria available
Qual - interpreted qualifier
RL - reporting limit
ug/m3 - micrograms per cubic meter

Qualifiers:
J - estimated result

Checked by: JTC 5/7/2014 and EG 9/25/2014

Table 8
Validated Analytical Detects - Groundwater
Phoenix Property
37-88 Review Avenue
Long Island City, Queens, New York

	Sample Location		PHOENIX (37-88 Review Ave)					
	Sample ID		GAL-15			GAL-15		
	Sample Date		8/20/2014			8/20/2014		
	N=Normal, FD=Field Duplicate		N			FD		
Parameter	NYS Standard or Guidance Value[1]	Unit	Result	Qual	RL	Result	Qual	RL
Volatile Organic Compounds								
1,1,1-Trichloroethane	5	ug/L	16	J	1	30	J	1
1,1-Dichloroethane	5	ug/L	29	J	1	50	J	1
1,1-Dichloroethene	5	ug/L	5.9	J	1	10	J	1
1,2-Dichlorobenzene	3	ug/L	6	J	1	9	J	1
1,3-Dichlorobenzene	3	ug/L				0.27	J	1
1,4-Dichlorobenzene	3	ug/L	1.7	J	1	2.6	J	1
Acetone	50	ug/L	10		5			
Benzene	1	ug/L	77		1	76		1
Chlorobenzene	5	ug/L	0.66	J	1	1.1		1
Chloroethane	5	ug/L	3.2	J	1	5.4	J	1
cis-1,2-Dichloroethene	5	ug/L	70	J	1	130	J	1
Cyclohexane	NS	ug/L	4.7		1	6		1
Ethylbenzene	5	ug/L	3.4	J	1	6.1	J	1
Freon 113	5	ug/L	18	J	1	32	J	1
Isopropylbenzene	5	ug/L	8.4		1	11		1
m,p-Xylenes	5	ug/L	0.7	J	1	0.87	J	1
Methyl Cyclohexane	NS	ug/L	4.6	J	1	6.4	J	1
Methyl tert-Butyl Ether	10	ug/L	3.1	J	1	4.6	J	1
o-Xylene	5	ug/L	0.82	J	1	1.5		1
Tetrachloroethene	5	ug/L	0.24	J	1	0.38	J	1
Toluene	5	ug/L	1.1		1	1.2		1
trans-1,2-Dichloroethene	5	ug/L	0.76	J	1	1.2		1
Trichloroethene	5	ug/L	2.9	J	1	5.1	J	1
Vinyl Chloride	2	ug/L	11	J	1	18	J	1
Semivolatile Organic Compounds								
Bis(2-ethylhexyl) Phthalate	5	ug/L	16		10	20		10
Pyrene	50*	ug/L	1.9	J	10			
Polychlorinated Biphenyls	no detects							
Metals								
Aluminum	NS	ug/L	341	J	40	469	J	40
Antimony	3	ug/L	2.9		2	3.3		2
Arsenic	25	ug/L	33.6		2	35.9		2
Barium	1000	ug/L	408		4	441		4
Calcium	NS	ug/L	253000		200	266000		200
Chromium	50	ug/L	2.6	J	4	3.4	J	4
Copper	200	ug/L	4.6		4	4.9		4
Iron[5]	300	ug/L	44800		120	45200		120
Lead	25	ug/L	3.8		1.2	5.2		1.2
Magnesium	35000*	ug/L	43200		200	44700		200
Manganese[5]	300	ug/L	1100		8	1100		8
Nickel	100	ug/L	5.9		4	6.3		4
Potassium	NS	ug/L	58000		200	60300		200
Sodium	20000	ug/L	259000		200	267000		200
Thallium	0.5*	ug/L	0.77	J	0.8	0.95		0.8
Vanadium	NS	ug/L	7.9		4	9.1		4
Zinc	2000*	ug/L	66.7		16	82.8		16

Checked by: TS 9/17/14 and LB 9/19/14

Table 8
Validated Analytical Detects - Groundwater
Phoenix Property
37-88 Review Avenue
Long Island City, Queens, New York

	Sample Location		PHOENIX (37-88 Review Ave)					
	Sample ID		GAL-15			GAL-15		
	Sample Date		8/20/2014			8/20/2014		
	N=Normal, FD=Field Duplicate		N			FD		
Parameter	NYS Standard or Guidance Value[1]	Unit	Result	Qual	RL	Result	Qual	RL
General Chemistry			17			17		
Dissolved Organic Carbon	NS	mg/L	30.3		1	30.5		1
Total Organic Carbon	NS	mg/L	36.1		1	35.7		1
Sulfate	250	mg/L	46.5		20	51.7		20
Nitrate as N	10	mg/L				0.13	J	0.1
Methane	NS	ug/L	1100		40	1200		200
Alkalinity, Total	NS	mg/L	632		5	618		5
Total Dissolved Solids	500	mg/L	2320		50	2200		50
Chloride	250	mg/L	715		20	714		20
Carbon Dioxide	NS	mg/L	205	J	5	209	J	5

Notes and Abbreviations:
1) 6 NYCRR 703.6 Groundwater Effluent Limitations for Discharges to Class GA Water, and as supplemented by NYSDEC TOGS 1.1.1 (6/1998), and amendments (04/2000 & 06/2004). Where no standard value has been promulgated and placed into regulation, guidance values provided for a substance in NYSDEC TOGS 1.1.1 are shown and notated by *. Analytical results greater than the standard or guidance value are shaded. 6 NYCRR Part 703 accessed at http://www.dec.ny.gov/regs/4590.html; TOGS 1.1.1 and amendments accessed at http://www.dec.ny.gov/docs/water_pdf/togs111.pdf and http://www.dec.ny.gov/docs/water_pdf/tog111table1.pdf.
2) Standard shown applies to the sum of the individual cis and trans isomers.
3) Standard shown applies to the sum of these substances.
4) Standard shown applies to the sum of all Aroclors.
5) Individual standard values are shown. Per 6 NYCRR 703.6, the sum of iron and manganese concentrations shall not exceed 500 ug/L.

mg/L - milligrams per liter
Qual - validation qualifier
RL - reporting limit
ug/L - micrograms per liter
ND - not detectable
NS - no standard

Qualifiers:
J - estimated result

Checked by: TS 9/17/14 and LB 9/19/14

Table 9
Validated Analytical Detects - Soil
Phoenix Property
37-88 Review Avenue
Long Island City, Queens, New York

			Sample ID	GAL-34			GAL-34			GAL-34			GAL-35			GAL-35			GAL-35			GAL-35		
			Sample Date	4/10/2014			4/18/2014			4/18/2014			4/10/2014			4/16/2014			4/16/2014			4/16/2014		
			N=Normal, FD=Field Duplicate	N			N			N			N			N			N			FD		
			Start Depth (ft)	0			5			18			0			5			10			10		
			End Depth (ft)	2			7			20			2			7			12			12		
Parameter	Protection of Public Health - Industrial[1]	Unit	Result	Qual	RL	Result	Qual	RL	Result	Qual	RL	Result	Qual	RL	Result	Qual	RL	Result	Qual	RL	Result	Qual	RL
Volatile Organic Compounds																							
1,2-Dichlorobenzene	1000	mg/kg																					
1,4-Dichlorobenzene	250	mg/kg	0.0005	J	0.00096																		
2-Butanone	1000	mg/kg										0.026		0.0065	0.0068		0.005						
Acetone	1000	mg/kg	0.0057		0.0048							0.073		0.0065	0.018		0.005	0.012		0.005	0.012		0.0049
Benzene	89	mg/kg							0.013	J	0.097	0.0004	J	0.0013	0.0003	J	0.001	0.0003	J	0.001	0.0004	J	0.00098
Carbon Disulfide	NS	mg/kg										0.0008	J	0.0013	0.0023		0.001						
Chloroform	700	mg/kg																					
cis-1,2-Dichloroethene	1000	mg/kg										0.0004	J	0.0013									
Cyclohexane	NS	mg/kg				1.2		0.11	0.6		0.097	0.0034		0.0013	0.0059		0.001	0.032		0.001	0.047		0.00098
Ethylbenzene	780	mg/kg							0.31		0.097				0.0003	J	0.001	0.0038		0.001	0.0052		0.00098
Isopropylbenzene	NS	mg/kg				0.056	J	0.11	0.21		0.097	0.0002	J	0.0013	0.0006	J	0.001	0.013		0.001	0.014		0.00098
m,p-Xylenes	NS	mg/kg				0.034	J	0.11	3.4		0.097							0.0091		0.001	0.012		0.00098
Methyl Cyclohexane	NS	mg/kg				4.6		0.11	2.5		0.097	0.0082		0.0013	0.018		0.001	0.13		0.001	0.18		0.00098
Methyl tert-Butyl Ether	1000	mg/kg										0.0002	J	0.0013	0.0001	J	0.001						
o-Xylene	NS	mg/kg				0.018	J	0.11	2.4		0.097	0.0006	J	0.0013	0.0006	J	0.001	0.015		0.001	0.018		0.00098
Toluene	1000	mg/kg				0.017	J	0.11	0.06	J	0.097	0.0003	J	0.0013	0.0005	J	0.001	0.0023		0.001	0.003		0.00098
Xylenes, Total[2]	1,000	mg/kg				0.052	J	0.22	5.8		0.194	0.0019	J	0.0026	0.0016	J	0.002	0.0241		0.002	0.03		0.00196
Semivolatile Organic Compounds																							
2-Methylnaphthalene	NS	mg/kg							1.2	J	3.8							1.3	J	3.9	0.86	J	3.9
Acenaphthene	1000	mg/kg							0.74	J	3.8												
Anthracene	1000	mg/kg	0.066	J	0.35	1.1	J	3.9	2.3	J	3.8	0.27	J	1.8	1.2	J	3.5	1.3	J	3.9	0.9	J	3.9
Benzo[a]anthracene	11	mg/kg	0.47		0.035	4.4		0.39	20		0.38	1.3		0.18									
Benzo[a]pyrene	1.1	mg/kg	0.56		0.035	3.6		0.39	12		0.38	1.8		0.18	1.4		0.35						
Benzo[b]fluoranthene	11	mg/kg	0.75		0.035	2.9	J	0.39	5.7	J	0.38	2.4		0.18	1.2	J	0.35						
Benzo[g,h,i]perylene	1000	mg/kg	0.51		0.35	5.7		3.9	7.8		3.8	0.94	J	1.8	1.2	J	3.5						
Benzo[k]fluoranthene	110	mg/kg	0.25		0.035	0.83		0.39	1.1		0.38	0.58		0.18									
Carbazole	NS	mg/kg	0.043	J	0.35																		
Chrysene	110	mg/kg	0.55		0.35	5.7		3.9	24		3.8	2.1		1.8	6.2		3.5	4.3		3.9	3	J	3.9
Dibenz[a,h]anthracene	1.1	mg/kg	0.12	J	0.035	1.6		0.39	3.6		0.38	0.41	J	0.18	0.68		0.35						
Dibenzofuran	1000	mg/kg																					
Fluoranthene	1000	mg/kg	0.81		0.35	2.8	J	3.9	1.9	J	3.8	2.1		1.8	0.94	J	3.5	0.69	J	3.9			
Fluorene	1000	mg/kg							1	J	3.8				1.4	J	3.5	1.4	J	3.9	0.82	J	3.9
Indeno[1,2,3-cd]pyrene	11	mg/kg	0.29	J	0.035	2.9		0.39	3.8		0.38	0.72	J	0.18	0.86		0.35						
Naphthalene	1000	mg/kg							0.54	J	3.8												
Phenanthrene	1000	mg/kg	0.28	J	0.35	2.2	J	3.9	6.2		3.8	0.9	J	1.8	4.5		3.5	8.5		3.9	5.8		3.9
Pyrene	1000	mg/kg	0.52		0.35	4.1		3.9	9.7		3.8	1.8		1.8	3.5		3.5	2.9	J	3.9	2.2	J	3.9
Polychlorinated Biphenyls			no detects																				

Checked by: JTC 5/19/2014

Table 9
Validated Analytical Detects - Soil
Phoenix Property
37-88 Review Avenue
Long Island City, Queens, New York

			Sample ID	GAL-34			GAL-34			GAL-34			GAL-35			GAL-35			GAL-35			GAL-35		
			Sample Date	4/10/2014			4/18/2014			4/18/2014			4/10/2014			4/16/2014			4/16/2014			4/16/2014		
			N=Normal, FD=Field Duplicate	N			N			N			N			N			N			FD		
			Start Depth (ft)	0			5			18			0			5			10			10		
			End Depth (ft)	2			7			20			2			7			12			12		
Parameter	Protection of Public Health - Industrial[1]	Unit		Result	Qual	RL	Result	Qual	RL	Result	Qual	RL	Result	Qual	RL	Result	Qual	RL	Result	Qual	RL	Result	Qual	RL
Metals																								
Aluminum	NS	mg/kg		6720		40.6	4200		43.4	7550		40.2	6340		44.1	5130		38	13400		35.6	12200		36.7
Antimony	NS	mg/kg		2	J	4.1							2.1	J	4.4									
Arsenic	16	mg/kg		4.7		3	12		3.3	3.4		3	9.5		3.3	10.7		2.9	3		2.7	3.2		2.8
Barium	10000	mg/kg		183	J	40.6	55.7	J	43.4	48.3	J	40.2	153		44.1	54.1		38	44.4		35.6	41.9		36.7
Beryllium	2700	mg/kg		0.85		0.41							0.38	J	0.44				0.34	J	0.36	0.31	J	0.37
Cadmium	60	mg/kg		0.77	J	0.81							1.5		0.88									
Calcium	NS	mg/kg		7640		1010	1060	J	1090	2110		1000	14100		1100	8180		951	1020		891	1020		918
Chromium[3]	6,800	mg/kg		36.1	J	2	9.6	J	2.2	9.5	J	2	24.2		2.2	11.8		1.9	18.2		1.8	15.8		1.8
Cobalt	NS	mg/kg		20.8	J	10.1	3.7	J	10.9	8	J	10	11.4		11	6	J	9.5	9.9		8.9	8.4	J	9.2
Copper	10000	mg/kg		380		5.1	58.6		5.4	56.8		5	607		5.5	29		4.8	15.6		4.5	14.6		4.6
Iron	NS	mg/kg		21100		30.4	9850		32.6	21700		30.1	24600		33.1	11600		28.5	22900		26.7	20800		27.5
Lead	3900	mg/kg		252	J	2	136	J	2.2	26.2	J	2	641		2.2	64.6		1.9	10.4		1.8	9		1.8
Magnesium	NS	mg/kg		5060		1010	1080	J	1090	2130		1000	4900		1100	2850		951	3230		891	3210		918
Manganese	10000	mg/kg		327		3	119		3.3	259		3	451		3.3	148		2.9	403		2.7	330		2.8
Mercury	5.7	mg/kg		0.12		0.018	0.11		0.019	0.13		0.019	0.39		0.019	0.1		0.018	0.037		0.019	0.038		0.019
Nickel	10000	mg/kg		54.5	J	8.1	12.4	J	8.7	11	J	8	18.5		8.8	12.1		7.6	16.9		7.1	15.9		7.3
Potassium	NS	mg/kg		910	J	1010	386	J	1090	1340		1000	588	J	1100	648	J	951	768	J	891	739	J	918
Silver	6800	mg/kg		0.56	J	2																		
Sodium	NS	mg/kg		290	J	1010	112	J	1090	93.1	J	1000	239	J	1100	80.1	J	951	92.4	J	891	83.1	J	918
Vanadium	NS	mg/kg		20		10.1	14.1		10.9	42.8		10	33		11	17.8		9.5	23.6		8.9	22		9.2
Zinc	10000	mg/kg		2480	J	30.4	96.4	J	6.5	48.1	J	6	754		6.6	85.2		5.7	48.2		5.3	46.6		5.5
General Chemistry																								
Cyanide	10000	mg/kg																						

Abbreviations:
mg/kg - milligrams per kilogram
Qual - interpreted qualifier
NS - soil cleanup objective not available
NYSDEC - New York State Department of Environmental Conservation
RL - reporting limit

Qualifiers:
J - estimated result

Notes:
1. NYSDEC Restricted Use Industrial Soil Cleanup Objectives for Protection of Public Health (Table 375-6.8(b)). Results greater than the Restricted Use Industrial Soil Cleanup Objectives are shaded.
2. Total Xylenes results were calculated by summing results for m,p-Xylenes
3. Trivalent chromium soil cleanup objectives are shown above.

Checked by: JTC 5/19/2014

Table 9
Validated Analytical Detects - Soil
Phoenix Property
37-88 Review Avenue
Long Island City, Queens, New York

			Sample ID			GAL-36			GAL-36			GAL-36			GAL-37			GAL-37			GAL-37		
			Sample Date			4/9/2014			4/16/2014			4/16/2014			4/9/2014			4/21/2014			4/21/2014		
			N=Normal, FD=Field Duplicate			N			N			N			N			N			N		
			Start Depth (ft)			0			5			10			0			5			10		
			End Depth (ft)			2			7			12			2			7			12		
Parameter	Protection of Public Health - Industrial[1]	Unit	Result	Qual	RL	Result	Qual	RL	Result	Qual	RL	Result	Qual	RL	Result	Qual	RL	Result	Qual	RL	Result	Qual	RL
Volatile Organic Compounds																							
1,2-Dichlorobenzene	1000	mg/kg													0.0008	J	0.0011						
1,4-Dichlorobenzene	250	mg/kg													0.0013		0.0011						
2-Butanone	1000	mg/kg	0.013		0.005				0.0063		0.0044	0.026		0.0047	0.0088		0.0053	0.013		0.0048			
Acetone	1000	mg/kg	0.055		0.005	0.0087		0.0044	0.033		0.0044	0.092		0.0047	0.032		0.0053	0.04		0.0048			
Benzene	89	mg/kg	0.0006	J	0.001	0.0001	J	0.00087	0.0001	J	0.00088	0.0004	J	0.00095	0.0002	J	0.0011	0.0004	J	0.00095			
Carbon Disulfide	NS	mg/kg	0.0014		0.001							0.0034		0.00095	0.0009	J	0.0011	0.0015		0.00095			
Chloroform	700	mg/kg	0.0003	J	0.001																		
cis-1,2-Dichloroethene	1000	mg/kg										0.0001	J	0.00095									
Cyclohexane	NS	mg/kg	0.0037		0.001	0.026		0.00087	0.015		0.00088	0.0015		0.00095	0.012		0.0011	0.055		0.00095			
Ethylbenzene	780	mg/kg	0.0006	J	0.001	0.0014		0.00087	0.0004	J	0.00088	0.0003	J	0.00095	0.0005	J	0.0011	0.001		0.00095			
Isopropylbenzene	NS	mg/kg	0.001	J	0.001	0.0074		0.00087	0.0053		0.00088	0.0012		0.00095	0.033		0.0011	0.02		0.00095			
m,p-Xylenes	NS	mg/kg	0.0009	J	0.001	0.0009		0.00087	0.0006	J	0.00088				0.0012		0.0011	0.0006	J	0.00095			
Methyl Cyclohexane	NS	mg/kg	0.0071		0.001	0.099		0.00087	0.065		0.00088	0.0035		0.00095	0.036		0.0011	0.22		0.00095			
Methyl tert-Butyl Ether	1000	mg/kg	0.0001	J	0.001				0.0004	J	0.00088	0.0046		0.00095	0.0026		0.0011	0.0025		0.00095			
o-Xylene	NS	mg/kg	0.0009	J	0.001	0.0021		0.00087	0.0018		0.00088	0.0004	J	0.00095	0.004		0.0011	0.0078		0.00095			
Toluene	1000	mg/kg	0.0007	J	0.001	0.0004	J	0.00087	0.0004	J	0.00088	0.0003	J	0.00095				0.0014		0.00095			
Xylenes, Total[2]	1,000	mg/kg	0.0017	J	0.002	0.003		0.00174	0.0024	J	0.00176	0.0004	J	0.0019	0.0052		0.0022	0.0084	J	0.0019			
Semivolatile Organic Compounds																							
2-Methylnaphthalene	NS	mg/kg				0.69		0.37	0.18	J	0.36												
Acenaphthene	1000	mg/kg	0.58	J	3.7													1	J	3.7			
Anthracene	1000	mg/kg	2	J	3.7							0.67	J	1.8				1.3	J	3.7			
Benzo[a]anthracene	11	mg/kg	6		0.37							2.5		0.18	2.9		0.39	2.8		0.37			
Benzo[a]pyrene	1.1	mg/kg	4.7		0.37				0.2		0.036	1.9		0.18				0.42		0.37			
Benzo[b]fluoranthene	11	mg/kg	6.5		0.37							2.3		0.18	0.69		0.39	0.91		0.37			
Benzo[g,h,i]perylene	1000	mg/kg	1.6	J	3.7							0.86	J	1.8									
Benzo[k]fluoranthene	110	mg/kg	2.5		0.37							0.69		0.18									
Carbazole	NS	mg/kg	0.87	J	3.7																		
Chrysene	110	mg/kg	7.1		3.7	1.2		0.37	1.5		0.36	3.3		1.8	3.6	J	3.9	4.9		3.7			
Dibenz[a,h]anthracene	1.1	mg/kg	0.75	J	0.37							0.38	J	0.18									
Dibenzofuran	1000	mg/kg	0.76	J	3.7	0.16	J	0.37	0.18	J	0.36												
Fluoranthene	1000	mg/kg	15		3.7				0.36		0.36	4.4		1.8	0.87	J	3.9	3.4	J	3.7			
Fluorene	1000	mg/kg	1.6	J	3.7	0.66		0.37	0.72		0.36	0.33	J	1.8				2.4	J	3.7			
Indeno[1,2,3-cd]pyrene	11	mg/kg	1.8	J	0.37							0.66	J	0.18									
Naphthalene	1000	mg/kg				0.047	J	0.37															
Phenanthrene	1000	mg/kg	9.7		3.7	4.3		0.37	4		0.36	2.3		1.8				9.8		3.7			
Pyrene	1000	mg/kg	7.7		3.7				0.46		0.36	2.8		1.8	1.9	J	3.9	2.4	J	3.7			
Polychlorinated Biphenyls			no detects																				

Checked by: JTC 5/19/2014

Table 9
Validated Analytical Detects - Soil
Phoenix Property
37-88 Review Avenue
Long Island City, Queens, New York

			Sample ID			GAL-36			GAL-36			GAL-36			GAL-37			GAL-37			GAL-37		
			Sample Date			4/9/2014			4/16/2014			4/16/2014			4/9/2014			4/21/2014			4/21/2014		
			N=Normal, FD=Field Duplicate			N			N			N			N			N			N		
			Start Depth (ft)			0			5			10			0			5			10		
			End Depth (ft)			2			7			12			2			7			12		
Parameter	Protection of Public Health - Industrial[1]	Unit	Result	Qual	RL	Result	Qual	RL	Result	Qual	RL	Result	Qual	RL	Result	Qual	RL	Result	Qual	RL	Result	Qual	RL
Metals																							
Aluminum	NS	mg/kg	7370		44	11700		37.6	5560		38	7970		42.6	16100		41	7680		40			
Antimony	NS	mg/kg	2	J	4.4																		
Arsenic	16	mg/kg	10.7		3.3	3.9		2.8	2.3	J	2.9	10.1		3.2	5.9		3.1	1.9	J	3			
Barium	10000	mg/kg	115		44	44.7		37.6	42.9		38	114		42.6	43.9		41	44		40			
Beryllium	2700	mg/kg				0.34	J	0.38				0.36	J	0.43	0.68		0.41	0.3	J	0.4			
Cadmium	60	mg/kg	1.2		0.88							0.73	J	0.85									
Calcium	NS	mg/kg	14000		1100	1470		940	1090		950	19700		1070	1520		1030	1230		1000			
Chromium[3]	6,800	mg/kg	117		2.2	22		1.9	13.8		1.9	15.8		2.1	19.4		2.1	16.1		2			
Cobalt	NS	mg/kg	11.3		11	8.1	J	9.4	4.4	J	9.5	7	J	10.7	10.7		10.3	5.3	J	10			
Copper	10000	mg/kg	93.4		5.5	17.7		4.7	12.4		4.8	44.9		5.3	12.9		5.1	14.5		5			
Iron	NS	mg/kg	30300		33	27300		28.2	17800		28.5	15000		32	23100		30.8	15300		30			
Lead	3900	mg/kg	134		2.2	7.1		1.9	3.3		1.9	176		2.1	9.9		2.1	4.2		2			
Magnesium	NS	mg/kg	2900		1100	2810		940	2020		950	11400		1070	3410		1030	2320		1000			
Manganese	10000	mg/kg	339		3.3	469		2.8	356		2.9	289		3.2	177		3.1	569		3			
Mercury	5.7	mg/kg	0.49		0.019	0.022		0.018				0.58		0.019	0.025		0.02						
Nickel	10000	mg/kg	25		8.8	16.3		7.5	10.5		7.6	15		8.5	22.5		8.2	13.7		8			
Potassium	NS	mg/kg	867	J	1100	884	J	940	1110		950	828	J	1070	891	J	1030	803	J	1000			
Silver	6800	mg/kg																					
Sodium	NS	mg/kg	255	J	1100	169	J	940	109	J	950	226	J	1070	190	J	1030	109	J	1000			
Vanadium	NS	mg/kg	24.5		11	31.2		9.4	17.3		9.5	24.3		10.7	30.2		10.3	26.7		10			
Zinc	10000	mg/kg	215		6.6	35.6		5.6	33.3		5.7	142		6.4	68.6		6.2	28.3		6			
General Chemistry																							
Cyanide	10000	mg/kg	0.12		0.11							0.19		0.11									

Abbreviations:
mg/kg - milligrams per kilogram
Qual - interpreted qualifier
NS - soil cleanup objective not available
NYSDEC - New York State Department of Environmental Conservation
RL - reporting limit

Qualifiers:
J - estimated result

Notes:
1. NYSDEC Restricted Use Industrial Soil Cleanup Objectives for Protection of Public Health (Table 375-6.8(b)). Results greater than the Restricted Use Industrial Soil Cleanup Objectives are shaded.
2. Total Xylenes results were calculated by summing results for m,p-Xylenes
3. Trivalent chromium soil cleanup objectives are shown above.

Checked by: JTC 5/19/2014

Table 10
Validated Analytical Results - LNAPL Physical Parameters
Phoenix Property
37-88 Review Avenue
Long Island City, Queens, New York

Sample Location		PHOENIX (37-88 Review Ave)									
Sample ID		GAL-14	GAL-17	GAL-26	GAL-32	GAL-33	GAL-35	GAL-36	GAL-36	GAL-37	MW-8
Sample Date		8/19/2014	8/19/2014	8/19/2014	8/19/2014	8/19/2014	8/19/2014	8/19/2014	8/19/2014	8/19/2014	8/19/2014
N=Normal, FD=Field Duplicate		N	N	N	N	N	N	N	FD	N	N
Parameter	Unit	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result
API gravity	-	25.12	25.36	24.87	22.88	25.49	25.45	25.38	25.37	24.94	25.27
Density	g/cm^3	0.903	0.9016	0.9044	0.916	0.9008	0.901	0.9015	0.9015	0.904	0.9021
Flash Point	F	265	273	269	192	278	249	292	288	283	262
Heat Of Combustion	btu/lb	19271	19232	19272	19067	19273	19326	19305	19294	19291	19289
Interfacial Tension	dynes/cm	41.5	66.1	43.2	44.3	38.1	40.8	39.7	44.9	55.7	38.1
Specific Gravity	-	0.9035	0.9021	0.9049	0.9166	0.9013	0.9015	0.902	0.902	0.9045	0.9026
Sulfur	%w	0.53	0.58	0.57	0.38	0.43	0.48	0.72	0.55	0.46	0.46
Surface Tension	dynes/cm	30.5	29.5	30.6	30.5	30.4	30.4	30.7	30.3	30.6	30.6
% Sediment	%v	< 0.05	< 0.05	< 0.05	0.3	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Viscosity	cSt	69.37	61.08	61.36	67.02	67.36	57.48	68.24	68.33	72.82	66.78

Sample Location		WASTE MANAGEMENT (38-22 Review Ave)		38-20 Review Ave				RADII (37-80 Review Ave)	
Sample ID		MW-6	MW-6S	MW-54	MW-54	MW-55	MW-56	GAL-08	GAL-16R
Sample Date		8/19/2014	8/19/2014	8/18/2014	9/3/2014	8/18/2014	9/3/2014	8/18/2014	8/18/2014
N=Normal, FD=Field Duplicate		N	N	N	N	N	N	N	N
Parameter	Unit	Result	Result	Result	Result	Result	Result	Result	Result
API gravity	-	24.77	19.41	24.9		25.25	33.38	24.26	24.96
Density	g/cm^3	0.905	0.9371	0.9042		0.8988	0.8542	0.9045	0.9004
Flash Point	F	224	298	332		225	172	153	234
Heat Of Combustion	btu/lb	19363	18867		19236	19222	19247	19064	19279
Interfacial Tension	dynes/cm	40.8	56.1	36.4		54.34	30.5	58.41	51.29
Specific Gravity	-	0.9055	0.9376	0.9047		0.9027	0.8582	0.9085	0.9044
Sulfur	%w	0.22	0.59	0.451		0.446	0.453	0.252	0.336
Surface Tension	dynes/cm	30.2	31.5	30.8		32.4	51.9	31.1	33
% Sediment	%v	0.1	< 0.05		< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Viscosity	cSt	64.49	276.05	61.78		51.8	30.74	39.91	82.34

Notes and Abbreviations
API - American Petroleum Institute
% - Percent
g/cm^3 - Grams Per Cubic Centimeter
%v - Percent Volume
%w - Percent Weight
btu/lb - British Thermal Units Per Pound
F - Degrees Fahrenheit
dynes/cm - Dynes Per Centimeter
cSt - Centistokes

Checked by: CD 9/19/2014

Table 11
Validated Analytical Detects - LNAPL Chemical Parameters
Phoenix Property
37-88 Review Avenue
Long Island City, Queens, New York

Sample Location		PHOENIX (37-88 Review Ave)																														
Sample ID		GAL-14			GAL-17			GAL-26			GAL-32			GAL-33			GAL-35			GAL-36			GAL-36			GAL-37			MW-8		
Sample Date		8/19/2014			8/19/2014			8/19/2014			8/19/2014			8/19/2014			8/19/2014			8/19/2014			8/19/2014			8/19/2014			8/19/2014		
N=Normal, FD=Field Duplicate		N			N			N			N			N			N			N			FD			N			N		
Parameter	Unit	Result	Qual	RL	Result	Qual	RL	Result	Qual	RL	Result	Qual	RL	Result	Qual	RL	Result	Qual	RL	Result	Qual	RL	Result	Qual	RL	Result	Qual	RL	Result	Qual	RL
Volatile Organic Compounds																																
1,2,3-Trichlorobenzene	mg/kg																															
1,2,4-Trichlorobenzene	mg/kg																															
1,2-Dichlorobenzene	mg/kg	0.71		0.5							5.7		2																2.4		0.5
1,3-Dichlorobenzene	mg/kg																												0.12	J	0.5
1,4-Dichlorobenzene	mg/kg										1.3	J	2																0.53		0.5
Benzene	mg/kg				1.6		0.5				1.2	J	2	0.81		0.5	0.46	J	0.5	0.3	J	0.5	0.25	J	0.49				0.1	J	0.5
Chlorobenzene	mg/kg																															
Chloroethane	mg/kg																															
Cyclohexane	mg/kg	20		0.5	16		0.5	7.9		0.5	150		2	15		0.5	27		0.5	16		0.5	16		0.49	14		0.49	24		0.5
Ethylbenzene	mg/kg				0.76		0.5							4		0.5	5.6		0.5	6		0.5	6.5		0.49						
Isopropylbenzene	mg/kg	5.2		0.5	4.8		0.5	1.1		0.5	20		2	5.2		0.5	9.2		0.5	5.1		0.5	5		0.49	6.7		0.49	7.3		0.5
m,p-Xylenes	mg/kg	1.4		0.5	0.58		0.5	0.23	J	0.5	20		2	13		0.5	6.2		0.5	3.7		0.5	3.8		0.49				6.2		0.5
Methyl Cyclohexane	mg/kg	83		0.5	60		0.5	41		0.5	660		2	57		0.5	100		0.5	71		0.5	69		0.49	62		0.49	89		0.5
Methyl tert-Butyl Ether	mg/kg				0.33	J	0.5																									
o-Xylene	mg/kg	2.1		0.5	2.3		0.5	0.28	J	0.5	4.1		2	10		0.5	7		0.5	6.1		0.5	6.1		0.49	2		0.49	4		0.5
Styrene	mg/kg																															
Toluene	mg/kg				0.42	J	0.5							1.2		0.5	2		0.5	0.99		0.5	1		0.49						
Semivolatile Organic Compounds																																
2-Methylnaphthalene	mg/kg																						250		49							
Benzo[a]anthracene	mg/kg	150		49				160		49	350		49										49		4.9				150		24
Benzo[a]pyrene	mg/kg							59		49	260		49				49		48										39		24
Benzo[b]fluoranthene	mg/kg										140		49										17		4.9				33		24
Bis(2-ethylhexyl) Phthalate	mg/kg																															
Chrysene	mg/kg																						150		49							
Dibenz[a,h]anthracene	mg/kg										120	J	49																			
Fluoranthene	mg/kg																						63		49							
Fluorene	mg/kg																						130		49							
Indeno[1,2,3-cd]pyrene	mg/kg										100	J	49																			
Phenanthrene	mg/kg																			530		490	610		49	740		480				
Pyrene	mg/kg																						62		49							
GRO/MRO/DRO																																
Gasoline Range Organics (C6-C10)	mg/kg	1300		250	960		62	980		63	5000		610	990		62	1600		61	560		25	620		25	650		25	1400		250
Diesel Range Organics (C10-C28)	mg/kg	570000		24000	620000		24000	640000		24000	540000		24000	590000		25000	620000		24000	660000		24000	620000		24000	630000		25000	640000		24000
Mineral Range Organics (C10-C44)	mg/kg	700000		24000	780000		24000	800000		24000	750000		24000	730000		25000	780000		24000	790000		24000	730000		24000	770000		25000	790000		24000
Polychlorinated Biphenyls																																
Aroclor 1248	mg/kg																															
Aroclor 1260	mg/kg																															
Polychlorinated Biphenyls	mg/kg																															
Metals																																
Aluminum	mg/kg																															
Arsenic	mg/kg	1.9		1.4	1	J	1.3	2.8		1.3	8.9		1.3	1.4		1.1	2.3		1.4	0.3	J	1.3	0.5	J	1.2	0.72	J	1.4	2.2		1.3
Barium	mg/kg	0.72	J	18	0.15	J	17.7	0.23	J	17.7	0.27	J	17.2	0.14	J	15							0.1	J	16.1	0.29	J	18.7	1.3	J	17.5
Cadmium	mg/kg																												0.032	J	0.44
Calcium	mg/kg										25.6	J	431	22	J	376	43.3	J	463	24.3	J	417									
Chromium	mg/kg	0.87	J	0.9	0.35	J	0.88	0.59	J	0.88	0.64	J	0.86	0.62	J	0.75	0.54	J	0.93	0.29	J	0.83	0.24	J	0.81	0.47	J	0.93	0.6	J	0.88
Copper	mg/kg				0.84	J	2.2																									
Iron	mg/kg							5.4	J	17.7	5.7	J	17.2	4.1	J	15	8.2	J	18.5										4.4	J	17.5
Lead	mg/kg	0.37	J	0.9				0.18	J	0.88																			0.71	J	0.88
Magnesium	mg/kg	8.3	J	450	6	J	442	6.8	J	442	6.3	J	431	5.9	J	376	7.3	J	463	6.2	J	417	6.7	J	403				7.3	J	439
Manganese	mg/kg				0.2	J	1.3				0.18	J	1.3																0.26	J	1.3
Selenium	mg/kg	0.68	J	1.8	0.5	J	1.8	0.63	J	1.8	0.55	J	1.7	0.47	J	1.5	0.58	J	1.9	0.39	J	1.7	0.55	J	1.6	0.53	J	1.9	0.69	J	1.8
Vanadium	mg/kg	1.6		0.9				0.8	J	0.88	1.2		0.86	0.69	J	0.75										0.2	J	0.93	0.55	J	0.88
Zinc	mg/kg																4.1	J	4.6	1.5	J	4.2	1.2	J	4	1.1	J	4.7			
Mercury	mg/kg	0.015	J	0.088																												
General Chemistry																																
Total Organic Halides	mg/kg				86.7	J	200																									
Cyanide	mg/kg																															

1. Additional volume was collected for wells MW-54 and MW-56 on 9/3/14 when sufficient sample volume was not available during the initial sampling event on 8/18/14.

mg/kg - milligrams per kilogram
Qual - validation qualifier
RL - reporting limit

Qualifiers:
J - estimated result

Checked by: SS 9/23/2014

Table 11
Validated Analytical Detects - LNAPL Chemical Parameters
Phoenix Property
37-88 Review Avenue
Long Island City, Queens, New York

Sample Location		WASTE MANAGEMENT (38-22 Review Ave)						38-20 Review Ave															RADII (37-80 Review Ave)					
Sample ID		MW-6			MW-6S			MW-54[1]			MW-54			MW-55			MW-56[1]			MW-56			GAL-08			GAL-16R		
Sample Date		8/19/2014			8/19/2014			8/18/2014			9/3/2014			8/18/2014			8/18/2014			9/3/2014			8/18/2014			8/18/2014		
N=Normal, FD=Field Duplicate		N			N			N			N			N			N			N			N			N		
Parameter	Unit	Result	Qual	RL	Result	Qual	RL	Result	Qual	RL	Result	Qual	RL	Result	Qual	RL	Result	Qual	RL	Result	Qual	RL	Result	Qual	RL	Result	Qual	RL
Volatile Organic Compounds																												
1,2,3-Trichlorobenzene	mg/kg				0.38	J	0.49																					
1,2,4-Trichlorobenzene	mg/kg				1.9	J	0.49																					
1,2-Dichlorobenzene	mg/kg				32		0.49																47		0.85			
1,3-Dichlorobenzene	mg/kg				1.9		0.49																2		0.85			
1,4-Dichlorobenzene	mg/kg				5.6		0.49																9.3		0.85			
Benzene	mg/kg	0.86		0.5	10		0.49							0.6	J	0.83				1.4	J	2				0.82		0.38
Chlorobenzene	mg/kg				0.72		0.49																					
Chloroethane	mg/kg																									2		0.38
Cyclohexane	mg/kg	13		0.5	18		0.49				26		0.5	50		0.83				240		2				27		0.38
Ethylbenzene	mg/kg	5.6		0.5	1.4		0.49				2.5		0.5	9.2		0.83				3.3		2	5.6		0.85			
Isopropylbenzene	mg/kg	2.4		0.5	5.6		0.49				6.5		0.5	18		0.83				39		2	230		0.85	8		0.38
m,p-Xylenes	mg/kg	29		0.5	2.1		0.49				1.8		0.5	23		0.83				15		2	8.6		0.85	45		0.38
Methyl Cyclohexane	mg/kg	50		0.5	50		0.49				88		0.5	210		0.83				890		2	190		0.85	100		0.38
Methyl tert-Butyl Ether	mg/kg																											
o-Xylene	mg/kg	4.2		0.5	4.2		0.49				3.5		0.5	9.8		0.83				8.1		2	4.2		0.85	4.2		0.38
Styrene	mg/kg													0.9		0.83												
Toluene	mg/kg	0.6		0.5	0.51		0.49				0.66		0.5	2.3		0.83				2.1		2				0.62		0.38
Semivolatile Organic Compounds																												
2-Methylnaphthalene	mg/kg													550	J	480												
Benzo[a]anthracene	mg/kg	190		25	290		48							150	J	48				130		48	440	J	49	160		24
Benzo[a]pyrene	mg/kg	33		25	230		48													48		48	57	J	49	51		24
Benzo[b]fluoranthene	mg/kg	37		25	160		48													56		48	100	J	49	39		24
Bis(2-ethylhexyl) Phthalate	mg/kg				1700		480																					
Chrysene	mg/kg																						510	J	490			
Dibenz[a,h]anthracene	mg/kg				81	J	48																					
Fluoranthene	mg/kg																											
Fluorene	mg/kg																											
Indeno[1,2,3-cd]pyrene	mg/kg				72	J	48																					
Phenanthrene	mg/kg	260		250							600		480	950	J	480				670		480				280		240
Pyrene	mg/kg																											
GRO/MRO/DRO																												
Gasoline Range Organics (C6-C10)	mg/kg	2500		500	250		25	840		55				2800		240	3500		110				30000		1100	1700		230
Diesel Range Organics (C10-C28)	mg/kg	590000		24000	440000		25000	610000		24000				590000		24000	530000		24000				460000		24000	530000		24000
Mineral Range Organics (C10-C44)	mg/kg	730000		24000	620000		25000	750000		24000				740000		24000	720000		24000				690000		24000	740000		24000
Polychlorinated Biphenyls																												
Aroclor 1248	mg/kg																									4.8		0.98
Aroclor 1260	mg/kg																									3.8		0.98
Polychlorinated Biphenyls	mg/kg																									8.5		0.98
Metals																												
Aluminum	mg/kg	13.4	J	14.1	203		18																			40.4		17.4
Arsenic	mg/kg	2.8		1.1	9		1.4				1.4		1.4	2.1		1.1				3.9		1.5	3.1		1.4	2.5		1.3
Barium	mg/kg	0.091	J	14.1	2.1	J	18							0.32	J	15							0.31	J	19	2.1	J	17.4
Cadmium	mg/kg																									0.038	J	0.43
Calcium	mg/kg				109	J	450																28.5	J	476	30	J	435
Chromium	mg/kg	0.2	J	0.7	2.6		0.9				0.31	J	0.94	0.7	J	0.75				0.79	J	0.99	1.7		0.95	0.72	J	0.87
Copper	mg/kg				0.67	J	2.3																			0.66	J	2.2
Iron	mg/kg				25.6		18				4.7	J	18.9	12.9	J	15				7.3	J	19.8	14	J	19	13.5	J	17.4
Lead	mg/kg				0.57	J	0.9																			0.67	J	0.87
Magnesium	mg/kg	4.9	J	352	8.7	J	450				6.6	J	472	5.7	J	376							7.3	J	476	7	J	435
Manganese	mg/kg	0.14	J	1.1	1.3	J	1.4							0.18	J	1.1							0.16	J	1.4	0.67	J	1.3
Selenium	mg/kg	0.41	J	1.4	0.5	J	1.8							0.54	J	1.5				0.47	J	2	0.72	J	1.9	0.48	J	1.7
Vanadium	mg/kg				7.8		0.9							0.63	J	0.75				2.8		0.99	2.8		0.95	0.77	J	0.87
Zinc	mg/kg	0.86	J	3.5	1.2	J	4.5																			2	J	4.3
Mercury	mg/kg																											
General Chemistry																												
Total Organic Halides	mg/kg																											
Cyanide	mg/kg				0.63		0.2																					

1. Additional volume was collected for wells MW-54 and MW-56 on 9/3/14 when sufficient sample volume was not available during the initial sampling event on 8/18/14.

mg/kg - milligrams per kilogram
Qual - validation qualifier
RL - reporting limit

Qualifiers:
J - estimated result

Checked by: SS 9/23/2014

REFERENCE

1.) BASE MAP FROM USGS 7.5 MINUTE QUADRANGLE OF BROOKLYN, N.Y., DATED 2013.

2000 0 2000
SCALE FEET

Golder Associates
Mt. Laurel, New Jersey

SCALE	AS SHOWN
DATE	11/18/14
DESIGN	HAL
CADD	RG
CHECK	HAL
REVIEW	SDM

FILE No. 1302414B010
PROJECT No. 1302414 REV. 0

TITLE

SITE LOCATION MAP

37-88 REVIEW AVENUE/PHOENIX PROPERTY

FIGURE 1

Drawing file: 1302414B010 - Figure 1.dwg Nov 18, 2014 - 3:00pm

LEGEND

- PROPERTY BOUNDARY
- BUILDING OUTLINE
- TOPOGRAPHIC CONTOUR
- RAILROAD TRACK
- UNKNOWN MANHOLE
- CATCH BASIN
- SURVEYED MONITORING WELL (SEE REFERENCE 3)
- MONITORING WELL (LOCATIONS APPROXIMATE) (SEE REFERENCE 4)
- APPROXIMATE SOIL VAPOR PROBE LOCATION
- APPROXIMATE OUTDOOR AIR SAMPLE LOCATION
- APPROXIMATE SUB-SLAB SOIL VAPOR LOCATION
- APPROXIMATE INDOOR AIR SAMPLE LOCATION
- SOIL BORING (GOLDER ASSOCIATES 2003/2004) (SEE REFERENCE 3)
- LNAPL PILOT TEST STUDY OBSERVATION WELL (SEE REFERENCE 3)
- LIF BORING LOCATION (SEE REFERENCE 4)
- SOIL VAPOR PROBE LOCATION (SAMPLED IN 2008/2009) (SEE REFERENCE 5)

NOTE

1.) ELEVATIONS REFERENCE THE NATIONAL GEODETIC VERTICAL DATUM OF 1929 (NGVD 29), OR MEAN SEA LEVEL.

REFERENCES

1.) AERIAL PHOTOGRAPH LICENSED FROM GOOGLE EARTH PRO. DATE OF AERIAL PHOTOGRAPH IS NOVEMBER, 2012.

2.) BASE TOPOGRAPHY AND PROPERTY BOUNDARY FROM DIGITAL FILE ACAD-2148-delivery-8-22-14.dwg, ENTITLED "BOUNDARY AND TOPOGRAPHIC PLAN, BLOCK 312 LOTS 41,69 & 79 , 37-80 REVIEW AVENUE, PREPARED FOR: GOLDER ASSOCIATES, LOCATED IN: LONG ISLAND CITY, QUEENS, N.Y. PROVIDED BY GEOD CORPORATION, DATED SEPTEMBER 12, 2014.

3.) WELL COORDINATES TAKEN FROM MICROSOFT EXCEL FILES QUANTA SAMPLES AND WELLS.XLS, 2148A 8-23-04.XLS, 2148A 4-11-05.XLS, 2340 MONITORING WELLS.XLS, 2148 83-88 WELLS 4-25-13.XLSX, AND MON WELLS 8-22-14 DELIV.XLSX PROVIDED BY GEOD CORP.

4.) LOCATIONS OF ALL OTHER WELLS WERE DIGITIZED FROM HARDCOPY OF A DRAWING BY KLEINFELDER ENTITLED "AERIAL PLAN" DATED MAY 13, 2013.

5.) SOIL VAPOR PROBE LOCATIONS DIGITIZED FROM FIGURE 1, ENTITLED "SOIL VAPOR PROBE LOCATIONS - VOC DETECTIONS," DATED JANUARY 26, 2010, PREPARED BY GEOSYNTEC CONSULTANTS.

REV	DATE	DES	REVISION DESCRIPTION	CADD	CHK	RVW

PROJECT

37-88 REVIEW AVENUE/PHOENIX PROPERTY
RI REPORT
LONG ISLAND CITY, QUEENS, NEW YORK

TITLE

PHOENIX PROPERTY PLAN

Golder Associates
Mt. Laurel, New Jersey

PROJECT No.		1302414	FILE No. 1302414B009
DESIGN	HAL	11/18/14	SCALE AS SHOWN REV. 0
CADD	RG	11/18/14	
CHECK	HAL	11/18/14	
REVIEW	SDM	11/18/14	

FIGURE 2

LEGEND

- PROPERTY BOUNDARY
- BUILDING OUTLINE
- TOPOGRAPHIC CONTOUR
- RAILROAD TRACK
- APPROXIMATE LOCATION OF DRAIN TRENCH
- UNKNOWN MANHOLE
- CATCH BASIN
- RI MONITORING WELL LOCATION
- APPROXIMATE OUTDOOR AIR SAMPLE LOCATION
- APPROXIMATE SOIL VAPOR PROBE LOCATION
- APPROXIMATE SUB-SLAB SOIL VAPOR LOCATION
- APPROXIMATE INDOOR AIR SAMPLE LOCATION
- SURVEYED MONITORING WELL
- MONITORING WELL (LOCATIONS APPROXIMATE) (SEE REFERENCE 4)
- SOIL BORING (GOLDER ASSOCIATES 2003/2004) (SEE REFERENCE 3)
- LNAPL PILOT TEST STUDY OBSERVATION WELL (SEE REFERENCE 3)
- LIF BORING LOCATION (SEE REFERENCE 4)
- SOIL VAPOR PROBE LOCATION (SAMPLED IN 2008/2009) (SEE REFERENCE 5)

NOTE

1.) ELEVATIONS REFERENCE THE NATIONAL GEODETIC VERTICAL DATUM OF 1929 (NGVD 29), OR MEAN SEA LEVEL.

REFERENCES

1.) AERIAL PHOTOGRAPH LICENSED FROM GOOGLE EARTH PRO. DATE OF AERIAL PHOTOGRAPH IS NOVEMBER, 2012.

2.) BASE TOPOGRAPHY AND PROPERTY BOUNDARY FROM DIGITAL FILE ACAD-2148-delivery-8-22-14.dwg, ENTITLED "BOUNDARY AND TOPOGRAPHIC PLAN, BLOCK 312 LOTS 41,69 & 79 , 37-80 REVIEW AVENUE, PREPARED FOR: GOLDER ASSOCIATES, LOCATED IN: LONG ISLAND CITY, QUEENS, N.Y. PROVIDED BY GEOD CORPORATION, DATED SEPTEMBER 12, 2014.

3.) WELL COORDINATES TAKEN FROM MICROSOFT EXCEL FILES QUANTA SAMPLES AND WELLS.XLS, 2148A 8-23-04.XLS, 2148A 4-11-05.XLS, 2340 MONITORING WELLS.XLS, 2148 83-88 WELLS 4-25-13.XLSX, AND MON WELLS 8-22-14 DELIV.XLSX PROVIDED BY GEOD CORP.

4.) LOCATIONS OF ALL OTHER WELLS WERE DIGITIZED FROM HARDCOPY OF A DRAWING BY KLEINFELDER ENTITLED "AERIAL PLAN" DATED MAY 13, 2013.

5.) SOIL VAPOR PROBE LOCATIONS DIGITIZED FROM FIGURE 1, ENTITLED "SOIL VAPOR PROBE LOCATIONS - VOC DETECTIONS," DATED JANUARY 26, 2010, PREPARED BY GEOSYNTEC CONSULTANTS.

SCALE: 30 0 30 60 FEET

REV	DATE	DES	REVISION DESCRIPTION	CADD	CHK	RVW

PROJECT

37-88 REVIEW AVENUE/PHOENIX PROPERTY
RI REPORT
LONG ISLAND CITY, QUEENS, NEW YORK

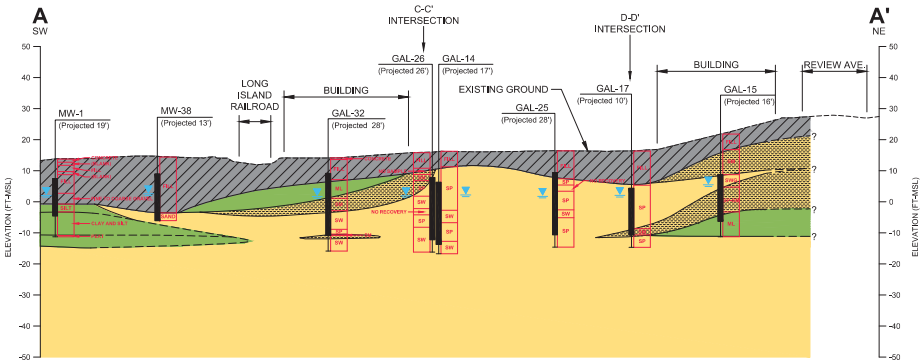
TITLE

REMEDIAL INVESTIGATION SAMPLING LOCATIONS

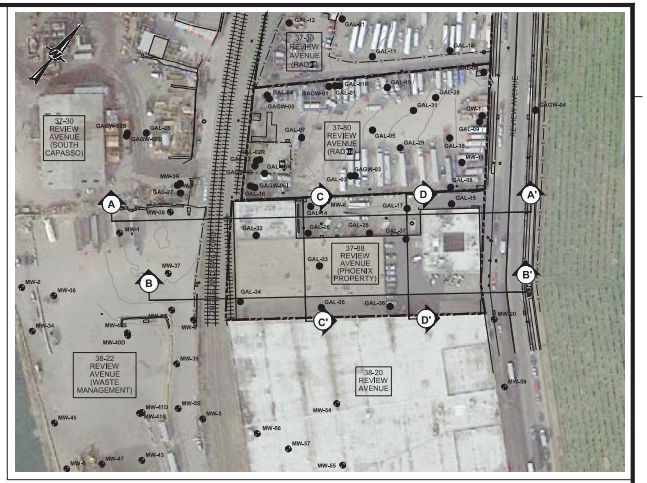
Golder Associates
Mt. Laurel, New Jersey

PROJECT No.		1302414	FILE No.		1302414B007
DESIGN	HAL	11/18/14	SCALE	AS SHOWN	REV. 0
CADD	RG	11/18/14			
CHECK	HAL	11/18/14			
REVIEW	SDM	11/18/14			

FIGURE 3

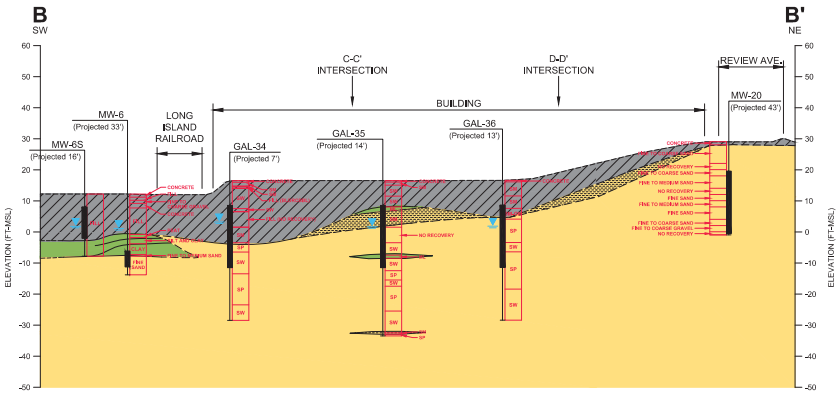


A CROSS SECTION A-A'

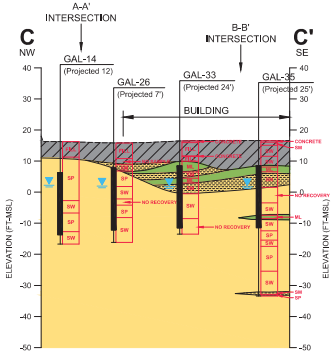


CROSS SECTION LOCATION MAP

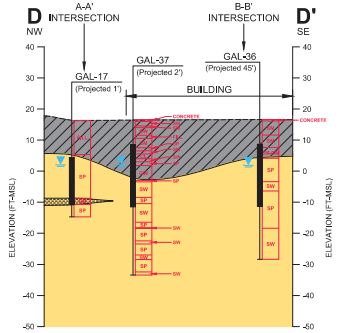
SCALE 100 0 100 200 FEET



B CROSS SECTION B-B'



C CROSS SECTION C-C'



D CROSS SECTION D-D'

LEGEND

GAL-36 — WELL/BORING IDENTIFICATION
TOP OF WELL/BORING
TOP OF SCREENED INTERVAL
BOTTOM OF SCREENED INTERVAL
BOTTOM OF WELL/BORING
GROUNDWATER ELEVATION (FT.-MSL) MEASURED ON SEPTEMBER 3, 2014

URBAN FILL
SAND AND GRAVEL UNIT
PEAT, SILT, SILTY-CLAY AND CLAY UNIT
SILTY SAND

NOTE

1.) FILL MATERIAL USCS CLASSIFICATION IN GOLDER LOGS GAL-34 THROUGH GAL-37 ONLY. LITHOLOGIC INFORMATION INCLUDED WITH FILL CLASSIFICATION FROM OTHER BORING LOGS INCORPORATED INTO GEOLOGIC INTERPRETATION.

2.) GEOLOGIC CONTACTS INFERRED WHERE DASHED.

REFERENCES

1.) BASE TOPOGRAPHY AND PROPERTY BOUNDARY FROM DIGITAL FILE ACAD-2148-delivery-8-22-14.dwg, ENTITLED "BOUNDARY AND TOPOGRAPHIC PLAN, BLOCK 312 LOTS 41,69 & 79 , 37-80 REVIEW AVENUE, PREPARED FOR: GOLDER ASSOCIATES, LOCATED IN: LONG ISLAND CITY, QUEENS, N.Y. PROVIDED BY GEOD CORPORATION, DATED SEPTEMBER 12, 2014.

2.) WELL COORDINATES TAKEN FROM A MICROSOFT EXCEL FILE QUANTA SAMPLES AND WELLS.XLS, 2148A 8-23-04.XLS, 2148A 4-11-05.XLS, 2340 MONITORING WELLS.XLS, AND 2148 83-88 WELLS 4-25-13.XLSX AND MON WELLS 8-22-14 DELIV.XLSX PROVIDED BY GEOD CORP.

3.) AERIAL PHOTOGRAPH LICENSED FROM GOOGLE EARTH PRO. DATE OF AERIAL PHOTOGRAPH IS NOVEMBER, 2012.

HORIZONTAL SCALE 50 0 50 100 FEET

VERTICAL SCALE 20 0 20 40 FEET

REV	DATE	DES	REVISION DESCRIPTION	CADD	CHK	RVW

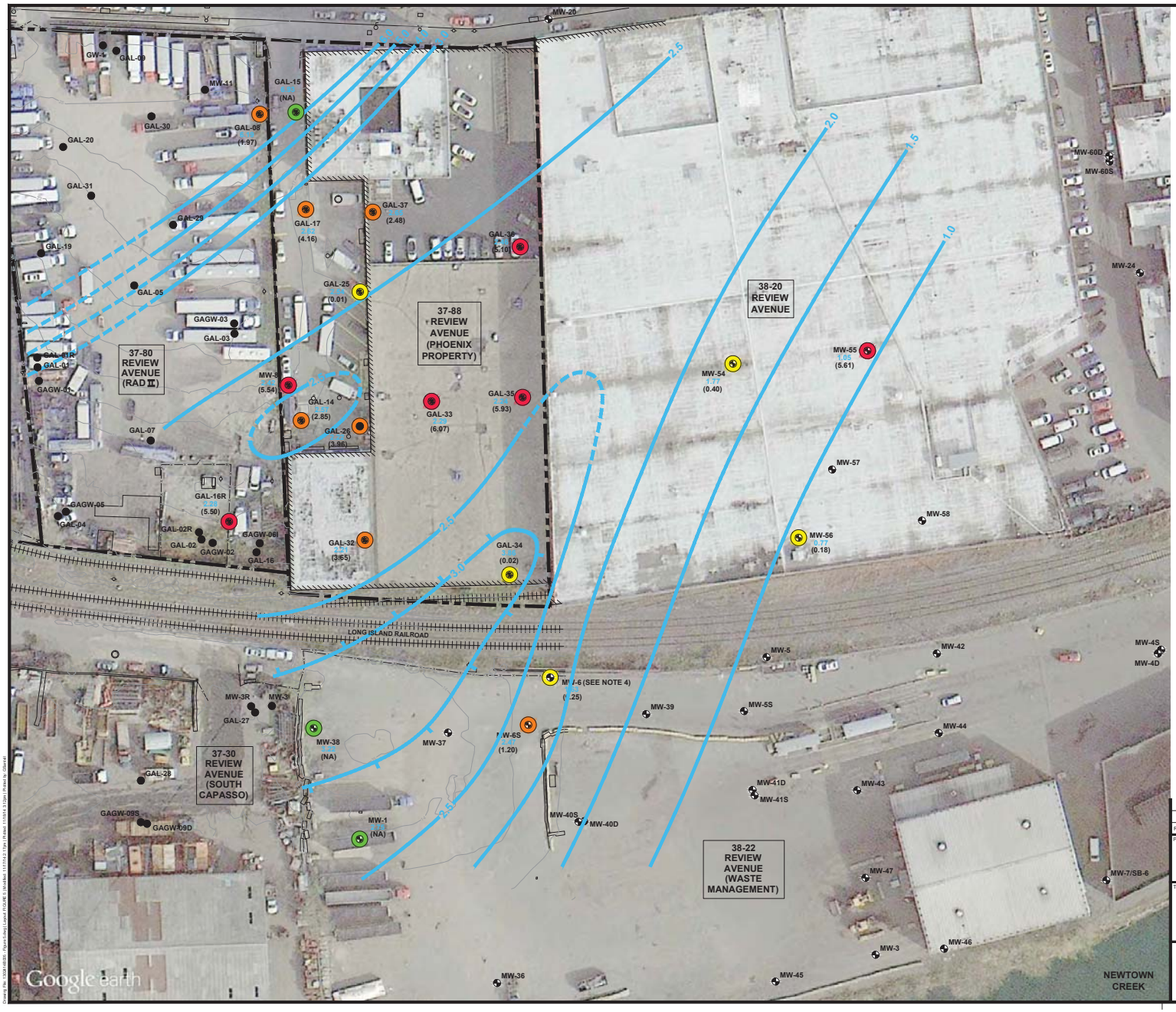
PROJECT
37-88 REVIEW AVENUE/PHOENIX PROPERTY
RI REPORT
LONG ISLAND CITY, QUEENS, NEW YORK

TITLE
GENERALIZED GEOLOGIC CROSS SECTIONS

Golder Associates
Mt. Laurel, New Jersey

PROJECT No.	130-2414	FILE No. 1302414B003
DESIGN	JLH	11/18/14
CADD	RG	11/18/14
CHECK	HAL	11/18/14
REVIEW	SDM	11/18/14
SCALE	AS SHOWN	REV. 0

FIGURE 4



LEGEND

- PROPERTY BOUNDARY
- BUILDING OUTLINE
- TOPOGRAPHIC CONTOUR
- RAILROAD TRACK
- UNKNOWN MANHOLE
- CATCH BASIN
- SURVEYED MONITORING WELL
- MONITORING WELL (LOCATIONS APPROXIMATE) (SEE REFERENCE 4)
- 1.0 — GROUNDWATER CONTOUR (DASHED WHERE INFERRED)
- 1.77 — GROUNDWATER ELEVATION (FT MSL)
- (5.61) — APPARENT LNAPL THICKNESS (FEET)
- NO MEASUREABLE LNAPL
- APPARENT LNAPL THICKNESS < 1 FT
- APPARENT LNAPL THICKNESS > 1 FT, < 5 FT
- APPARENT LNAPL THICKNESS > 5 FT

NOTES

1.) ELEVATIONS REFERENCE THE NATIONAL GEODETIC VERTICAL DATUM OF 1929 (NGVD 29), OR MEAN SEA LEVEL.

2.) SYNOPTIC GROUNDWATER AND LNAPL INTERFACES GAUGED ON AUGUST 18, 2014.

3.) NA - NOT APPLICABLE.

4.) GROUNDWATER ELEVATION NOT USED IN CONTOURS AS THIS WELL IS SCREENED BELOW THE WATER TABLE.

REFERENCES

1.) AERIAL PHOTOGRAPH LICENSED FROM GOOGLE EARTH PRO. DATE OF AERIAL PHOTOGRAPH IS NOVEMBER, 2012.

2.) BASE TOPOGRAPHY AND PROPERTY BOUNDARY FROM DIGITAL FILE ACAD-2148-delivery-8-22-14.dwg, ENTITLED "BOUNDARY AND TOPOGRAPHIC PLAN, BLOCK 312 LOTS 41,69 & 79 , 37-80 REVIEW AVENUE, PREPARED FOR: GOLDER ASSOCIATES, LOCATED IN: LONG ISLAND CITY, QUEENS, N.Y. PROVIDED BY GEOD CORPORATION, DATED SEPTEMBER 12, 2014.

3.) WELL COORDINATES TAKEN FROM MICROSOFT EXCEL FILES QUANTA SAMPLES AND WELLS.XLS, 2148A 8-23-04.XLS, 2148A 4-11-05.XLS, 2340 MONITORING WELLS.XLS, 2148 83-88 WELLS 4-25-13.XLSX, AND MON WELLS 8-22-14 DELIV.XLSX PROVIDED BY GEOD CORP.

4.) LOCATIONS OF ALL OTHER WELLS WERE DIGITIZED FROM HARDCOPY OF A DRAWING BY KLEINFELDER ENTITLED "AERIAL PLAN" DATED MAY 13, 2013.

35 0 35 70
SCALE FEET

REV	DATE	DES	REVISION DESCRIPTION	CADD	CHK	RVW

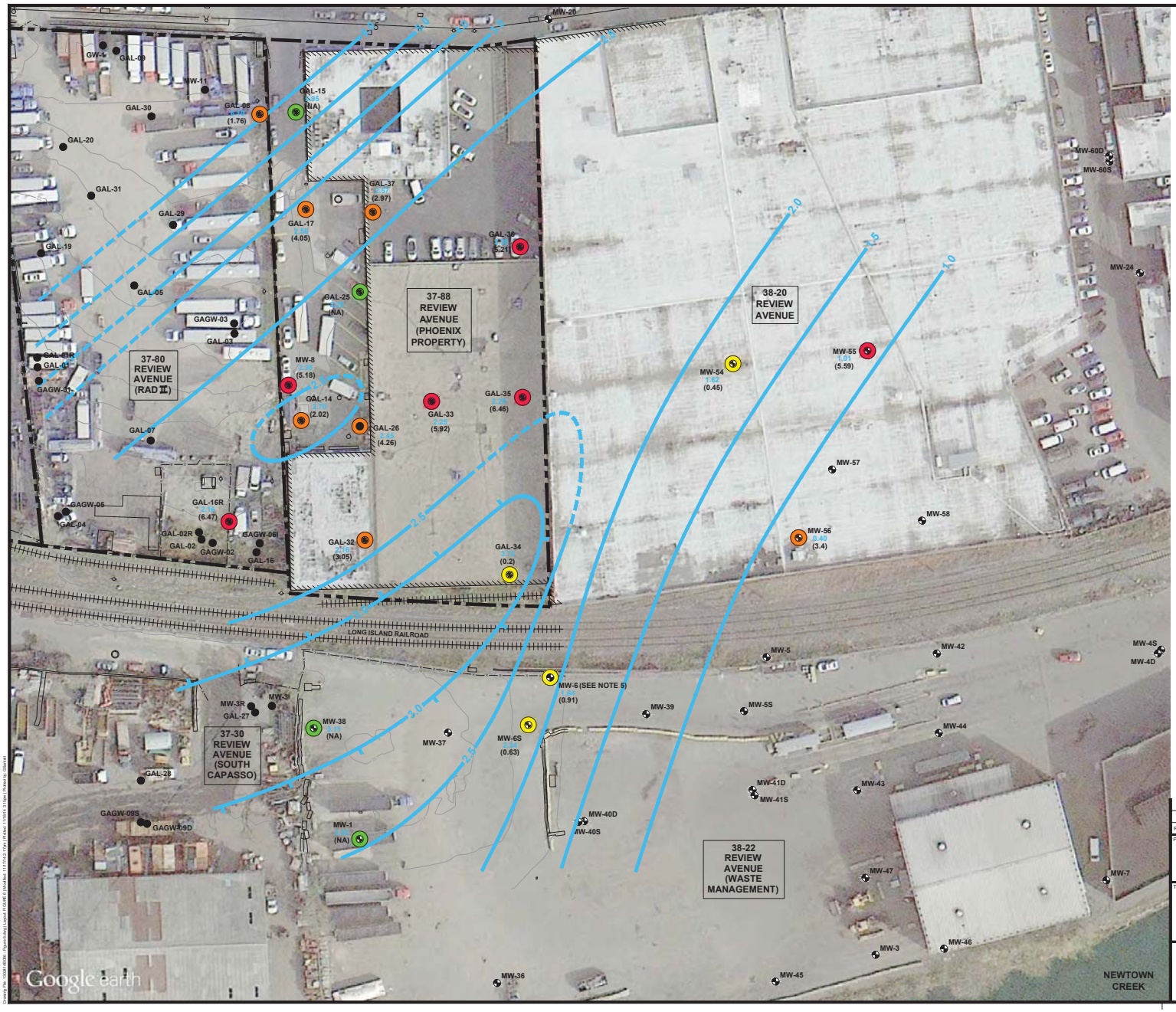
PROJECT
37-88 REVIEW AVENUE/PHOENIX PROPERTY
RI REPORT
LONG ISLAND CITY, QUEENS, NEW YORK

TITLE
INTERPRETED GROUNDWATER CONTOUR MAP (AUGUST 2014)

Golder Associates
Mt. Laurel, New Jersey

PROJECT No.	1302414		FILE No.	1302414B005	
DESIGN	HAL	11/18/14	SCALE	AS SHOWN	REV. 0
CADD	RG	11/18/14			
CHECK	HAL	11/18/14			
REVIEW	SDM	11/18/14			

FIGURE 5



LEGEND

- PROPERTY BOUNDARY
- BUILDING OUTLINE
- TOPOGRAPHIC CONTOUR
- RAILROAD TRACK
- UNKNOWN MANHOLE
- CATCH BASIN
- SURVEYED MONITORING WELL
- MONITORING WELL (LOCATIONS APPROXIMATE) (SEE REFERENCE 4)
- 1.0 — GROUNDWATER CONTOUR (DASHED WHERE INFERRED)
- 1.62 — GROUNDWATER ELEVATION (FT MSL)
- (5.59) — APPARENT LNAPL THICKNESS (FEET)
- NO MEASUREABLE LNAPL (SEE NOTE 3)
- APPARENT LNAPL THICKNESS < 1 FT
- APPARENT LNAPL THICKNESS > 1 FT, < 5 FT
- APPARENT LNAPL THICKNESS > 5 FT

NOTES

1.) ELEVATIONS REFERENCE THE NATIONAL GEODETIC VERTICAL DATUM OF 1929 (NGVD 29), OR MEAN SEA LEVEL.

2.) SYNOPTIC GROUNDWATER AND LNAPL INTERFACES GAUGED ON SEPTEMBER 3, 2014.

3.) NO MEASURABLE LNAPL AT GAL-25; ONLY A SHEEN OBSERVED.

4.) NA - NOT APPLICABLE.

5.) GROUNDWATER ELEVATION NOT USED IN CONTOURS AS THIS WELL IS SCREENED BELOW THE WATER TABLE.

REFERENCES

1.) AERIAL PHOTOGRAPH LICENSED FROM GOOGLE EARTH PRO. DATE OF AERIAL PHOTOGRAPH IS NOVEMBER, 2012.

2.) BASE TOPOGRAPHY AND PROPERTY BOUNDARY FROM DIGITAL FILE ACAD-2148-delivery-8-22-14.dwg, ENTITLED "BOUNDARY AND TOPOGRAPHIC PLAN, BLOCK 312 LOTS 41,69 & 79 , 37-80 REVIEW AVENUE, PREPARED FOR: GOLDER ASSOCIATES, LOCATED IN: LONG ISLAND CITY, QUEENS, N.Y. PROVIDED BY GEOD CORPORATION, DATED SEPTEMBER 12, 2014.

3.) WELL COORDINATES TAKEN FROM MICROSOFT EXCEL FILES QUANTA SAMPLES AND WELLS.XLS, 2148A 8-23-04.XLS, 2148A 4-11-05.XLS, 2340 MONITORING WELLS.XLS, 2148 83-88 WELLS 4-25-13.XLSX, AND MON WELLS 8-22-14 DELIV.XLSX PROVIDED BY GEOD CORP.

4.) LOCATIONS OF ALL OTHER WELLS WERE DIGITIZED FROM HARDCOPY OF A DRAWING BY KLEINFELDER ENTITLED "AERIAL PLAN" DATED MAY 13, 2013.

SCALE: 35 0 35 70 FEET

REV	DATE	DES	REVISION DESCRIPTION	CADD	CHK	RVW

PROJECT

37-88 REVIEW AVENUE/PHOENIX PROPERTY
RI REPORT
LONG ISLAND CITY, QUEENS, NEW YORK

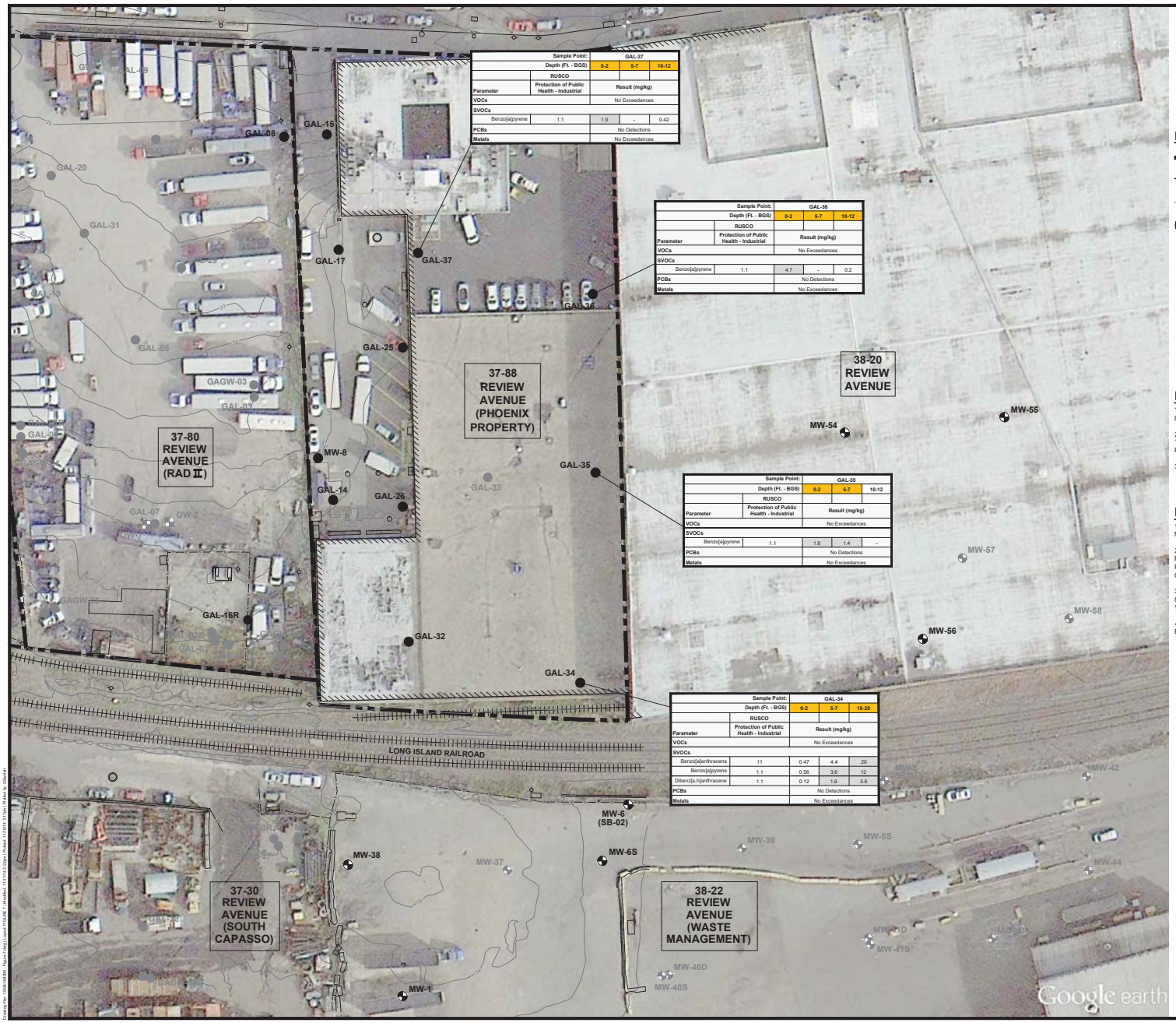
TITLE

INTERPRETED GROUNDWATER CONTOUR MAP (SEPTEMBER 2014)

Golder Associates
Mt. Laurel, New Jersey

PROJECT No.	1302414		FILE No.	1302414B006	
DESIGN	HAL	11/18/14	SCALE	AS SHOWN	REV. 0
CADD	RG	11/18/14			
CHECK	HAL	11/18/14			
REVIEW	SDM	11/18/14			

FIGURE 6



Sample Point:		GAL-37		
Depth (Ft. - BGS)		0-2	5-7	10-12
Parameter	RUSCO Protection of Public Health - Industrial	Result (mg/kg)		
VOCs		No Exceedances		
SVOCs				
Benzo[a]pyrene	1.1	1.9	-	0.42
PCBs		No Detections		
Metals		No Exceedances		

Sample Point:		GAL-36		
Depth (Ft. - BGS)		0-2	5-7	10-12
Parameter	RUSCO Protection of Public Health - Industrial	Result (mg/kg)		
VOCs		No Exceedances		
SVOCs				
Benzo[a]pyrene	1.1	4.7	-	0.2
PCBs		No Detections		
Metals		No Exceedances		

Sample Point:		GAL-35		
Depth (Ft. - BGS)		0-2	5-7	10-12
Parameter	RUSCO Protection of Public Health - Industrial	Result (mg/kg)		
VOCs		No Exceedances		
SVOCs				
Benzo[a]pyrene	1.1	1.8	1.4	-
PCBs		No Detections		
Metals		No Exceedances		

Sample Point:		GAL-34		
Depth (Ft. - BGS)		0-2	5-7	18-20
Parameter	RUSCO Protection of Public Health - Industrial	Result (mg/kg)		
VOCs		No Exceedances		
SVOCs				
Benzo[a]anthracene	11	0.47	4.4	20
Benzo[a]pyrene	1.1	0.56	3.6	12
Dibenz[a,h]anthracene	1.1	0.12	1.8	3.6
PCBs		No Detections		
Metals		No Exceedances		

LEGEND

- PROPERTY BOUNDARY
- BUILDING OUTLINE
- TOPOGRAPHIC CONTOUR
- RAILROAD TRACK
- SAMPLING LOCATION
- UNKNOWN MANHOLE
- CATCH BASIN
- SURVEYED MONITORING WELL
- MONITORING WELL (LOCATIONS APPROXIMATE) (SEE REFERENCE 4)

NOTES

1.) ELEVATIONS REFERENCE THE NATIONAL GEODETIC VERTICAL DATUM OF 1929 (NGVD 29), OR MEAN SEA LEVEL.

2.) FIGURE SHOWS SOIL/FILL EXCEEDANCES BASED ON COMPARISION OF REPORTED ANALYTICAL RESULTS TO THE NYSDEC RESTRICTED USE SOIL CLEANUP OBJECTIVES FOR INDUSTRIAL SOIL FOR PROTECTION OF PUBLIC HEALTH (SHADED).

3.) ALL RESULTS IN mg/kg.

REFERENCES

1.) AERIAL PHOTOGRAPH LICENSED FROM GOOGLE EARTH PRO. DATE OF AERIAL PHOTOGRAPH IS NOVEMBER, 2012.

2.) BASE TOPOGRAPHY AND PROPERTY BOUNDARY FROM DIGITAL FILE ACAD-2148-delivery-8-22-14.dwg, ENTITLED "BOUNDARY AND TOPOGRAPHIC PLAN, BLOCK 312 LOTS 41,69 & 79 , 37-80 REVIEW AVENUE, PREPARED FOR: GOLDER ASSOCIATES, LOCATED IN: LONG ISLAND CITY, QUEENS, N.Y. PROVIDED BY GEOD CORPORATION, DATED SEPTEMBER 12, 2014.

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4.) LOCATIONS OF ALL OTHER WELLS WERE DIGITIZED FROM HARDCOPY OF A DRAWING BY KLEINFELDER ENTITLED "AERIAL PLAN" DATED MAY 13, 2013.

30 0 30 60
SCALE FEET

REV	DATE	DES	REVISION DESCRIPTION	CADD	CHK	RVW

PROJECT
37-88 REVIEW AVENUE/PHOENIX PROPERTY
RI REPORT
LONG ISLAND CITY, QUEENS, NEW YORK

TITLE
SOIL EXCEEDANCES

Golder Associates
Mt. Laurel, New Jersey

PROJECT No.		1302414	FILE No.		1302414B008
DESIGN	HAL	11/18/14	SCALE	AS SHOWN	REV. 0
CADD	RG	11/18/14			
CHECK	HAL	11/18/14			
REVIEW	SDM	11/18/14			

FIGURE 7

At Golder Associates we strive to be the most respected global group of companies specializing in ground engineering and environmental services. Employee owned since our formation in 1960, we have created a unique culture with pride in ownership, resulting in long-term organizational stability. Golder professionals take the time to build an understanding of client needs and of the specific environments in which they operate. We continue to expand our technical capabilities and have experienced steady growth with employees now operating from offices located throughout Africa, Asia, Australasia, Europe, North America and South America.

Africa	+ 27 11 254 4800
Asia	+ 852 2562 3658
Australasia	+ 61 3 8862 3500
Europe	+ 356 21 42 30 20
North America	+ 1 800 275 3281
South America	+ 55 21 3095 9500

solutions@golder.com
www.golder.com

Golder Associates Inc.
200 Century Parkway, Suite C
Mt. Laurel, NJ 08054 USA
Tel: (856) 793-2005
Fax: (856) 793-2006

Golder Associates