Remedial Investigation/ Interim Remedial Measures/ Alternatives Analysis Report

251 Homer Street Redevelopment Site
BCP Site No. C905037
Olean, New York

August 2015
Revised August 2016

0311-014-001

Prepared For:

Benson Construction and Development, LLC
&
Homer Street Properties, LLC

Prepared By:

TurnKey Environmental Restoration, LLC

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REMEDIAL INVESTIGATION/ INTERIM REMEDIAL MEASURES/ ALTERNATIVES ANALYSIS REPORT

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RI/IRM/AA REPORT

251 Homer Street Redevelopment Site

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1.0 INTRODUCTION

This Remedial Investigation/Interim Remedial Measures/Alternatives Analysis (RI/IRM/AA) Report has been prepared on behalf of Benson Construction and Development, Inc. and Homer Street Properties, LLC (collectively referred to as Benson) for the 251 Homer Street Redevelopment Site in the City of Olean, Cattaraugus County, New York (see Figures 1 and 2).

Benson elected to pursue cleanup and redevelopment of the Site under the New York State Brownfield Cleanup Program (BCP), and executed a Brownfield Cleanup Agreement (BCA) with the New York State Department of Environmental Conservation (NYSDEC) in 2010 (BCP Site No. C905037). The RI/AAR Work Plan (Ref. 1) was approved by the NYSDEC, with concurrence of the New York State Department of Health (NYSDOH), on June 6, 2011. TurnKey Environmental Restoration, LLC in association with Benchmark Environmental Engineering & Science, PLLC (TurnKey-Benchmark) performed RI activities at the Site in May and June 2011. A Supplemental RI Work Plan (Ref. 2) was submitted to NYSDEC on April 19, 2012; approved on May 1, 2012, and field activities were completed at the Site in May 2012. An interim remedial measure (IRM) was performed in accordance with the NYSDEC-approved IRM Work Plan (Ref. 3) between October 2012 and February 2013, as summarized in Section 5.0 and detailed in the February 26, 2013 IRM Closeout Report (Ref. 4). An additional IRM was performed in accordance with the NYSDEC-approved Additional IRM Work Plan (Ref. 5) between September 2014 and August 2015, as summarized in Section 5.0. The 2014-2015 IRM will be further documented in the Final Engineering Report.

1.1 Purpose and Scope

This RI/IRM/AA Report has been prepared on behalf of Benson to: describe and present the findings of the 2011 RI and 2012 Supplemental RI activities; summarize the 2012-2015 IRMs performed; and evaluate remedial alternatives for the Site. This report contains the following sections:

- Section 2.0 presents the approach for the Remedial Investigations.
- Section 3.0 describes the physical characteristics of the Site as they pertain to the investigation findings.
- Section 4.0 presents the investigation results by media.

- Section 5.0 summarizes the IRMs performed.
- Section 6.0 describes the fate and transport of the constituents of concern (COCs).
- Section 7.0 presents the qualitative risk assessment.
- Section 8.0 evaluates remedial alternatives for the Site.
- Section 9.0 presents describes the post-remedial requirements for the Site.
- Section 10.0 provides a list of references for this report.

1.2 Background

1.2.1 Property and Site Description

The BCP property, located at 251 Homer Street, is situated in an industrially zoned area of the City of Olean, Cattaraugus County, New York (SBL No. 94.032-1-2.10). The Site currently consists of approximately 16.68 acres of vacant land that was originally developed in 1890 for the oil industry and used for refinery purposes and as a petroleum storage tank farm. Historically, nearby adjoining properties were also developed and used in association with oil refining operations and petroleum storage.

The Site is bound by residential properties across Homer Street to the northwest; the Southern Tier Expressway I-86 to the southeast; and industrial/commercial properties to the northeast and southwest (see Figures 1 and 2). Two Mile Creek flows (off-site) along the northwest boundary of the Site and traverses the Site to the west.

1.2.2 Previous Investigations

Appendix A includes the assessments and investigations at the Site that are summarized below.

1.2.2.1 Historic and Current Site Conditions Report

AMEC Earth & Environmental, Inc. (AMEC) prepared a Historic and Current Site Conditions Report in April 2006 for ExxonMobil Refining & Supply – Global Remediation (ExxonMobil) for the refinery site located in Olean, New York (Ref. 6). Pertinent findings of this report regarding site operations at the subject property are:

- The Vacuum Oil Company (Vacuum Oil) and the Socony-Vacuum Oil Company, Inc., which were predecessors of the Mobil Oil Corporation, previously owned the refinery site.
- The refinery was divided into three sections known as the #1 Works, #2 Works, and #3 Works. The subject property is located within the #3 Works.
- Most of the initial refining took place at the #3 Works after the addition of a two stage Crude Pipe Still.
- The #3 Works is situated along the southern and eastern banks of Two Mile Creek, which flows in a south and southwest direction and discharges to the Allegheny River. The creek is classified as a Class C stream.
- The supply of crude oil for the refinery came from the Tuna Valley through a single pipeline.
- By the early 1920s, each Works area had their own separate shop buildings such as boiler shops, carpenter shops, machine shops, pipe shops, and a lead shop.
- The Claflin Manufacturing Company Tannery (1888) adjoined the western border of the former #3 Works.
- The Erie Railroad opened their line in Olean in 1851. The Erie track traversed the former Socony Vacuum refinery creating northern (#3 Works) and southern (#1 and #2 Works) sections.
- The Olean Chemical Works (1893) was located adjacent to the eastern border of the former Socony-Vacuum #3 Works refinery area. The chemicals manufactured by the Olean Chemical Works plant included: sulfuric, nitric, muriatic, and mixed acids; aqua ammonia; and extra-distilled glycerin.

1.2.2.2 Phase I Site Assessment

A Phase I Environmental Site Assessment (ESA) for 251 Homer Street, Olean, New York was completed by Neeson-Clark Associates, Inc., Technical & Environmental Services for Benson Construction & Development, LLC, dated October 4, 2007 (Ref. 7). Pertinent findings of this report are:

- The Site is approximately 16.68 acres in size.
- The Site was originally developed in 1890 for the oil industry and used as a petroleum storage tank farm. In 1962, Felmont Oil demolished numerous structures on-site and off-site, including aboveground storage tanks (ASTs).
- The Site is currently vacant land with minor amounts of residential fill material. A large diameter rusted steel pipe was on-site but was recycled during the IRMs.

- Surface staining and discoloration were observed and appeared to be petroleum based.
- NYSDEC spill #8701580 was opened 5/27/87 and closed 12/16/87. The database report indicates that oil was found during excavation for a proposed NYSDOT building. Limited information was provided in the database; however, it indicated that no further work was possible by the spill unit and the surface was clean.

1.2.2.3 Supplemental Environmental Services

GZA GeoEnvironmental of New York (GZA) completed additional Supplemental Environmental Services for Benson Construction & Development, LLC dated November 21, 2007 for 251 Homer Street [portion of the ExxonMobil Legacy Site (EMLS)] Olean, New York (Ref. 8). Pertinent findings of this report are:

- The Site was formerly part of the EMLS, identified as Socony Vacuum and Felmont Oil. The Site was included within the Works #3 area of the EMLS in which much of the refining took place. Additionally, the Site was used for oil storage in large ASTs.
- Historic documentation from the North Olean area indicates that significant leakage occurred from the ASTs in 1922, enough that nearby residences were able to retrieve barrels of oil from depths of 18 feet below ground surface (fbgs).
- The Site is identified within the City of Olean Brownfield Opportunity Area (BOA) and within the EMLS Works #3 area. According to the BOA, these areas likely contain some level of petroleum contamination in the subsurface.
- Several buildings, storage tanks, berm areas, and areas of possible fill were apparent on 1938 and 1955 aerial photographs.
- Areas of black "petroleum-like material" were observed at several locations on the Site. Additionally, these areas can be seen in the 2006, 2002, and 1995 aerial photographs. The source of the black petroleum material is not known, and may be from the subsurface. Its presence on the Site may be related to historic petroleum impact from previous operations at the Site.
- Several areas of surface debris, including concrete, brick, and rebar were present in the southwestern portion of the Site. These areas appeared to correlate with the location of possible filling observed in the 1938 and 1955 aerial photographs.

1.2.2.4 Preliminary Investigation and Sampling

GZA also completed a Preliminary Investigation and Sampling Report for 251 Homer Street, Olean, New York for Benson Construction & Development, LLC dated

November 17, 2009 (Ref. 9). As part of the preliminary investigation, GZA observed, documented, and photographed soil conditions to approximately 6 to 7 fbgs at three test pit locations. Two soil samples were collected and analyzed for volatile organic compounds (VOCs), semi-volatile compounds (SVOCs), polychlorinated biphenyls (PCBs), target analyte list (TAL) metals, and total petroleum hydrocarbons (TPH). Based on GZA's findings, one soil sample was analyzed by toxicity characteristic leaching procedure (TCLP) for lead. Pertinent findings of this report as summarized by GZA include:

- Site subsurface soil from ground surface to 3 fbgs was identified as fill material that generally contained a heterogeneous cohesive and coarse-grained soil matrix intermixed with a pungent black petroliferous "tar-like" material. Within the soil and petroleum mixture, GZA also observed the presence of fill material bricks, brick fragments, organics (wood), cinders, shale fragments, and metal piping. Fill soil encountered from 3 to 6 fbgs was predominantly a fine to coarse-grained sand and bricks intermixed with the "tar-like" material. GZA observed a strong petroleum odor during completion of the test pits.
- Thirteen VOCs were detected in concentrations above method detection limits (MDLs) in each of the two soil samples collected. Six VOCs were identified in each sample exceeding their respective Part 375 Unrestricted Use soil cleanup objectives (USCOs).
- Sixteen metals were detected in concentrations above MDLs in each of the two soil samples collected. Lead was identified at concentrations of 7,800 ppm at TP-1 (2-4 fbgs) and 7,300 pm at TP-3 (4-6 fbgs), exceeding its respective Part 375 Commercial and Industrial Use SCOs. TCLP testing identified lead at a concentration of 0.95 mg/L, which is below the USEPA Maximum Toxicity Concentration of 5 mg/L.
- PCBs were not detected above MDLs in the two samples selected. However, due to petroleum product present within the sample, the MDLs were elevated to values that exceeded the Part 375 Unrestricted and Restricted Use SCOs.
- Due to the high levels of petroleum product in each sample collected, SVOC analysis was performed following several dilutions to comply with instrument calibration procedures as required by the test method. As a result, the specific concentrations of SVOCs could not be detected above the elevated MDLs.
- Due to the inability to detect SVOCs because of petroleum interference, each sample was analyzed for TPHs. As with the SVOC analysis, samples TP-1 (2-4 fbgs) and TP-3 (4-6fbgs) were analyzed following a dilution process due to the high level of petroleum product present in both samples. TPHs were detected in

samples TP-1 (2-4 fbgs) and TP-3 (4-6 fbgs) at concentrations of 50,000 ppm and 46,000 ppm.

- The characteristics of the chromatograms for samples TP-1 (2-4 fbgs) and TP-3 (4-6 fbgs) in combination with the physical characteristics of the samples indicate a petroleum product in the boiling range of Fuel Oil #6.
- Upon the completion of test pit excavations, based on visual observations and OVM readings, GZA contacted NYSDEC and spill #0907933 was assigned to the Site.

2.0 INVESTIGATION APPROACH

The purpose of the RI field activities was to define the nature and extent of contamination on the BCP Site, and to collect data of sufficient quantity and quality to perform the remedial alternatives evaluation. The 2011 RI was completed across the BCP Site to supplement previous environmental data and to delineate areas requiring remediation. On-site field activities included soil boring advancement; test pit excavation; surface soil/fill sampling; sediment and surface water sampling; subsurface piping sampling; monitoring well installation; and groundwater quality sample collection.

The 2012 Supplemental RI was performed to investigate data gaps identified in the initial RI. On-site field activities included test pit excavations to delineate the viscous light non-aqueous phase liquid (LNAPL) area; additional surface and subsurface soil/fill and sediment sampling; and impacted soil and LNAPL sampling for waste characterization. In addition, certain test pits, soil borings, and monitoring wells were advanced along property boundaries to: evaluate whether environmental impacts are potentially present off-site; and complete a qualitative off-site exposure assessment as part of the RI Report. Subsurface soil and groundwater samples collected from these test locations were analyzed for TCL VOCs (plus tentatively identified compounds (TICs)), TCL SVOCs (plus TICs), Diesel Range Organics (DROs), and Gasoline Range Organics (GROs), and TAL Metals. Any sample location containing visible evidence of LNAPL was not submitted for analytical testing.

Field team personnel collected environmental samples in accordance with the rationale and protocols described in the Field Sampling Plan (FSP) presented in the Quality Assurance Project Plan (QAPP). USEPA and NYSDEC-approved sample collection and handling techniques were used. Samples for chemical analysis were analyzed in accordance with USEPA SW-846 methodology with an equivalent Category B (Level IV) deliverable package to meet the definitive-level data requirements. Analytical results were evaluated by a third-party data validation expert in accordance with provisions described in the QAPP.

The RI and Supplement RI sampling activities described below are summarized on Table 1. Figure 3 presents the historic, RI, and Supplemental RI sample locations. Appendix B contains photographs of field activities.

2.1 Soil/Fill Investigation

Soil/fill investigations were completed across the Site to supplement previous environmental data and further delineate contamination on-site. Field activities included soil boring advancement, test pit excavation, and surface and subsurface soil/fill sampling. Appendix C includes the field borehole and test pit excavation logs.

2.1.1 Grossly Contaminated Surface Soil/Fill

Certain areas of the Site have historically been observed to contain petroleum-like product and visual/olfactory evidence of contamination in surface soils. These surface soils can be characterized as "grossly contaminated media." As defined by 6NYCRR Part 375-1.2(u), "Grossly Contaminated Media" means soil, sediment, surface water, or groundwater which contains sources or substantial quantities of mobile contamination in the form of NAPL, as defined in subdivision 375-1.2 (ac), that is identifiable either visually, through strong odor, by elevated contaminant vapor levels, or is otherwise readily detectable without laboratory analysis.

During the 2011 RI, viscous LNAPL was noted at or near the surface in the central portion of the Site (including an isolated area around test pit TP-31) and near the southern boundary of the Site proximate well MW-8. This "Grossly Contamination Soil (GCS)" was delineated by visual (viscous LNAPL), and olfactory (petroleum-like odors) observations, not through analytical testing.

During the 2012 Supplemental RI, 12 test pits (TP-51 through TP-62) and 13 soil borings (SB-1 through SB-13) were advanced across the Site to better define the horizontal and vertical limits of the GCS areas identified during the 2011 RI.

2.1.2 Surface Soil/Fill Investigation

The 2011 RI included collection of 17 surface soil/fill samples, including: five samples in the area of former buildings; seven samples in the area of surficial petroleum contamination; three samples in the area of former oil storage tanks; and two samples from the drainage ditch that traverses the northeastern portion of the Site. The 2012 Supplemental RI included collection of four near-surface (0-12 inches below ground surface) soil/fill samples to close data gaps identified in the northeastern portion of the Site.

A dedicated stainless steel hand trowel or stainless steel spoon was used to collect a representative aliquot of soil/fill at each grab sample location. If the area was vegetated, the sod/vegetation was removed prior to sample collection. Representative samples were described in the field by qualified TurnKey-Benchmark personnel, scanned for total volatile organic vapors with a calibrated Photovac 2020 PID equipped with a 10.6 eV lamp (or equivalent), and characterized for impacts via visual and/or olfactory observations. Samples were transferred to laboratory supplied, pre-cleaned sample containers for analysis. The 2011 samples were analyzed for TCL SVOCs and TAL metals (all samples), and PCBs, pesticides, and herbicides (select samples) using USEPA SW-846 methodology. The 2012 near-surface soil/fill samples were analyzed for TCL SVOCs (plus TICs), TAL metals, PCBs, DROs, and GROs using USEPA SW-846 methodology. No samples were analyzed for TCL VOCs since PID readings were below 5 ppm.

All samples were collected and analyzed in accordance with USEPA SW-846 methodology with equivalent NYSDEC Category B (Level IV) deliverable packages to allow for third-party data usability assessment.

2.1.3 Subsurface Soil/Fill Investigation

2.1.3.1 Test Pit Excavation

The 2011 RI included excavation of 50 test pits in areas of potential concern or where surficial petroleum-like material was identified during the previous investigation work. As stated in Section 2.1.1, an additional 12 test pits were excavated during the 2012 Supplemental RI; nine in the central portion of the Site to delineate the observed GCS and three in the northern portion of the Site. A track excavator with an approximate 16 to 18 foot reach was used to complete the test pits. Test pits were excavated to a maximum depth of 16 fbgs. A TurnKey-Benchmark field geologist observed the excavations and created a field log (including photograph) for each test pit location. Real time air and particulate monitoring was conducted while the excavations were open using a PID and particulate monitor. Excavated soil was placed on plastic sheeting near the test pit location. Soil samples were collected at two-foot intervals to the bottom of the test pit for observation, classification, and field (PID) screening. Select samples were collected for analytical testing based on visual and olfactory observations, PID screening, and engineering judgment. Excavated soil/fill was returned to the test pit in the general order that it was excavated.

Additional test pits were excavated in January and March 2015 during the Additional IRM and are therefore discussed in Section 5.0. To summarize, three test pits (TP-B, TP-D, & TP-E) were excavated adjacent to Two Mile Creek to evaluate the potential for Site soil/fill to impact the creek; and one test pit (TP-RR01) was excavated next to the railroad tracks and switch gear/signal boxes at the request of NYSDEC.

2.1.4 Soil Boring Advancement

Eight soil borings were completed across the Site for conversion to permanent monitoring wells during the 2011 RI. An additional six soil boring were completed for conversion to permanent monitoring wells during the 2012 Supplemental RI. The test boring (monitoring well) locations were advanced through the overburden soil/fill into the underlying native soils using a Deidrich D-50 track-mounted rotary drill rig with 4¼ inch inside diameter (I.D.) hollow stem augers (HSAs). The depth to native soils ranged from 18 to 24 fbgs. Soil/fill samples were obtained by driving a $1^3/_8$ inch I.D. by 24-inch long split spoon sampler 24 inches ahead of the lead cutting shoe of the HSA, in general accordance with ASTM D1586. Soil samples were collected at approximate two-foot intervals to the bottom of the boring for classification and screening with the PID equipment. Select samples were collected for analytical testing based on visual and olfactory observations, field (PID) screening, and engineering judgment. Drilling fluids were not used while advancing the HSA so overburden groundwater could be identified. Spoils generated from the test borings were placed on the ground at the Site near the monitoring well location.

As discussed in Section 2.1.1, 13 soil borings were advanced during the 2012 Supplemental RI to delineate the GCS observed during the 2011 RI.

2.1.4.1 Subsurface Soil/Fill Sampling and Analysis

Subsurface soil/fill samples were collected using dedicated stainless steel sampling tools. Representative samples were placed in pre-cleaned laboratory provided sample bottles, cooled to 4ºC in the field, and transported under chain-of-custody command to Test America Laboratory, located in Amherst, New York, a New York State Department of Health (NYSDOH) ELAP-certified analytical laboratory. All test pit and boring soil/fill samples were analyzed for TCL VOCs, TCL SVOCs (plus TICs), TAL metals, PCBs, DROs, and GROs using USEPA SW-846 methodology. Select samples were analyzed for PCBs, pesticides, and herbicides. All samples were collected and analyzed in accordance with

USEPA SW-846 methodology with equivalent NYSDEC Category B deliverables to allow for independent third-party data usability assessment.

2.1.5 Exploratory Trenching

The 2011 RI included excavation of six exploratory trenches in search of subsurface infrastructure (i.e., piping, tanks, and/or foundations) at the Site. Trench locations were selected based on actual conditions (i.e., subsurface obstructions such as old foundations) encountered during test pit excavation, soil boring advancement, and/or trenching. The trenching procedure included the following:

- Excavated trench approximately 3-feet wide down to approximately 6-feet deep.
- As the trenching progressed, the trench was continued laterally away from the principal trace of the trench to facilitate exploration of encountered subsurface piping and/or infrastructure.
- Encountered pipes were traced using a metal detector and/or visual observations, exposed, tapped, and drained to the extent practicable.
- Liquids contained within the encountered piping were visually characterized, removed, and containerized. Upon completion of the trenching, recovered liquid was characterized and properly disposed off-site.
- Trenching was completed in sections and backfilled accordingly.
- Subsurface conditions were documented and photographed.

Underground piping was encountered in several test pits and trenches during the 2011 RI. Therefore, the 2012 Supplemental RI included excavation of an additional eight trenches. Three samples were collected for waste characterization purposes: one sample of the GCS, one sample representative of impacted soil/fill, and one sample of the solid material within the piping. The samples were analyzed for TCL VOCs, TCL SVOCs, Resource Conservation and Recovery Act (RCRA) metals, PCBs, TCLP VOCs, TCLP SVOCs, TCLP RCRA metals, ignitability (flashpoint), corrosivity (pH), and reactivity (cyanide and sulfide).

2.2 Sediment Investigation

The 2011 RI included collection of two sediment samples from Two Mile Creek located near the eastern and southern property limits. Sediment samples were collected from upstream and downstream locations. Dedicated stainless steel sampling tools were used to collect representative sediment samples from 0-6 inches below the face of the stream. Grab samples were placed into laboratory supplied, pre-cleaned sample containers for analysis of TCL VOCs, TCL SVOCs, TAL metals, Total Petroleum Hydrocarbons (TPH), and PCBs using USEPA SW-846 methodology, with an equivalent NYSDEC Category B (Level IV) deliverable package to allow for third-party data validation.

At the request of the NYSDEC, the 2012 Supplemental RI included collection of a sediment sample from the mid-point of Two Mile Creek. A dedicated stainless steel sampling tool was used to collect a representative sediment sample from 0-6 inches below the face of the stream for TCL VOCs (plus TICs), TCL SVOCs (plus TICs), TAL metals, DROs, GROs, and TOC analysis via USEPA SW-846 methodology, with an equivalent NYSDEC Category B (Level IV) deliverable package to allow for third-party usability assessment.

2.3 Surface Water Investigation

The 2011 RI included collection of four surface water samples: two samples from the drainage ditch and two samples from Two Mile Creek. Surface water samples were collected from an upstream and downstream location along Two Mile Creek and at the beginning and end of the drainage ditch. Surface water samples were collected by slowly submerging the sample bottle with minimal surface disturbance. Grab samples were placed into laboratory supplied, pre-cleaned sample containers for analysis of TCL VOCs, TCL SVOCs, TAL metals, TPH, and PCBs using USEPA SW-846 methodology.

No additional surface water samples were collected during the 2012 Supplemental RI.

2.4 Groundwater Investigation

The 2011 RI included installation of eight new groundwater monitoring wells screened within the sand and gravel unit to investigate groundwater flow and quality. The eight test borings described in Section 2.1.3.2 were converted to monitoring wells MW1 though MW-8. The 2012 Supplement RI included installation of an additional six groundwater monitoring wells (MW-9 through MW-14) also screened within the sand and gravel unit. These wells were installed to further delineate the shallow groundwater impacts identified proximate to existing wells MW-3 and MW-5 and collect additional groundwater quality data from the hydraulically up-gradient (i.e., northwest) property boundary.

2.4.1 Monitoring Well Installation

The groundwater monitoring wells were constructed of 2-inch I.D. flush coupled PVC riser and screen. The screened interval consists of an approximate 10-foot long section of machine slotted pipe, with the exception of MW-7 (5-ft length) and MW-8 (6.5-ft length). A sand filter was placed in the boring around the annulus space of the well screen such that the sand extends a minimum of one foot above the top of the screen. A bentonite-chip layer was placed above the sand filter to provide a seal from the overlying overburden conditions. A mixture of cement/bentonite grout was placed above the bentonite-chip layer to ground surface. Due to the relative shallow nature of wells MW-7 through MW-14, the bentonite chip seal was extended to approximately 1 fbgs, precluding the installation of cement/ bentonite grout. The newly installed monitoring wells were completed as stick-up wells with keyed alike locks and a lockable J-plug anchored within a 2-foot by 2-foot by 1-foot square concrete pad. Table 2 summarizes the monitoring well construction details. Appendix D includes the monitoring well completion logs.

2.4.2 Groundwater Sample Collection

The monitoring wells were developed to remove residual sediments and ensure good hydraulic connection with the water-bearing zone. Upon installation, but not within 24 hours, newly installed monitoring wells were developed in accordance with TurnKey-Benchmark and NYSDEC protocols. Development of the monitoring wells was accomplished with dedicated disposable polyethylene bailers via surge and purge methodology. Field parameters including pH, oxidation-reduction potential (ORP), dissolved oxygen (DO), temperature, turbidity, and specific conductance were measured periodically (i.e., every well volume or as necessary) during development. Field measurements continued until they became relatively stable. Stability was defined as variation between measurements of approximately 10 percent or less with no overall upward or downward trend in the measurements. A minimum of three well volumes were evacuated from each monitoring well. Monitoring wells MW-1 through MW-8 were developed June 2-3, 2011. Monitoring wells MW-9 through MW-14 were developed May 15, 2012.

Prior to sample collection, static water levels were measured to interpret groundwater flow direction within the overburden soil/fill. Following water level measurement, TurnKey-Benchmark personnel purged and sampled the wells using a pump and dedicated tubing following low-flow/minimal drawdown purge and sample collection procedures. Prior to sample collection, groundwater was evacuated from each well at a low-flow rate (typically less than 0.1 L/min). Field measurements for pH, ORP, specific conductance, temperature, turbidity, DO, and water level were periodically monitored for stabilization. Visual and olfactory field observations were also recorded. Purging was considered complete when pH, specific conductivity, and temperature stabilized, and when turbidity measurements fell below 50 Nephelometric Turbidity Units (NTU) or became stable above 50 NTU. Upon stabilization of field parameters, groundwater samples were collected.

Groundwater samples were collected from wells MW-1 through MW-8 on June 6-7, 2011. During the Supplemental RI, groundwater samples were collected from newly installed wells MW-9 through MW-14 and existing wells MW-1 through MW-8 on May 21-22, 2012. Immediately following collection of groundwater samples, field parameters and visual and olfactory field observations were again recorded.

All collected groundwater samples were placed in pre-cleaned, pre-preserved laboratory provided sample bottles, cooled to 4°C in the field, and transported under chain-of-custody command to TestAmerica for laboratory analysis.

2.4.3 Groundwater Sample Analyses

Groundwater samples collected from all monitoring wells were analyzed for TCL VOCs (plus TICs), TCL SVOCs (plus TICs), TAL Metals (total and dissolved), DROs, and GROs. All samples were collected and analyzed in accordance with USEPA SW-846 methodology with equivalent NYSDEC Category B deliverables to allow for independent third-party data usability assessment.

2.4.4 Groundwater Gauging

At the request of the NYSDEC, periodic groundwater gauging is being performed through approval of a Remedial Action Work Plan. During groundwater gauging events, static water levels are measured and recorded from on-site monitoring wells using an interface probe capable of detecting petroleum. Observations for presence/absence of LNAPL are also recorded at each location.

2.5 Field Specific Quality Assurance/Quality Control Sampling

In addition to the soil/fill and groundwater samples described above, field-specific quality assurance/quality control (QA/QC) samples were collected (see Table 1) and analyzed to ensure the reliability of the generated data and to support the required third-party data usability assessment effort. Site-specific QA/QC samples include matrix spikes, matrix spike duplicates, blind duplicates, and trip blanks in accordance with the NYSDEC-approved RI Work Plan. A Category B (Level IV) deliverable package was provided for all samples collected to allow third-party data validation and provide defensible data.

2.6 Site Mapping

A Site map was developed during the RI and Supplemental RI. TurnKey-Benchmark personnel employed a Trimble GeoXH handheld GPS unit to identify the locations of all soil borings, test pits, test trenches, sample points, and newly installed monitoring wells relative to State planar grid coordinates. Monitoring well elevations were measured by TurnKey-Benchmark's surveyor. Figures 4A and 4B are isopotential maps showing the general direction of groundwater flow based on historic (2013) and current (2016) water level measurements relative to USGS vertical datum.

3.0 SITE PHYSICAL CHARACTERISTICS

The physical characteristics of the Site observed during the RI are described in the following sections.

3.1 Site Topography and Drainage

The Site in situated within the Allegheny Plateau province of western New York within the Allegheny Watershed (USGS 05010001). The Site elevation is approximately 1,430 feet above mean sea level and dips very gently to the south and southwest toward the Allegheny River. Two Mile Creek, located along the western boundary of the Site, flows in a southwest direction eventually bisecting the southwestern portion of the Site (between wells MW-7 and MW-8) before continuing beneath NYS Route 86 (see Figure 3). Prior to the IRMs, a southeast to northwest ditch traversed the northern portion of the Site and intermittently discharged surface water to Two Mile Creek. The ditch occasionally stored water; however, it did not contain significant, if any, benthic aquatic life. During the 2014/2015 Additional IRM, this on-site drainage ditch was converted to a closed 30-inch subsurface drainage pipe. The Site is flat but immediately off-site to the southeast, the land slopes steeply upward to elevated NYS Route 86.

3.2 Site Geology and Hydrogeology

In the northern portion of the Site, the typical subsurface profile from ground surface consists of:

- Sandy lean clay with fill ranging in thickness from 3.5 to 10.5 feet.
- Sandy silt with fill ranging in thickness from 1 to 3 feet.
- Lean clay with sand (native) ranging in thickness from 1 to 5 feet.
- Poorly graded sand with silt and gravel (test pits excavated to a maximum 16 fbgs).

In some areas (i.e., test pits TP-1, TP-2, and TP-8 through TP-10), the sandy lean clay (4 to 15 feet thick) is underlain directly by the poorly graded sand with silt and gravel. The water table in the northern portion of the Site was observed between 4 and 15.5 fbgs, typically at the interface between the lean clay and the sand with silt/gravel layer.

In the southern portion of the Site, the typical subsurface profile from ground surface consists of:

- Sandy lean clay with fill ranging in thickness from 1 to 5 feet. In some areas (i.e., test pits TP-34, TP-36, and TP-47), fill was not present in the upper sandy lean clay layer.
- Sandy silt with fill ranging in thickness from 1 to 6 feet. In some areas (i.e., test pits TP-37, TP-38, and TP-43), the sandy silt with fill is the upper layer.
- Lean clay with sand (native) upwards of 5 feet thick (end of test pits within this layer).
- Poorly graded sand with silt and gravel (the only test pits excavated to this layer were TP-36, TP-39, TP-45, and TP-47).

A perched water table was observed in the majority of the southern portion of the Site, with water observed between 3 and 5 fbgs in the sandy silt with fill layer. The water table was observed between 6 and 11.5 fbgs in the other test pits from the southern portion of the Site.

Based on the May 2016 groundwater sampling event, the shallow groundwater table at the Site ranges for the:

- Northern portion of the Site between 12.75 and 14.19 fbgs
- Central portion of the Site between 12.17 and 14.84 fbgs.
- Southern portion of the Site between 8.55 and 12.67 fbgs.

Figures 4A and 4B depict shallow groundwater isopotential maps for February 2013 and May 2016. Groundwater at the Site generally flows to the east and southeast. Tables 3A and 3B summarize the groundwater elevation data for February 2013 and May 2016.

4.0 INVESTIGATION RESULTS BY MEDIA

The following sections discuss the analytical results of the 2011 RI and the 2012 Supplemental RI. Tables 4 through 9 summarize the results with comparison to cleanup objectives. Appendix E includes the laboratory analytical data packages. Figure 3 shows the locations of samples collected.

4.1 Surface Soil/Fill

Table 4 presents a comparison of the 22 surface soil sample results to the 6NYCRR Part 375 Commercial Use Soil Cleanup Objectives (CSCOs). Figure 5 illustrates the samples that exceed their respective Part 375 CSCOs as well as the approximate extent of surficial staining.

4.1.1 Volatile Organic Compounds

Surface soil/fill was not analyzed for VOCs.

4.1.2 Semi-Volatile Organic Compounds

Benzo(a)pyrene (3 locations) and dibenz(a,h)anthracene (1 location) were the only SVOCs detected at concentrations slightly above CSCOs.

4.1.3 Inorganic Compounds

Arsenic was the only metal detected at concentrations above its Part 375 CSCO of 16 mg/kg (14 of 19 samples). The concentrations (16.1-42.1 mg/kg) were of the same order of magnitude as the CSCO.

4.1.4 Pesticides, Herbicides, and Polychlorinated Biphenyls

Pesticides, herbicides, and PCBs were reported as non-detectable by the analytical laboratory.

4.1.5 Surface Soil/Fill Summary

As described above, the surface soil/fill has minor SVOC impacts in four sample locations and widespread minor arsenic impact; however, arsenic is ubiquitous to industrial soil/fill.

4.2 Subsurface Soil/Fill

Table 5 presents a comparison of the 42 subsurface soil sample results to the Part 375 CSCOs. Figure 6 illustrates the samples that exceed their respective CSCOs.

4.2.1 Field Observations

As indicated on Table 6, elevated PID readings were observed within test pits and borings across the Site. GCS was visually delineated as discussed in Section 4.3. LNAPL was observed within the subsurface soil/fill matrix throughout the Site, typically on the surface of the test pit water. Appendix C includes the soil boring and test pit logs.

4.2.2 Volatile Organic Compounds

No individual VOCs were detected above the Part 375 CSCOs in subsurface soil/fill sample. GRO concentrations ranged from non-detect in several borings and test pits to 940 mg/kg at test pit TP-13 (6-8 fbgs).

4.2.3 Semi-Volatile Organic Compounds

The following polycyclic aromatic hydrocarbons (PAHs) were present above Part 375 CSCOs in subsurface soil/fill at 14 of the 42 sampling locations across the Site: benzo(a)anthracene (3 locations); benzo(a)pyrene (10 locations); benzo(b)fluoranthene (5 locations); dibenz(a,h)anthracene (7 locations); and indeno(1,2,3-cd)pyrene (3 locations).

DRO concentrations ranged from non-detect at boring MW-2 (4-6 fbgs) to 250,000 mg/kg at test pit TP-32 (3-7 fbgs).

4.2.4 Inorganic Compounds

Only arsenic (19 locations), copper (1 location), lead (8 RI locations and 2 locations during GZA's November 2009 investigation), and mercury (2 locations) were present above their respective Part 375 CSCOs in subsurface soil/fill. Elevated concentrations of metals in subsurface soil/fill, particularly lead, appear to coincide with the presence of GCS.

4.2.5 Pesticides, Herbicides and Polychlorinated Biphenyls

Pesticides were reported as non-detectable or at trace (estimated) concentrations well below the sample quantitation limit. Herbicides and PCBs were reported as non-detectable by the analytical laboratory.

4.2.6 TCLP Sampling

The soil sample analyzed for TCLP lead by GZA in November 2009 identified lead at a concentration of 0.95 mg/L, which is below the USEPA Maximum Toxicity Concentration of 5 mg/L.

During the 2012 Supplemental RI, three samples were collected for waste characterization purposes: one sample of the GCS, one sample representative of impacted soil/fill, and one sample of the solid material within the piping. The samples were analyzed for TCL VOCs, TCL SVOCs, Resource Conservation and Recovery Act (RCRA) metals, PCBs, TCLP VOCs, TCLP SVOCs, TCLP RCRA metals, ignitability (flashpoint), corrosivity (pH), and reactivity (cyanide and sulfide). None of the samples exhibited the characteristics of hazardous waste.

4.2.7 Subsurface Soil/Fill Summary

As described above, no VOCs, herbicides, or PCBs were detected above Part 375 CSCOs. Several PAHs were detected above Part 375 CSCOs; however, total PAH concentrations were reported at less than 500 parts per million. NYSDEC's CP-51 Soil Cleanup Policy (Ref. 10) has provided as an alternative soil cleanup objective (i.e., in lieu of individual SCOs) for soils where end use of the site will be for commercial or industrial purposes; a cover (1 foot of clean soil, building, and/or pavement) will be placed; and a Site Management Plan will be implemented. The DRO and GRO concentrations at depth suggest weathered petroleum impacts to subsurface soil/fill together with nuisance conditions (odor and elevated PID). Lead impacts to soil/fill appear to be localized within two areas between 2 and 6 fbgs, and appear to coincide with the GCS impact. The arsenic impact to subsurface soil/fill, ubiquitous to industrial soil/fill, is widespread across the Site. None of the soil samples tested exhibited the characteristics of hazardous waste.

4.3 Grossly Contaminated Soil

During the 2011 RI, GCS (as defined in Section 2.1.1) was noted at or near the surface in the central portion of the Site in five general areas proximate test pit(s): TP-20 through TP-22; TP-23; TP-24 through TP-28, TP-49, and well MW-5; TP-32; and TP-31. GCS was also noted near the southern boundary of the Site proximate well MW-8. Less viscous LNAPL and/or sheening was noted in other test pits and borings across the Site.

During the 2012 Supplemental RI, seven test pits (TP-51 through TP-57) and 13 soil borings (SB-1 through SB-13) were advanced across the central portion of the Site to better define the horizontal and vertical limits of the GCS areas identified during the 2011 RI. As shown on Figure 7, GCS was observed at surface and subsurface locations within 12 of the 13 supplemental soil borings and 4 of the 7 supplemental test pits together with elevated PID readings. GCS was also observed from 6.5-7 fbgs in TP-62, which was excavated for the off-site exposure assessment presented in Section 7.3. The thickness of the GCS varies from 1 inch to 4 feet at depths up to 10 fbgs. GCS was observed within test pits TP-53 and TP-54 at two depths. In addition, GCS was observed south of TP-60 during piping removal (labeled as GCS Area 3), as discussed in Section 5.

4.4 Underground Piping Assessment

Underground piping was encountered in several test pits and trenches during the 2011 RI. Eight additional test trenches were advanced during the 2012 Supplemental RI to further investigate and document the location(s) of underground piping. Three samples of pipe contents were collected for waste characterization purposes: one sample of the viscous LNAPL; one sample representative of impacted soil/fill; and one sample of the solid material within the piping. None of the samples are characteristically hazardous; therefore, any material excavated can be disposed off-site at a permitted solid waste landfill. Figure 8 outlines the approximate location and extent of underground piping uncovered, the majority of which exists on the northern portion of the Site.

4.5 Sediment

Table 7 summarizes the sediment sample results for the three samples collected along Two Mile Creek. During the 2012 Supplemental RI, the total organic carbon of the sediment within the Creek was evaluated in order to derive site-specific sediment criteria. The 2014 NYSDEC Screening and Assessment of Contaminated Sediments (Ref. 11) guidance was used to calculate site-specific "bulk" sediment guidance values (SGVs) for VOCs and SVOCs. For inorganic compounds, sediment concentrations were compared to the Class A and C freshwater SGVs presented on Table 5 of the 2014 NYSDEC guidance document. According to this guidance, Class A sediments are considered to be of low risk to aquatic life. Class C sediments are considered to be highly contaminated and likely to pose a risk to aquatic life.

4.5.1 Volatile Organic Compounds

Acetone, 2-butanone (MEK), and toluene were detected in the downstream (SED-DOWN) sediment samples, with only MEK detected at a concentration above the SGV. GROs ranged from 1.2 mg/kg (qualified as estimated) in the downstream sediment sample (SED-DOWN) to 3.6 mg/kg (qualified as estimated and analytes found in laboratory blank) in the midstream sediment sample SED-MID).

4.5.2 Semi-Volatile Organic Compounds

Low concentrations of several PAHs were detected in 2 of the 3 sediment samples; however, only benzo(a)pyrene and chrysene in the upstream sediment sample (SED-UP) exceeded the SGV. DROs ranged from 50 mg/kg in the upstream sediment sample (SED-UP) to 340 mg/kg (qualified as estimated) in the downstream sediment sample (SED-DOWN).

4.5.3 Inorganic Compounds

Several inorganic compounds were detected above the Class A SGV indicating that the sediment is slightly to moderately contaminated, with the majority of the exceedances in the downstream sample.

4.5.4 Polychlorinated Biphenyls

PCBs were reported as non-detectable by the analytical laboratory.

4.5.5 Sediment Summary

As described above, the sediment samples collected from Two Mile Creek have minor (insignificant) impact by VOCs and SVOCs. The downstream sediment sample had the majority of the inorganic exceedances of the Class A SGV and the only location with MEK above the SGV; this sediment was removed during the 2016 Supplemental IRM. Furthermore, the IRMs completed in 2012-2015 (further discussed in Section 5) removed the sources of potential SVOC and inorganic compounds contamination (subsurface piping and over 50,000 tons of GCS) and the Site will be covered with clean imported soil.

4.6 Surface Water

Table 8 compares the results of the four surface water samples collected along Two Mile Creek and the drainage ditch to the NYSDEC TOGS 1.1.1 Class C Surface Water Quality Standards (SWQSs).

4.6.1 Volatile Organic Compounds

All VOCs were reported as non-detectable with the exception of a trace (estimated) concentrations of acetone in SW-1 (drainage ditch) below the laboratory quantitation limit.

4.6.2 Semi-Volatile Organic Compounds

All SVOCs were reported as non-detectable.

4.6.3 Inorganic Compounds

Only total cobalt (1 location), total iron (4 locations), and nickel (2 locations) were detected at concentrations above their respective SWQSs. Iron in one sample (SW-1) is the only exceedance along the on-site drainage ditch.

4.6.4 Polychlorinated Biphenyls

PCBs were reported as non-detectable by the analytical laboratory.

4.6.5 Surface Water Summary

As described above, VOCs (with the exception of acetone below SWQSs), SVOCs, and PCBs were reported as non-detectable. Cobalt, iron, and nickel concentrations exceeded SWQSs.

4.7 Groundwater

Table 9 presents a comparison of the detected groundwater concentration in all 14 monitoring wells to the Class GA Groundwater Quality Standards/Guidance Values (GWQS/GVs) per NYSDEC Division of Water Technical and Operational Guidance Series (TOGS) 1.1.1 Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations (June 1988).

4.7.1 Field Observations

During the May 2012 sampling event, some evidence of product (LNAPL) was observed in wells MW-5, MW-6, and MW-9; sheen and petroleum odor were observed in wells MW-1, MW-3, MW-11, and MW-12; sheen was observed in well MW-10; slight petroleum odor was noted in MW-14; and slight sulfur odor was noted in MW-7. In 2013, LNAPL was only observed in well MW-5. Appendix F includes the groundwater development and sampling field logs.

4.7.2 Groundwater Flow Direction

As shown on Figures 6 through 8, the groundwater flow direction varies across the Site but generally flows in a southeast to east direction away from Two Mile Creek.

4.7.3 Volatile Organic Compounds

Only benzene was detected in one well (MW-12) at a concentration (20 ug/L) above its GWQS/GV (1 ug/L). All other analytes were reported as non-detectable, with the exception of methylene chloride that was qualified as estimated and present in the associated blank indicating a laboratory contaminant.

GRO concentrations ranged from non-detectable in MW-7 to 3,100 ug/L in MW-12.

4.7.4 Semi-Volatile Organic Compounds

Only benzo(b)fluoranthene and chrysene were detected in MW-10 at concentrations above GWQS/GVs. DRO concentrations ranged from non-detectable in MW-2 and MW-7 to 49,000 ug/L (estimated) in MW-11.

4.7.5 Inorganic Compounds

Total metals concentrations above GWQS/GVs were primarily limited to naturally occurring minerals, including iron, magnesium, manganese, and sodium. Total arsenic was detected at a concentration slightly above its GWQS/GV (25 ug/L) in MW-1 and at its GWQS/GV in MW-5; dissolved arsenic concentrations from these wells were below the GWQS. Samples were not filtered in the field; therefore, detected constituents may be associated with sediments in the unfiltered sample.

Only dissolved iron (1 location), dissolved magnesium (2 locations), dissolved manganese (8 locations), and dissolved sodium (6 locations) were detected above their respective GWQSs/GVs.

4.7.6 Groundwater Summary

As described above, VOCs and SVOCs were predominantly reported as non-detectable, trace (estimated), or detected at concentrations below GWQS/GVs. Only benzene was detected above its GWQS in monitoring well MW-12. With the exception of MW-7, GROs were present in all wells with the highest concentration detected in MW-12. Only benzo(b)fluoranthene and chrysene were detected in MW-10 at concentrations above GWQS/GVs. With the exception of MW-2 and MW-7, DROs were present in all wells with the highest concentration detected in MW-11. During the May 2012 sampling event, some evidence of product (LNAPL) was observed in wells MW-5, MW-6, and MW-9; sheen and petroleum odor were observed in wells MW-1, MW-3, MW-11, and MW-12; sheen was observed in well MW-10; slight petroleum odor was noted in MW-14; and slight sulfur odor was noted in MW-7. However in 2013, LNAPL was only observed in well MW-5.

Metals detected at concentrations above GWQS/GVs are primarily naturally occurring minerals, including iron, manganese, magnesium, and sodium. Total arsenic was detected in MW-1 at a concentration slightly above its GWQS/GV but dissolved arsenic concentrations were below the GWQS/GV.

The visual and olfactory evidence of impact observed in the groundwater monitoring wells is likely associated with the subsurface piping and GCS present across the Site prior to implementation of the IRMs. Removal of these sources will mitigate these groundwater impacts. Groundwater flows in a southeast to east direction away from Two Mile Creek.

4.8 Data Usability Summary

In accordance with the RI/AAR Work Plan, the laboratory analytical data from this investigation was assessed and, as required, submitted for independent review. Data Validation Services located in North Creek, New York performed the data usability summary assessment, which involved a review of the summary form information and sample raw data, and a limited review of associated QC raw data. Specifically, the following items were reviewed:

- Laboratory Narrative Discussion
- Custody Documentation
- Holding Times
- Surrogate and Internal Standard Recoveries
- Matrix Spike Recoveries/Duplicate Recoveries
- Field Duplicate Correlation
- Preparation/Calibration Blanks
- Control Spike/Laboratory Control Samples
- Instrumental IDLs
- Calibration/CRI/CRA Standards
- ICP Interference Check Standards
- ICP Serial Dilution Correlations
- Sample Results Verification

The Data Usability Summary Reports (DUSRs), included as Appendix G, were conducted using guidance from the USEPA Region 2 validation Standard Operating Procedures, the USEPA National Functional Guidelines for Data Review, as well as professional judgment.

The 2011 RI sample analyses were primarily conducted in compliance with the required analytical protocols. With the following exceptions, sample results are usable either as reported or with qualification/edit:

- Herbicide results in TP-46 (5-5.5) and Blind Dup#2 are rejected due to matrix effects.
- Pesticide results in MW-27 (2-4) are rejected due to matrix effects.
- The result for barium in TP-25 (4-8.5) is edited upward to a concentration above the SCO, reflecting the value from the location field duplicate.
- The mercury result in TP-46 (5-5.5) is qualified as estimated, and flagged (by highlighting) to be considered as potentially above the SCO concentration due to matrix effect.

Due to matrix interferences and/or poor compound identification, many of the reported low-level volatile and semi-volatile detections in the soil samples have been qualified as tentative in identification or edited to non-detection. All filtered fraction metals have been qualified as estimated due to delay of preservation. Additional qualifications of the data have been added to the data summary tables.

The 2012 Supplemental RI sample analyses were primarily conducted in compliance with the required analytical protocols. Sample results are usable either as reported or with minor qualification/edit. One quality issue highlighted in the DUSR concerns samples SS-DITCH 3 and SED-MID. Because these samples showed very low solids content (85% and 48%, respectively), they were decanted prior to sample preparation. However, the laboratory did not perform the solids determination on the decanted product but used the determination that included the water. Because that solids value is included in the dry weight results for the soil samples, falsely elevated detected values and reporting limits were reported for those two samples. Results for those two samples have been qualified as estimated, and may have a high bias by unknown factors; however, the degree of which are not likely to exceed an order of magnitude for SS-DITCH 3 and two-fold for SED-MID.

4.9 Constituents of Concern (COCs)

Based on the findings related to historic use of the Site, the RI, and Supplemental RI, the constituents of concern (COCs) prior to IRM activities are presented below:

- ***Soil/Fill:*** GCS and inorganic compounds (arsenic and lead)
- ***Groundwater:*** Field evidence of impact (discrete locations) and LNAPL (MW-5 only)

5.0 INTERIM REMEDIAL MEASURES

5.1 2012/2013 IRM

During the RI and Supplemental RI, abandoned subsurface piping was observed in several test pits and test trenches across the Site. Certain pipes were tapped and sampled; piping contents consisted of water with traces of oil or a heavier oil product. Waste characterization samples were collected from water, pipe scale, and oil within certain pipes.

In accordance with the NYSDEC-approved IRM Work Plan (Ref. 3), IRM field activities were conducted October 29, 2012 through February 7, 2013. The IRM activities are fully described in the February 26, 2013 IRM Closeout Report (Ref. 4) and summarized below:

- Approximately 10,644 linear feet of piping ranging in diameter from 2” to 12” was removed and recycled as scrap (approximately 97 tons) at Gateway Materials in Cheektowaga, NY.
- A total of 51, 55-gallon drums containing oil, sludge, and scale from within the pipes were disposed at CWM Chemical Services in Model City, NY.
- Approximately 21,000 gallons of water from within the pipes and perched water encountered during trench excavation was treated with a bag filter and granular activated carbon then discharged to the Olean Publically Owned Treatment Works (POTW) under a temporary discharge permit issued by the City of Olean Wastewater Treatment Plant.
- Piping that extended to a property boundary was drained to the extent practicable, cut, and capped at the property boundary.

5.2 2014/2015 Additional IRM

An Additional IRM Work Plan was submitted to the NYSDEC in July 2014 (Ref. 5) to excavate and dispose off-site the GCS present within the areas shown on Figure 9 and described below. The following excavation work was conducted between September 29, 2014 and March 12, 2015:

- **GCS Area 1**: Excavation within the central portion of the Site measured approximately 3.79 acres with depths ranging from 5 to 14 fbgs. Approximately 45,775 tons of GCS were removed and disposed at the Chaffee Landfill. During the IRM piping removal in 2012/2013, GCS was identified near MW-12. Excavation of the “MW-12 GCS Area” extended to the property boundary; a total of 270 tons of GCS were removed and disposed at the Chaffee Landfill. Therefore, a total of approximately 46,045 tons of GCS was removed from these areas.

- **GCS Area 2**: Excavation in September/October 2014 proximate to monitoring well MW-8 measured approximately 11,600 square feet with depths ranging from 6 to 11 fbgs. A total of 3,263 tons of GCS were removed and disposed at the Chaffee Landfill. A small seam (6- to 12-inches thick) of GCS remained along the eastern border of Area 2 due to the proximity of bank of Two Mile Creek. On January 20, 2015, the extent of remaining GCS was further evaluated by excavating two test pits (TP-A & TP-C) between the eastern boundary of Area 2 and Two Mile Creek; no GCS was observed in those test pits. Therefore, the small seam of GCS previously left along the eastern border of Area 2 was removed in January and February 2015.
- **GCS Area 3**: During the IRM piping removal in 2012/2013, GCS was identified along the northeastern property boundary south of test pit TP-60. Excavation, which extended partially off-site, measured approximately 1,800 square feet with depth ranging from 4 to 5 fbgs. A total of 361 tons of GCS were removed and disposed at the Chaffee Landfill.
- **Arsenic Area 4**: During the excavation of GCS around MW-8 and MW-11, two locations with elevated arsenic remained (MW-7, 2-4 fbgs, 126 mg/kg; TP-42, 1.5-4.5 fbgs, 97.7 mg/kg). Although not completed under a NYSDEC-approved Work Plan, NYSDEC conceptually agreed that, based on the site-specific arsenic data, these two areas were outliers and needed to be removed. In March 2015, approximately 2,106 tons of arsenic-impacted soil/fill was removed and disposed at the Chaffee Landfill. The area was backfilled with clean imported soil.
- Extraction, treatment, and discharge of approximately 250,000 gallons of water from encountered during IRM excavation activities under a temporary discharge permit issued by the City of Olean Wastewater Treatment Plant.

Tables 10-13 summarize the results of the post-excavation end-point sampling by remedial area. As indicated on Table 11, four samples (one floor and three sidewalls) in GCS Area 2 exceeded the Part 375 CSCO for lead (1,000 mg/kg) but were well below the Industrial SCO (3,900 mg/kg). As summarized on Table 13, two sidewall samples slightly exceeded the CSCO for arsenic in Area 4.

The excavations were backfilled with non-impacted soil/fill as well as imported clean material from Birch Run Gravel Pit. The on-site drainage ditch was converted to a closed 30-inch diameter subsurface drainage pipe as discussed with NYSDEC. Appendix E includes the laboratory data package for post-excavation end-point samples.

The Final Engineering Report will fully describe these additional IRM activities.

5.2.1 Additional Test Pit Excavations

On January 20, 2015, five test pits, including two test pits west (TP-A and TP-C) and three test pits east (TP-B, TP-D, & TP-E) of Two Mile Creek, were excavated and samples were collected for analytical testing to evaluate the potential for Site soil/fill to impact the creek. As summarized on Table 14, all results were below CSCOs; no GCS was observed in any of the test pits.

On March 27, 2015 at the request of the NYSDEC, one test pit (TP-RR01) was excavated near the railroad tracks near switch gear/signal boxes to determine if other electrical equipment (e.g., transformers) may have been historically located there. As shown on Table 14, arsenic (22.1 mg/kg) was the only constituent detected at a concentration slightly above its CSCO. In addition, only arsenic, copper, and lead were detected at concentrations above their USCOs.

In October 2015, at the request of NYSDEC and with NYSDEC personnel present, nine additional test pits (TP-F through TP-N) were excavated along the lower approximate 350-foot segment of Two Mile Creek near the culvert under Interstate Route I-86 to evaluate whether impacted soil was present along the creek banks based on field observations and/or analytical data. Four near-surface soil samples were also collected from 0-1 fbgs along the creek banks. As summarized on Table 14, the vast majority of soil results from test pits TP-A through TP-N and the near-surface samples were below CSCOs and Protection of Ecological Resources (PER) SCOs, with minor exception of two PAHs and certain metals above their respective PER and/or CSCOs. Only two test pits (TP-F and TP-I) and one near-surface sample (SS-CA1) slightly exceeded the CSCOs. The only PAHs slightly above their CSCOs were benzo(a)pyrene (1.9 mg/kg above its CSCO of 1.0 mg/kg) and dibenz(a,h)anthracene (0.62 mg/kg above its CSCO of 0.56 mg/kg). Arsenic (at concentrations of 17 mg/kg and 20 mg/kg) was the only metal to exceed its CSCO of 16 mg/kg. Significant petroleum odors and/or sheen were observed in 5 of the 9 test pits. Figure 9 shows the locations of these additional test pits and near-surface samples. Appendix E includes the laboratory analytical data packages.2016 Supplemental IRM – Two Mile Creek (Area 5)

Upon completion of the additional test pits and sampling adjacent to Two Mile Creek, TurnKey and Homer Street Properties representatives met with NYSDEC on November 5, 2015 to discuss the results and a proposed remedy to address apparent petroleum impacts in the area of Two Mile Creek.

5.2.2 On-Site Work

A Supplemental IRM Work Plan was submitted to NYSDEC on November 19, 2015 (Ref. 12) to supplement previously completed IRMs and immediately address known environmental impacts adjacent to the lower approximate 200-foot segment of Two Mile Creek. Based on comments received from NYSDEC, TurnKey revised and resubmitted the Work Plan on February 4, 2016; NYSDEC approved the Work Plan on February 23, 2016.

As part of the Work Plan, a Joint Application Form was submitted for the United States Army Corps of Engineers (USACE) Nationwide Permit 38 and NYSDEC 401 Water Quality Certification. In a letter dated December 8, 2015, NYSDEC indicated that no Department permit was identified for the proposed remedial work and affirmed that the Department grants the Section 401 Water Quality Certification to Homer Street Properties. On March 16, 2016, Homer Street Properties, LLC received the Nationwide Permit 38 from USACE.

The following remedial work was conducted on-site March 30 to April 20, 2016:

- Earthen dams supported by metal plates were constructed upstream and downstream of the work area. Both 6-inch and 8-inch trash pumps were used to convey water upstream of the dam around the excavation area for discharge downstream of the second dam.
- Approximately 3,099 tons of material was excavated from the Creek bed and banks and disposed at the Waste Management Chaffee Landfill. Excavation proceeded to native clay, with an average depth of 6.5 fbgs.
- Filter fabric was placed on the excavated face and serves as demarcation material.
- A total of 593 tons of gravel aggregate (3"-4") was placed in a 12-inch layer along the Creek bed and up each bank to the ordinary high water mark (OHWM).
- Approximately 279 tons of clean soil; 1,764 tons of clay soil; and 228 tons of topsoil were used to backfill the creek bed and banks. A minimum one-foot thick layer of the clay soil was placed along the outer extent of the creek area IRM excavation adjacent to the native soil to prevent migration of residual impacts toward the creek.

- The soil/topsoil bank area was hydro-seeded with a "low grow" seed mix.
- A biodegradable straw erosion control blanket manufactured by Tensar International Corporation (BioNet S150BN) was placed, anchored, and staked.

Between April 27 and 28, 2016, a mixture of riparian shrubs (e.g., buttonbush, hybrid poplar, willow, red oak, and white spruce) were planted through the erosion control blanket on 3-foot centers.

Table 15A presents the results for the end-point sampling for on-site locations shown on Figure 10. Two sidewall samples exceeded the arsenic CSCO. Appendix E includes the laboratory data packages for post-excavation end-point samples.

5.2.3 Off-Site Work

On March 29, 2016, TurnKey received approval from ExxonMobil to remediate and restore the off-site portion of Two Mile Creek located in the Department of Transportation (DOT) right-of-way. On behalf of Homer Street Properties, TurnKey prepared the DOT Highway Work Permit Application for Non-Utility Work (PERM 33) and submitted the application package on March 31, 2016 to the DOT Cattaraugus County Residency. The DOT permit was received on April 13, 2016 and expires October 31, 2016.

The following off-site remedial work was performed in accordance with the NYSDEC-approved Supplemental IRM Work Plan:

- Approximately 973 tons of material was excavated from the creek bed and banks and disposed at the Chaffee Landfill. Excavation proceeded to native clay, with an average depth of 6.5 fbgs.
- Filter fabric was placed on the excavated face and serves as demarcation material.
- A total of 197 tons of gravel aggregate (3"-4") was placed in a 12-inch layer along the creek bed and up each bank to the ordinary high water mark (OHWM).
- Approximately 588 tons of clay soil and 76 tons of top soil was used to backfill the creek bed and banks. A minimum one-foot thick layer of the clay soil was placed along the outer extent of the creek area IRM excavation adjacent to the native soil to prevent migration of residual impacts toward the creek.
- The soil/topsoil bank area was hydro-seeded with a "low grow" seed mix.
- A biodegradable straw erosion control blanket manufactured by Tensar International Corporation (BioNet S150BN) was placed, anchored, and staked.

Between April 27 and 28, 2016, a mixture of riparian shrubs (e.g., buttonbush, hybrid poplar, willow, red oak, and white spruce) were planted through the erosion control blanket on 3-foot centers.

Table 15B presents the results for the end-point sampling for off-site locations shown on Figure 10. Three sidewall samples exceeded the arsenic CSCO; one of these locations also exceeded the lead CSCO. Appendix E includes the laboratory data packages for post-excavation end-point samples.

5.3 Monitoring Well Installation

During excavation of impacted soil/fill, monitoring wells MW-5, MW-6, MW-8, MW-11, and MW-12 were destroyed. From May 10-13, 2016, replacement groundwater monitoring wells MW-6R, MW-8R, and MW-12R were installed in locations approved by NYSDEC. Wells MW-7 and MW-10 were repaired during this time. From May 16-17, 2016, monitoring wells MW-2, MW-3, MW-4, MW-9, and MW-13 were decommissioned with NYSDEC approval. Figure 11 shows the locations of new and existing groundwater monitoring wells. Appendix D includes the monitoring well construction logs.

6.0 FATE AND TRANSPORT OF COCS

The soil/fill, sediment, surface water, and groundwater sample analytical results were incorporated with the physical characterization of the Site to evaluate the fate and transport of the COCs in Site media. The mechanisms by which the COCs can migrate to other areas or media are briefly outlined below. In all instances, the potential pathways are evaluated in the context of post-IRM conditions.

6.1 Fugitive Dust Generation

Chemicals present in soil/fill can be released to ambient air through fugitive dust generation. Piping and the GCS were excavated/removed and disposed off-site as part of the IRM activities; however, some metals-impacted soil/fill remains. The Site is presently unoccupied and the areas not disturbed by IRM activities are substantially vegetated with grasses, and trees; therefore, suspension due to wind erosion or physical disturbance of surface soil/fill particles is unlikely under the current use scenario. Under the planned future commercial land use, the majority of the Site would be covered by asphalt, structures, grass/vegetation, and/or ornamental landscaping. Fugitive dust may be generated during excavation activities either during or following redevelopment. Therefore, this migration pathway is potentially relevant under the current and reasonably anticipated future land use scenario.

6.2 Volatilization

Volatile chemicals present in soil/fill and groundwater may be released to ambient or indoor air through volatilization either from or through the soil/fill underlying building structures. Volatile chemicals typically have a low organic-carbon partition coefficient (K_{oc}), low molecular weight, and a high Henry's Law constant.

No VOCs were detected in subsurface soil/fill above 6NYCRR Part 375 CSCOs; however, several subsurface soil/fill samples remaining after the IRMs contained acetone, MEK, and BTEX at concentrations above Part 375 USCOs. Therefore, the release of VOCs from soil/fill may be considered relevant in current and future use scenarios. Surface soil/fill was not analyzed for VOCs as surface VOCs would have volatilized over time. Similarly, groundwater samples generally yielded non-detectable or trace levels of VOCs at or near

Class GA GWQS/GVs with the exception of benzene in one location (MW-12) and methylene chloride in MW-5 (likely due to laboratory contamination).

However, low concentrations or non-detection of volatile contaminants in subsurface soil/fill and groundwater indicate volatilization is not a relevant pathway.

6.3 Surface Water Runoff and Transport

Precipitation waters on the northern portion of the Site likely collects within the on-site drainage ditch, while the rest of the overland flow likely drains toward Two Mile Creek, located primarily off-site. Under the current use scenario, the potential for soil particle transport with surface water runoff is low, as the Site was backfilled with clean imported soil, is mostly flat lying with well-drained soils, and otherwise contains a significant amount of vegetative growth. Furthermore, Two Mile Creek underwent remediation and restoration including implementation of storm water erosion measures.

Under the reasonably anticipated future commercial use scenario, the Site will be substantially covered by asphalt, buildings, minimum one-foot of vegetated clean soil and landscaping, mitigating transport of subsurface (i.e., covered) soil/fill via storm water runoff. Although stormwater runoff during excavation activities is possible during the future use scenario, erosion controls are typical construction practice and would be implemented as a component of the Site Management Plan required for BCP Sites that do not achieve unrestricted use conditions.

Therefore, surface water runoff is not considered a relevant migration pathway.

6.4 Leaching

Leaching refers to chemicals present in soil/fill migrating downward to groundwater because of infiltration of precipitation. Groundwater samples generally yielded non-detectable or trace levels of VOCs and SVOCs at or near GWQS/GVs, with detections of GROs and DROs. Dissolved metals detected at concentrations above Class GA GWQS/GVs were limited to naturally occurring minerals, including iron, magnesium, manganese, and sodium. Although select metals (e.g., arsenic and lead) may remain in subsurface soil/fill above the SCOs in some areas, soil/fill containing elevated arsenic concentrations was removed during the IRMs. Prior to the IRMs, only one groundwater sample (MW-1 in June

2011) detected arsenic at a concentration slightly above the GWQS/GV indicating that these metals likely exist in their insoluble forms and, as such, are relatively immobile.

The presence of weathered petroleum constituents and nuisance conditions in overburden groundwater indicates that the chemical migration via leaching pathway is likely a relevant migration pathway. However, this pathway has been significantly reduced following the IRM activities that removed the GCS and all of the known subsurface piping.

6.5 Groundwater Transport

Groundwater underlying the Site primarily migrates to the east and southeast, and does not appear to be influenced by the Two Mile Creek corridor (see Figures 7 through 9). VOCs and SVOCs detected in groundwater are present at relatively low concentrations; however, LNAPL was observed in monitoring wells MW-5, MW-6, and MW-9. The GCS and subsurface piping has been removed and transported off-site; this removes the contaminant source and groundwater quality is expected to improve over time.

The Site and surrounding areas are serviced by a municipal (supplied) water, with no evidence of potable wells in the area of the subject property. As such, transport off-site via groundwater migration is a relevant migration pathway; however, COCs present would not reach receptors at significant exposure point concentrations.

6.6 Exposure Pathways

Based on the analysis of chemical fate and transport provided above, the pathways through which Site COCs could potentially migrate to other areas or media include: fugitive dust emissions via physical disturbance of soil particles during any remaining intrusive remedial measures and redevelopment; leaching of contaminants from the residual impacted soil/fill to groundwater; and, to a lesser extent, groundwater transport.

However, it is unlikely that on-site or off-site receptors would be exposed to any site-related COCs given the completed IRMs removed source material; the planned Site Management Plan (SMP) and Environmental Easement restricting potable use of groundwater; and NYSDEC and NYSDOH requirements for dust controls during future excavation at remedial program construction sites.

7.0 QUALITATIVE RISK ASSESSMENT

7.1 Human Health Exposure Assessment

A qualitative exposure assessment consists of characterizing the exposure setting (including the physical environment and potentially exposed human populations), identifying exposure pathways, and evaluating contaminant fate and transport.

An exposure pathway describes the means by which an individual may be exposed to contaminants originating from a site. An exposure pathway has the following five elements:

- Receptor population
- Contaminant source
- Contaminant release and transport mechanism
- Point of exposure
- Route of exposure

An exposure pathway is complete when all five elements of an exposure pathway are documented; a potential exposure pathway exists when any one or more of the five elements comprising an exposure pathway is not documented but could reasonably occur. An exposure pathway may be eliminated from further evaluation when any one of the five elements comprising an exposure pathway does not exist in the present and will not exist in the future.

7.1.1 Receptor Population

The receptor population includes the people who are or may be exposed to contaminants at a point of exposure. The identification of potential human receptors is based on the characteristics of the Site, the surrounding land uses, and the probable future land uses. The Site is presently unoccupied and vacant. Under current Site use conditions, receptors would be limited to trespassers who may traverse the Site (partially mitigated by fencing along NYS Route 86, Two Mile Creek, and site access controls); construction workers that may access the Site to complete remedial activities and service utilities; and environmental personnel on-site for sampling Site media. Trespassers might be comprised of adolescents and adults, whereas construction workers and environmental personnel would be limited to adults.

The reasonably anticipated future use of the Site is for commercial/industrial purposes consistent with surrounding property use and Site zoning. Exposed receptors under the future use scenario may be comprised of indoor workers, outdoor workers (e.g., groundskeepers or maintenance staff), and construction workers who may be employed at or perform work on the property. Site visitors/customers may also be considered receptors; however, their exposure would be similar to that of the indoor worker but at a lesser frequency and duration. Therefore, consideration of the indoor worker is conservatively protective of the Site visitor.

7.1.2 Contaminant Sources

The source of contamination is defined as either the source of contaminant release to the environment (such as a waste disposal area or point of discharge) or the impacted environmental medium (soil, air, biota, water) at the point of exposure. Section 4.0 discusses the COCs present in unremediated Site media at elevated concentrations; however, the majority of impacted materials have been removed via IRM activities. Limited areas containing SVOCs (specifically PAHs), weathered petroleum constituents, and select inorganic compounds in soil/fill remain. Groundwater contains elevated concentrations of GROs and DROs within the same general soil/fill area impacted by GCS (i.e., viscous LNAPL); however, these concentrations will decrease over time since the GCS source has been removed.

7.1.3 Contaminant Release and Transport Mechanisms

Contaminant release and transport mechanisms carry contaminants from the source to points where people may be exposed, and are specific to the type of contaminant and site use. For the non-volatile COCs present in Site soil/fill, contaminant release and transport mechanisms will generally be limited to fugitive dust migration and direct contact during intrusive work (e.g., during construction and grounds keeping activities) since the Site is currently covered by vegetation or clean imported soil and will be substantially covered by roads, parking lots, buildings, minimum one-foot of vegetated clean soil, and landscaping after redevelopment. For the volatile COCs in the unsaturated zone, the contaminant release and transport mechanism is limited to volatilization during additional intrusive remedial activities and future Site development.

7.1.4 Point of Exposure

The point of exposure is a location where actual or potential human contact with a contaminated medium may occur. Based on the widespread exceedance of CSCOs in soil/fill for certain ubiquitous parameters (i.e., arsenic, lead, and PAHs), the point of exposure is defined as those areas not excavated during the IRM activities. For both the current and future use scenarios, groundwater is not considered to pose a relevant mechanism due to the absence of significant groundwater impacts, the availability of a local municipal potable water source, the depth to groundwater (greater than 4.5 feet[1]; the standard depth of utilities and foundation footers), and the requirement for an Environmental Easement that will restrict the use of Site groundwater.

7.1.5 Route of Exposure

The route of exposure is the manner in which a contaminant actually enters or contacts the body (i.e., ingestion, inhalation, dermal absorption). Based on the types of receptors and points of exposure identified above, potential routes of exposure are listed below:

<u>Current Use Scenario</u>

- Construction Worker/Environmental Personnel – skin contact, inhalation, and incidental ingestion

<u>Future Use Scenario</u>

- Indoor Worker/Visitor/Vendor – inhalation
- Construction and Outdoor Worker – skin contact, inhalation, and incidental ingestion

7.1.6 Exposure Assessment Summary

Based on the above assessment, the potential exposure pathways for the current and future use conditions are listed below.

Current Use Scenario

- Construction Worker/Environmental Personnel – direct contact, incidental ingestion, and inhalation of non-volatile COCs present in site-wide soil/fill, and inhalation of volatile (weathered) organics present in impacted soil/fill during intrusive activities.

Future Use Scenario

- Indoor Worker/Visitor/Vendor – inhalation of volatile (weathered) organics present in petroleum-impacted soil/fill via the process known as soil vapor intrusion.
- Construction and Outdoor Worker – direct contact, incidental ingestion and inhalation of non-volatile COCs present in site-wide soil/fill, and inhalation of volatile (weathered) organics present in impacted soil/fill during intrusive activities.

In most instances, these exposures can be readily mitigated through the use of personal protective equipment (PPE); proper soil/fill management during intrusive activities; engineering controls including placement of asphalt, building, and landscape cover; and installation of vapor barriers or sub-slab depressurization systems in newly constructed buildings.

7.2 Fish and Wildlife Impact Assessment (FWIA)

The Site has been vacant since 1984. The historical use of the Site has eliminated the majority of native species. The Site was mainly populated by low-lying vegetation and small stature early successional trees (e.g., eastern cottonwood and poplar). The majority of fauna found on the Site are avian and small mammal species with the possible exception of the white-tailed deer. No federally listed or proposed threatened or endangered species are known to exist in the project area (USFWS 1999). The on-site drainage ditch occasionally contains storm water runoff; however, it does not contain significant, if any, benthic aquatic life. Two Mile Creek runs adjacent to the northwestern property boundary and is hydraulically upgradient of the Site. Two Mile Creek turns southwest and traverses the Site on the western end of the property. A small area of the Site is located on the western end of

[1] A perched water table was observed in the majority of the southern portion of the Site, with water observed between 3 and 5 fbgs in the sandy silt with fill layer. However, Site conditions near the perched groundwater have most

the creek; however, GCS was removed from that area of the Site and the area backfilled with clean imported soil.

Based on the results of test pits excavated in January and October 2015 along Two Mile Creek (TP-A through N), near-surface (0-1 fbgs) soil samples collected along the creek banks, and field observations during excavation, an approximate 400-foot section of Two Mile Creek was remediated and restored.

The Site is slated for redevelopment as a commercial/industrial area, consistent with surrounding property. Roadways, buildings, parking facilities, and maintained ornamental landscaping will substantially limit availability of suitable cover type for reestablishment of biota; however, the banks of Two Mile Creek were seeded and restored with riparian shrubs. Based on the Fish and Wildlife Resource Impact Analysis Decision Key included as Appendix H (NYSDEC DER-10 Appendix 3C; Ref. 13), no fish and wildlife resources impact analysis is warranted.

7.3 Qualitative Off-Site Exposure Assessment

During the 2012 Supplemental RI, test pits and soil borings (for installation of monitoring wells) were advanced along Site property boundaries to evaluate whether environmental impacts are potentially present off-site. These supplemental sampling locations were used in conjunction with previously collected data to complete this qualitative off-site exposure assessment and to evaluate potential remedial measures to address Site contamination. The following suggested a potential for off-site groundwater impact:

- Northern Boundary of Site: Sheen and petroleum odor were observed in monitoring well MW-1 and nearby TP-58 at 12.5 fbgs (with a corresponding PID reading of 387 ppm and petroleum-like odor).
- Northeastern Boundary of Site: Sheen was observed in monitoring well MW-10 together with petroleum odor and PID readings up to 440 ppm during advancement of the soil boring. During the IRM, GCS northeast of MW-10 was excavated along and beyond the property boundary ("GCS Area 3") and disposed off-site. No GCS remained at the excavation terminus.
- Eastern Boundary of Site: Sheen and petroleum odor were observed in monitoring well MW-12 together with petroleum odor, PID readings up to 220 ppm, and LNAPL from 10 to 12 fbgs during advancement of the soil boring.

likely changed since the GCS Area 2 excavation extended below 4.5 feet.

During the IRM, GCS surrounding MW-12 was excavated to the property boundary and disposed off-site. No parameters were detected above USCOs in the sidewall sample (VSW-14) collected along the property boundary and GCS was not present and the excavation terminus.

- Southeastern Boundary of Site: GCS was observed in TP-31 from 3 to 7 fbgs, with petroleum odor and PID readings between 128 ppm (6 fbgs) and 131 ppm (10 fbgs). Trace LNAPL and petroleum odor were observed in nearby monitoring well MW-6. During the IRM, GCS was excavated near TP-31/MW-6 ("GCS Area 1") and disposed off-site. Only acetone was detected at an estimated concentration above its USCO in one verification sidewall sample (VSW-08) along the property boundary in the vicinity of TP-31. Lead was also detected in this sample at a concentration above its USCO but below its CSCO.

The following suggested a potential for off-site surface water impact:

- Two Mile Creek: Sediment sample SED-DOWN collected on-site at the furthest downstream location exhibited the highest concentration of DROs, one VOC (MEK) that exceeded the SGV, and the majority of the elevated metals concentrations. Two PAHs were detected slightly above the screening criterion in the off-site upstream (SED-UP) sample only, not in the off-site midstream (SED-MID) sample that is adjacent to the GCS -impacted central portion of the Site (Area 1). During the 2015 IRM, GCS was excavated south of Two Mile Creek ("Area 1") and west of Two Mile Creek ("Area 2") and disposed off-site. During the 2016 Supplemental IRM, both on-site (including the SED-DOWN sample location) and off-site portions of Two Mile Creek were remediated and restored. Along the outer extent of the creek area IRM excavation, a minimum one-foot thick layer of clayey material was placed adjacent to the native soil to prevent migration of residual impacts toward the creek and, hence, recontamination of the Site.

As discussed in Section 5 and shown on Figures 7 and 8, the IRMs completed in 2012-2016 removed the sources of contamination and the Site will be covered with clean imported soil. GCS was not left in place at any property boundary. Therefore, any off-site exposure to residual impact remaining on the Site would be minor and expected to decrease over time.

8.0 REMEDIAL ALTERNATIVES EVALUATION

8.1 Remedial Action Objectives

The remedial actions for the 251 Homer Street Redevelopment Site must satisfy Remedial Action Objectives (RAOs). RAOs are site-specific statements that convey the goals for minimizing substantial risks to public health and the environment. For the 251 Homer Street Redevelopment Site, appropriate RAOs have been defined as:

Soil/Fill RAOs

- Remove, treat, or mitigate GCS to the degree possible to protect public health and the environment and prevent further degradation of on-site and off-site groundwater quality.
- Remove subsurface infrastructure (i.e., abandoned process piping) to prevent potential discharge of contaminants to surrounding soil/fill.
- Prevent ingestion/direct contact with contaminated soil/fill.
- Prevent migration of contaminants that may further result in groundwater or surface water contamination.
- Prevent inhalation of or exposure to contaminants volatilizing from contaminated soil/fill.

Groundwater RAOs

- Prevent ingestion of groundwater containing contaminant levels exceeding NYSDEC Class GA GWQS/GVs or with evidence of LNAPL.
- Prevent degradation of off-site water quality.

Subsurface Piping RAOs

- Remove or mitigate subsurface piping to the degree necessary to protect public health and the environment and to prevent further degradation of on-site and off-site soil/fill and groundwater quality.

Surface Water and Sediment RAOs

- Prevent surface water and sediment contamination.

Soil Vapor RAOs

- Mitigate impacts to public health resulting from existing, or the potential for, soil vapor intrusion to impact indoor air quality in future buildings at the Site.

8.2 General Response Actions

General Response Actions (GRAs) are broad classes of actions that are developed to achieve the RAOs and form the foundation for the identification and screening of remedial technologies and alternatives.

The GRAs available to address the RAOs for soil/fill include:

- Institutional controls (e.g., Site Management Plan, Environmental Easement)
- Engineering controls (e.g., cover system)
- Treatment (e.g., in-situ or ex-situ)
- Excavation and off-site disposal

The GRAs available to address the RAOs for groundwater include:

- Monitored natural attenuation
- Institutional controls
- Engineering controls (e.g., pump-and-treat)
- Treatment (e.g., in-situ or ex-situ)

The GRAs available to address the RAOs for subsurface product piping include:

- Removal and off-site disposal/recycling
- Cleaning and capping in-place

The GRAs available to address the RAOs for surface water and sediment include:

- Excavation and off-site disposal of impacted soil/fill and sediment

The GRAs available to address the RAOs for soil vapor include:

- Engineering controls (e.g., vapor barrier or ASD system)

8.3 Standards, Criteria, and Guidance

According to DER-10 Section 1.3(b)71, SCGs mean "*standards and criteria that are generally applicable, consistently applied, and officially promulgated, that are either directly applicable or not directly applicable but are relevant and appropriate, unless good cause exists why conformity should be dispensed with, and with consideration being given to guidance determined, after the exercise of scientific and* *engineering judgment, to be applicable. This term incorporates both the CERCLA concept of 'applicable or relevant and appropriate requirements' (ARARs) and the USEPA's 'to be considered' (TBCs) category of non-enforceable criteria or guidance. For purposes of this Guidance, 'soil SCGs' means the soil cleanup objectives and supplemental soil cleanup objectives identified in 6NYCRR 375-6.8 and the Commissioner Policy on Soil Cleanup Guidance (CP-51).*"

Additional discussions concerning the specific chemical-, action-, and location-specific SCGs that may be applicable, relevant, or appropriate to remedy selection for the Site are presented below. In each case, the identified SCGs are generally limited to regulations or technical guidance in lieu of the environmental laws from which they are authorized, as the laws are typically less prescriptive in nature and are inherently considered in the regulatory and guidance evaluations. Table 16 summarizes the SCGs by media that may be applicable or relevant and appropriate to the Site.

8.3.1 Chemical-Specific SCGs

Chemical-specific SCGs are usually health- or risk-based concentrations in environmental media (e.g., air, soil, water), or methodologies that when applied to site-specific conditions, result in the establishment of concentrations of a chemical that may be found in, or discharged to, the ambient environment. The determination of potential chemical-specific SCGs for a site is based on the nature and extent of contamination; potential migration pathways and release mechanisms for site contaminants; reasonably anticipated future site use; and likelihood that exposure to site contaminants will occur. RI and Supplemental RI sampling events included the collection and analysis of surface soil/fill, subsurface soil/fill, sediment, and groundwater samples.

One of the remedial alternatives to be assessed for the Site is a Track 4 cleanup for soil/fill. This approach requires institutional controls (e.g., groundwater and land use restrictions, Site Management Plan, and Environmental Easement) and engineering controls [e.g., a soil cover system, active sub-slab depressurization (ASD) systems in future buildings] as components of the final remedy to reduce future potential exposure to impacted soil/fill.

Site-specific action levels (SSALs) were developed for the Site. These SSALs will be applicable to soil/fill that greatly exceed CSCOs, have the potential to impact groundwater, or otherwise represent an unacceptable risk to public health or the environment in the context of reasonably anticipated future use and a Track 4 cleanup and therefore require excavation and off-site disposal. These SSALs were developed based on the removal of source areas, including areas that have a greater potential for contaminant migration, and the feasibility of achieving the SSALs based on the nine factors outlined in 6NYCRR Part 375-1.8(f) and described in Section 8.3. The SSALs only apply to a Track 4 cleanup with a cover system to be installed over all areas with remaining soil/fill concentrations above CSCOs, SMP, and Environmental Easement. The following SSALs were developed and used to designate soil/fill areas requiring remediation:

- Total Arsenic >60 mg/kg
- Total Lead >3,900 mg/kg
- Total PAHs >500 mg/kg
- GCS soil/fill areas

Arsenic is a ubiquitous metal with urban background soils in New York State frequently containing concentrations in excess of the CSCO (16 mg/kg), particularly at former industrial properties with a history of fossil fuel burning and oil refining such as that which occurred on the Site and surrounding sites. With the removal of the soil around MW-8 and MW-11, NYSDEC conceptually agreed that based on the site-specific arsenic data two areas with elevated arsenic (MW-7, 2-4 fbgs, 126 mg/kg; TP-42, 1.5-4.5 fbgs, 97.7 mg/kg) were outliers and needed to be removed. The remaining arsenic levels on-site fall below the SSAL of 60 mg/kg. The SSAL for lead is based on the Part 375 Industrial SCO of 3,900 mg/kg. For PAHs, the alternative Soil Cleanup Level of 500 mg/kg total PAHs was employed in lieu of individual CSCOs, per NYSDEC Commissioner Policy on Soil Cleanup Guidance (CP-51).

8.4 Evaluation of Alternatives

In addition to achieving RAOs, NYSDEC's Brownfield Cleanup Program calls for remedy evaluation using the following evaluation criteria set forth in DER-10 Technical Guidance for Site Investigation and Remediation and 6NYCRR 375-1.8(f):

- **Overall Protectiveness of Public Health and the Environment**. This criterion is an evaluation of the remedy's ability to protect public health and the environment, assessing how risks posed through each existing or potential pathway of exposure are eliminated, reduced, or controlled through removal, treatment, engineering controls, or institutional controls.

- **Compliance with Standards, Criteria, and Guidance (SCGs)**. Compliance with SCGs addresses whether a remedy will meet applicable environmental laws, regulations, standards, and guidance.
- **Long-Term Effectiveness and Permanence**. This criterion evaluates the long-term effectiveness of the remedy after implementation. If wastes or treated residuals remain on-site after the selected remedy has been implemented, the following items are evaluated: (i) the magnitude of the remaining risks (i.e., will there be any significant threats, exposure pathways, or risks to the community and environment from the remaining wastes or treated residuals), (ii) the adequacy of the engineering and institutional controls intended to limit the risk, (iii) the reliability of these controls, and (iv) the ability of the remedy to continue to meet RAOs in the future.
- **Reduction of Toxicity, Mobility, or Volume of Contamination through Treatment**. This criterion evaluates the remedy's ability to reduce the toxicity, mobility, and volume of Site contamination. Preference is given to remedies that permanently and significantly reduce the toxicity, mobility, or volume of the contamination at the Site.
- **Short-Term Impacts and Effectiveness**. This criterion is an evaluation of the potential short-term adverse impacts and risks of the remedy upon the community, the workers, and the environment during construction and/or implementation. This includes a discussion of how the identified adverse impacts and health risks to the community or workers at the Site will be controlled, and the effectiveness of the controls. This criterion also includes a discussion of engineering controls that will be used to mitigate short-term impacts (i.e., dust control measures), and an estimate of the length of time needed to achieve the remedial objectives.
- **Implementability**. The implementability criterion evaluates the technical and administrative feasibility of implementing the remedy. Technical feasibility includes the difficulties associated with the construction and the ability to monitor the effectiveness of the remedy. For administrative feasibility, the availability of the necessary personnel and material is evaluated along with potential difficulties in obtaining specific operating approvals, access for construction, etc.
- **Cost-Effectiveness**. Capital, operation, maintenance, and monitoring costs are estimated for each remedial alternative and presented on a present worth basis. A remedy is cost effective if the costs are proportional to the overall effectiveness.
- **Community Acceptance**. This criterion evaluates the public's comments, concerns, and overall perception of the remedy. Therefore, community acceptance will be evaluated based on comments to be received from the public in

response to Fact Sheets and other planned Citizen Participation activities, including a public comment period for the AAR.

8.5 Future Land Use Evaluation

In developing and screening remedial alternatives, NYSDEC's Part 375 regulations require that the reasonableness of the anticipated future land use be factored into the evaluation of remedial alternatives. The regulations identify 16 criteria that must be considered. These criteria and the resultant outcome for the 251 Homer Street Redevelopment Site are presented below.

1. *Current use and historical and/or recent development patterns:* The 251 Homer Street Redevelopment Site was historically a portion of a larger petroleum refinery and petroleum bulk storage facility commonly known as the former Socony-Vacuum facility. The Site and surrounding area were historically developed as a petroleum refinery with numerous ASTs and heavy industrial operations; and current surrounding land use is a mixed commercial and residential area in the City of Olean. The Site is presently vacant. **Accordingly, commercial site redevelopment would be consistent with historic site use.**
2. *Applicable zoning laws and maps:* The Site is located in an area of the City zoned for industrial use. **A Track 4 Commercial Cleanup is therefore consistent with current zoning.**
3. *Brownfield opportunity areas as designated set forth in GML 970-r:* The Brownfield Opportunity Area (BOA) Program provides municipalities and community based organizations with assistance to complete revitalization plans and implementation strategies for areas or communities affected by the presence of brownfield sites, and site assessments for strategic sites. **The subject property lies within the Northwest Quadrant of the City of Olean BOA. The City of Olean is currently in Step 2: Nomination Study of the Northwest Quadrant Revitalization Plan (October 2015) under the BOA Program.**
4. *Applicable comprehensive community master plans, local waterfront revitalization plans as provided for in EL article 42, or any other applicable land use plan formally adopted by a municipality:* The Site lies within the boundaries of the City of Olean Comprehensive Development Plan 2005-2025. **Site remediation and redevelopment is consistent with the redevelopment plan.**
5. *Proximity to real property currently used for residential use, and to urban, commercial, industrial, agricultural, and recreational areas:* The adjacent and surrounding land is predominantly commercial with some nearby vacant land. Residential land use is located nearby, southeast and northwest of the Site. The property located less than one-quarter mile to the west of the Site has been converted from recreational

land to commercial use. **Maintaining the use of the Site in a commercial capacity is consistent with surrounding property.**

6. *Any written and oral comments submitted by members of the public on the proposed use as part of the activities performed pursuant to the citizen participation plan:* **No comments have been received from the public relevant to Site use concerns.**

7. *Environmental justice concerns, which include the extent to which the proposed use may reasonably be expected to cause or increase a disproportionate burden on the community in which the site is located, including low-income minority communities, or to result in a disproportionate concentration of commercial or industrial uses in what has historically been a mixed use or residential community:* **Nearby and adjacent property is actively used in a commercial capacity. Maintaining use of the site in a commercial capacity does not pose environmental justice issues.**

8. *Federal or State land use designations:* The property is designated Commercial Land Use (COM 1) by the City of Olean (Real Property GIS). **Reuse in a restricted capacity (commercial) is consistent with the current land use designation.**

9. *Population growth patterns and projections:* The City of Olean, encompassing 6.2 square miles, has a population of 14,452 (2010 US Census Bureau), a decrease of 5.8% from the 2000 US Census (15,347 people) and, as such, the redevelopment of the site is not expected to have a significant impact on the housing market**. Reuse of the Site in a non-residential capacity does not materially affect opportunities for residential growth.**

10. *Accessibility to existing infrastructure:* Access to the Site is from Homer Street. Utilities (sewer, water, electric) that service adjacent and nearby properties are present along this corridor. **Existing infrastructure supports reuse in a commercial capacity**.

11. *Proximity of the site to important cultural resources, including federal or State historic or heritage sites or Native American religious sites*: **No such resources or sites are known to be present on or adjacent to the Site.**

12. *Natural resources, including proximity of the site to important federal, State, or local natural resources, including waterways, wildlife refuges, wetlands, or critical habitats of endangered or threatened species:* Two Mile Creek is located north of the Site and traverses the southwestern end of the Site. Two Mile Creek traverses numerous current and historical commercial/industrial properties in the area of the Site. **Commercial redevelopment of the 251 Homer Street Redevelopment Site will not adversely affect this water body. If necessary, an Article 15 Stream Disturbance Permit and/or Stormwater Pollution Prevention Permit will be obtained from the NYSDEC during Site redevelopment.**

13. *Potential vulnerability of groundwater to contamination that might emanate from the site, including proximity to wellhead protection and groundwater recharge areas and other areas*

identified by the Department and the State's comprehensive groundwater remediation and protection program established set forth in ECL article 15 title 31: Currently, there are no known deed restrictions on the use of groundwater at the Site. Municipal water is available to the Site and all surrounding properties. The municipal water supply is derived from the following sources:

- Ischua Creek (a tributary of Olean Creek) at the City of Olean's Water Filtration Plan, 1332 River Street, approximately 3,000 feet east (cross-gradient) of the Site.
- Groundwater supply wells:
  - Well Site M18: 104 Richmond Ave., approximately 3.0 miles southeast of the Site.
  - Well Sites M37/38: 1900 East River Rd., approximately 4.0 miles southeast of the Site.

Potable water service is provided off-site and on-site by the local municipal water authority. **The cleanup to restricted use conditions will not pose a drinking water threat.**

14. *Proximity to flood plains:* Although the Cattaraugus County Parcel Viewer indicates the 100-year flood plain traverses the northwestern end of the Site, it does correspond to the current alignment of Two Mile Creek. According to Figure 2 in the May 2008 Phase I ESA prepared by GZA GeoEnvironmental for the neighboring 229 Homer Street Site, Two Mile Creek formerly traversed the northwestern portion of the Site (observed in a 1960 aerial photograph). The 1988 aerial photograph shows the current alignment of the Creek, off-site along the northwestern property boundary. Since Two Mile Creek is off-site and the Site will be covered with one foot of clean vegetated soil/fill, there is no risk of significant soil erosion due to flooding. **As such, cleanup to commercial standards does not pose a threat to surface water.**
15. *Geography and geology:* The Site is located within the Allegheny River valley, with the primary bedrock type that forms the bedrock surface in the Olean area consists predominantly of Upper Devonian shale, siltstone, and sandstone of the Conewango and Conneaut Groups. Surface soils within the vicinity of the Site are described as Chenango gravelly silt loam, 0 to 3 percent slopes (ChA), as nearly level, very deep, and well drained. Former development cycles of the Site have impacted both the surface and subsurface geology. **Geography and geology are consistent with a commercial re-use.**
16. *Current institutional controls applicable to the site:* **No institutional controls are currently present that would affect redevelopment options.**

Based on the above analysis, reuse of the Site in a commercial capacity is consistent with past and current development and zoning on-site and within the vicinity of the Site, and does not pose additional environmental or human health risk.

8.6 Volume, Nature, and Extent of Contamination

Section 5.0 presents the volume, nature, and extent of media removed from the Site during IRM activities. Estimation of the remaining volume, nature, and extent of media that may require remediation to satisfy the RAOs or that needs to be quantified to facilitate evaluation of remedial alternatives is presented in this section. For the unrestricted use scenario, the cleanup goal would involve achieving USCOs. For the reasonably anticipated future use scenario, the cleanup goal would involve achieving the CSCOs and SSALs. The volume and extent of media requiring cleanup under these scenarios is presented in Section 8.6.1 and 8.6.2. In all instances, these volume estimates (and associated cost estimates presented later in this AAR) are projected based on data collected and observations made during the 2011 RI, 2012 Supplemental RI, and 2012-2016 IRMs.

8.6.1 Comparison to Unrestricted SCOs (Track 1 Cleanup)

Exceedance of the USCOs was noted in the majority of soil/fill samples collected, primarily for petroleum SVOCs (PAHs), and metals (i.e., arsenic, lead, and mercury) to varying degrees depending on the media. Elevated concentrations of GROs and DROs are also present together with nuisance conditions indicating widespread petroleum impact. Due to the ubiquitous nature of the constituents observed in Site soil/fill and the extent to which they exceeded the USCO values, it is likely that the entire 16.68-acre property defined the impacted soil/fill area prior to IRM activities. During the IRMs, approximately 5.53 acres of the Site were excavated to remove impacted material; however, excavation sidewall and floor end-point sampling results indicate concentrations above USCOs. Therefore, the Track 1 Cleanup area remains at 16.68 acres. The depth of impact varies significantly across the Site and extends to 18 fbgs in some areas. Thus, the volume of impacted soil/fill requiring remediation under the unrestricted use scenario is approximately 484,387 cubic yards.

8.6.2 Comparison to Commercial SCOs (Track 4 Cleanup)

The soil/fill data indicated widespread exceedance of the Part 375 CSCOs for several ubiquitous constituents. Approximately 50% of the samples collected from the soil borings advanced for installation of permanent monitoring wells and 25% of the samples collected from the test pits exhibited exceedance of the CSCOs for PAHs and/or metals. However, many of the samples that did not exceed CSCOs exhibited nuisance conditions (odor, elevated PID, sheen); contained elevated concentrations of GROs and DROs; and/or contained GCS.

Certain test pit and monitoring well boring locations contained visually impacted soil/fill with the impacts corroborated by analytical results and/or nuisance conditions (petroleum-like odors); however, the GCS was excavated from Area 1, MW-12 Area, Area 2, Area 3, and Two Mile Creek and removed off-site during IRM activities. In addition, the arsenic-impacted soil/fill (Area 4) was removed off-site during IRM activities.

Table 17 presents the soil/fill sample locations that remain above CSCOs following the IRMs, which amounts to approximately 9,000 cubic yards of soil/fill. These areas exceed CSCOs but meet the SSALs for the Site.

8.6.3 Groundwater Impacts

VOCs and SVOCs were predominantly reported as non-detectable, trace (estimated), or detected at concentrations below GWQS/GVs; only benzene was detected above its GWQS in monitoring well MW-12. Metals detected at concentrations above GWQS/GVs are primarily naturally occurring minerals, including iron, manganese, magnesium, and sodium. Total arsenic was detected in MW-1 at a concentration slightly above its GWQS/GV but dissolved arsenic concentrations were below the GWQS/GV.

During the May 2012 sampling event, some evidence of product (LNAPL) was observed in wells MW-5, MW-6, and MW-9; sheen and petroleum odor were observed in wells MW-1, MW-3, MW-11, and MW-12; sheen was observed in well MW-10; slight petroleum odor was noted in MW-14; and slight sulfur odor was noted in MW-7. Site-wide weathered petroleum impacts existed prior to the IRMs. In 2013, LNAPL was only observed in well MW-5; however, the source material surrounding this well and the well itself have been removed. Monitoring wells MW-6, MW-8, MW-11, and MW-12 were also removed during excavation of the GCS. Replacement monitoring wells MW-6R, MW-8R, and MW-

12R were installed and will be monitored following remediation. LNAPL has not been detected since completion of the IRM excavations.

The visual and olfactory evidence of impact observed in the groundwater monitoring wells is likely associated with the subsurface piping and GCS present across the Site prior to implementation of the IRMs. Removal of these sources will mitigate these groundwater impacts.

8.7 Alternatives Evaluation

In addition to the evaluation of alternatives to remediate to the likely end use of the Site, NYSDEC regulation and policy calls for evaluation of more restrictive end-use scenarios, such as an unrestricted use scenario (considered under 6NYCRR Part 375 to be representative of cleanup to pre-disposal conditions), and a scenario less restrictive than the reasonably anticipated future use. Per NYSDEC DER-10 Technical Guidance for Site Investigation and Remediation, evaluation of a "no action/no further action" alternative is also required to provide a baseline for comparison against other alternatives. The alternatives evaluated below in detail include:

- Alternative 1: No Further Action (beyond the IRMs)
- Alternative 2: Unrestricted Use (Track 1) Cleanup
- Alternative 3: Commercial Use (Track 4) Cleanup

8.7.1 Alternative 1 – No Further Action

Under this alternative, the Site would remain in its current state, with no additional remediation, beyond that which occurred during the IRMs, or controls in-place.

Overall Protection of Public Health and the Environment – The Site is not protective of human health and the environment, due to the presence of contamination remaining on-site above SCGs; the absence of engineering controls (e.g., cover system); and the absence of institutional controls to prevent more restrictive forms of future site use (e.g., unrestricted, residential, and restricted residential) or the export of Site soils to uncontrolled off-site locations. Accordingly, no further action is not protective of public health and does not satisfy the RAOs.

***Compliance with SCGs* –** Under the current and reasonably anticipated future use scenario (commercial), the remaining contamination on-site detected in the soil/fill and groundwater do not comply with applicable SCGs.

***Long-Term Effectiveness and Permanence* –** The no further action alternative involves no additional remedial activities, equipment, institutional controls or facilities subject to maintenance, and provides no long-term effectiveness or permanence toward achieving the RAOs.

***Reduction of Toxicity, Mobility, or Volume of Contamination through Treatment* –** The IRMs completed at the Site have reduced the toxicity, mobility, and volume of contaminants in soil/fill. Reduction of COC concentrations in groundwater will occur over time because of this source removal. However, the toxicity, mobility, and volume of residual COCs remaining in Site soil and groundwater would not be reduced under this scenario. Therefore, this alternative would not comply with applicable SCGs, be protective of public health, or satisfy the RAOs.

***Short-Term Impacts and Effectiveness* –** The remaining contamination on-site does pose short-term risks to on-site workers and the environment. Therefore, implementation of the no further action alternative does not satisfy the RAOs.

***Implementability* –** No technical or administrative implementability issues are associated with the no further action alternative.

***Cost-Effectiveness* –** There would be no capital or long-term operation, maintenance, or monitoring costs associated with the no further action alternative.

***Community Acceptance* –** IRMs were completed under approved work plans that were made available for public comments; no comments were received. Community acceptance will be evaluated based on comments to be received from the public in response to Fact Sheets and other planned Citizen Participation activities, including a public comment period for the AAR.

8.7.2 Alternative 2 – Unrestricted (Track 1) Use Cleanup

An unrestricted use alternative would necessitate remediation of all soil/fill where concentrations exceed the USCO per 6NYCRR Part 375. For unrestricted use scenarios, excavation and off-site disposal of impacted soil/fill is generally regarded as the most applicable remedial measure because engineering controls cannot be used to supplement the remedy. As such, the unrestricted use alternative assumes that those areas that exceed USCOs would be excavated and disposed at an off-site commercial solid waste landfill. Therefore, the entire 16.68-acre Site would need to be excavated to approximately 18 fbgs to achieve USCOs. The estimated total volume of impacted soil/fill that would be removed from the Site is approximately 484,387 cubic yards.

Based on the removal of all source areas, groundwater remediation and monitoring would not be necessary, as concentrations would be expected to decrease significantly. In addition, a restriction on groundwater use would be included as part of the remedial program per 6NYCRR Part 375.

Overall Protection of Public Health and the Environment – Excavation and off-site disposal to USCOs would be protective of public health under any reuse scenario. However, this alternative would permanently use and displace approximately 484,387 cubic yards of valuable landfill airspace, causing ancillary environmental issues due to reduced landfill capacity, and would require excavating, transporting, and placing 484,387 cubic yards of clean soil from an off-site borrow source to backfill the excavation, also contributing to significant detrimental off-site environmental issues. The unrestricted use alternative would achieve the corresponding Part 375 USCOs, which are designed to be protective of public health under any reuse scenario.

Compliance with SCGs – Similar to the IRM soil/fill removal activities, the additional excavation and off-site disposal would need to be performed in accordance with applicable, relevant, and appropriate SCGs. Soil excavation activities would necessitate preparation of and adherence to a community air monitoring plan (CAMP) in accordance with Appendices 1A and 1B of DER-10.

Long-Term Effectiveness and Permanence – The unrestricted use alternative would achieve removal of all residual impacted soil/fill; therefore, no soil/fill exceeding the USCOs would remain on the Site. As such, the unrestricted use alternative would provide long-term effectiveness and permanence.

Reduction of Toxicity, Mobility, or Volume of Contamination through Treatment – Through removal of all impacted soil/fill, LNAPL, and subgrade piping, the unrestricted use alternative would reduce the toxicity, mobility, and volume of Site contamination permanently and significantly. However, since this alternative transfers Site soil/fill from one environment to another, an overall reduction of toxicity and volume would not occur, although mobility of soluble constituents would be reduced in the commercial landfill with a liner, leachate collection, and a cover system.

Short-Term Impacts and Effectiveness – The principal advantage of a large-scale excavation to achieve USCOs is reliability of effectiveness in the long-term. In the short-term, there would be significant increase in exposure of impacted soil/fill to on-site workers and the community under this alternative. Remaining excavation activities would be completed over an approximate six-month period and backfilling would take approximately two months. Commercial construction equipment would be used; a health and safety plan would be followed; and community air monitoring would be completed during excavation activities. However, primary disadvantages include increased truck traffic during excavation and backfill; noise; and air emissions, including fugitive dust and odors. This action would result in potential storm water impacts at the borrow source(s) and on-site; diesel fuel consumption on the order of 350,000 gallons (assuming 80 miles round trip to a local landfill; 8 miles per gallon) to transport the 35,000 truckloads of impacted soil/fill, with several thousands of gallons also consumed by excavation and grading equipment. The USEPA's estimated CO_2 generation rate for diesel engines is approximately 22.2 pounds per gallon of diesel consumed. Accordingly, this alternative would produce over 7.8 million pounds of greenhouse gas. Therefore, this alternative represents a significant adverse effect in the short-term; however, the RAOs would be achieved once the soil/fill is removed from the Site and backfill soils are in place (est. 12 months).

***Implementability* –** Excavation of impacted soil/fill to depths of 18 fbgs in sandy silt and gravel poses several technical implementability concerns. Sloughing of excavation walls could occur, which would likely require shoring/stabilizing excavation sidewalls. Groundwater and/or stormwater handling, treatment and/or discharge/disposal would be required. Given the high volume of soil/fill required for removal, a high volume of truck traffic on a relatively small Site would be needed to remove the impacted soil/fill from the Site. Administrative implementability issues may include the need for rezoning to allow for unrestricted uses since this would not be consistent with current surrounding land use or the reasonably anticipated future use of the Site; the need to coordinate and secure disposal contracts with numerous permitted off-site landfills since no single location would be able to accept the volume of soil/fill generated under this alternative; and difficulty locating local borrow sources for such a large volume of backfill.

***Cost-Effectiveness* –** The capital cost of implementing an unrestricted use alternative is estimated at $74 million. Table 18 provides a detailed breakdown of these costs.

***Community Acceptance* –** IRMs were completed under approved work plans that were made available for public comments, with no comments received. Community acceptance will be evaluated based on comments to be received from the public in response to Fact Sheets and other planned citizen participation activities.

8.7.3 Alternative 3 – Commercial Use (Track 4) Cleanup

Under this alternative, the Site would be cleaned up to facilitate future commercial or industrial use, which will include the following as illustrated on Figure 11:

- The completed IRMs, which included:
  - Removal and recycling of approximately 10,644 linear feet of piping (97.46 tons) ranging in diameter from 2” to 12”.
  - Removal and disposal of 51, 55-gallon drums containing oil, sludge, and scale from within the pipes.
  - Extraction, treatment, and discharge of approximately 21,000 gallons of water from within the pipes and perched water encountered during trench excavation under a temporary discharge permit issued by the City of Olean Wastewater Treatment Plant.

- Excavation and off-site disposal of 49,670 tons of GCS (Areas 1-3) followed by backfill with clean imported soil. The on-site drainage ditch was converted to a closed 30-inch subsurface drainage pipe as discussed with NYSDEC.
- Excavation and off-site disposal of approximately 2,100 tons of elevated arsenic soil/fill (Area 4).
- Extraction, treatment, and discharge of approximately 250,000 gallons of water encountered during IRM excavation activities under a temporary discharge permit issued by the City of Olean Wastewater Treatment Plant.
- Excavation and off-site disposal of approximately 3,100 tons of Two Mile Creek on-site bed and bank material followed by backfill with clean soil and imported river rock to the OHWM and clean soil and top soil along the banks. The creek banks were seeded and a biodegradable erosion control blanket was installed. The banks were further restored with riparian shrubs.

- Installation of replacement monitoring wells MW-6R, MW-8R, and MW-12R and repair of existing monitoring wells MW-7 and MW-10.
- Engineering Controls:
  - Placement of a cover system, consisting of: building foundations; approximately 6 inches of asphalt or concrete (including sub-base); or minimum 12 inches of clean soil or gravel.
  - Installation of an active sub-slab depressurization system within future buildings.
- Institutional Controls:
  - Implementation of an SMP, including: an environmental easement; an EC/IC Plan; a Site Monitoring Plan; an Excavation Work Plan; an Operation and Maintenance (O&M) Plan; Site use limitations; and groundwater use restriction.

Overall Protection of Public Health and the Environment – This alternative would be fully protective of public health and the environment. The above completed IRMs together with the planned use of engineering controls, including a soil cover system and ASD systems in future buildings, and institutional controls, including an Environmental Easement and SMP, will prevent potential future exposure to residual contaminated soil and limit the future Site use for commercial/industrial purposes. Groundwater quality, which will be monitored over time in accordance with the SMP, is expected to continue to improve via natural attenuation as the contamination sources have been removed. Furthermore, groundwater is not used for drinking water purposes in the area of the Site; drinking water is supplied by the local municipality. Accordingly, the commercial use (Track 4) alternative is protective of public health and fully satisfies the soil, groundwater, subsurface piping, surface water, and sediment RAOs.

Compliance with SCGs **–** The remedial activities will be performed in accordance with applicable, relevant, and appropriate standards, guidance, and criteria, including NYSDEC DER-10. The completed IRMs and planned remedial actions are fully protective of public health and the environment, and achieve all RAOs for the Site. The SMP will include:

- An IC/EC Plan that describes the procedures for the implementation and management of all EC/ICs at the Site.
- A Site Monitoring Plan that describes the measures for evaluating the performance and effectiveness of the remedy to reduce or mitigate contamination at the site, including the soil cover system and all affected site media.
- An Excavation Work Plan to address any impacted soil/fill encountered during post-development intrusive and/or maintenance activities.
- An O&M Plan that describes the measures necessary to operate, monitor, and maintain the mechanical components of the remedy selected for the Site.
- A Site-wide inspection program to assure that the engineering and institutional controls placed on the Site have not been altered and remain effective.

Long-Term Effectiveness and Permanence **–** The removal of source materials during the IRMs as well as construction of a cover system will prevent direct contact with soil/fill exceeding CSCOs and SSALs. Installation of an ASD system within future buildings will mitigate potential on-site VOC vapor intrusion concerns. An SMP will address any impacted soil/fill encountered during post-development intrusive/ maintenance activities, and provide a mechanism to assure that the engineering and institutional controls placed on the Site have not been altered and remain effective. Furthermore, an Environmental Easement for the Site will be filed with Cattaraugus County, which will limit future Site use to industrial/commercial uses, restrict groundwater use, and reference the Department-approved SMP. As such, this alternative will provide long-term effectiveness and permanence.

Reduction of Toxicity, Mobility, or Volume of Contamination through Treatment – This alternative will reduce the toxicity, mobility, and volume of COCs on-site significantly and permanently. The completed IRMs removed the contaminant sources from the Site; however, the toxicity of the contamination was not reduced since the impacted soil/fill was disposed untreated off-site or transferred to the granular activated carbon during water treatment. Construction of a cover system will prevent direct contact with remaining soil/fill exceeding CSCOs and SSALs. Installation of an ASD system within future buildings will mitigate potential on-site VOC vapor intrusion concerns. The SMP will include an Excavation Work Plan to address any impacted soil/fill encountered during post-development intrusive/maintenance activities and a Site-wide Inspection Program to assure that the engineering and institutional controls placed on the Site have not been altered and remain effective. Accordingly, this alternative satisfies this criterion.

Short-Term Impacts and Effectiveness – The short-term adverse impacts and risks to the community, workers, and environment will be controlled during implementation of the remedy. During intrusive remedial activities, including excavation and cover system placement, increased truck traffic and handling of contaminated soil/fill could potentially cause adverse short-term effects. Community air monitoring for vapors, dust particulate and odors was implemented during the IRMs and will be performed during future intrusive activities to assure conformance with community air monitoring action levels during remedial activities. The potential for chemical exposures and physical injuries are reduced through safe work practices; proper personal protection equipment; environmental monitoring; establishment of work zones and Site control; and appropriate decontamination procedures. The future remedial work will be completed within one construction season. Planned remedial activities will be performed in accordance with an approved work plan, including a health and safety plan (HASP) and CAMP. This alternative achieves the RAOs for the Site.

Implementability – No technical or action-specific administrative implementability issues are associated with the Commercial Use (Track 4) Cleanup alternative.

Cost Effectiveness – The IRMs were completed at a capital cost of approximately $5.2 million. Additional capital cost to complete the final remedial activities under

Alternative 3 is estimated at approximately $1.4 million, and long-term monitoring and annual certification is estimated at approximately $29,800 per year. Based on an assumed 30 years of monitoring and annual certifications, the net present value of this alternative, including the completed IRMs, is approximately $6.6 million. Table 19 provides a detailed breakdown of these costs.

***Community Acceptance* –** IRMs were completed under approved work plans that were made available for public comments, with no comments received. Continued community acceptance will be evaluated based on comments to be received from the public in response to Fact Sheets and other planned citizen participation activities.

8.8 Comparison of Remedial Alternatives

The previous sections describe and evaluate the remedial alternatives for the 251 Homer Street Redevelopment Site against the screening criteria. Table 20 provides a comparison of the alternatives by media to identify appropriate remedial measures that will achieve the RAOs for the Site.

8.9 Recommended Remedial Alternative

Based on the alternatives analysis evaluation, *Alternative 3 – Commercial Use (Track 4) Cleanup* is the recommended final remedial approach for the 251 Homer Street Redevelopment Site. This alternative is fully protective of public health and the environment; is significantly less disruptive to the community; is consistent with current and future land use; and represents a more cost-effective approach than Alternative 2 while fully satisfying the RAOs. The recommended remedial alternative would involve:

- The completed IRMs, which included:
  - Removal and recycling of approximately 10,644 linear feet of piping (97.46 tons) ranging in diameter from 2” to 12”.
  - Removal and disposal of 51, 55-gallon drums containing oil, sludge, and scale from within the pipes.
  - Extraction, treatment, and discharge of approximately 21,000 gallons of water from within the pipes and perched water encountered during trench excavation under a temporary discharge permit issued by the City of Olean Wastewater Treatment Plant.

  - Excavation and off-site disposal of 49,670 tons of GCS (Areas 1-3) followed by backfill with clean imported soil. The on-site drainage ditch was converted to a closed 30-inch subsurface drainage pipe as discussed with NYSDEC.
  - Excavation and off-site disposal of approximately 2,100 tons of elevated arsenic soil/fill (Area 4).
  - Extraction, treatment, and discharge of approximately 250,000 gallons of water encountered during IRM excavation activities under a temporary discharge permit issued by the City of Olean Wastewater Treatment Plant.
  - Excavation and off-site disposal of approximately 3,100 tons of Two Mile Creek on-site bed and bank material followed by backfill with clean soil and imported river rock to the OHWM and clean soil and top soil along the banks. The creek banks were seeded and a biodegradable erosion control blanket was installed. The banks were further restored with riparian shrubs.
- Installation of replacement monitoring wells MW-6R, MW-8R, and MW-12R and repair of existing monitoring wells MW-7 and MW-10.
- Engineering Controls:
  - Placement of a cover system, consisting of: building foundations; approximately 6 inches of asphalt or concrete (including sub-base); or minimum 12 inches of clean soil or gravel.
  - Installation of an active sub-slab depressurization system within future buildings.
- Institutional Controls:
  - Implementation of an SMP, including: an environmental easement; an Institutional Controls and Engineering Controls (IC/ECs) Plan; a Site Monitoring Plan; an Excavation Work Plan; an Operation and Maintenance (O&M) Plan; Site use limitations; and groundwater use restriction.

This remedy is fully protective of public health and the environment; is advantageous over other remedies when evaluated against the remedy selection criteria; and fully satisfies all RAOs for the Site. The components and details of the cover system will be more fully described in the FER.

9.0 POST-REMEDIAL REQUIREMENTS

9.1 Final Engineering Report

Following completion of the remedial measures, a Final Engineering Report (FER) will be submitted to the NYSDEC. The FER will include the following information and documentation, consistent with the NYSDEC regulations contained in 6NYCRR Part 375-1.6(c):

- Background and Site description.
- Summary of the Site remedy that satisfied the RAOs for the Site.
- Certification by a Professional Engineer to satisfy the requirements outlined in 6 NYCRR Part 375-1.6(c)(4).
- Description of engineering and institutional controls at the Site.
- Site map showing the areas remediated.
- Documentation of imported materials.
- Documentation of materials disposed off-site.
- Copies of daily inspection reports and, if applicable, problem identification and corrective measure reports.
- Air monitoring data and reports.
- Photo documentation of remedial activities.
- Text describing the remedial activities performed; a description of any deviations from the Work Plan and associated corrective measures taken; and other pertinent information necessary to document that the site activities were carried out in accordance with this Work Plan.
- Analytical data packages and data usability summary reports (DUSRs).

9.2 Site Management Plan

The SMP covering the entire Homer Street Site will be prepared and submitted concurrent with the FER. The purpose of the SMP is to assure that proper procedures are in place to provide for long-term protection of public health and the environment after remedial construction is complete. The SMP is comprised of four main components:

- Engineering and Institutional Control Plan

- Site Monitoring Plan
- Operation and Maintenance Plan
- Inspections, Reporting, and Certifications

9.2.1 Engineering and Institutional Control Plan

An institutional control in the form of an Environmental Easement will be necessary to limit future use of the Site to restricted (commercial or industrial) applications and prevent groundwater use for potable purposes or as industrial process water without prior approval from NYSDOH or an authorized county health department.

Benson will prepare an Engineering and Institutional Control (EC/IC) Plan that will include a complete description of all institutional and/or engineering controls employed at the Site, including the mechanisms that will be used to continually implement, maintain, monitor, and enforce such controls. The EC/IC Plan will include:

- A description of all EC/ICs on the Site.
- The basic implementation and intended role of each EC/IC.
- A description of the key components of the ICs set forth in the Environmental Easement.
- A description of the features to be evaluated during each required inspection and periodic review, including the EC/IC certification, reporting, and Site monitoring.
- A description of plans and procedures to be followed for construction of a soil cover system as required.
- Any other provisions necessary to identify or establish methods for implementing the EC/ICs required by the Site remedy, as determined by the NYSDEC.

9.2.2 Site Monitoring Plan

The Site Monitoring Plan will describe the measures for evaluating the performance and effectiveness of the remedy to reduce or mitigate contamination at the Site, including:

- Sampling and analysis of all appropriate media (e.g., groundwater).
- Assessing compliance with applicable NYSDEC standards, criteria and guidance, particularly ambient groundwater standards and Part 375 SCOs for soil.
- Assessing achievement of the remedial performance criteria.

- Evaluating Site information periodically to confirm that the remedy continues to be effective in protecting public health and the environment; and
- Preparing the necessary reports for the various monitoring activities.

To address these issues, this Site Monitoring Plan will provide information on:

- Sampling locations, protocol, and frequency.
- Information on all designed monitoring systems (e.g., well logs).
- Analytical sampling program requirements.
- Reporting requirements.
- Quality assurance/quality control (QA/QC) requirements.
- Inspection and maintenance requirements for monitoring wells.
- Monitoring well decommissioning procedures.
- Annual inspection and periodic certification.

Semi-annual groundwater monitoring to assess overall reduction in contamination on-site will be conducted for the first two years. The frequency thereafter will be discussed with the NYSDEC. Trends in contaminant levels in groundwater in the affected areas will be evaluated to determine if the remedy continues to be effective in achieving remedial goals.

9.2.3 Operation and Maintenance Plan

An Operation & Maintenance (O&M) Plan governing maintenance of the cover system will:

- Include the O&M activities necessary to allow individuals unfamiliar with the Site to maintain the soil cover system.
- Include an O&M contingency plan.
- Evaluate Site information periodically to confirm that the remedy continues to be effective for the protection of public health and the environment. If necessary, the O&M Plan will be updated to reflect changes in Site conditions or the manner in which the cover system is maintained.

9.2.4 Inspections, Reporting, and Certifications

Site-wide inspection will be conducted annually or as otherwise approved by the NYSDEC. All applicable inspection forms and other records, including all media sampling data and system maintenance reports, generated for the Site during the reporting period will be provided in electronic format in a Periodic Review Report (PRR).

The PRR will be submitted to the NYSDEC annually or as otherwise approved, beginning 18 months after the Certificate of Completion (COC) or equivalent document is issued. The report will be prepared in accordance with NYSDEC DER-10 and submitted within 45 days of the end of each certification period. The PRR will include:

- Identification, assessment, and certification of all EC/ICs required by the remedy for the Site.
- Results of the required annual Site inspections and severe condition inspections, if applicable.
- All applicable inspection forms and other records generated for the Site during the reporting period in electronic format.
- A summary of any discharge monitoring data and/or information generated during the reporting period with comments and conclusions.
- Data summary tables and graphical representations of contaminants of concern by media (e.g., groundwater), which include a listing of all compounds analyzed, along with the applicable standards, with all exceedances highlighted. These will include a presentation of past data as part of an evaluation of contaminant concentration trends.
- Results of all analyses, copies of all laboratory data sheets, and the required laboratory data deliverables for all samples collected during the reporting period will be submitted electronically in a NYSDEC-approved format.
- A Site evaluation that includes the following:
    - The compliance of the remedy with the requirements of the site-specific RAWP, ROD, or Decision Document.
    - The operation and the effectiveness of all treatment units, etc., including identification of any needed repairs or modifications.
    - Any new conclusions or observations regarding site contamination based on inspections or data generated by the Site Monitoring Plan for the media being monitored.
    - Recommendations regarding any necessary changes to the remedy and/or Site Monitoring Plan.
    - The overall performance and effectiveness of the remedy.

The signed EC/IC Certification will be included in the PRR. For each institutional or engineering control identified for the Site, a Professional Engineer licensed to practice in New York State will certify that all of the following statements are true:

- The inspection of the Site to confirm the effectiveness of the institutional and engineering controls required by the remedial program was performed under my direction.
- The engineering and institutional controls employed at this Site are unchanged from the date the control was put in place, or last approved by the NYSDEC.
- Nothing has occurred that would impair the ability of the control to protect the public health and environment.
- Nothing has occurred that would constitute a violation or failure to comply with any Site Management Plan for this control.
- Access to the Site will continue to be provided to the NYSDEC to evaluate the remedy, including access to evaluate the continued maintenance of this control.
- If a financial assurance mechanism is required under the oversight document for the Site, the mechanism remains valid and sufficient for the intended purpose under the document.
- Use of the Site is compliant with the Environmental Easement.
- The engineering control systems are performing as designed and are effective.
- To the best of my knowledge and belief, the work and conclusions described in this certification are in accordance with the requirements of the Site remedial program and generally accepted engineering practices.
- The information presented in this report is accurate and complete.

If any component of the remedy is found to have failed, or if the periodic certification cannot be provided due to the failure of an institutional or engineering control, a Corrective Measures Plan will be submitted to the NYSDEC for approval. This plan will explain the failure and provide the details and schedule for performing work necessary to correct the failure. Unless an emergency condition exists, no work will be performed pursuant to the Corrective Measures Plan until it is approved by the NYSDEC.

10.0 REFERENCES

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TABLES

TurnKey Environmental Restoration, LLC

Benchmark Environmental Engineering & Science, PLLC

TABLE 1

SAMPLING AND ANALYSIS SUMMARY

251 HOMER STREET REDEVELOPMENT SITE
OLEAN, NEW YORK

Sample Identifier	Data Source	Depth Sampled/ Screened (fbgs)	Analysis								Date Sampled	Comments
			TCL VOCs	TCL SVOCs	PCBs	TAL Metals	Pesticides	Herbicides	GRO	DRO		
Surface Soil/Fill												
SS-1	Remedial Investigation	--	--	X	--	X	--	--	--	--	5/18/2011	
SS-2	Remedial Investigation	--	--	X	--	X	--	--	--	--	5/18/2011	
SS-3	Remedial Investigation	--	--	X	--	X	--	--	--	--	5/18/2011	
SS-4	Remedial Investigation	--	--	X	X	X	X	X	--	--	5/18/2011	
SS-5	Remedial Investigation	--	--	X	--	X	--	--	--	--	5/18/2011	
SS-6	Remedial Investigation	--	--	X	--	X	--	--	--	--	5/18/2011	
SS-7	Remedial Investigation	--	--	X	X	X	X	X	--	--	5/18/2011	MS/MSD
SS-8	Remedial Investigation	--	--	X	--	X	--	--	--	--	5/18/2011	
SS-9	Remedial Investigation	--	--	X	--	X	--	--	--	--	5/18/2011	
SS-10	Remedial Investigation	--	--	X	--	X	--	--	--	--	5/18/2011	
SS-11	Remedial Investigation	--	--	X	--	X	--	--	--	--	5/18/2011	
SS-12	Remedial Investigation	--	--	X	--	X	--	--	--	--	5/19/2011	
SS-13	Remedial Investigation	--	--	X	--	X	--	--	--	--	5/19/2011	
SS-14	Remedial Investigation	--	--	X	--	X	--	--	--	--	5/19/2011	
SS-15	Remedial Investigation	--	--	X	X	X	X	X	--	--	5/19/2011	
SS-16	Supplemental Remedial Investigation	--	--	X	X	X	--	--	X	X	4/30/2012	
SS-17	Supplemental Remedial Investigation	--	--	X	X	X	--	--	X	X	4/30/2012	
SS-18	Supplemental Remedial Investigation	--	--	X	X	X	--	--	X	X	4/30/2012	
SS-19	Supplemental Remedial Investigation	--	--	X	X	X	--	--	X	X	4/30/2012	
SS-Ditch-1	Remedial Investigation	--	X	X	X	X	--	--	X	X	5/27/2011	
SS-Ditch-2	Remedial Investigation	--	X	X	X	X	--	--	X	X	5/27/2011	
SS-Ditch-3	Supplemental Remedial Investigation	--	X	X	--	X	--	--	X	X	5/7/2012	TOC
SS-CA1	Supplemental IRM	--	X	X	--	X	--	--	--	--	10/13/2015	
SS-CA2	Supplemental IRM	--	X	X	--	X	--	--	--	--	10/13/2015	
SS-CA3	Supplemental IRM	--	X	X	--	X	--	--	--	--	10/13/2015	
SS-CA4	Supplemental IRM	--	X	X	--	X	--	--	--	--	10/13/2015	
Subsurface Soil/Fill (Test Pits)												
TP-2	Remedial Investigation	7-9	X	X	X	X	X	X	X	X	5/9/2011	
TP-3	Remedial Investigation	4-6.5	X	X	--	X	--	--	X	X	5/9/2011	
TP-4	Remedial Investigation	6.5-9	X	X	--	X	--	--	X	X	5/9/2011	
TP-5	Remedial Investigation	8.5-11	X	X	--	X	--	--	X	X	5/10/2011	
TP-7	Remedial Investigation	2.5-4	X	X	--	X	--	--	X	X	5/10/2011	
TP-8	Remedial Investigation	4-6	X	X	--	X	--	--	X	X	5/10/2011	
TP-13	Remedial Investigation	6-8	X	X	--	X	--	--	X	X	5/11/2011	
TP-16	Remedial Investigation	4.5-7	X	X	--	X	--	--	X	X	5/11/2011	
TP-18	Remedial Investigation	6-9.5	X	X	X	X	X	X	X	X	5/12/2011	MS/MSD
TP-20	Remedial Investigation	5-8	X	X	--	X	--	--	X	X	5/12/2011	
TP-21	Remedial Investigation	4-6	X	X	--	X	--	--	X	X	5/12/2011	
TP-22	Remedial Investigation	4-5	X	X	--	X	--	--	X	X	5/13/2011	
TP-25	Remedial Investigation	4-8.5	X	X	X	X	X	X	X	X	5/13/2011	
TP-27	Remedial Investigation	7-10	X	X	--	X	--	--	X	X	5/13/2011	
TP-28	Remedial Investigation	0-2	X	X	--	X	--	--	X	X	5/16/2011	
TP-31	Remedial Investigation	9-11	X	X	--	X	--	--	X	X	5/16/2011	
TP-32	Remedial Investigation	3-7	X	X	--	X	--	--	X	X	5/16/2011	
TP-33	Remedial Investigation	4-9	X	X	--	X	--	--	X	X	5/16/2011	
TP-36	Remedial Investigation	5-7	X	X	--	X	--	--	X	X	5/17/2011	
TP-37	Remedial Investigation	4.5-6.5	X	X	--	X	--	--	X	X	5/17/2011	
TP-39	Remedial Investigation	0-3	X	X	--	X	--	--	X	X	5/17/2011	
TP-41	Remedial Investigation	0-5	X	X	--	X	--	--	X	X	5/17/2011	
TP-42	Remedial Investigation	1.5-4.5	X	X	X	X	X	X	X	X	5/17/2011	
TP-46	Remedial Investigation	5-8.5	X	X	X	X	X	X	X	X	5/18/2011	MS/MSD
TP-48	Remedial Investigation	3-9	X	X	--	X	--	--	X	X	5/18/2011	
TP-59	Supplemental Remedial Investigation	10-12	X	X	--	X	--	--	X	X	4/30/2012	
TP-60	Supplemental Remedial Investigation	8-10	X	X	--	X	--	--	X	X	4/30/2012	
TP-61	Supplemental Remedial Investigation	6-8	X	X	--	X	--	--	X	X	5/2/2012	MS/MSD

TurnKey Environmental Restoration, LLC
Benchmark Environmental Engineering & Science, PLLC

TABLE 1

SAMPLING AND ANALYSIS SUMMARY

251 HOMER STREET REDEVELOPMENT SITE
OLEAN, NEW YORK

Sample Identifier	Data Source	Depth Sampled/ Screened (fbgs)	Analysis								Date Sampled	Comments
			TCL VOCs	TCL SVOCs	PCBs	TAL Metals	Pesticides	Herbicides	GRO	DRO		
TP-A	Supplemental IRM	8	X	X	--	X	--	--	--	--	1/20/2015	Lead
TP-B	Supplemental IRM	7.5	X	X	--	X	--	--	--	--	1/20/2015	Lead
TP-C	Supplemental IRM	7	X	X	--	X	--	--	--	--	1/20/2015	Lead
TP-D	Supplemental IRM	5	X	X	--	X	--	--	--	--	1/20/2015	Lead
TP-E	Supplemental IRM	4.5	X	X	--	X	--	--	--	--	1/20/2015	Lead
TP-F	Supplemental IRM	1-4	X	X	--	X	--	--	--	--	10/13/2015	
TP-I	Supplemental IRM	3-6	X	X	--	X	--	--	--	--	10/13/2015	
TP-RR01	Supplemental IRM	--	X	X	X	X	--	--	--	--	3/27/2015	
Subsurface Soil/Fill (Borings)												
MW-1	Remedial Investigation	6-8	X	X	X	X	--	--	X	X	5/25/2011	
MW-2	Remedial Investigation	4-6	X	X	X	X	--	--	X	X	5/25/2011	
MW-3	Remedial Investigation	4-6	X	X	--	X	--	--	X	X	5/26/2011	
MW-4	Remedial Investigation	4-6	X	X	--	X	--	--	X	X	5/26/2011	
MW-5	Remedial Investigation	4-6	X	X	--	X	--	--	X	X	5/27/2011	
MW-6	Remedial Investigation	2-4	X	X	X	X	X	X	X	X	5/31/2011	
MW-7	Remedial Investigation	4-8	X	X	X	X	X	X	X	X	5/31/2011	
MW-8	Remedial Investigation	2-4	X	X	--	X	--	--	X	X	6/1/2011	
MW-9	Supplemental Remedial Investigation	2-4	X	X	--	X	--	--	X	X	5/10/2012	
MW-10	Supplemental Remedial Investigation	2-4	X	X	--	X	--	--	X	X	5/10/2012	
MW-11	Supplemental Remedial Investigation	4-6	X	X	--	X	--	--	X	X	5/11/2012	
MW-12	Supplemental Remedial Investigation	4-6	X	X	--	X	--	--	X	X	5/11/2012	
MW-13	Supplemental Remedial Investigation	6-8	X	X	--	X	--	--	X	X	5/14/2012	
MW-14	Supplemental Remedial Investigation	6-8	X	X	--	X	--	--	X	X	5/14/2012	
Sediment												
Sed-Up	Remedial Investigation	--	X	X	X	X	--	--	X	X	6/1/2011	MS/MSD
Sed-Down	Remedial Investigation	--	X	X	X	X	--	--	X	X	6/1/2011	
Sed-Mid	Supplemental Remedial Investigation	--	X	X	--	X	--	--	X	X	5/17/2012	TOC
Groundwater												
MW-1	Remedial Investigation	--	X	X	--	X	--	--	X	X	6/6/2011	
MW-1	Supplemental Remedial Investigation	--	X	X	--	--	--	--	X	X	5/22/2012	
MW-2	Remedial Investigation	--	X	X	--	X	--	--	X	X	6/6/2011	
MW-2	Supplemental Remedial Investigation	--	X	X	--	--	--	--	X	X	5/22/2012	
MW-3	Remedial Investigation	--	X	X	--	X	--	--	X	X	6/7/2011	
MW-3	Supplemental Remedial Investigation	--	X	X	--	--	--	--	X	X	5/22/2012	
MW-4	Remedial Investigation	--	X	X	--	X	--	--	X	X	6/6/2011	MS/MSD
MW-4	Supplemental Remedial Investigation	--	X	X	--	--	--	--	X	X	5/21/2012	
MW-5	Remedial Investigation	--	X	X	--	X	--	--	X	X	6/7/2011	
MW-6	Remedial Investigation	--	X	X	--	X	--	--	X	X	6/7/2011	
MW-6	Supplemental Remedial Investigation	--	X	X	--	--	--	--	X	X	5/21/2012	
MW-7	Remedial Investigation	--	X	X	--	X	--	--	X	X	6/7/2011	
MW-7	Supplemental Remedial Investigation	--	X	X	--	--	--	--	X	X	5/21/2012	MS/MSD
MW-8	Remedial Investigation	--	X	X	--	X	--	--	X	X	6/6/2011	
MW-8	Supplemental Remedial Investigation	--	X	X	--	--	--	--	X	X	5/22/2012	
MW-9	Supplemental Remedial Investigation	--	X	X	--	--	--	--	X	X	5/22/2012	
MW-10	Supplemental Remedial Investigation	--	X	X	--	--	--	--	X	X	5/22/2012	
MW-11	Supplemental Remedial Investigation	--	X	X	--	--	--	--	X	X	5/21/2012	
MW-12	Supplemental Remedial Investigation	--	X	X	--	--	--	--	X	X	5/21/2012	
MW-13	Supplemental Remedial Investigation	--	X	X	--	--	--	--	X	X	5/21/2012	
MW-14	Supplemental Remedial Investigation	--	X	X	--	--	--	--	X	X	5/21/2012	
Surface Water												
SW-1	Remedial Investigation	--	X	X	X	X	--	--	X	X	6/3/2011	
SW-2	Remedial Investigation	--	X	X	X	X	--	--	X	X	6/3/2011	
SW-3	Remedial Investigation	--	X	X	X	X	--	--	X	X	6/3/2011	
SW-4	Remedial Investigation	--	X	X	X	X	--	--	X	X	6/3/2011	MS/MSD

TABLE 2

MONITORING WELL CONSTRUCTION DETAILS

251 HOMER STREET REDEVELOPMENT SITE
OLEAN, NEW YORK

Well Identification			Well Elevations						Well Diameter (inches)	Well Screen Data		
Well Number	Well Type	Date Completed	TOR Elevation (fmsl)	Ground Elevation (fmsl)	Stick-up (feet)	Total Depth (fbgs)	Total Depth (fbTOR)	Bottom of Well Elevation (fmsl)		Length of Well Screen (feet)	Screen Interval (fmsl)	Screen Interval (fbTOR)
MW-1	OB	05/25/2011	1426.78	1423.37	3.41	20.00	23.41	1403.37	2	10	1413.37 to 1403.37	13.41 to 23.41
MW-2	*OB*	*05/26/2011*	*1426.01*	*1423.07*	*2.94*	*16.00*	*18.94*	*1407.07*	*2*	*10*	*1417.07 to 1407.07*	*8.94 to 18.94*
MW-3	*OB*	*05/26/2011*	*1425.84*	*1423.15*	*2.69*	*17.00*	*19.69*	*1406.15*	*2*	*10*	*1416.15 to 1406.15*	*9.69 to 19.69*
MW-4	*OB*	*05/26/2011*	*1428.69*	*1425.80*	*2.89*	*22.00*	*24.89*	*1403.80*	*2*	*9*	*1412.80 to 1403.80*	*15.89 to 24.89*
MW-5	*OB*	*05/26/2011*	*1430.09*	*1427.30*	*2.79*	*22.00*	*24.79*	*1405.30*	*2*	*10*	*1415.30 to 1405.30*	*14.79 to 24.79*
MW-6R	OB	05/10/2016	1427.14	1425.00	2.14	19.00	21.14	1406.00	2	10	1416.00 to 1406.00	11.14 to 21.14
MW-7	OB	05/31/2011	1424.42	1421.81	2.61	16.00	18.61	1405.81	2	5	1410.81 to 1405.81	13.61 to 18.61
MW-8R	OB	05/11/2016	1426.74	1424.28	2.46	21.00	23.46	1403.28	2	10	1413.28 to 1403.28	14.46 to 24.46
MW-9	*OB*	*05/10/2012*	*1425.21*	*1423.07*	*2.14*	*18.00*	*20.14*	*1405.07*	*2*	*10*	*1415.07 to 1405.07*	*10.14 to 20.14*
MW-10	OB	05/10/2012	1428.28	1425.58	2.70	18.00	20.70	1407.58	2	10	1417.58 to 1407.58	10.70 to 20.70
MW-11	*OB*	*05/11/2012*	*1430.07*	*1427.72*	*2.35*	*20.00*	*22.35*	*1407.72*	*2*	*10*	*1417.72 to 1407.72*	*12.35 to 22.35*
MW-12R	OB	05/11/2016	1427.76	1425.34	2.42	22.00	24.42	1403.34	2	6	1409.34 to 1403.34	17.42 to 23.42
MW-13	*OB*	*05/14/2012*	*1427.99*	*1425.61*	*2.38*	*18.00*	*20.38*	*1407.61*	*2*	*10*	*1417.61 to 1407.61*	*10.38 to 20.38*
MW-14	OB	05/14/2012	1427.50	1424.89	2.61	20.00	22.61	1404.89	2	10	1414.89 to 1404.89	12.61 to 22.61

Abbreviations:

OB = Indicates a well completed in shallow unconsolidated overburden
DTW = depth to water
fmsl = feet above mean sea level
fbgs = feet below ground surface
fbTOR = feet below top of riser
MW-6R = Replacement well

Notes:

[shaded] = *Well was decommissioned or destroyed during IRM activities*

TurnKey Environmental Restoration, LLC — Benchmark Environmental Engineering & Science, PLLC

TABLE 3A

SUMMARY OF GROUNDWATER ELEVATIONS

251 HOMER STREET REDEVELOPMENT SITE
OLEAN, NEW YORK

Location	Date	TOR Elevation[1] (fmsl)	DTP (if present) (fbTOR)	DTW (fbTOR)	Product Thickness (feet)	Groundwater Elevation (fmsl)	Corrected Groundwater Elevation[2] (fmsl)
MW-1	6/27/2011	1426.78	NP	12.11	NP	1414.67	1414.67
	5/22/2012		NP	13.48	NP	1413.30	1413.30
	2/27/2013		NP	12.37	NP	1414.41	1414.41
MW-2	6/27/2011	1426.01	NP	9.32	NP	1416.69	1416.69
	5/22/2012		NP	9.81	NP	1416.20	1416.20
	2/27/2013		NP	8.71	NP	1417.30	1417.30
MW-3	6/27/2011	1425.84	NP	12.05	NP	1413.79	1413.79
	5/21/2012		NP	13.91	NP	1411.93	1411.93
	2/27/2013		NP	11.21	NP	1414.63	1414.63
MW-4	6/27/2011	1428.69	NP	14.71	NP	1413.98	1413.98
	5/21/2012		NP	16.35	NP	1412.34	1412.34
	2/27/2013		NP	15.09	NP	1413.60	1413.60
MW-5	6/27/2011	1430.09	15.99	16.00	0.01	1414.09	1414.10
	5/21/2012		18.05	21.05	3.00	1409.04	1411.89
	2/27/2013		18.50	21.50	3.00	1408.59	1411.44
MW-6	6/27/2011	1427.91	NP	11.11	NP	1416.80	1416.80
	5/21/2012		12.51	12.52	0.01	1415.39	1415.40
	2/27/2013		NP	11.12	NP	1416.79	1416.79
MW-7	6/27/2011	1424.42	NP	7.99	NP	1416.43	1416.43
	5/21/2012		NP	9.65	NP	1414.77	1414.77
	2/27/2013		NP	8.25	NP	1416.17	1416.17
MW-8	6/27/2011	1429.32	NP	11.10	NP	1418.22	1418.22
	5/22/2012		NP	12.44	NP	1416.88	1416.88
	2/27/2013		NP	10.97	NP	1418.35	1418.35
MW-9	5/22/2012	1425.21	12.44	12.80	0.36	1412.41	1412.75
	2/27/2013		NP	11.54	NP	1413.67	1413.67
MW-10	5/22/2012	1425.88	NP	13.23	NP	1412.65	1412.65
	2/27/2013		NP	11.69	NP	1414.19	1414.19
MW-11	5/21/2012	1430.07	NP	17.85	NP	1412.22	1412.22
	2/27/2013		NP	16.54	NP	1413.53	1413.53
MW-12	5/21/2012	1429.54	NP	17.93	NP	1411.61	1411.61
	2/27/2013		NP	16.53	NP	1413.01	1413.01
MW-13	5/21/2012	1427.99	NP	12.86	NP	1415.13	1415.13
	2/27/2013		NP	11.09	NP	1416.90	1416.90
MW-14	5/21/2012	1427.5	NP	14.05	NP	1413.45	1413.45
	2/27/2013		NP	12.48	NP	1415.02	1415.02

Notes:

1. Wells MW-1 through MW-8 were surveyed on 6/27/11 and wells MW-9 through MW-14 were surveyed on 5/21/12 to 5/22/12
2. Groundwater elevation corrected for product level using assumed specific gravity of 0.95
3. All elevations are feet above mean sea level (fmsl)

fbTOR = Feet below top of riser

DTP = Depth to product

DTW = Depth to water

NP = No measureable product

[shaded cell] = Most recent sampling event, elevations used to generate isopotential map (Figure 4A)

TurnKey Environmental Restoration, LLC
Benchmark Environmental Engineering & Science, PLLC

TABLE 3B

SUMMARY OF GROUNDWATER ELEVATIONS

251 HOMER STREET REDEVELOPMENT SITE
OLEAN, NEW YORK

Location	Date	TOR Elevation[1] (fmsl)	DTP (if present) (fbTOR)	DTW (fbTOR)	Product Thickness (feet)	Groundwater Elevation (fmsl)	Corrected Groundwater Elevation[2] (fmsl)
MW-1	6/27/2011	1426.78	NP	12.11	NP	1414.67	1414.67
	5/22/2012		NP	13.48	NP	1413.30	1413.30
	2/27/2013		NP	12.37	NP	1414.41	1414.41
	5/16/2016		NP	12.75	NP	1414.03	1414.03
MW-6R	5/16/2016	1427.14	NP	12.67	NP	1414.47	1414.47
MW-7	6/27/2011	1424.42	NP	7.99	NP	1416.43	1416.43
	5/21/2012		NP	9.65	NP	1414.77	1414.77
	2/27/2013		NP	8.25	NP	1416.17	1416.17
	5/16/2016		NP	8.55	NP	1415.87	1415.87
MW-8R	5/16/2016	1426.74	NP	9.97	NP	1416.77	1416.77
MW-10	5/22/2012	1425.88	NP	13.23	NP	1412.65	1412.65
	2/27/2013		NP	11.69	NP	1414.19	1414.19
	5/16/2016	1428.28	NP	14.19	NP	1411.69	1411.69
MW-12R	5/16/2016	1427.76	NP	14.84	NP	1412.92	1412.92
MW-14	5/21/2012	1427.50	NP	14.05	NP	1413.45	1413.45
	2/27/2013		NP	12.48	NP	1415.02	1415.02
	5/16/2016		NP	12.17	NP	1415.33	1415.33

Notes:

1. Wells were surveyed 5/19/16
2. Groundwater elevation corrected for product level using assumed specific gravity of 0.95
3. All elevations are feet above mean sea level (fmsl)

fbTOR = Feet below top of riser

DTP = Depth to product

DTW = Depth to water

NP = No measureable product

= Most recent sampling event, elevations used to generate isopotential map (Figure 4B)

TABLE 4

SUMMARY OF SURFACE SOIL/FILL ANALYTICAL DATA

251 HOMER STREET REDEVELOPMENT SITE
OLEAN, NEW YORK

Parameter [1]	Unrestricted SCOs[2] (mg/kg)	Commercial SCOs[2] (mg/kg)	SAMPLE LOCATION																				
			Remedial Investigation Samples (2011)																	Supplemental Remedial Investigation Samples (2012)				
			SS-1	SS-2	SS-3	SS-4	SS-5	SS-6	SS-7	SS-8	SS-9	SS-10	SS-11	SS-12	SS-13	SS-14	SS-15	SS-Ditch-2	SS-Ditch-1	SS-16	SS-17	SS-18	SS-19	SS-Ditch-3[4]
			5/18/2011	5/18/2011	5/18/2011	5/18/2011	5/18/2011	5/18/2011	5/18/2011	5/18/2011	5/18/2011	5/18/2011	5/18/2011	5/18/2011	5/18/2011	5/18/2011	5/18/2011	5/18/2011	5/18/2011	4/30/2012	4/30/2012	4/30/2012	4/30/2012	4/30/2012
TCL Semi-Volatile Organic Compounds (SVOCs) - mg/kg [3]																								
Acenaphthene	20	500	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.015 J	ND
Acenapthylene	100	500	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.015	ND	ND	ND	ND	ND
Anthracene	100	500	0.045 J	ND	ND	ND	ND	ND	ND	ND	0.0072	0.098	0.027	0.055 DJ	ND	0.072 DJ	ND	0.045 J	ND	ND	ND	0.26 J	0.035 J	ND
Benzo(a)anthracene	1	5.6	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.77 J	0.15 J	0.025 J	0.041 J	**1.4 J**	0.095 J	ND
Benzo(b)fluoranthene	1	5.6	0.23 J	ND	ND	ND	0.012 DJ	ND	0.43 DJ	ND	0.058 DJ	0.12 DJ	0.1 DJ	0.16 DJ	ND	0.14 DJ	ND	**1.3 J**	0.23 J	0.052 J	0.057 J	**1.7 J**	0.14 J	ND
Benzo(k)fluoranthene	0.8	56	0.14 J	ND	ND	ND	ND	ND	ND	ND	ND	0.046 DJ	0.047 DJ	0.049 DJ	ND	0.056 DJ	ND	**0.83 J**	0.11 J	0.029 J	0.043 J	**0.83 J**	0.065 J	ND
Benzo(g,h,i)perylene	100	500	0.22 J	1.1 DJ	ND	2.1 DJ	ND	ND	0.59 DJ	ND	0.066 DJ	0.061 DJ	0.07 DJ	0.19 DJ	1.8 DJ	0.35 DJ	7 DJ	1.4 J	0.14 J	ND	ND	ND	ND	ND
Benzo(a)pyrene	1	1	0.19 J	ND	ND	ND	0.011 DJ	ND	0.6 DJ	ND	0.055 DJ	0.097 DJ	0.093 DJ	0.16 DJ	**1.1 DJ**	0.19 DJ	**1.6 DJ**	0.89 J	0.16 J	0.031 J	0.05 J	**1.2 J**	0.1 J	ND
Bis (2-ethylhexyl) phthalate	--	--	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.12 J	ND	ND	ND	ND
Carbozole	--	--	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.049 DJ	0.0091 DJ	ND	ND	ND	ND	ND	0.027 J	ND	ND	ND	ND	ND
Chrysene	1	56	0.29 J	0.43 DJ	0.0076 J	0.93 DJ	0.012 DJ	ND	ND	ND	0.06 DJ	0.12 DJ	0.1 DJ	0.17 DJ	0.88 DJ	0.22 DJ	ND	0.83 J	0.19 J	0.043 J	0.04 J	**1.2 J**	0.11 J	ND
Dibenzofuran	7	350	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.04 DJ	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Dibenz(a,h)anthracene	0.33	0.56	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**2.9 DJ**	ND	ND	ND	ND	ND	ND	ND
Fluoranthene	100	500	0.37 J	ND	ND	1.7 DJ	0.02 DJ	ND	ND	ND	0.08 DJ	0.28 D	0.19 DJ	0.25 DJ	ND	0.19 DJ	ND	1.1 J	0.33 J	0.065 J	0.072 J	2.5 J	0.19 J	ND
Fluorene	30	500	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.05	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Indeno(1,2,3-cd)pyrene	0.5	5.6	0.11 J	ND	ND	ND	0.0067 DJ	ND	0.27 DJ	ND	0.03 DJ	0.047 DJ	0.047 DJ	0.079 DJ	0.41 DJ	0.1 DJ	**2.7 DJ**	**0.86 J**	0.12 J	0.022 J	0.03 J	0.39 J	0.032 J	ND
4-Methylphenol	--	--	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	3.4 J	0.71	ND	ND	ND	ND	ND
2-Methylnaphthalene	--	--	0.23 J	1 DJ	ND	ND	ND	ND	ND	ND	0.0059 DJ	0.019 DJ	0.012 DJ	0.17 DJ	3 DJ	0.48 DJ	0.55 DJ	ND	ND	ND	ND	ND	0.026 J	ND
Naphthalene	12	500	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.024	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.025 J	ND
Phenanthrene	100	500	0.4 J	0.86 DJ	0.0094 J	2 DJ	0.011 DJ	ND	ND	ND	0.051 DJ	0.35 D	0.11 DJ	0.28 DJ	3.6 DJ	0.63 DJ	1.1 DJ	0.47 J	0.15 J	ND	0.027 J	1.4 J	0.14 J	ND
Phenol	0.33	500	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.046 J	ND	ND	ND	ND	ND
Pyrene	100	500	0.43 J	ND	ND	1.8 DJ	ND	ND	1.2 DJ	0.19 DJ	0.079 DJ	0.22 DJ	0.17 DJ	0.28 DJ	2.2 DJ	0.45 DJ	ND	1 J	0.27 J	0.05 J	0.059 J	2 J	0.15 J	ND
TAL Metals - mg/kg																								
Aluminum	--	--	13400	15500	15500	10100	15600	14400	23800	17300	16000	14400	16300	13200	12500	13300	12300	22400 J	11800	15200 J	15300 J	8230 J	15200 J	22400 J
Arsenic	13	16	**14.8**	**16**	**16.5**	**27**	**15.9**	**20**	**42.1**	**19.5**	**15.1**	**13.3**	**17.9**	**16.1**	**30.3**	**20.2**	**19.9**	**22.5**	9.5	**39.6**	**13.3**	9.1	**23.5**	**18.6 J**
Barium	350	400	139	145	218	135	103	180	144	200	105	162	111	97	168	134	159	253	119	215 J	100 J	80.6 J	183 J	292 J
Beryllium	7.2	590	0.73	0.77	0.88	0.7	0.88	0.83	1.1	1	0.91	0.79	0.95	0.82	0.79	0.81	0.68	1.3	0.59	0.88	0.9	0.37	0.92	1.1 J
Cadmium	2.5	9.3	0.34	ND	ND	0.69	ND	ND	0.95	ND	ND	ND	ND	0.3	0.33	0.32	0.24	1	ND	ND	0.43	0.27	0.42	ND
Calcium	--	--	3860	3360	2420	7970	1860	3620	10100	2480	2650	2320	2520	3880	3400	4070	1120	5110 J	1690	2870 J	4490 J	20600 J	2540 J	4490 J
Chromium	1	400	**19.2 J**	**19.5 J**	**18.2 J**	**16.8 J**	**18.2 J**	**22.1 J**	**199 J**	**22 J**	**19 J**	**17.3 J**	**20.1 J**	**17.1 J**	**16.4 J**	**17.9 J**	**14.7 J**	**28.1 J**	**14.1**	**19.4 J**	**19.1 J**	**11.4 J**	**20.6 J**	**27.6 J**
Cobalt	--	--	10.4	12	15.7	7.3	16	15.6	7.8	16.7	14.7	10.7	17.2	13.3	11	14.1	9.1	20	10.4	14.1 J	14.5 J	7.6 J	18.4 J	17.3 J
Copper	50	270	43.2 J	33.9 J	23.2 J	**64.2 J**	21.2 J	49.6 J	**217 J**	33.3 J	29.6 J	26.1 J	32.4 J	**53.9 J**	**51.7 J**	50 J	**50.4 J**	**66.5 J**	17.8	24.6 J	24.8 J	18.1 J	34.1 J	**54.3 J**
Iron	--	--	27000 J	26600 J	31900 J	20000 J	34300 J	31700 J	27500 J	35400 J	29100 J	27100 J	36400 J	28800 J	26500 J	30000 J	28000 J	46200	23200	31700 J	33200 J	17900 J	37800 J	42000 J
Lead	63	1,000	**135**	**129**	45.8	**338**	20	**635**	**852**	**96.3**	59.4	37.6	45.9	**121**	**319**	**148**	**155**	**96.7 J**	20.6	**90.8 J**	25.8 J	20.3 J	58.4 J	61.7 J
Magnesium	--	--	3250	5220	4490	5190	5130	3850	18600	5380	4250	4090	5770	5010	3460	4340	2640	5750 J	3110	4310 J	4900 J	4640 J	5040 J	5400 J
Manganese	1,600	10,000	826	620	888	467	812	1020	358	846	451	484	806	727	581	783	211	1400 J	824	576 J	668 J	733 J	1300 J	799 J
Nickel	30	310	21.6	24.6	29.8	20.9	**31.4**	28.6	22.7	**33.1**	26.8	25.4	**34.6**	28.6	27.4	28.6	22.3	**40.5 J**	20.5	28	**30.7**	15.4	**33**	**36.7 J**
Potassium	--	--	1610	2110	2320	1240	2330	2030	3100	2540	2220	1970	2730	1970	1960	1900	1310	2710 J	1290 J	1860 J	2220 J	803 J	1930 J	3270 J
Sodium	--	--	ND	ND	ND	ND	ND	ND	875	ND	512	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Vanadium	--	--	20.2	22.5	21.2	21.3	20.7	20.3	49.5	25.1	24.1	21.1	22.2	19.4	21.8	19.9	20.3	35.2	16.9	23 J	20.5 J	12.9 J	22.4 J	31.7
Zinc	109	10,000	88.9 J	72.3 J	72.4 J	85.3 J	76 J	83.3 J	**178 J**	92.6 J	95.1	73	94.1	86.9	97.6	96.6	75.6	**236**	78.7	87.5 J	93.5 J	68.6 J	90.8 J	**243**
Mercury	0.18	2.8	0.11	**0.76**	0.055	**0.73**	ND	0.16	**1.2**	0.08	0.076	0.051	0.081	0.12	0.12	0.11	0.085	**0.2**	0.044	0.033	ND	ND	0.12	**0.62 J**

Notes:

1. Only those parameters detected at a minimum of one sample location are presented in this table; all other compounds were reported as non-detect.
2. Values per NYSDEC Part 375 Soil Cleanup Objectives (SCOs).
3. Sample results were reported by the laboratory in micrograms per kilogram (ug/kg) and converted to milligram per kilogram (mg/kg) for comparison to SCOs.
4. As discussed in Section 4.9 of the Report, analytical results for this sample may have a high bias by unknown factors, the degree of which may exceed upwards of one order of magnitude.

Definitions:

mg/kg = milligrams per kilogram
ug/kg = micrograms per kilogram
ND = Parameter not detected above laboratory detection limit.
NA = Sample not analyzed for parameter.
"--" = No SCO available.
J = Estimated value; result is less than the sample quantitation limit but greater than zero.
D = All compounds were identified in an analyisis at the secondary dilution factor.

Bold = Result exceeds Unrestricted SCOs
Bold = Result exceeds Commercial SCOs

TABLE 5

SUMMARY OF SUBSURFACE SOIL/FILL ANALYTICAL DATA

251 HOMER STREET REDEVELOPMENT SITE
OLEAN, NEW YORK

Parameter [1]	Unrestricted SCOs[2] (mg/kg)	Commercial SCOs[2] (mg/kg)	SAMPLE LOCATION																					
			Historic Samples [4]		Remedial Investigation Samples (2011)																			
			TP-1 (2-4)	TP-3 (4-6)	TP-2 (7-9)	TP-3 (4-6.5)	TP-4 (6.5-9.0)	TP-5 (8.5-11)	TP-7 (2.5-4.0)	TP-8 (4-6)	TP-13 (6-8)	TP-16 (4.5-7.0)	TP-18 (6-9.5)	TP-20 (5-8)	TP-21 (4-6)	TP-22 (4-5)	TP-25 (4-8.5)	TP-27 (7-10)	TP-28 (0-2)	TP-31 (9-11)	TP-32 (3-7)	TP-33 (4-9)	TP-36 (5-7)	TP-37 (4.5-6.5)
			(November 2009)		5/9/11	5/9/11	5/9/11	5/10/11	5/10/11	5/10/11	5/11/11	5/11/11	5/12/11	5/12/11	5/12/11	5/13/11	5/13/11	5/13/11	5/16/11	5/16/11	5/16/11	5/16/11	5/17/11	5/17/11
TCL Volatile Organic Compounds (VOCs) - mg/kg[3]																								
1,2-Dibromo-3-Chloropropane	--	--	NA	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dichlorobenzene	**1.1**	**500**	NA	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-Butanone (MEK)	**0.12**	**500**	NA	NA	ND	ND	0.0099 J	0.036 J	0.032 J	0.0053 J	ND	ND	ND	ND	ND	ND	**0.16 J**	ND	ND	ND	ND	ND	ND	ND
4-Methyl-2-pentanone (MIBK)	--	--	NA	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Acetone	**0.05**	**500**	NA	NA	ND	ND	**0.12**	**0.21**	**0.15**	**0.061**	ND	ND	ND	ND	ND	ND	**0.76**	**0.25 J**	ND	ND	ND	ND	ND	ND
Benzene	**0.06**	**44**	NA	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**0.44 NJ**	**0.68 NJ**	ND	0.023 J	ND	ND	**0.4 NJ**	ND	**0.21 NJ**	ND
Carbon disulfide	--	--	NA	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.11 J	0.1 J	ND	ND	ND	ND
Chlorobenzene	**1**	**500**	NA	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Cyclohexane	--	--	NA	NA	10	12 NJ	ND	0.12	ND	0.04 NJ	ND	ND	ND	0.7	5.9	9.2	ND	0.42 NJ	0.93	ND	3.3	ND	2.4 NJ	1.0
Ethylbenzene	**1**	**390**	NA	NA	ND	ND	ND	ND	ND	ND	ND	0.11 J	ND	0.18	**2.0**	**3.0**	ND	0.12	0.25	ND	**1.2 J**	ND	0.17	0.13 J
2-Hexanone	--	--	NA	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	7.0	ND	ND	ND	ND	ND	ND	ND	ND	ND
Isopropylbenzene (Cumene)	--	--	NA	NA	ND	0.12	ND	0 NJ	ND	0.01 NJ	1.3 NJ	ND	ND	0.09 NJ	1 NJ	1.4 NJ	ND	0.05 NJ	0.23 NJ	ND	0.74 NJ	ND	0.43 NJ	ND
Methyl Acetate	--	--	NA	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.83	ND	ND	ND	ND	ND
Methylcyclohexane	--	--	NA	NA	38	49	0.0049 J	0.49	0.0034 J	0.26	94	3.2	3.8	2.2	18	27	0.13	0.96	4.0	ND	11.0	1.7	3.8	1.6
Methylene chloride	**0.05**	**500**	NA	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
tert-Butylbenzene		**500**	NA	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**2.6**	ND	ND	ND	ND	ND	ND	ND	ND
Toluene	**0.7**	**500**	NA	NA	ND	ND	ND	ND	0.0008 J	ND	ND	ND	ND	ND	**0.72 NJ**	**2.6**	ND	ND	ND	ND	**2.6**	ND	ND	0.33
Xylenes, Total	**0.26**	**500**	NA	NA	ND	ND	ND	ND	ND	0 NJ	**2.2 NJ**	0.19 NJ	ND	**1.0**	**11 NJ**	**28**	0.13	**1.3**	**1.5**	ND	**16.0**	0.13 J	**1.1**	ND
Gasoline Range Organics [C6-C10]	--	--	NA	NA	*550*	*460*	*1 J*	*510*	*5.7*	*200*	*940*	*62*	*130*	*210*	*620*	*490*	*43*	*250*	*190*	*50*	*360*	*44*	*170*	*62*
TCL Semi-Volatile Organic Compounds (SVOCs) - mg/kg[3]																								
2-Methylnaphthalene	--	--	NA	NA	4.7 J	ND	ND	0.18 J	4.6 J	5	3.5	ND	ND	28 J	40	ND	1.7 J	1.4 J	ND	ND	230	ND	0.5 NJ	ND
Acenaphthene	**20**	**500**	NA	NA	11	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.0092 J	0.77 NJ	ND	ND	ND	ND	ND	0.67 J	ND
Acetophenone	--	--	--	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Anthracene	**100**	**500**	NA	NA	30	ND	ND	ND	ND	0.46 J	ND	ND	ND	ND	ND	ND	ND	ND	4 J	ND	ND	0.95 J	1 J	ND
Benzo(a)anthracene	**1**	**5.6**	NA	NA	**30**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**13**	ND
Benzo(a)pyrene	**1**	**1**	NA	NA	**23**	ND	0.012 J	ND	ND	0.13 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.064 J	ND	**1.7 J**	**17**	**1.6 J**
Benzo(b)fluoranthene	**1**	**5.6**	NA	NA	**23**	ND	0.018 J	ND	**8.6 J**	ND	ND	**13 J**	0.27 J	ND	ND	0.056 J	**4.1 J**	ND	ND	0.045 J	ND	**1.8 J**	**7.5 J**	ND
Benzo(g,h,i)perylene	**100**	**500**	NA	NA	4.9 J	ND	ND	ND	ND	0.39 J	ND	ND	ND	ND	ND	ND	ND	ND	3.9 J	0.07 J	ND	2 J	12	1.6 J
Benzo(k)fluoranthene	**0.8**	**56**	NA	NA	**14**	ND	0.03 NJ	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.0054 J	ND		**1.4 J**	ND
Biphenyl	--	--	NA	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	4.6 J	ND	ND	ND	3.2 J	ND	21 J	ND	ND	ND
Bis(2-ethylhexyl) phthalate	--	--	NA	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Cabazole	--	--	NA	NA	9.4 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chrysene	**1**	**56**	NA	NA	**27**	ND	0.02 NJ	ND	ND	0.42 J	ND	ND	ND	ND	ND	ND	**1.3 J**	ND	ND	0.13 J	ND	**2.6 J**	**13**	**1.3 J**
Dibenz(a,h)anthracene	**0.33**	**0.56**	NA	NA	**4 J**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.023 J	ND	ND	**7.4 J**	**1 J**
Dibenzofuran	**7**	**350**	NA	NA	**8.8 J**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Fluoranthene	**100**	**500**	NA	NA	69	ND	0.018 J	0.028 J	ND	0.043 J	ND	ND	ND	ND	ND	ND	1.2 J	ND	4.9 J	0.15 J	ND	3.2 J	2 J	ND
Fluorene	**30**	**500**	NA	NA	16	ND	ND	ND	ND	0.42 NJ	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Indeno(1,2,3-cd)pyrene	**0.5**	**5.6**	NA	NA	**11**	ND	0.01 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.034 J	ND	**1.1 J**	**5.2 J**	**0.58 J**
Isophorone	--	--	NA	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
N-Nitrosodi-n-propylamine	--	--	NA	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Naphthalene	**12**	**500**	NA	NA	6.7 J	ND	ND	ND	ND	0.39 J	0.76 NJ	ND	ND	ND	ND	0.099 J	ND	ND	ND	ND	ND	ND	0.4 J	ND
Phenanthrene	**100**	**500**	NA	NA	90	ND	ND	ND	ND	5.1	0.32 J	ND	ND	ND	18 J	ND	11	0.2 J	ND	ND	62	2.8 J	2.7 J	0.91 J
Pyrene	**100**	**500**	NA	NA	48	ND	0.018 J	0.018 J	ND	2.4	ND	ND	ND	ND	2 J	ND	8.4 J	ND	22 J	0.31	ND	4.8 J	6.2 J	0.9 J
TOTAL SVOCs			*0*	*0*	*431*	*0*	*0*	*0*	*13*	*15*	*5*	*13*	*0*	*28*	*65*	*0*	*28*	*2*	*38*	*1*	*313*	*21*	*90*	*8*
Diesel Range Organics [C10-C28]	--	--	*50,000*	*46,000*	*3,900*	*370*	*75*	*380*	*5,100*	*2,800*	*12,000*	*1,300*	*1,200*	*42,000*	*34,000*	*5,700*	*8,900*	*2,600*	*22,000*	*3,300*	*250,000*	*7,900*	*9,900*	*5,500*
TAL Metals - mg/kg																								
Aluminum	--	--	NA	NA	10800 J	7160 J	20200 J	20400 J	5690 J	9980 J	14600 J	12200 J	12300 J	10700 J	12800 J	6610 J	16800 J	13100 J	13800 J	16100 J	413 J	20600 J	11900 J	6370 J
Arsenic	**13**	**16**	NA	NA	**24.1**	8.9	8.7	2.7	**15.3**	11.3	6.1	**24.7**	4.4	**15.5**	**15.8**	**15.9**	**47.9**	11.5	**17.8**	6.3	ND	**17.9**	**55.7**	**17**
Barium	**350**	**400**	NA	NA	118 J	58 J	218 J	314 J	79.4 J	113 J	72.9 J	89.6 J	56 J	113 J	182 J	93.4 J	**1030 J**	178 J	168 J	55.1 J	2.4 J	71.1 J	126 J	111 J
Beryllium	**7.2**	**590**	NA	NA	0.63	0.44	1.0	0.71	0.45	0.6	0.72	0.83	0.56	0.68	0.76	0.39	0.71	0.69	0.76	0.66	ND	1.1	1.1	0.68
Cadmium	**2.5**	**9.3**	NA	NA	0.37	ND	ND	ND	0.47	ND	ND	0.68	ND	0.26	ND	0.31	1.1	ND	0.51	ND	ND	0.87	0.32	ND
Calcium	--	--	NA	NA	53300 J	810 J	3040 J	2330 J	2790 J	1170 J	1130 J	20600 J	442 J	8010 J	12100 J	70700 J	32300 J	1950 J	6180 J	1480 J	189000 J	19100 J	8930 J	1700 J
Chromium	**1**	**400**	NA	NA	**13.0**	**8.6**	**22.3**	**22.1**	**8.0**	**12.8**	**14.1**	**27.5**	**13.8**	**18.0**	**21.7**	**38.3**	**54.1**	**16.6**	**20.7**	**15.3**	**4.4**	**51.5**	**11.4**	**6.8**
Cobalt	--	--	NA	NA	10.7 J	7.9 J	7.5 J	6 J	5 J	12.7 J	10.6 J	5.9 J	11.3 J	14 J	14.2 J	6.9 J	5.8 J	12 J	12.2 J	7.7 J	ND	6.2 J	7.5 J	5.6 J
Copper	**50**	**270**	NA	NA	37.7 J	14.7 J	9.6 J	14.6 J	32.7 J	20.9 J	12.8 J	46.5 J	11.6 J	**69.9 J**	36.6 J	**111 J**	**208 J**	27.8 J	**390 J**	14.6 J	10.4 J	30.8 J	**103 J**	32.9 J
Iron	--	--	NA	NA	38100 J	14800 J	31800 J	14700 J	11600 J	24700 J	20900 J	23200 J	19800 J	58700 J	31100 J	15800 J	27100 J	28900 J	27700 J	24700 J	1180 J	16800 J	36600 J	13900 J
Lead	**63**	**1000**	**7800**	**7300**	**1240 J**	18.1 J	20.3 J	20.6 J	**90.6 J**	17 J	13.3 J	**363 J**	13.4 J	**245 J**	**752 J**	**5150 J**	**1190 J**	61 J	**834 J**	14.8 J	**1330 J**	**386 J**	**191 J**	11.7 J
Magnesium	--	--	NA	NA	4130 J	1850 J	3510 J	2820 J	1540 J	3130 J	2430 J	9830 J	3060 J	4770 J	4420 J	3220 J	11100 J	3710 J	4900 J	2590 J	2040 J	22700 J	2000 J	720 J
Manganese	**1,600**	**10,000**	NA	NA	**2010 J**	386 J	448 J	331 J	168 J	922 J	295 J	326 J	251 J	826 J	621 J	383 J	394 J	792 J	640 J	275 J	16.6 J	291 J	570 J	57.9 J
Nickel	**30**	**310**	NA	NA	17 J	14.5 J	20.8 J	17.4 J	13.7 J	24 J	16 J	16 J	18.1 J	29.6 J	26.9 J	14.2 J	20.8 J	24.1 J	24.7 J	14.9 J	ND	16.8 J	**36.5 J**	13.4 J
Potassium	--	--	NA	NA	926 J	795 J	1380 J	1490 J	508 J	1060 J	590 J	1340 J	856 J	1690 J	1610 J	1110 J	1670 J	1270 J	1550 J	747 J	ND	2700 J	1190 J	692 J
Sodium	--	--	NA	NA	ND	ND	ND	ND	ND	ND	ND	328	ND	ND	ND	ND	596	ND	ND	322	ND	488	233	ND
Vanadium	--	--	NA	NA	17.8 J	9.1 J	24 J	16.6 J	12.4 J	15.2 J	16.6 J	30.3 J	15.6 J	16.7 J	17.7 J	10.9 J	34 J	18.7 J	22.4 J	20.4 J	3.2 J	50.5 J	26.5 J	18.8 J
Zinc	**109**	**10,000**	NA	NA	77.9 J	43.7 J	73.6 J	68.2 J	70.3 J	57.3 J	55.5 J	**121 J**	60.1 J	81.3 J	76.6 J	78.4 J	**504 J**	70.5 J	**157 J**	57.9 J	14.5 J	75.8 J	60.4 J	18.3 J
Mercury	**0.18**	**2.8**	NA	NA	0.08	ND	0.051	0.076	**0.23**	ND	0.058	**0.74**	0.025	**0.41**	**0.19**	**0.4**	**4.4**	0.042	**0.89**	0.031	0.044	0.14	0.048	0.053
Organochlorine Pesticides mg/kg[3]																								
4,4'-DDD	**0.0033**	**92**	NA	NA	ND	NA	NA	NA	NA	NA	NA	NA	ND	NA	NA	NA	**0.16 J**	NA	NA	NA	NA	NA	NA	NA
4,4'-DDE	**0.0033**	**62**	NA	NA	**0.034 J**	NA	NA	NA	NA	NA	NA	NA	ND	NA	NA	NA	**0.07 NJ**	NA	NA	NA	NA	NA	NA	NA
4,4'-DDT	**0.0033**	**47**	NA	NA	ND	NA	NA	NA	NA	NA	NA	NA	ND	NA	NA	NA	**0.1 J**	NA	NA	NA	NA	NA	NA	NA
alpha-BHC	**0.02**	**3.4**	NA	NA	ND	NA	NA	NA	NA	NA	NA	NA	ND	NA	NA	NA	**0.2 J**	NA	NA	NA	NA	NA	NA	NA

Notes:
1. Only those parameters detected at a minimum of one sample location are presented in this table; all other compounds were reported as non-detect.
2. Values per NYSDEC Part 375 Soil Cleanup Objectives (SCOs).
3. Sample results were reported by the laboratory in micograms per kilogram (ug/kg) and converted to milligram per kilogram (mg/kg) for comparison to SCOs.
4. Results per GZA GeoEnvironmental's Prelimanry Investigation and Sampling report, November 2009.

Definitions:

mg/kg = milligrams per kilogram
ND = Parameter not detected above laboratory detection limit.
NA = Sample not analyzed for parameter.
"--" = No SCO available.
J = Estimated value; result is less than the sample quantitation limit but greater than zero.
B = Analyte was detected in the associated blank as well as in the sample.
N = Presumptive evidence of analyte; result should be used with caution as a potential false positive and/or elevated quantitative value.
* = LCS or LCSD exceeds the control limits.

Bold = Result exceeds Unrestricted SCOs
Bold = Result exceeds Commercial SCOs

TABLE 5

SUMMARY OF SUBSURFACE SOIL/FILL ANALYTICAL DATA

251 HOMER STREET REDEVELOPMENT SITE
OLEAN, NEW YORK

Parameter [1]	Unrestricted SCOs[2] (mg/kg)	Commercial SCOs[2] (mg/kg)	SAMPLE LOCATION																					
			Remedial Investigation Samples (2011)													Supplemental RI (2012)								
			TP-39 (0-3)	TP-41 (0-5)	TP-42 (1.5-4.5)	TP-46 (5-5.5)	TP-48 (3-9)	MW-1 (6-8)	MW-2 (4-6)	MW-3 (4-6)	MW-4 (4-6)	MW-5 (4-6)	MW-6 (4-8)	MW-7 (2-4)	MW-8 (4-6)	MW-9 (2-4)	MW-10 (2-4)	MW-11 (4-6)	MW-12 (4-6)	MW-13 (6-8)	MW-14 (6-8)	TP-59 (10-12)	TP-60 (8-10)	TP-61 (6-8)
			5/17/11	5/17/11	5/17/11	5/18/11	5/18/11	5/25/11	5/25/11	5/26/11	5/26/11	5/27/11	5/31/11	5/31/11	6/1/11	5/10/12	5/10/12	5/11/12	5/11/12	5/14/12	5/14/12	4/30/12	4/30/12	5/2/12
TCL Volatile Organic Compounds (VOCs) - mg/kg [3]																								
1,2-Dibromo-3-Chloropropane	--	--	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dichlorobenzene	**1.1**	**500**	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.025 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-Butanone (MEK)	**0.12**	**500**	ND	ND	ND	ND	ND	ND	ND	0.011 J	0.019 J	0.033 J	ND	ND	0.12 J	ND	ND	0.049	ND	**0.24**	0.076	ND	ND	ND
4-Methyl-2-pentanone (MIBK)	--	--	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.01 J	ND	ND	0.0034 J	ND	ND	ND	ND
Acetone	**0.05**	**500**	ND	ND	ND	ND	ND	**0.11 J**	0.0056 J	**0.051**	**0.092**	**1.2 B**	ND	ND	**0.36**	ND	**0.06**	**0.25**	**0.23**	**0.71**	**0.33**	0.025 J	0.018 J	**0.08**
Benzene	**0.06**	**44**	ND	ND	ND	**1 NJ**	ND	ND	ND	ND	ND	**0.1**	ND	ND	**0.065**	ND	ND	ND	ND	ND	0.0051 J	ND	ND	ND
Carbon disulfide	--	--	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.0032 J	0.0071 J	ND	ND	ND	ND	ND
Chlorobenzene	**1**	**500**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Cyclohexane	--	--	3.6	8	ND	21	3.5	5.8	ND	ND	ND	11	ND	ND	0.43	ND	ND	ND	0.14	0.0059 J	0.088	ND	ND	ND
Ethylbenzene	**1**	**390**	**1.1**	0.22 J	ND	**4.3**	**1.2**	ND	0.001 J	ND	0.0025 J	**5.6 J**	ND	ND	0.13 NJ	ND	ND	ND	ND	0.001 J	0.012	ND	ND	ND
2-Hexanone	--	--	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.016 J	ND	ND	ND	ND
Isopropylbenzene (Cumene)	--	--	0.57 NJ	0.53	ND	1.8 NJ	0.86 NJ	ND	ND	ND	0.0072	3.1	ND	ND	0.069	0.0012 J	ND	ND	ND	ND	0.01 NJ	ND	ND	ND
Methyl Acetate	--	--	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Methylcyclohexane	--	--	11	23	0.18	51	16	29	0.0022 J	ND	0.024	66	ND	ND	1.6	0.023	ND	ND	0.037	ND	0.19	ND	ND	ND
Methylene chloride	**0.05**	**500**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.0025 J	0.0029 J	ND
tert-Butylbenzene		**500**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND				ND
Toluene	**0.7**	**500**	0.57	0.36	ND	**5.9**	ND	ND	ND	ND	ND	0.15 B	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Xylenes, Total	**0.26**	**500**	**5.2 NJ**	**1.8**	0.16 J	**36 J**	**4.1**	0.0055 J	0.0033 J	0.0028 J	0.0025 J	**29**	ND	ND	**0.68 NJ**	ND	ND	ND	ND	0 NJ	0.09 NJ	ND	ND	ND
Gasoline Range Organics [C6-C10]	--	--	*97*	*170*	*17*	*270*	*59*	*190 B*	*ND*	*2.1 B*	*190 B*	*380 B*	*130 B*	*3.1 B*	*200 B*	*5.2*	ND	*30 B*	*19 J*	*12 B*	*180 B*	ND	0.39 BJ	ND
TCL Semi-Volatile Organic Compounds (SVOCs) - mg/kg [3]																								
2-Methylnaphthalene	--	--	2.4 NJ	ND	0.21 NJ	21 J	ND	ND	ND	0.058 J	ND	ND	ND	ND	22 NJ	ND	ND	ND	ND	ND	30 J	ND	ND	ND
Acenaphthene	**20**	**500**	ND	ND	ND	ND	ND	ND	ND	0.034 J	ND	3.4 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Acetophenone	--	--	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Anthracene	**100**	**500**	ND	ND	ND	ND	ND	ND	ND	ND	ND	6.9 J	ND	ND	ND	ND	0.94 J	0.75 J	ND	ND	ND	ND	ND	ND
Benzo(a)anthracene	**1**	**5.6**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**10 J**	ND	ND	ND
Benzo(a)pyrene	**1**	**1**	**19 J**	**2.3 J**	**1.2 J**	**16 J**	**10 J**	ND	ND	ND	ND	**2.6 J**	0.82 J	0.83 J	ND	ND	0.71 J*	ND	ND	ND	ND	ND	ND	ND
Benzo(b)fluoranthene	**1**	**5.6**	ND	ND	ND	**6.1 J**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.77 J	ND	ND	ND	ND	ND	ND	ND
Benzo(g,h,i)perylene	**100**	**500**	30 J	4.9 J	2.2 J	28 J	ND	ND	ND	0.31 J	0.31 J	3.7 J	1.1 J	2.5	ND	ND	0.87 J*	0.88 J	ND	ND	ND	ND	ND	ND
Benzo(k)fluoranthene	**0.8**	**56**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Biphenyl	--	--	ND	ND	ND	ND	ND	ND	ND	ND	ND	2.8 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Bis(2-ethylhexyl) phthalate	--	--	ND	ND	ND	ND	ND	0.28	0.07 J	0.7 J	ND	ND	1.4 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Cabazole	--	--	ND	ND	ND	ND	ND	ND	ND	0.02 NJ	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chrysene	**1**	**56**	**6.6 J**	**2.5 J**	ND	**20 J**	**13 NJ**	ND	ND	0.12 J	ND	**9.1 NJ**	0.72 J	ND	ND	ND	ND	**1.4 J**	ND	ND	**20 J**	ND	ND	ND
Dibenz(a,h)anthracene	**0.33**	**0.56**	**10 J**	**1.7 J**	**1.1 J**	ND	ND	ND	ND	ND	ND	ND	**0.46 J**	**0.84 J**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Dibenzofuran	**7**	**350**	ND	ND	ND	ND	ND	ND	ND	ND	ND	4.1 NJ	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Fluoranthene	**100**	**500**	ND	ND	ND	8.2 J	10 J	ND	ND	0.18 J	0.16 J	8.4 J	ND	0.56 J	ND	ND	0.95 J	0.91 J	ND	ND	ND	ND	ND	ND
Fluorene	**30**	**500**	ND	ND	ND	ND	ND	0.05 NJ	ND	ND	ND	6.7 J	ND	ND	ND	ND	ND	0.52 J	ND	ND	ND	ND	ND	ND
Indeno(1,2,3-cd)pyrene	**0.5**	**5.6**	**8 J**	**1.5 J**	**0.78 J**	**7.4 NJ**	ND	ND	ND	0.082 J	ND	ND	0.32 J	**0.77 J**	ND	ND	0.27 J*	**0.55 J**	ND	ND	ND	ND	ND	ND
Isophorone	--	--	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
N-Nitrosodi-n-propylamine	--	--	ND	ND	ND	ND	ND	ND	ND	ND	0.65 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Naphthalene	**12**	**500**	ND	ND	ND	ND	ND	0.08 NJ	ND	ND	ND	4.6 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Phenanthrene	**100**	**500**	2.5 J	4.5 J	0.35 J	41 J	19 J	0.13 J	ND	0.17 J	0.44 J	37 J	ND	0.61 J	19 J	ND	ND	0.77 J	ND	ND	37 J	ND	ND	ND
Pyrene	**100**	**500**	ND	2.3 J	0.54 J	47 J	13 J	ND	ND	0.15 J	0.31 J	23 J	0.5 J	0.57 J	14 J	ND	1.1 J	1.9 J	ND	ND	19 J	ND	ND	0.039 J
TOTAL SVOCs			*79*	*20*	*6*	*195*	*65*	*1*	*0*	*2*	*2*	*112*	*5*	*7*	*55*	*0*	*6*	*8*	*0*	*0*	*116*	*0*	*0*	*0*
Diesel Range Organics [C10-C28]	--	--	*14,000*	*12,000*	*3,400*	*47,000*	*37,000*	*2,000*	*ND*	*88*	*1,800*	*14,000*	*1,700*	*4,900*	*96,000*	*1,500*	*1.3 J*	*2,800*	*830*	*520*	*39,000*	20	29	70 J
TAL Metals - mg/kg																								
Aluminum	--	--	3400 J	12000 J	6470 J	8290 J	4990 J	10600	13600	12200	8030	12800	10300	5660	5660	5630 J	9370 J	12400 J	30200 J	15000 J	11500 J	10600	9820	17100
Arsenic	**13**	**16**	**42.2**	**31**	**97.7**	**30.1**	**57.1**	**17.1**	9.4	9.1	10.9	**44.3**	**17.2**	**126**	**17.2**	**17**	**14.8**	**64**	**15.4**	10.9	**20.1**	9	8.1	9
Barium	**350**	**400**	55.2 J	120 J	174 J	113	140	107 J	166 J	89.1 J	50.5 J	140 J	118 J	74.4 J	139 J	86.3 J	117 J	219 J	62.6 J	226 J	173 J	69.4	93.1	261
Beryllium	**7.2**	**590**	0.26	1.1	0.71	0.58	0.55	0.78	0.66	0.53	0.39	0.54	0.72	0.61	0.29	0.37	0.54	0.61	1.1	0.76	0.64	0.51	0.45	1.1
Cadmium	**2.5**	**9.3**	ND	0.63	ND	1.2	1.2	ND	ND	0.25	ND	0.77	ND	0.28	ND	0.25	0.37	0.93	0.79	ND	0.32	ND	0.22	ND
Calcium	--	--	3040 J	8840 J	3440 J	41200 J	19300	1320	1890	1150	17000	55900	4210	10800	25200	2330 J	6380 J	45600 J	18400 J	2780 J	2300 J	1620	9180	3310
Chromium	**1**	**400**	**8.4**	**14.3**	**10.7**	**18.2**	**17.1**	**12.4**	**16.3**	**12.5**	**9.5**	**38.3**	**12.1**	**7.7**	**12.1**	**12.4 J**	**12.2 J**	**38.1 J**	**76.9 J**	**17 J**	**17 J**	**12**	**11.9**	**21.2**
Cobalt	--	--	5.2 J	15.9 J	10.3 J	4.2	9.8	10.5	8	8.9	5.3	4.6	12.6	12.6	2.2	3.5 J	7.2 J	5.4 J	4.3 J	16.2 J	8.3 J	9.8	8.6	13
Copper	**50**	**270**	30.2 J	**83.3 J**	**120 J**	**50.2 J**	**130 J**	19.3	14.1	16.6	22.9	**147**	45.5	**101**	**52.6**	36.3 J	33.1 J	**115 J**	14.1 J	21.6 J	42.6 J	19.8	20.9	23.3
Iron	--	--	17800 J	21700 J	32600 J	18600 J	90500	31100	27700	20200	15600	35200	21800	51100	9830	15200 J	17700 J	17500 J	15900 J	28200 J	17000 J	23300	17800	29400
Lead	**63**	**1000**	**79.5 J**	**335 J**	**66.2 J**	**1030 J**	**1100 J**	17.7	10.4	19.5	**84.4**	**2100**	**141**	**89**	**1200**	**405 J**	**165 J**	**513 J**	43.2 J	35.4 J	**167 J**	14.8	12.1	52
Magnesium	--	--	541 J	4120 J	467 J	2900 J	2560 J	2830	4010	3110	2360	7250	2260	1250	4510	1630 J	2690 J	7900 J	29800 J	4130 J	2390 J	2690	3390	5090
Manganese	**1,600**	**10,000**	77.7 J	281 J	189 J	160 J	343 J	744	472	321	464	828	461	128	77.5	103 J	537 J	1260 J	247 J	670 J	363 J	323	1000	257
Nickel	**30**	**310**	12.7 J	**43.7 J**	23.7 J	28.9	25.4	23.7	24.1 J	15.5	12.9	14.2	22.1	**30.9**	11.6	8.7	15.1	15.7	15.7	28.5	17.8	20.8	18.2	27.5
Potassium	--	--	534 J	1150 J	779 J	984	552	947	1160	869	7.3	1210	1040	535	549	704 J	1070 J	1950 J	3780 J	1790 J	1340 J	1070 J	1810 J	2140 BJ
Sodium	--	--	ND	786	280	227	330	ND	ND	ND	ND	746	295	265	ND	ND	ND	355	1990	ND	ND	ND	ND	257
Vanadium	--	--	7.7 J	24.1 J	23.1 J	28.3	41.8	16.1	18.5	16	12.4	24.9	17.3	18.3	25.6	15.5 J	16.3 J	27.6 J	72.3 J	21.1 J	19.1 J	14.2	15	25.5
Zinc	**109**	**10,000**	31.6 J	**131 J**	43.7 J	**119 J**	65 J	51.5	61.1	64	49.9	**150**	62.2	82.3	30.3	44.3 J	73.9 J	**216 J**	56.9 J	61.3 J	56 J	61 J	55.7 J	80.5 J
Mercury	**0.18**	**2.8**	0.061	0.12	0.023	**0.64 J**	**2.4 J**	ND	ND	0.027	0.097	**3.9**	0.12	0.054	**2**	**0.77**	**0.29 B7**	**1.7**	ND	ND	0.12	ND	ND	0.036
Organochlorine Pesticides mg/kg [3]																								
4,4'-DDD	**0.0033**	**92**	NA	NA	ND	ND	NA	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4,4'-DDE	**0.0033**	**62**	NA	NA	ND	ND	NA	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4,4'-DDT	**0.0033**	**47**	NA	NA	ND	ND	NA	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
alpha-BHC	**0.02**	**3.4**	NA	NA	ND	ND	NA	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Notes:

1. Only those parameters detected at a minimum of one sample location are presented in this table; all other compounds were reported as non-detect.
2. Values per NYSDEC Part 375 Soil Cleanup Objectives (SCOs).
3. Sample results were reported by the laboratory in micrograms per kilogram (ug/kg) and converted to milligram per kilogram (mg/kg) for comparison to SCOs.
4. Results per GZA GeoEnvironmental's Prelimanry Investigation and Sampling report, November 2009.

Definitions:

mg/kg = milligrams per kilogram
ND = Parameter not detected above laboratory detection limit.
NA = Sample not analyzed for parameter.
"--" = No SCO available.
J = Estimated value; result is less than the sample quantitation limit but greater than zero.
B = Analyte was detected in the associated blank as well as in the sample.
N = Presumptive evidence of analyte; result should be used with caution as a potential false positive and/or elevated quantitative value.
* = LCS or LCSD exceeds the control limits.

Bold = Result exceeds Unrestricted SCOs
Bold = Result exceeds Commercial SCOs

TABLE 6

SUMMARY OF PID[1] SOIL/FILL SCREENING RESULTS

251 HOMER STREET REDEVELOPMENT SITE
OLEAN, NEW YORK

Feet Below Ground Surface (fbgs)	MW-1	MW-2	MW-3	MW-4	MW-5	MW-6	MW-7	MW-8	MW-9	MW-10	MW-11	MW-12	MW-13	MW-14	TP-1	TP-2	TP-3	TP-4	TP-5	TP-6	TP-7	TP-8	TP-9	TP-10	TP-11	TP-12	TP-13	TP-14	TP-15	TP-16	TP-17
0-2	0.1	1	1.2	6.1	2.6	5.2	1.1	131	0	0	0	0	0	0	1.5	9.9	0	2.6	8.9	43.1	0.4	0	2.2	2.3	148	203	352	21	10.1	11.8	1.6
2-4	3.8	1.6	5.9	90.1	131	4.4	265	324	0.1	1.2	0	0	0	26.3	1.4	33	0	1.9	165	NS	16.5	2.4	NS	NS	57.4	NS	NS	NS	NS	NS	8.6
4-6	5.3	1.5	6.2	204	624	9.2	130	NS	0	0.7	12.8	11.9	0.9	3.8	1.7	356	1621	5.7	NS	4.2	NS	835	1.6	43.1	NS	204	58.3	191	62.4	157	NS
6-8	772	1.4	170	NS	112	309	28.5	153	4.3	14.4	63.4	182.5	3.2	70.3	0.9	713	321	40.5	422	1.8	35.7	504	3.9	NS	90.3	NS	658	109	210	9.3	30
8-10	673	1.8	283	7.1	140	NS	NS	62.3	29.6	25	2.2	149	0	1.9	1.9	366	276	3.7	800	NS	2.7	54.6	2.5	44.2	NS		651	NS	364	NS	NS
10-12	158	0.3	117	7.6	107	70.6	1.8	4.9	54.3	89.3	5.3	182	0.1	NS	1.6	638		NS	NS	0.3	1.4	11.6	2	NS	261		NS	924	NS	NS	93
12-14	NS	0.2	32	6.8	315	708	NS	144	74.9	173	2.4	36.9	0	9.7	1	603		1.7	1273	NS	1.4	NS	NS	7.9	139		NS	NS		147	NS
14-16	4.3	0.3	110	5.8	632	614	2.3	110	21.4	440	0.7	220	0	NS	NS	NS		NS			NS		1.9							NS	
16-18	4	0	23.2	3.4	88.2	8.2	1.5	108	56.6	380	NS	70	NS	0.8																	
18-20	4.5			33	937	20.1		22.1			141	NS		NS																	
20-22				1.6	1267	25.8		NS			60.1	16.5																			
22-24				2.3							92																				
24-26																															

Feet Below Ground Surface (fbgs)	TP-18	TP-19	TP-20	TP-21	TP-22	TP-23	TP-24	TP-25	TP-26	TP-27	TP-28	TP-29	TP-30	TP-31	TP-32	TP-33	TP-34	TP-35	TP-36	TP-37	TP-38	TP-39	TP-40	TP-41	TP-42	TP-43	TP-44	TP-45	TP-46	TP-47	TP-48
0-2	15.6	2	0.3	88	3.2	11.1	58	13	46.8	4.1	140	NS	3.3	4.2	4	6.8	6.8	29	1.5	2.4	3.9	193	0.1	276	98.4	44	7.1	NS	8.9	0	11.2
2-4	30.1	55	8.1	183	186	NS	NS	NS	NS	131	NS		19.4	NS	NS	13.8	NS	NS	NS	6.5	5.3	NS	5.8	397	90.3	3.7	NS	7.1	72.8	0	NS
4-6	12.4	39	NS	198	195	NS	163	NS	141	108	59.2		6.1	128	134	NS	63.6	NS	54.3	202	22.2	106	NS	20.4	3.3	3.7	15.9	4.3	NS	0	NS
6-8	379	62	238	121	14.3	98	NS	156	NS	NS			NS	NS	NS	54.1	NS	1.2	173	NS		NS		NS			15.8	NS	347	NS	133
8-10	661	NS	189	NS	NS	NS	140	NS	10.7	233				131	24	NS	NS	NS	24.8			41.9							16	0	4
10-12	331	238	20.1	5.3	NS	121	NS	53.9	NS	115				NS	NS		NS	2.8	75.7											NS	
12-14	NS	NS	8.9	17.5	40.7	65.3	2.4	123	10.1	52.9							6.8													0	
14-16			NS	8.6	NS			NS	NS	NS																				NS	
16-18																															

Feet Below Ground Surface (fbgs)	TP-49	TP-50	TP-51	TP-52	TP-53	TP-54	TP-55	TP-56	TP-57	TP-58	TP-59	TP-60	TP-61	TP-62	SB-1	SB-2	SB-3	SB-4	SB-5	SB-6	SB-7	SB-8	SB-9	SB-10	SB-11	SB-12	SB-13	SB-12	SB-13
0-2	11.2	NS	0	8	0.3	0.3	0	0.1	0	0	1.1	5	0	0	0	0	0	0	0.8	85	8	1.6	0	0.7	0.3	0	2.9	0	2.9
2-4	NS	NS	3.2	89.7	0.2	1.8	30.6	0.3	0.1	0	0.9	3.2	0	1.8	0	0	2.3	0	20	8.2	1.7	2	54.3	1	0	0	0.9	0	0.9
4-6	NS	NS	162.3	54.6	93.7	76.6	20	NS	NS	0	0.4	1.9	0.1	42.5	0	75.1	0	2.3	1	0	24.3	0	41.6	1	3	2.3	NS	2.3	NS
6-8	13.7	NS	82.3	61.9	28.8	NS	NS			0.4	1.9	1.3	0	98.2	NS	NS	1.6	44	5.8	1	23	NS	182	0.2	82.9	21.7	0	21.7	0
8-10	44.5	NS	12	10.5	NS	35.5	18.3			1.1	1.2	129.4	0	54.6	25.6	63.5	0	14.1	14.7	1.7	14	90	96.1	110	62.3	250	0.9	250	0.9
10-12	10.2		3.5	27.4	74.9	6.8	34.2			3.1	8.2		0	10.3	NS	1.9	0	11.2	14.8	0.2	9.3	90	163	14.8	14.2	251	0.4	251	0.4
12-14			90.1	14.4	11.4	2.1	11.3			387	1.2		0	13.4	5.8	0	0	1.3	0.5	0	4.7	34	240	13.5	3.9	37	25.6	37	25.6
14-16					22.5	NS	NS				NS		NS		1.2	0	0	0	0.1	0.1	4.7	144	146	0	5.9	11.2	33	11.2	33
16-18																													

Notes:

1. Photoionization detector (PID) screening results in parts per million (ppm).
2) NS = Not Screened

═══════ = Bottom of Test Pit/Boring

TABLE 7

SUMMARY OF SEDIMENT ANALYTICAL DATA

251 HOMER STREET REDEVELOPMENT SITE
OLEAN, NEW YORK

Parameter [1]	Water Quality Standard (ug/L)	K_{ow}	K_{ow} [2] (log L/kg)	K_{oc} (L/kgOC)	SGV_{oc} [3] (ug/gOC)	Bulk Sediment SGV [4] (mg/kg)	Two Mile Creek		
							SED-UP	SED-MID	SED-DOWN
							Upstream	Midstream	Downstream
Total Organic Carbon (mg/kg)								**13900**	
TCL Volatile Organic Compounds (VOCs) - mg/kg [5]									
Acetone	50	0.575	-0.240	0.581	0.0291	**0.00040**	ND	ND	ND
2-Butanone (MEK)	50	1.95	0.290	1.93	0.0965	**0.00134**	ND	ND	**0.0048 J**
Methylcyclohexane	--	--	--	--	--	**--**	ND	ND	ND
Methyl tert butyl ether (MTBE)	--	--	--	--	--	**--**	ND	ND	0.00083 J
Toluene	5	516	2.71	465	2.32	**0.0323**	ND	ND	ND
Total Xylene	5	1413	3.15	1249	6.25	**0.0868**	ND	ND	0.0011 J
Gasoline Range Organics [C6-C10]	--	--	--	--	--	**--**	*1.3 J*	*3.6 BJ*	*1.2 J*
TCL Semi-Volatile Organic Compounds (SVOCs) - mg/kg [5]									
Acenaphthylene	--	--	--	--	--	**--**	ND	ND	ND
Anthracene	50	34198	4.534	28655	1433	**19.9**	ND	ND	ND
Benzo(a)anthracene	0.002	470977	5.673	377432	0.755	**0.0105**	ND	ND	ND
Benzo(b)fluoranthene	0.002	1845015	6.266	1444635	2.89	**0.0402**	ND	ND	ND
Benzo(k)fluoranthene	0.002	1954339	6.291	1528738	3.06	**0.0425**	ND	ND	ND
Benzo(g,h,i)perylene	--	3213661	6.507	2492648	--	**--**	ND	ND	0.42 J
Benzo(a)pyrene	0.0012	1279381	6.107	1008001	1.21	**0.0168**	**0.11 J**	ND	ND
Carbozole	--	3890	3.590	3383	--	**--**	ND	ND	ND
Chrysene	0.002	516416	5.713	413199	0.826	**0.0115**	**0.12 J**	ND	ND
Dibenz(a,h)anthracene	--	5164164	6.713	3973370	--	**--**	ND	ND	0.09 J
Fluoranthene	50	121339	5.084	99507	4975	**69.2**	0.21 J	ND	ND
Indeno(1,2,3-cd)pyrene	0.002	5272299	6.722	4055141	8.11	**0.113**	ND	ND	0.11 J
4-Methylphenol	--	--	--	--	--	**--**	ND	ND	ND
2-Methylnaphthalene	42	7244	3.860	6232	262	**3.64**	ND	ND	0.17 J
Phenanthrene	50	37239	4.571	31158	1558	**21.7**	ND	ND	0.24 J
Phenol	2	100	2.000	92.5	0.185	**0.00257**	ND	ND	ND
Pyrene	50	83560	4.922	68961	3448	**47.9**	ND	ND	0.36 J
Diesel Range Organics [C10-C28]	--	--	--	--	--	**--**	*50*	*57 J*	*340 DJ*
TAL Metals - mg/kg					**Class A [6] (Low Risk)**	**Class C [6] (High Risk)**			
Aluminum	2000	1			**--**	**--**	11100	10000 J	11900
Arsenic	50	1			**< 10**	**> 33**	**10.6**	**13 J**	9.9
Barium	2000	1			**--**	**--**	116	116 J	124
Beryllium	3	1			**--**	**--**	0.59	0.58 J	0.65
Cadmium	10	1			**< 1**	**> 5**	ND	ND	0.25
Calcium	--	1			**--**	**--**	1800	1540 J	1630
Chromium	100	1			**< 43**	**> 110**	12.2	14 J	15.9
Cobalt	5	1			**--**	**--**	11.2	10.6 J	11.6
Copper	200	1			**< 32**	**> 150**	16.4	25.6 J	**33.4**
Iron	300	1			**--**	**--**	22900	26600 J	22300
Lead	25	1			**< 36**	**> 130**	24	22.7 J	**110**
Magnesium	35000	1			**--**	**--**	2850	2970 J	3660
Manganese	600	1			**--**	**--**	1030	982 J	220
Nickel	100	1			**< 23**	**> 49**	20.2	20.3 J	**24.1**
Potassium	--	1			**--**	**--**	1020 J	1210 J	1470 J
Vanadium	14	1			**--**	**--**	16.7	14.9 J	17.6
Zinc	5,000	1			**< 120**	**> 460**	70.8	93.5 J	**124 J**
Mercury	0.7	1			**< 0.2**	**> 1**	0.032	ND	0.089

Notes:

1. Only those parameters detected at a minimum of one sample location are presented in this table; all other compounds were reported as non-detect.
2. Values from Table 7. Sediment Guidance Values for PAHs (USEPA 2003)
3. Sediment guidance value (SGV) per NYSDEC Screening and Assessment of Contaminated Sediment (June 24, 2014).
4. Calculated based on TOC measured in midstream sediment sample.
5. Sample results reported by the laboratory in ug/kg were converted to mg/kg for comparison to SCOs.
6. Values from Table 5. Freshwater Sediment Guidance Values. NYSDEC June 24, 2014 Guidance.

Definitions:

K_{oc} = Organic carbon partitioning coefficient: measures conc. of a contaminant that adsorbs to sediment organic carbon content / conc. dissolved in water after mixing.
K_{ow} = n-octanol water partitioning coefficient: ratio describing the partitioning of a nonpolar organic compound between water and octanol.
mg/kg = milligrams per kilogram
ug/kg = micrograms per kilogram
OC = organic carbon
"--" = No value available.
ND = Parameter not detected above laboratory detection limit.
B = Analyte was detected in the associated blank as well as in the sample.
D = All compounds were identified in an analysis at the secondary dilution factor.
J = Estimated value; result is less than the sample quantitation limit but greater than zero.

BOLD	= Result exceeds calculated bulk sediment SGV
BOLD	= Result exceeds Freshwater Sediment Class A Guidance Value
BOLD	= Result exceeds Freshwater Sediment Class C Guidance Value

TurnKey Environmental Restoration, LLC
Benchmark Environmental Engineering & Science, PLLC

TABLE 8

SUMMARY OF SURFACE WATER ANALYTICAL DATA

251 HOMER STREET REDEVELOPMENT SITE
OLEAN, NEW YORK

Parameter [1]	NYSDEC Class C SWQS[2,3]	Sample Location and Date			
		Ditch (On-Site)		Two Mile Creek (Off-Site)	
		SW-1	SW-2	SW-3	SW-4
		6/3/2011	6/3/2011	6/3/2011	6/3/2011
TCL STARS Volatile Organic Compounds (VOCs) - ug/L					
Acetone	--	3.3 J	ND	ND	ND
TAL Metals - ug/L					
Aluminum	--	ND	280	340	310
Barium	--	120 J	22 J	29 J	25 J
Calcium	--	46800 J	13200 J	17200 J	12800 J
Cobalt	**5**	ND	ND	ND	**58**
Iron	**300**	**2200**	**380**	**580**	**410**
Magnesium	--	5600	3200	4100	3200
Manganese	--	1000	190	160	190
Nickel [4]	**3.3**	ND	ND	**49**	**49**
Potassium	--	2400	840	990	800
Sodium	--	16400	6600	8100	5900

Notes:
1. Only those parameters detected at a minimum of one sample location are presented in this table; all other con were reported as non-detect.
2. Values per NYSDEC TOGS 1.1.1 Class C Surface Water Quality Standards (SWQS).
3. Two Mile Creek is listed as a Class C water body according to NYSDEC Environmental Resource Mapper.
4. SWQS calculated based upon an assumed hardness of 4.0 on the Mohs Hardness Scale.

Definitions:
ND = Parameter not detected above laboratory detection limit.
"--" = No SCO available.
J = Estimated value; result is less than the sample quantitation limit but greater than zero.

BOLD = Sample result exceeds NYSDEC Surface Water Quality Standards.

TABLE 9

SUMMARY OF GROUNDWATER ANALYTICAL DATA

251 HOMER STREET REDEVELOPMENT SITE
OLEAN, NEW YORK

Parameter [1]	NYSDEC Class GA GWQS[2]	Sample Location and Date																				
		MW-1		MW-2		MW-3		MW-4		MW-5	MW-6		MW-7		MW-8		MW-9	MW-10	MW-11	MW-12	MW-13	MW-14
		6/6/2011	5/22/2012	6/6/2011	5/22/2012	6/7/2011	5/22/2012	6/6/2011	5/21/2012	6/7/2011	6/7/2011	5/21/2012	6/7/2011	5/21/2012	6/6/2011	5/22/2012	5/22/2012	5/22/2012	5/21/2012	5/21/2012	5/22/2012	5/21/2012
TCL Volatile Organic Compounds (VOCs) - ug/L																						
Acetone	**50**	ND	ND	ND	ND	5 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	9.5 J	ND	ND
Benzene	**1**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**20**	ND	ND
2-Butanone (MEK)	**50**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Carbon disulfide	**60**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Cyclohexane	**--**	98	18	ND	ND	ND	ND	ND	ND	35	ND	ND	ND	ND	ND	ND	94	ND	67	520 D	ND	ND
1,2-Dichlorobenzene	**3**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Isopropylbenzene	**5**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	10	ND	ND
Methylcyclohexane	**--**	150	25	ND	ND	ND	6.4	750 J	ND	52	ND	ND	ND	ND	ND	ND	440 E	46	160	590	0.8 J	1.2
Methylene Chloride	**5**	ND	ND	ND	ND	ND	ND	ND	ND	**13 BJ**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Xylenes (Total)	**5**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	25	ND	ND
TICs [3]	**--**	*ND*	*42.2 TJN*	*ND*	*308.5 TJN*	*ND*	*ND*	*ND*	*12.9 TJN*	*ND*	*ND*	*57 TJN*	*ND*	*ND*	*ND*	*ND*	*628 TJN*	*319 TJN*	*454 TJN*	*1721 TJN*	*1.59 J*	*87.4 TJN*
Gasoline Range Organics [C6-C10]	**--**	*580*	*200 B*	*6.7 J*	*21*	*58*	*140 B*	*40*	*ND*	*600*	*140*	*150*	*ND*	*ND*	*100*	*ND*	*1900 B*	*480 B*	*820 B*	*3,100*	*ND*	*110 B*
TCL Semi-Volatile Organic Compounds (SVOCs) - ug/L																						
2-Methylnaphthalene	**--**	ND	0.59 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	140	ND	ND	25 J	1.7 J	2.8 J
Acenaphthene	**20**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.37 J	ND	ND	0.49 J	ND	ND	ND	ND
Acenaphthylene	**--**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.52 NJ	ND	ND	ND	ND
Acetophenone	**--**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.52 J	ND	ND	ND	ND
Anthracene	**50**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.52 J	ND	ND	ND	ND
Benzo(a)anthracene	**0.002**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Benzo(b)fluoranthene	**0.002**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**0.44 J**	ND	ND	ND	ND
Benzo(g,h,i)perylene	**--**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.48 J	ND	ND	ND	ND
Biphenyl	**5**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.64 J	ND	ND	ND	ND
Bis(2-ethylhexyl) phthalate	**--**	ND	ND	2.9 J	ND	ND	ND	ND	ND	ND	2.5 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	2.3 J	ND
Butyl benzyl phthalate	**50**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.44 J	ND	ND	0.63 J	ND
Carbazole	**--**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.44 J	ND	ND	ND	ND
Chrysene	**0.002**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**0.52 J**	ND	ND	ND	ND
Dibenz(a,h)anthracene	**--**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.45 J	ND	ND	ND	ND
Diethyl phthalate	**50**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.42 J	ND	ND	ND	ND
Di-n-butyl phthalate	**50**	0.3 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.34 J	ND	ND	0.59 J	ND	ND	ND	ND
Fluoranthene	**50**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.48 J	ND	ND	ND	ND
Fluorene	**50**	ND	ND	ND	ND	ND	0.53 J	ND	ND	ND	ND	ND	0.37 J	ND	ND	ND	15	1.1 NJ	ND	ND	0.39 J	ND
Phenanthrene	**50**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	36 J	1 J	11 J	ND	2 J	1.5 J
Pyrene	**50**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.46 J	ND	ND	0.36 J	ND
TICs [3]	**--**	*ND*	*101.6 TJN*	*ND*	*84.3 TJN*	*ND*	*92.8 TJN*	*ND*	*105.3 TJ*	*ND*	*ND*	*ND*	*ND*	*15.8 TJ*	*ND*	*28.9 TJ*	*5280 TJN*	*206 TJN*	*3160 TJN*	*849 TJN*	*59 TJ*	*267 TJN*
Diesel Range Organics [C10-C28]	**--**	*1,000*	*1,300*	*320 J*	*ND*	*960*	*990*	*1,100*	*910*	*22,000*	*2,000*	*9,700*	*950*	*ND*	*550 J*	*300 J*	*46000 J*	*2,200*	*49000 J*	*17,000*	*1,700*	*4,100*
TAL Metals - ug/L (Total)																						
Aluminum	**--**	6600 J	NA	6800 J	NA	ND	NA	3500 J	NA	ND	5500 J	NA	780 J	NA	760 J	NA	NA	NA	NA	NA	NA	NA
Arsenic	**25**	**38**	NA	ND	NA	13	NA	ND	NA	25	19	NA	ND	NA	ND	NA	NA	NA	NA	NA	NA	NA
Barium	**1000**	86	NA	200	NA	130	NA	410	NA	410	410	NA	140	NA	27	NA	NA	NA	NA	NA	NA	NA
Calcium	**--**	105000	NA	83100	NA	36800	NA	117000	NA	150000	213000	NA	158000	NA	296000	NA	NA	NA	NA	NA	NA	NA
Chromium	**50**	4	NA	6.4	NA	ND	NA	ND	NA	ND	5	NA	ND	NA	ND	NA	NA	NA	NA	NA	NA	NA
Cobalt	**--**	ND	NA	5.1	NA	ND	NA	ND	NA	ND	ND	NA	ND	NA	58	NA	NA	NA	NA	NA	NA	NA
Copper	**200**	25	NA	16.0	NA	ND	NA	ND	NA	ND	19	NA	ND	NA	ND	NA	NA	NA	NA	NA	NA	NA
Iron	**300**	**64200**	NA	**14800**	NA	**28400**	NA	**64700**	NA	**100000**	**23400**	NA	**29900**	NA	**112000**	NA	NA	NA	NA	NA	NA	NA
Lead	**25**	15	NA	13.0	NA	ND	NA	8.30	NA	ND	22	NA	ND	NA	ND	NA	NA	NA	NA	NA	NA	NA
Magnesium	**35000**	22800	NA	25100	NA	19900	NA	27200	NA	**83100**	**37600**	NA	12300	NA	**36600**	NA	NA	NA	NA	NA	NA	NA
Manganese	**300**	**5500**	NA	**7800**	NA	**6100**	NA	**9100**	NA	**23100**	**3100**	NA	**1800**	NA	**12100**	NA	NA	NA	NA	NA	NA	NA
Nickel	**100**	ND	NA	ND	NA	ND	NA	ND	NA	ND	ND	NA	ND	NA	49	NA	NA	NA	NA	NA	NA	NA
Potassium	**--**	7400	NA	5200	NA	ND	NA	4300	NA	9300	11200	NA	ND	NA	3800	NA	NA	NA	NA	NA	NA	NA
Sodium	**20000**	**34000**	NA	**33500**	NA	3700	NA	15500	NA	**39400**	**162000**	NA	**52900**	NA	**86600**	NA	NA	NA	NA	NA	NA	NA
Vanadium	**--**	16	NA	18	NA	7.2	NA	14	NA	20	12	NA	ND	NA	14	NA	NA	NA	NA	NA	NA	NA
Zinc	**5000**	50	NA	32	NA	ND	NA	19	NA	ND	39	NA	ND	NA	31	NA	NA	NA	NA	NA	NA	NA
Dissolved Metals - ug/L																						
Arsenic	**25**	ND	NA	ND	NA	ND	NA	ND	NA	11 J	ND	NA	ND	NA	ND	NA	NA	NA	NA	NA	NA	NA
Barium	**1000**	520 J	NA	130 J	NA	79 J	NA	220 J	NA	180 J	260 J	NA	98 J	NA	17 J	NA	NA	NA	NA	NA	NA	NA
Calcium	**--**	90700 J	NA	74300 J	NA	60100 J	NA	105000 J	NA	144000 J	195000 J	NA	149000 J	NA	288000 J	NA	NA	NA	NA	NA	NA	NA
Cobalt	**--**	ND	NA	ND	NA	ND	NA	ND	NA	ND	ND	NA	ND	NA	52 J	NA	NA	NA	NA	NA	NA	NA
Iron	**300**	ND	NA	ND	NA	170 J	NA	ND	NA	ND	ND	NA	ND	NA	**8900 J**	NA	NA	NA	NA	NA	NA	NA
Magnesium	**35000**	19800 J	NA	21700 J	NA	19300 J	NA	24700 J	NA	**82300 J**	34400 J	NA	11700 J	NA	**35300 J**	NA	NA	NA	NA	NA	NA	NA
Manganese	**300**	**5200 J**	NA	**8600 J**	NA	**5700 J**	NA	**8300 J**	NA	**23900 J**	**2700 J**	NA	**1600 J**	NA	**11500 J**	NA	NA	NA	NA	NA	NA	NA
Nickel	**100**	ND	NA	ND	NA	ND	NA	ND	NA	ND	ND	NA	ND	NA	40 J	NA	NA	NA	NA	NA	NA	NA
Potassium	**--**	5500 J	NA	3000 J	NA	2900 J	NA	3500 J	NA	9400 J	9500 J	NA	2000 J	NA	3600 J	NA	NA	NA	NA	NA	NA	NA
Sodium	**20000**	**32000 J**	NA	**27700 J**	NA	3700 J	NA	14400 J	NA	**41600 J**	**148000 J**	NA	**49300 J**	NA	**80500 J**	NA	NA	NA	NA	NA	NA	NA
Vanadium	**--**	5.1 J	NA	7.3 J	NA	5.2 J	NA	6.9 J	NA	14 J	ND	NA	ND	NA	8.7 J	NA	NA	NA	NA	NA	NA	NA
Zinc	**5000**	ND	NA	ND	NA	ND	NA	ND	NA	ND	ND	NA	ND	NA	12 J	NA	NA	NA	NA	NA	NA	NA

Notes:
1. Only those parameters detected at a minimum of one sample location are presented in this table; all other compounds were reported as non-detect.
2. Values per NYSDEC TOGS 1.1.1 Class GA Groundwater Quality Standards (GWQS).
3. Tentatively identified compounds

Definitions:
ND = Parameter not detected above laboratory detection limit.
"--" = No GWQS available.
J = Estimated value; result is less than the sample quantitation limit but greater than zero.
B = Analytical was detected in the associated blank as well as in the sample.
T = Result is tentatively identified compound (TIC) and an estimated value.
N = Presumptive evidence of analyte; result should be used with caution as a potential false positive and/or elevated quantitative value.
E = Results exceeded calibration range.
BOLD = Sample result exceeds NYSDEC Class GA GWQS

TURNKEY ENVIRONMENTAL RESTORATION, LLC — BENCHMARK ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC

TABLE 10

SUMMARY OF GCS AREA 1 END-POINT SOIL ANALYTICAL DATA

251 HOMER STREET REDEVELOPMENT SITE
OLEAN, NEW YORK

PARAMETER[1]	Unrestricted SCOs[2]	Commercial SCOs[2]	Area 1 Sample Location																						
			VFL-1	VFL-2	VFL-3	VFL-4	VFL-5	VFL-6	VFL-7	VFL-8	VFL-9	VFL-10	VFL-11	VFL-12	VFL-13	VFL-14	VFL-15	VFL-16	VFL-17	VFL-711[3]	VFL-18	VFL-19	VFL-20	VFL-21	VFL-22
Volatile Organic Compounds (VOCs) - mg/kg																									
1,1,2,2-TETRACHLOROETHANE	--	--	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.041 U	ND	ND	ND
1,2,3-TRICHLOROBENZENE	--	--	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2,4-TRIMETHYLBENZENE	--	--	ND	ND	0.0603	0.0296	0.224	0.298	0.0816	ND	ND	ND	ND	ND	ND	0.00494	ND	0.0221	0.236 J+	0.327	7.4	18.1	0.419 J+	0.00531	0.111
1,2-DICHLOROBENZENE	**1.1**	**500**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.044 U	0.02 U, J	ND	ND
1,3,5-TRIMETHYLBENZENE (MESITYLENE)	**8.4**	**190**	ND	ND	0.0261	0.0157	0.139	0.191	0.0407	ND	ND	ND	ND	ND	ND	ND	ND	0.0105	0.094 J+	0.12	2.96	0.451 J+	0.199 J+	0.00336	0.0445
1,4-DICHLOROBENZENE	**1.8**	**130**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.04 U	0.04 U, J	ND	0.0026
ACETONE	**0.05**	**500**	ND	**0.0744**	**0.102**	**0.0846**	**0.0847**	**0.287**	**0.111**	ND	ND	ND	**0.177 J-**	ND	ND	**0.133**	**0.171**	ND	ND	ND	**0.172 J+**	**0.266 J+**	**0.167 J+**	**0.354**	**0.374**
BENZENE	**0.06**	**44**	ND	ND	ND	0.00279	0.0203	0.0428	ND	ND	ND	ND	ND	0.005 J-	ND	ND	ND	0.00474	0.025 J+	0.0181	ND	0.039 J+	0.016 J+	ND	ND
CARBON DISULFIDE	--	--	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.01 J-	ND	0.019 J-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
CHLOROBENZENE	**1.1**	**500**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.006 J+	ND	ND	ND
CHLOROFORM	**0.37**	**350**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00489
CYCLOHEXANE	--	--	ND	ND	ND	ND	0.151	0.119	0.0142	ND	ND	ND	ND	ND	ND	ND	ND	0.0822	0.081 J+	0.054	3.54	0.295 J+	0.119 J+	ND	ND
CYMENE	--	--	ND	ND	ND	0.00259	0.0163	0.0197	0.00695	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.0162 J	0.0281 J	0.402	0.051 J+	0.027 J+	ND	0.005
ETHYLBENZENE	**1**	**390**	ND	ND	ND	0.00291	0.0374	0.0597	0.00783	ND	ND	ND	ND	ND	ND	ND	ND	0.00385	0.035 J+	0.0426	0.05 J+	0.081 J+	0.038 J+	ND	0.00342
ISOPROPYLBENZENE (CUMENE)	--	--	ND	ND	ND	ND	0.0149	0.0205	0.00544	ND	ND	ND	ND	ND	ND	ND	ND	0.00489	0.009 J+	0.0108	0.0916	0.029 J+	0.015 J+	ND	0.00524
M,P-XYLENES	--	--	ND	ND	ND	ND	0.167	0.063	0.0356	ND	ND	ND	ND	0.007 J-	ND	0.00484	ND	0.0239	0.054 J+	0.0272 J	0.124 J+	0.411 J+	0.032 J+	ND	0.0111
METHYL ETHYL KETONE (2-BUTANONE)	**0.01**	**500**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**0.075 J+**	ND	ND	**0.0676**
METHYLCYCLOHEXANE	--	--	ND	ND	0.0245	0.023	0.404	0.371	0.065	ND	ND	ND	ND	ND	ND	ND	ND	0.477	0.281 J+	0.223	9.53	7.73 J+	0.343 J+	ND	0.0281
METHYLENE CHLORIDE	**0.05**	**500**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.0121 J	ND	ND	ND	ND	ND
NAPHTHALENE	--	--	ND	ND	0.0146	ND	0.0262	0.0714	0.0105	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.082 J+	0.0917	1.01	0.148 J+	0.102 J+	ND	ND
N-BUTYLBENZENE	**12**	**500**	ND	ND	ND	0.00265	0.0226	0.0336	0.00955	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.013 J+	0.043	0.994	0.108 J+	0.053 J+	ND	0.00597
N-PROPYLBENZENE	**3.9**	**500**	ND	ND	0.00469	0.00274	0.0267	0.0366	0.00997	ND	ND	ND	ND	ND	ND	ND	ND	0.00618	0.02 J+	0.0293	1.04	0.071 J+	0.04 J+	ND	0.0105
O-XYLENE (1,2-DIMETHYLBENZENE)	--	--	ND	ND	0.00294	0.00496	0.0423	0.139	0.0108	ND	ND	ND	ND	ND	ND	ND	ND	0.00335	0.067 J+	0.0779	0.063 J+	0.216 J+	0.092 J+	ND	0.00727
SEC-BUTYLBENZENE	**11**	**500**	ND	ND	ND	ND	0.0101	0.0147	0.00563	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.008 J+	0.0098	0.697	0.03 J+	0.016 J+	ND	0.00493
T-BUTYLBENZENE	**5.9**	**500**	ND	ND	ND	ND	0.00332	0.00427	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
TETRACHLOROETHYLENE(PCE)	**1.3**	**150**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
TOLUENE	**0.7**	**500**	ND	ND	ND	ND	0.00427	0.00455	ND	ND	ND	ND	ND	0.005 J-	ND	ND	ND	ND	0.0148 J	0.00521 J	ND	0.109 J+	0.005 J+	ND	ND
TRANS-1,2-DICHLOROETHENE	**0.19**	**500**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
TRANS-1,3-DICHLOROPROPENE	--	--	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
TRICHLOROETHYLENE (TCE)	--	--	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
VINYL CHLORIDE	**0.02**	**13**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Polycyclic Aromatic Hydrocarbons (PAHs) - mg/kg																									
ANTHRACENE	**100**	**500**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.37 J	ND	ND	ND	ND	ND	ND
BENZO(A)ANTHRACENE	**1**	**5.6**	ND	ND	ND	ND	ND	ND	ND	0.125	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
BENZO(A)PYRENE	**1**	**1**	ND	ND	ND	ND	ND	ND	ND	0.119	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
BENZO(B)FLUORANTHENE	**1**	**5.6**	ND	ND	ND	ND	ND	ND	ND	0.137	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
BENZO(G,H,I)PERYLENE	**100**	**500**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
BENZO(K)FLUORANTHENE	**0.8**	**56**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
CHRYSENE	**1**	**56**	ND	1	ND	ND	ND	ND	ND	0.134	ND	ND	ND	ND	ND	ND	ND	ND	0.869 J	ND	0.366	ND	ND	ND	ND
DIBENZ(A,H)ANTHRACENE	**0.33**	**0.56**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
FLUORANTHENE	**100**	**500**	ND	ND	ND	ND	ND	ND	ND	0.207	0.0998	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
FLUORENE	**30**	**500**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.92 J	ND	ND	ND	ND	ND	ND
INDENO(1,2,3-C,D)PYRENE	**0.5**	**5.6**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
NAPHTHALENE	**12**	**500**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.981	ND	ND
PHENANTHRENE	**100**	**500**	ND	ND	0.328	0.415	ND	1.39	ND	0.209	0.174	ND	ND	ND	ND	ND	ND	ND	7.07 J	3.11 U, J	0.777	1.26	4.07	ND	0.0672
PYRENE	**100**	**500**	ND	ND	0.214	0.251	ND	ND	ND	0.267	0.165	ND	ND	ND	ND	ND	ND	ND	5.21 J	2.18 U, J	ND	1.08	2.99	ND	ND
TOTAL PAHs		*500*	*ND*	*1*	*0.542*	*0.666*	*ND*	*1.39*	*ND*	*1.20*	*0.439*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*15.4*	*5.3*	*1.14*	*2.34*	*8.04*	*ND*	*0.067*
Total Lead (mg/kg)																									
LEAD, TOTAL	**63**	**1000**	18	10.8	8.15	8.23	13.3	38.5	**258**	26.6	50.1	40.7	2.06	**86.5**	1.61	9.61 J	**310**	39.8	12.4	11.7	10.2	**925**	**80.8**	22.5	19

Notes:
1. Only those parameters detected at a minimum of one sample location are presented in this table; all other compounds were reported as non-detect
2. Values per 6NYCRR Part 375 Soil Cleanup Objectives (SCOs)
3. Blind Duplicate of VFL-17
4. Blind Duplicate of VFL-34
5. Blind Duplicate of VFL-41

Definitions:

ND = Parameter not detected above laboratory detection limit

J+ = The analyte was positively identified; the associated numerical value is an estimated quantity that may be biased high

J = The analyte was positively identified; the associated numerical value is an approximate concentration of the analyte in the sample

J- = The analyte was positively identified; the associated numerical value is an estimated quantity that may be biased low

Bold = Result exceeds Unrestricted SCOs

Bold = Result exceeds Commercial SCOs

TurnKey Environmental Restoration, LLC — Benchmark Environmental Engineering & Science, PLLC

TABLE 10

SUMMARY OF GCS AREA 1 END-POINT SOIL ANALYTICAL DATA

251 HOMER STREET REDEVELOPMENT SITE
OLEAN, NEW YORK

PARAMETER[1]	Unrestricted SCOs[2]	Commercial SCOs[2]	Area 1 Sample Location																					
			VFL-23	VFL-24	VFL-25	VFL-26	VFL-27	VFL-28	VFL-29	VFL-30	VFL-31	VFL-32	VFL-33	VFL-34	VFL-431[4]	VFL-35	VFL-36	VFL-37	VFL-38	VFL-39 (MW-12 Area)	VFL-40	VFL-41	VFL-114[5]	VSW-1
Volatile Organic Compounds (VOCs) - mg/kg																								
1,1,2,2-TETRACHLOROETHANE	--	--	ND	ND	ND	ND	0.053 U	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2,3-TRICHLOROBENZENE	--	--	ND	ND	ND	ND	ND	ND	ND	ND	0.00294	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2,4-TRIMETHYLBENZENE	--	--	1.4	0.0237	0.0266	0.286	0.194 J+	0.00398	1.93	0.296	0.123	0.026	0.0621	ND	0.119 J	0.0977	ND	ND	ND	4.42	ND	ND	ND	0.00581
1,2-DICHLOROBENZENE	1.1	500	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,3,5-TRIMETHYLBENZENE (MESITYLENE)	8.4	190	0.803	0.012	0.0114	0.124	0.086 J+	0.00191	1.4	0.102	0.0596	0.00843	0.016	ND	0.055	0.0449	ND	ND	ND	0.0304	ND	ND	ND	0.00235
1,4-DICHLOROBENZENE	1.8	130	0.223 U	ND	ND	ND	0.0595 U	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
ACETONE	0.05	500	**0.339 J+**	**0.611**	**0.251**	**0.392**	**0.368 J+**	**0.0585**	**0.267 J+**	**0.28 J+**	**0.259**	**0.341**	**0.265**	**0.115**	**0.111**	**0.121**	**0.109**	**0.236**	**0.229**	**0.259**	**0.27**	**0.147**	**0.212**	ND
BENZENE	0.06	44	ND	0.00848	ND	0.00644	0.003 J+		0.002 J+	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
CARBON DISULFIDE	--	--	0.014 J+	ND	0.0152	0.0262	0.006 J+	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00731 J	ND
CHLOROBENZENE	1.1	500	0.004 J+	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00242	ND	ND	ND	ND
CHLOROFORM	0.37	350	0.004 J+	ND	ND	ND	0.003 J+	0.00324	0.006 J+	0.006 J+	0.00546	0.00411	0.00391	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
CYCLOHEXANE	--	--	0.155 J+	ND	ND	0.0302	0.052 J+	ND	0.271 J+	0.115 J+	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.0905	ND	ND	ND	ND
CYMENE	--	--	ND	0.00621	0.00397	0.0129	0.022 J+	ND	0.277	ND	0.0105	ND	0.0041	ND	0.00962 J	0.00623	ND	ND	ND	ND	ND	ND	ND	ND
ETHYLBENZENE	1	390	0.006 J+	0.00467	0.00591	0.0234	0.01 J+	ND	0.017 J+	0.007 J+	0.0068	0.00253	ND	ND	0.00596 J	0.00571	ND	ND	ND	ND	ND	ND	ND	ND
ISOPROPYLBENZENE (CUMENE)	--	--	0.0114	ND	0.00369	0.0075	0.01 J+	ND	0.0222	0.0217	0.00645	ND	0.0028	ND	ND	ND	ND	ND	ND	0.00515	ND	ND	ND	ND
M,P-XYLENES	--	--	0.063 J+	0.0187	0.00839	0.077	0.059 J+	0.00389	0.021 J+	0.016 J+	0.0279	0.00528	0.00638	ND	0.0396 J	0.038	ND	ND	ND	0.00719	ND	ND	ND	ND
METHYL ETHYL KETONE (2-BUTANONE)	0.01	500	**0.061 J+**	**0.119**	ND	**0.0582**	**0.067 J+**	ND	ND	**0.048 J+**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
METHYLCYCLOHEXANE	--	--	0.208 J+	0.0601	0.0638	0.101	0.229 J+	ND	2.12	0.261 J+	0.0186	ND	0.0232	ND	0.0261 J	0.0305	ND	ND	ND	0.268	ND	ND	ND	ND
METHYLENE CHLORIDE	0.05	500	ND	ND	ND	ND	0.019 J+	ND	0.037 J+	0.043 J+	0.0156	0.0226	0.0299	ND	ND	ND	ND	**0.057**	**0.0626**	**0.0629**	**0.0873**	0.0238 J	**0.0754 J**	ND
NAPHTHALENE	--	--	ND	ND	ND	0.0081	0.031 J+	ND	0.385	0.0367	0.0317	0.00975	0.00637	ND	0.0225 J	0.0248	ND	ND	ND	0.0248	ND	ND	ND	ND
N-BUTYLBENZENE	12	500	0.188 J	ND	0.005	0.0216	0.038 J+	ND	0.00296	ND	0.0197	ND	0.00642	ND	0.0183 J	0.014	ND	ND	ND	0.009 U	ND	ND	ND	ND
N-PROPYLBENZENE	3.9	500	ND	0.00421	0.00659	0.0166	0.029 J+	ND	0.224	ND	0.0102	ND	0.00472	ND	0.00471 J	0.00429	ND	ND	ND	0.00719	ND	ND	ND	ND
O-XYLENE (1,2-DIMETHYLBENZENE)	--	--	0.03 J+	0.0105	0.0103	0.064	0.038 J+	ND	0.079 J+	ND	0.0231	0.00958	0.00967	ND	0.015 J	0.0148	ND	ND	ND	0.0099	ND	ND	ND	ND
SEC-BUTYLBENZENE	11	500	ND	ND	ND	0.00806	0.015 J+	ND	ND	ND	0.00779	ND	0.00291	ND	ND	0.00284	ND	ND	ND	0.0121	ND	ND	ND	ND
T-BUTYLBENZENE	5.9	500	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00241	ND	ND	ND	ND
TETRACHLOROETHYLENE(PCE)	1.3	150	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.0676	ND	ND	ND	ND
TOLUENE	0.7	500	0.0101 U	0.0029	ND	0.0112	0.0079 U	0.00295	0.003 J+	0.003 J+	0.00358	ND	ND	ND	0.00655 J	0.0079	ND	ND	ND	ND	ND	ND	ND	ND
TRANS-1,2-DICHLOROETHENE	0.19	500	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
TRANS-1,3-DICHLOROPROPENE	--	--	0.0056 U	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
TRICHLOROETHYLENE (TCE)	--	--	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.0027	ND	ND	ND	ND
VINYL CHLORIDE	0.02	13	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Polycyclic Aromatic Hydrocarbons (PAHs) - mg/kg																								
ANTHRACENE	100	500	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.0739 J	0.147 J	0.0886	ND	ND	ND	ND	ND	ND	ND	ND
BENZO(A)ANTHRACENE	1	5.6	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.0686	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
BENZO(A)PYRENE	1	1	0.444	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.215	0.274	ND	ND	ND	ND	ND	ND	ND	ND	ND
BENZO(B)FLUORANTHENE	1	5.6	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
BENZO(G,H,I)PERYLENE	100	500	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.0953	0.114	ND	ND	ND	ND	ND	ND	ND	ND	ND
BENZO(K)FLUORANTHENE	0.8	56	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
CHRYSENE	1	56	0.502	0.548	ND	ND	0.0744	ND	0.753	ND	ND	0.0694	ND	0.501	0.474	0.561	ND	ND	ND	ND	ND	ND	ND	ND
DIBENZ(A,H)ANTHRACENE	0.33	0.56	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
FLUORANTHENE	100	500	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.135	ND	0.0914	0.092	0.138	ND	ND	ND	ND	ND	ND	ND	ND
FLUORENE	30	500	ND	ND	ND	ND	0.0718	ND	ND	ND	ND	ND	ND	0.103	0.145	ND	ND	ND	ND	ND	ND	ND	ND	ND
INDENO(1,2,3-C,D)PYRENE	0.5	5.6	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
NAPHTHALENE	12	500	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.0951	0.139	ND	ND	ND	ND	ND	ND	ND	ND
PHENANTHRENE	100	500	0.967	2.22	ND	ND	0.255	ND	2.13	ND	ND	0.181	0.379	0.707	1	1.51	ND	ND	ND	ND	ND	ND	ND	ND
PYRENE	100	500	1.01	1.66	1.03	0.463	0.21	ND	1.17	ND	ND	0.124	ND	0.94 J	0.495 J	0.588	ND	ND	ND	ND	ND	ND	ND	ND
TOTAL PAHs		*500*	*2.92*	*4.43*	*1.03*	*0.463*	*0.611*	*ND*	*4.05*	*ND*	*ND*	*0.578*	*0.379*	*2.73*	*2.84*	*3.02*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*
Total Lead (mg/kg)																								
LEAD, TOTAL	63	1000	24.2	25.2	26.1	19.9	10.6	**313**	**130**	48.7	30.2	33.3	**75.6**	13.4	17.4	16.9	28.1	20	16.5	20.8	15	12.2	17.4	18.8

Notes:
1. Only those parameters detected at a minimum of one sample location are presented in this table; all other compounds were reported as non-detect
2. Values per 6NYCRR Part 375 Soil Cleanup Objectives (SCOs)
3. Blind Duplicate of VFL-17
4. Blind Duplicate of VFL-34
5. Blind Duplicate of VFL-41

Definitions:

ND = Parameter not detected above laboratory detection limit

J+ = The analyte was positively identified; the associated numerical value is an estimated quantity that may be biased high

J = The analyte was positively identified; the associated numerical value is an approximate concentration of the analyte in the sample

J- = The analyte was positively identified; the associated numerical value is an estimated quantity that may be biased low

Bold = Result exceeds Unrestricted SCOs

Bold = Result exceeds Commercial SCOs

TABLE 10

SUMMARY OF GCS AREA 1 END-POINT SOIL ANALYTICAL DATA

251 HOMER STREET REDEVELOPMENT SITE
OLEAN, NEW YORK

PARAMETER[1]	Unrestricted SCOs[2]	Commercial SCOs[2]	Area 1 Sample Location												
			VSW-2	VSW-3	VSW-4	VSW-5	VSW-6	VSW-7	VSW-8	VSW-9	VSW-10	VSW-11	VSW-12	VSW-13	VSW-14 (MW-12 Area)
Volatile Organic Compounds (VOCs) - mg/kg															
1,1,2,2-TETRACHLOROETHANE	--	--	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2,3-TRICHLOROBENZENE	--	--	ND	ND	ND	ND	ND	ND	0.225 J+	ND	ND	ND	ND	ND	ND
1,2,4-TRIMETHYLBENZENE	--	--	ND	0.208	0.028	ND	ND	ND	ND	7.76	45.8	0.0323	ND	ND	ND
1,2-DICHLOROBENZENE	1.1	500	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,3,5-TRIMETHYLBENZENE (MESITYLENE)	8.4	190	ND	0.109	0.0142	ND	ND	ND	ND	3.35	**8.86**	0.0228	ND	ND	ND
1,4-DICHLOROBENZENE	1.8	130	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
ACETONE	0.05	500	**0.136 J+**	ND	**0.186**	ND	ND	**0.188 J-**	**0.226 J+**	**0.361 J**	**1.8**	**0.144**	**0.19 J+**	**0.116**	ND
BENZENE	0.06	44	ND	0.0054	0.0178	ND	ND	0.004 J-	0.004 J+	0.039 J	**0.0854 J+**	0.00511	0.006 J+	0.00362	ND
CARBON DISULFIDE	--	--	ND	ND	0.0118	ND	ND	ND	ND	ND	0.0931 J+	ND	ND	ND	ND
CHLOROBENZENE	1.1	500	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
CHLOROFORM	0.37	350	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
CYCLOHEXANE	--	--	ND	0.0305	ND	ND	ND	ND	0.036 J+	0.364 J	ND	0.0183	0.041 J+	ND	ND
CYMENE	--	--	ND	ND	ND	ND	ND	ND	ND	0.494	ND	0.00708	ND	ND	ND
ETHYLBENZENE	1	390	ND	0.0118	ND	ND	ND	ND	ND	0.0885 J	ND	0.00289	ND	ND	ND
ISOPROPYLBENZENE (CUMENE)	--	--	ND	0.0047 J	ND	ND	ND	ND	ND	0.0425	5.18		ND	ND	ND
M,P-XYLENES	--	--	ND	0.0131	ND	ND	ND	0.004 J-	0.011 J+	5.17	ND	0.01	0.006 J+	ND	ND
METHYL ETHYL KETONE (2-BUTANONE)	0.01	500	ND	ND	ND	ND	ND	ND	ND	ND	**0.524 J+**	ND	ND	ND	ND
METHYLCYCLOHEXANE	--	--	ND	0.11	ND	ND	ND	0.015 J-	ND	4.72	33.5	0.0565	0.035 J+	ND	ND
METHYLENE CHLORIDE	0.05	500	ND	ND	ND	ND	ND	ND	ND	ND	0.0189 J+	ND	ND	**0.0606**	0.02 J+
NAPHTHALENE	--	--	ND	0.0307	0.00977	ND	ND	ND	ND	3.96	ND	ND	8.52	ND	ND
N-BUTYLBENZENE	12	500	0.003 J+	0.0276 J	0.00442	ND	ND	ND	ND	1.1	ND	0.00734	ND	ND	ND
N-PROPYLBENZENE	3.9	500	ND	0.0124	ND	ND	ND	ND	ND	0.57	**8.29**	0.00297	ND	ND	ND
O-XYLENE (1,2-DIMETHYLBENZENE)	--	--	ND	0.0367	0.00502	ND	ND	ND	0.005 J+	1.89 Z	ND	0.00922	0.003 J+	ND	ND
SEC-BUTYLBENZENE	11	500	0.005 J+	ND	ND	ND	ND	ND	ND	0.363	ND	0.00295	ND	0.00332	ND
T-BUTYLBENZENE	5.9	500	0.003 J+	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
TETRACHLOROETHYLENE(PCE)	1.3	150	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
TOLUENE	0.7	500	ND	ND	ND	ND	0.00228	0.003 J-	0.004 J+	0.1 J	ND	0.00487	0.003 J+	ND	ND
TRANS-1,2-DICHLOROETHENE	0.19	500	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
TRANS-1,3-DICHLOROPROPENE	--	--	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
TRICHLOROETHYLENE (TCE)	--	--	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
VINYL CHLORIDE	0.02	13	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.01 J+	ND	ND
Polycyclic Aromatic Hydrocarbons (PAHs) - mg/kg															
ANTHRACENE	100	500	ND	0.474	ND	ND	0.257	ND	ND	3.21	ND	ND	ND	ND	ND
BENZO(A)ANTHRACENE	1	5.6	ND	ND	ND	ND	0.346	ND	0.45	**3.31**	ND	ND	0.13	ND	ND
BENZO(A)PYRENE	1	1	ND	ND	ND	ND	0.299	ND	ND	**2.72**	ND	ND	0.128	ND	ND
BENZO(B)FLUORANTHENE	1	5.6	ND	ND	ND	ND	0.338	ND	0.544	**2.52**	ND	ND	0.195	ND	ND
BENZO(G,H,I)PERYLENE	100	500	ND	ND	ND	ND	0.271	ND	ND	2.5	ND	ND	0.117	ND	ND
BENZO(K)FLUORANTHENE	0.8	56	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.0688	ND	ND
CHRYSENE	1	56	ND	0.558	ND	ND	0.365	ND	0.63	**3.91**	0.44	0.648	0.195	ND	ND
DIBENZ(A,H)ANTHRACENE	0.33	0.56	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
FLUORANTHENE	100	500	ND	ND	ND	0.0904	0.517	ND	0.824	5.91	0.36	ND	0.22	ND	ND
FLUORENE	30	500	ND	0.518	3.12	ND	0.161	ND	ND	2.11	ND	0.45	ND	ND	ND
INDENO(1,2,3-C,D)PYRENE	0.5	5.6	ND	ND	ND	ND	0.16	ND	ND	**1.37**	ND	ND	0.0954	ND	ND
NAPHTHALENE	12	500	ND	ND	3.38	ND	ND	ND	ND	ND	ND	ND	0.124	ND	ND
PHENANTHRENE	100	500	ND	3.42	21.1	ND	1.25	ND	ND	16	1.1	1.55	0.177	ND	ND
PYRENE	100	500	ND	2.44	12.3	0.121	1.16	ND	1.07	13.7	0.784	1.28	0.254	ND	ND
TOTAL PAHs		*500*	*ND*	*7.41*	*39.9*	*0.211*	*5.12*	*ND*	*3.52*	*57.3*	*2.68*	*3.93*	*1.70*	*ND*	*ND*
Total Lead (mg/kg)															
LEAD, TOTAL	63	1000	**439**	**336**	44.1	**96.2**	**136**	**129**	**525**	**394**	**345**	**152**	**371**	39.5	29.3

Notes:

1. Only those parameters detected at a minimum of one sample location are presented in this table; all other compounds were reported as non-detect
2. Values per 6NYCRR Part 375 Soil Cleanup Objectives (SCOs)
3. Blind Duplicate of VFL-17
4. Blind Duplicate of VFL-34
5. Blind Duplicate of VFL-41

Definitions:

ND = Parameter not detected above laboratory detection limit
J+ = The analyte was positively identified; the associated numerical value is an estimated quantity that may be biased high
J = The analyte was positively identified; the associated numerical value is an approximate concentration of the analyte in the sample
J- = The analyte was positively identified; the associated numerical value is an estimated quantity that may be biased low
Bold = Result exceeds Unrestricted SCOs
Bold = Result exceeds Commercial SCOs

TABLE 11

SUMMARY OF GCS AREA 2 END-POINT SOIL ANALYTICAL DATA

251 HOMER STREET REDEVELOPMENT SITE
OLEAN, NEW YORK

PARAMETER[1]	Unrestricted SCOs[2]	Commercial SCOs[2]	Area 2 Sample Locations																								
			Verification Floor Sample Locations													Verification Sidewall Sample Locations												
			VFL-1	VFL-2	VFL-3	VFL-4	VFL-5	VFL-6	VFL-7	VFL-8	VFL-9	VFL-10	VFL-11	VFL-12	VFL-13	VSW-1	VSW-2	VSW-3	VSW-4	VSW-5	VSW-6	VSW-7r	VSW-8	VSW-9	VSW-10	VSW-11	VSW-S2-21	VSW-S2-22
Volatile Organic Compounds (VOCs) - mg/kg																												
1,2,4-TRIMETHYLBENZENE	--	--	ND	0.113	0.0421	0.0842	0.0734	0.0589	1.64	ND	0.216	0.0242	ND	0.0413	ND	ND	ND	ND	2.32	0.0713	ND	ND	ND	0.349	ND	ND	0.422	ND
1,2-DICHLOROPROPANE	--	--	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.02 J+	ND	ND	ND	ND
1,3,5-TRIMETHYLBENZENE (MESITYLENE)	8.4	190	ND	0.0427	0.0156	0.0304	0.0421	0.0178	0.45 J+	ND	0.0682	ND	ND	ND	ND	ND	ND	ND	1.16	0.0528	ND	ND	ND	ND	ND	ND	0.275	ND
ACETONE	0.05	500	**0.0923**	**0.289**	**0.122**	**0.12**	**0.157**	ND	**0.27 J+**	**0.0886**	**0.0888**	**0.101**	ND	**0.0787**	ND	**0.0911**	ND	ND	**0.19 J+**	**0.0639**	**0.0812**	**0.114**	**0.206**	**0.25 J+**	**0.0762**	**0.18 J+**	ND	**0.181**
BENZENE	0.06	44	ND	ND	0.0184	0.0352	0.0326	0.0198	0 J+	ND	0.00501	ND	ND	0.0154	ND	ND	ND	0.01 J+	0.0178	0.00497	ND	ND	0.0175	0.03 J+	ND	0.02 J+	ND	ND
CARBON DISULFIDE	--	--	ND	0.0131	0.0109	0.0172	0.0172	ND	ND	0.00786	ND	ND	ND	0.0139	ND	ND	ND	ND	0.0118	ND	ND	ND	ND	0.01 J+	ND	ND	ND	ND
CHLOROBENZENE	1.1	500	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**1.48**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
CHLOROFORM	0.37	350	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00631	ND	ND	ND
CYCLOHEXANE	--	--	0.0859	0.0221	0.119	0.211	0.107	0.0857	0.03 J+	ND	0.0554	ND	ND	ND	ND	ND	ND	ND	0.234	0.0204	ND	ND	ND	ND	ND	0.02 J+	ND	ND
CYMENE	--	--	ND	0.00592	0.0221	0.0479	0.0128	0.00536	0.05 J+	ND	0.0118	ND	ND	ND	ND	ND	ND	ND	0.158	0.00435	ND	ND	ND	ND	ND	ND	ND	ND
ETHYLBENZENE	1	390	0.00557	0.00826	0.0089	0.0119	0.0188	0.00644	0.06 J+	ND	0.00741	ND	ND	ND	ND	ND	ND	ND	0.216	ND	ND	ND	ND	0.01 J+	ND	ND	ND	ND
ISOPROPYLBENZENE (CUMENE)	--	--	0.00656	0.00527	0.00367	0.00653	0.00507	0.00419	0.03 J+	ND	0.00932	0.00598	ND	0.0027	ND	ND	ND	ND	ND	0.00298	ND	ND	ND	0.062	ND	ND	ND	ND
M,P-XYLENES	--	--	0.0153	0.0318	0.00587	0.00648	0.0146	0.0243	0.44 J+	ND	0.0178	ND	ND	ND	ND	ND	ND	ND	1.24	0.0295	ND	ND	0.00482	0.05 J+	ND	ND	0.309	ND
METHYL ETHYL KETONE (2-BUTANONE)	0.01	500	ND	ND	ND	ND	ND	ND	**0.11 J+**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
METHYLCYCLOHEXANE	--	--	0.235 J	0.081 J	0.0978	0.147	0.0929	0.106	0.26 J+	ND	0.256	ND	ND	0.0222	ND	ND	ND	ND	1.2	0.107	ND	ND	0.0194	ND	ND	0.04 J+	ND	ND
METHYLENE CHLORIDE	--	--	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.0857
NAPHTHALENE	--	--	ND	ND	ND	ND	ND	ND	0.03 J+	ND	0.0231	ND	ND	ND	ND	ND	ND	ND	ND	0.00781	ND	ND	ND	ND	ND	ND	ND	ND
N-BUTYLBENZENE	12	500	ND	ND	ND	ND	ND	0.00382	0.09 J+	ND	0.0254	0.0024	ND	ND	ND	ND	ND	ND	0.3	0.00862	ND	ND	ND	ND	ND	ND	ND	ND
N-PROPYLBENZENE	3.9	500	ND	0.00838	ND	ND	ND	ND	0.06 J+	ND	0.0156	0.0102	ND	0.005	ND	ND	ND	ND	0.182	0.00464	ND	ND	ND	ND	ND	ND	ND	ND
O-XYLENE (1,2-DIMETHYLBENZENE)	--	--	0.0222	0.0257	0.0623	0.101	0.0852	0.0271	0.17 J+	ND	0.0204	ND	ND	0.0092	ND	ND	ND	ND	0.616	0.00781	ND	ND	ND	0.02 J+	ND	ND	ND	ND
SEC-BUTYLBENZENE	11	500	ND	0.00538	ND	ND	ND	ND	0.03 J+	ND	0.00932	0.00686	ND	0.00252	ND	ND	ND	ND	ND	0.00266	ND	ND	ND	ND	ND	ND	ND	ND
T-BUTYLBENZENE	5.9	500	ND	ND	ND	ND	ND	ND	0.01 J+	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
TOLUENE	0.7	500	0.0141	0.00869	ND	ND	0.042	0.00823	0.07 J+	ND	ND	ND	ND	ND	ND	0.00723	ND	ND	0.361	0.003 U	ND	ND	0.00556	0.01 J+	ND	ND	ND	ND
Polycyclic Aromatic Hydrocarbons (PAHs) - mg/kg																												
ANTHRACENE	100	500		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.0876	ND	ND	ND	ND
BENZO(A)ANTHRACENE	1	5.6	**1.4**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.0978	0.156	0.328	ND	ND
BENZO(A)PYRENE	1	1	**2.13**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.687	ND	ND	ND	0.152	0.171	0.435	ND	ND
BENZO(B)FLUORANTHENE	1	5.6	**1.45**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.073	0.146	ND	ND	ND
BENZO(G,H,I)PERYLENE	100	500	2.85	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2.26	ND	1.15	4.23	ND	0.0822	0.237	0.293	0.517	ND	ND
BENZO(K)FLUORANTHENE	0.8	56	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**0.831**
CHRYSENE	1	56	**1.98**	1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.727	ND	ND	ND	0.136	0.209	ND	ND	ND
DIBENZ(A,H)ANTHRACENE	0.33	0.56	**1.5**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.0775	ND	ND	ND	ND
FLUORANTHENE	100	500	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.155	ND	ND	ND
FLUORENE	30	500	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.0766	ND	ND	ND	ND
INDENO(1,2,3-C,D)PYRENE	0.5	5.6	**1.19**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.0788	ND	ND	ND
NAPHTHALENE	12	500	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.182	ND	ND	ND	ND
PHENANTHRENE	100	500	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.87	ND	ND	0.103	0.687	0.529	1.91	ND	ND
PYRENE	100	500	0.904	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.79	0.932	ND	0.094	0.416	0.455	1.66	ND	ND
TOTAL PAHs	*--*	*500*	*13*	*1*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*2.3*	*ND*	*6.2*	*5.2*	*ND*	*0.28*	*2.2*	*2.2*	*4.9*	*ND*	*0.8*
Total Lead (mg/kg)																												
LEAD, TOTAL	63	1000	**234**	**329**	42.5	62.1	**68.2**	23.2	12.1	19.6	**144**	13.3	17.9	**1090**	14.1	**1730**	**252**	19.9	**1280**	**958**	13.8	60.3	**328**	19.8	**174**	**855**	**439**	**1520**

Notes:

1. Only those parameters detected at a minimum of one sample location are presented in this table; all other compounds were reported as non-detect
2. Values per 6NYCRR Part 375 Soil Cleanup Objectives (SCOs)

Definitions:

ND = Parameter not detected above laboratory detection limit
Q = Qualifier from data validation
J+ = The analyte was positively identified; the associated numerical value is an estimated quantity that may be biased high
J = The analyte was positively identified; the associated numerical value is an approximate concentration of the analyte in the sample
J- = The analyte was positively identified; the associated numerical value is an estimated quantity that may be biased low

Bold (blue) = Result exceeds Unrestricted SCOs
Bold (yellow) = Result exceeds Commercial SCOs

TABLE 12

SUMMARY OF GCS AREA 3 END-POINT SOIL ANALYTICAL DATA

251 HOMER STREET REDEVELOPMENT SITE
OLEAN, NEW YORK

PARAMETER[1]	Unrestricted SCOs [2]	Commercial SCOs [2]	Area 3 Sample Location			
			Verification Floor Sample Locations		Verification Sidewall Sample Locations	
			VFL-42	VFL-43	VSW-15	VSW-16
Volatile Organic Compounds (VOCs) - mg/kg						
ACETONE	**0.05**	**500**	**0.259**	ND	ND	**0.16**
CHLOROFORM	**0.37**	**350**	0.00229	ND	ND	ND
METHYLENE CHLORIDE	**0.05**	**500**	0.0427	0.0424	0.043	0.0445
Polycyclic Aromatic Hydrocarbons (PAHs) - mg/kg						
BENZO(A)ANTHRACENE	**1**	**5.6**	ND	ND	ND	0.0753
BENZO(A)PYRENE	**1**	**1**	ND	ND	0.597	0.0701
BENZO(B)FLUORANTHENE	**1**	**5.6**	ND	ND	0.4	0.0999
BENZO(G,H,I)PERYLENE	**100**	**500**	ND	ND	1.01	ND
CHRYSENE	**1**	**56**	ND	ND	ND	0.0855
DIBENZ(A,H)ANTHRACENE	**0.33**	**0.56**	ND	ND	**0.492**	ND
FLUORANTHENE	**100**	**500**	ND	ND	ND	0.131
INDENO(1,2,3-C,D)PYRENE	**0.5**	**5.6**	ND	ND	0.362	ND
PYRENE	**100**	**500**	ND	ND	ND	0.11
TOTAL PAHs	*-*	***500***	*ND*	*ND*	*2.86*	*0.572*
Total Lead (mg/kg)						
LEAD, TOTAL	**63**	**1000**	47.3	42.3	**124**	34

Notes:

1. Only those parameters detected at a minimum of one sample location are presented in this table; all other compounds were reported as non-detect
2. Values per 6NYCRR Part 375 Soil Cleanup Objectives (SCOs)

Definitions:

ND = Parameter not detected above laboratory detection limit

Q = Qualifier from data validation

Bold	= Result exceeds Unrestricted SCOs
Bold	= Result exceeds Commercial SCOs

TABLE 13

SUMMARY OF ARSENIC AREA 4 END-POINT ANALYTICAL DATA

251 HOMER STREET SITE
OLEAN, NEW YORK

PARAMETER[1]	Unrestricted SCOs[2]	Commercial SCOs[2]	Sample Locations										
			Verification Floor Sample Locations						Verification Sidewall Sample Locations				
			VFL-AR-01	VFL-AR-02	VFL-AR-03	VFL-AR-04	VFL-AR-05	VFL-AR-06	VSW-AR-01	VSW-AR-02	VSW-AR-03	VSW-AR-04	VSW-AR-05
Total Arsenic (mg/kg)													
Arsenic	**13**	**16**	8.78	4.81	5.2	5.35	**13.4**	**15.5**	**21.4**	9.5	**15.6**	10.2	**17.2**

Notes:
1. Only those parameters detected at a minimum of one sample location are presented in this table; all other compounds were reported as non-detect
2. Values per 6NYCRR Part 375 Soil Cleanup Objectives (SCOs)

Definitions:

ND = Parameter not detected above laboratory detection limit.

Bold	= Result exceeds Unrestricted SCOs
Bold	= Result exceeds Commercial SCOs

TABLE 14

SUMMARY OF 2015 TEST PIT AND NEAR-SURFACE SOIL ANALYTICAL DATA

251 HOMER STREET REDEVELOPMENT SITE
OLEAN, NEW YORK

Parameter [1]	Unrestricted SCOs[2] (mg/kg)	Protection of Ecological Resources [2]	Commercial SCOs[2] (mg/kg)	SAMPLE LOCATION											
				Jan-15					Mar-15			Oct-15			
				SE of Area 2		Along Two Mile Creek					NE of Area 3	Surface Sample			
				TP-A	TP-C	TP-B	TP-D	TP-E	TP-F (1-4') [3]	TP-I (3-6') [3]	TP-RR01	SS-CA1 (0-1') [4]	SS-CA2 (0-1') [4]	SS-CA3 (0-1') [4]	SS-CA4 (0-1') [4]
TCL Volatile Organic Compounds (VOCs) - mg/kg															
Ethylbenzene	**30**	**--**	**390**	ND	ND	ND	ND	ND	ND	0.015	ND	ND	ND	ND	ND
Chloromethane	**--**	**--**	**--**	ND	ND	ND	ND	ND	ND	0.019	ND	ND	ND	ND	ND
Bromomethane	**--**	**--**	**--**	ND	ND	ND	ND	ND	ND	0.032	ND	ND	ND	ND	ND
Xylenes (mixed)	**0.26**	**0.26**	**500**	ND	ND	ND	ND	ND	ND	0.101	ND	ND	ND	ND	ND
2-Butanone (MEK)	**0.12**	**100**	**500**	ND	0.102	ND	0.0894	**0.193**	ND	**0.59**	0.0692	ND	ND	ND	ND
Acetone	**0.05**	**2.2**	**500**	**0.105**	**0.628**	**0.065**	**0.399**	**1.07**	0.0021	**0.94**	**0.0692**	ND	ND	ND	ND
Carbon disulfide	**--**	**--**	**--**	ND	ND	ND	0.015	0.0485	ND	ND	0.00997	ND	ND	ND	ND
Isopropylbenzene	**--**	**--**	**--**	ND	ND	ND	ND	ND	ND	0.033	ND	ND	ND	ND	ND
Methyl Acetate	**--**	**--**	**--**	ND	ND	ND	ND	ND	ND	0.28	ND	ND	ND	ND	ND
Cyclohexane	**--**	**--**	**--**	ND	ND	ND	ND	ND	ND	0.12	ND	ND	ND	ND	ND
Chloroform	**0.37**	**12**	**350**	0.0118	0.0151	0.0114	0.0079	0.0129	ND	0.0151	0.00277	ND	ND	ND	ND
Methyl cyclohexane	**--**	**--**	**--**	ND	ND	ND	ND	ND	ND	1.6	ND	ND	ND	ND	ND
TCL Semi-Volatile Organic Compounds (SVOCs) - mg/kg															
Naphthalene	**100**	**--**	**500**	ND	ND	ND	ND	ND	0.31	2.1	ND	ND	0.28	ND	ND
Benzo(a)anthracene	**1**	**--**	**5.6**	ND	ND	ND	ND	ND	0.21	**1.9**	ND	ND	0.16	ND	0.069
Benzo(a)pyrene	**1**	**2.6**	**1**	ND	ND	ND	ND	ND	0.45	**1.9**	0.0936	0.51	0.2	0.058	0.08
Benzo(b)fluoranthene	**1**	**--**	**5.6**	ND	ND	ND	ND	ND	0.27	0.93	0.172	0.32	0.16	0.05	0.059
Benzo(ghi)perylene	**100**	**--**	**500**	ND	ND	ND	0.38	ND	1.4	4	ND	1.4	0.52	0.13	0.18
Benzo(k)fluoranthene	**1**	**--**	**56**	ND	ND	ND	ND	ND	ND	0.19	ND	ND	ND	ND	ND
Biphenyl	**--**	**60**	**--**	ND	ND	ND	ND	ND	ND	1.2	ND	ND	ND	ND	ND
Dibenz(a,h)anthracene	**0.33**	**--**	**0.56**	ND	ND	ND	ND	ND	**0.53**	**0.51**	ND	**0.62**	0.15	ND	0.042
Indeno(1,2,3-cd)pyrene	**0.5**	**--**	**5.6**	ND	ND	ND	ND	ND	0.46	**0.74**	ND	0.37	0.14	ND	0.05
2-Methylnaphthalene	**--**	**--**	**--**	ND	ND	ND	ND	ND	0.86	14	ND	1.3	0.98	0.15	0.43
Chrysene	**1**	**--**	**56**	ND	ND	ND	ND	ND	0.75	**2.9**	0.114	0.32	0.36	0.069	0.091
Fluoranthene	**100**		**500**	ND	ND	ND	ND	ND	ND	ND	0.14	ND	ND	ND	ND
Phenanthrene	**100**	**--**	**500**	ND	ND	ND	0.276	ND	1	16	ND	0.62	1	0.14	0.41
Anthracene	**100**	**--**	**500**	ND	ND	ND	ND	ND	0.13	1.4	ND	ND	0.12	ND	0.037
Pyrene	**100**	**--**	**500**	ND	ND	ND	0.135	ND	0.64	11	0.134	0.33	0.65	0.099	0.28
TAL Metals - mg/kg															
Aluminum	**10,000**	**10,000**	**--**	**13,400**	**41,000**	**13,300**	4,170	**42,000**	5,800	**10,000**	8,510	8,800	**14,000**	**11,000**	**11,000**
Antimony	**12**	**12**	**--**	ND	ND	ND	ND	ND	0.94	1.7	ND	0.99	ND	0.94	ND
Arsenic	**13**	**13**	**16**	11.1	4.67	5.75	**13**	4.4	**17**	**17**	**22.1**	**20**	**13**	**15**	**14**
Barium	**350**	**433**	**400**	127	343	138	150	316	100	120	131	110	130	120	120
Beryllium	**7.2**	**10**	**--**	ND	ND	ND	ND	ND	0.46	0.56	ND	0.53	0.7	0.73	0.57
Calcium	**10,000**	**10,000**	**--**	1,370	3,400	1,480	1,120	3,550	2,900	3,100	9,800	1,700	2,300	3,000	2,600
Chromium	**30**	**--**	**400**	16.5	**34.7**	15	7.87	**37.3**	9.3	13	16.3	12	18	14	14
Cobalt	**20**	**20**	**--**	5.6	7.92	8.34	6.45	7.62	6.1	11	10	7.2	11	7.9	10
Copper	**50**	**50**	**270**	7.74	9.91	3.41	30.4	10.2	37	49	**145**	48	35	45	43
Iron	**--**	**--**	**--**	24,500	23,000	21,700	20,700	24,300	26,000	22,000	43,400	26,000	27,000	26,000	28,000
Lead	**63**	**63**	**1,000**	23.5	17.8	18.7	51.8	16.1	56	**200**	**221**	**220**	**110**	43	**88**
Magnesium	**--**	**--**	**--**	2,040	4,470	2,230	ND	4,590	1,100	2,800	1,500	1,700	3,800	1,600	3,100
Manganese	**1,600**	**1,600**	**10,000**	199	249	1,030	58.1	263	280	390	556	230	440	470	410
Mercury	**0.18**	**0.18**	**2.8**	NA	NA	NA	NA	NA	0.07	**0.24**	ND	0.08	0.1	0.08	0.09
Nickel	**30**	**30**	**310**	14	21.3	12.6	21.2	21.4	19	29	23.1	18	22	22	21
Potassium	**--**	**--**	**--**	833	4,810	814	410	6,150	410	670	1040	700	1100	790	1000
Selenium	**3.9**	**3.9**	**1,500**	**4.59**	ND	**4.16**	**4.75**	**4.32**	0.77	ND	3.46	0.73	ND	0.68	ND
Sodium	**--**	**--**	**--**	ND	ND	ND	ND	ND	100	140	20.6	150	51	210	59
Vanadium	**39**	**39**	**--**	21.8	**39.9**	17.7	ND	**46.8**	27	16	20.6	18	19	31	14
Zinc	**109**	**109**	**10,000**	54.9	**116**	48.9	35.4	**109**	31	**210**	88.3	70	**110**	62	67

Notes:
1. Only those parameters detected at a minimum of one sample location are presented in this table; all other compounds were reported as non-detect.
2. Values per NYSDEC Part 375 Commercial Soil Cleanup Objectives (SCOs) and Commissioner's Policy CP 51.
3. TP-F (1-4') is listed in the analytical report as TP-1 (1-4'); and TP-I (3-6') is listed as TP-4 (3-6')
3. SS-CA1 (0-1'), SS-CA2 (0-1'), SS-CA3 (0-1') and SS-CA4 (0-1') are listed as SS-1, SS-2, SS-3 and SS-4 in the analytical report (all 0-1').

Definitions:
mg/kg = milligrams per kilogram
ND = Parameter not detected above laboratory detection limit
NA = Parameter not analyzed
"--" = No SCO available

BOLD	Exceeds protection of ecological resource SCO
BOLD	Exceeds Commercial Soil Cleanup Objectives CSCO
BOLD	Exceeds Protection of Ecological and Commercial Soil Cleanup Objectives

TABLE 15A

SUMMARY OF TWO MILE CREEK (ON-SITE) END-POINT SOIL ANALYTICAL DATA

251 HOMER STREET REDEVELOPMENT SITE
OLEAN, NEW YORK

PARAMETER[1]	Unrestricted Use SCOs[2]	Protection of Ecological Resources[2]	Commercial Use SCOs[2]	Two Mile Creek Sample Locations[3]																				
				Verification Floor Sample Locations															Verification Sidewall Sample Locations					
				CA-VFL-02	CA-VFL-03	CA-VFL-06	CA-VFL-07	CA-VFL-08	CA-VFL-09	CA-VFL-10	CA-VFL-11-2	CA-VFL-12	CA-VFL-13	CA-VFL-14	CA-VFL-15	CA-VFL-16	CA-VFL-17	CA-VFL-18	CA-VSW-02	CA-VSW-03	CA-VSW-06	CA-VSW-07	CA-VSW-08	CA-VSW-09
Volatile Organic Compounds (VOCs) - mg/kg																								
Acetone	**0.05**	**2.2**	**500**	**0.257**	ND	0.0861	0.0806	**0.11**	**0.19**	**0.157**	0.0666	ND	ND	**0.115**	ND	ND	ND	**0.227**	**0.354**	ND	ND	ND	ND	**0.0643**
Benzene	**0.06**	**70**	**44**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00312	0.00239	0.00258	0.00326	ND	0.00398
2-Butanone (MEK)	**100**	**--**	**--**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.0744	ND	ND	ND	ND	ND
Carbon disulfide	**--**	**--**	**--**	0.0613	0.00847	0.00626	ND	ND	0.00889	0.00553	ND	ND	ND	ND	ND	ND	ND	ND	0.0274	ND	ND	ND	ND	ND
Cyclohexane	**--**	**--**	**--**	ND	0.113	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.0197	ND	0.017	ND	ND	ND
Methyl Acetate	**--**	**--**	**--**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Methylcyclohexane	**--**	**--**	**--**	ND	0.346	ND	ND	ND	0.0191	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.0814	ND	0.0266	0.0199	ND	ND
Methylene chloride	**0.05**	**12**	**500**	0.0364	0.0129	**0.0879**	0.014	ND	ND	ND	ND	ND	ND	**0.148**	**0.153**	ND	ND	**0.159**	ND	ND	ND	**0.196**	ND	ND
n-Butylbenzene	**--**	**--**	**--**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Toluene	**0.7**	**36**	**500**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00562	0.00572	0.00607	ND	ND
m-Xylene & p-Xylene	**--**	**--**	**--**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.281	0.00436	0.00773	0.00693	ND	ND
o-Xylenes	**--**	**--**	**--**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00358	0.00221	ND	ND
Total Xylene	**0.26**	**--**	**500**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00914	ND	ND
p-Cymene (p-isopropyltoluene)	**--**	**--**	**--**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00227	ND	ND
1,2,4-Trimethylbenzene	**3.6**	**--**	**190**	ND	0.051 F1	ND	ND	0.0129	0.0172	0.0061	ND	ND	ND	ND	ND	ND	ND	ND	0.336	0.00288	ND	0.0048	ND	ND
1,3,5-Trimethylbenzene	**8.4**	**--**	**190**	ND	0.0344	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.165	ND	ND	0.00293	ND	ND
Polycyclic Aromatic Hydrocarbons (PAHs) - mg/kg																								
Benzo(a)anthracene	**1**	**1**	**5.6**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.213	ND	ND
Benzo(b)fluoranthene	**1**	**1**	**5.6**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.162	0.287	ND
Benzo(g,h,i)perylene	**100**	**100**	**500**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.808	0.636
Benzo(a)pyrene	**1**	**1**	**1**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.184	0.409	ND
Chrysene	**1**	**1**	**56**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.242	ND	ND
Dibenz(a,h)anthracene	**0.33**	**0.33**	**0.56**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**0.546**	**0.468**
Fluoranthene	**100**	**--**	**500**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.36	ND	ND
Indeno(1,2,3-cd)pyrene	**0.5**	**0.5**	**5.6**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.297	0.471
Phenanthrene	**100**	**--**	**500**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.537	0.311	ND
Pyrene	**100**	**--**	**500**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.581	ND	ND
Total PAHs	*--*	*--*	***500***	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*2.279*	*2.658*	*1.575*
Total Lead and Arsenic (mg/kg)																								
Arsenic	**13**	**13**	**16**	9.3	**14.9**	**14.8**	11.9	10.6	**14.1**	8.45	6.26	11.8	**14.9**	8.55	4.19	4.87	6.19	5.5	7.68	9.1	**15.9**	9.33	**47.2**	**35.1**
Lead	**63**	**63**	**1000**	23.4	25	43.8	35.6	20.4	26.6	16.2	13.2	33.3	25.6	21.8	16.7	18.3	16.2	16.4	164	26.9	**245**	27	**110**	**100**

Notes:

1. Only those parameters detected at a minimum of one sample location are presented in this table; all other compounds were reported as non-detect
2. Values per 6NYCRR Part 375 Soil Cleanup Objectives (SCOs)
3. Sample location names changed to CA (Creek Area) to distinguish from other samples

Definitions:

ND = Parameter not detected above laboratory detection limit

E = Result exceeded calibration range

"--" = No value available for the parameter or parameter not analyzed for

Bold	= Result exceeds Unrestricted Use SCOs
Bold	= Result exceeds Protection of Ecological Resources
Bold	= Result exceeds Commercial Use SCOs

TurnKey Environmental Restoration, LLC

Benchmark Environmental Engineering & Science, PLLC

TABLE 15B

SUMMARY OF TWO MILE CREEK (OFF SITE) END-POINT SOIL ANALYTICAL DATA

251 HOMER STREET REDEVELOPMENT SITE
OLEAN, NEW YORK

PARAMETER[1]	Unrestricted SCOs[2]	Protection of Ecological Resources[2]	Commercial SCOs[2]	Two Mile Creek Off Site Sample Locations[4]					
				Verification Floor Sample Locations			Verification Sidewall Sample Locations		
				CA-VFL-01	CA-VFL-04	CA-VFL-05	CA-VSW-01	CA-VSW-04	CA-VSW-05-2
Volatile Organic Compounds (VOCs) - mg/kg									
Acetone	**0.05**	**2.20**	**500**	ND	**0.0989 J**	**0.154**	**0.252**	ND	**0.076**
Benzene	**0.06**	**70.00**	**44**	ND	ND	ND	ND	ND	0.00744
2-Butanone (MEK)	**100**	**--**	**--**	ND	ND	ND	ND	ND	ND
Carbon disulfide	**--**	**--**	**--**	0.0181	ND	ND	ND	ND	ND
Cyclohexane	**--**	**--**	**--**	ND	ND	ND	ND	ND	0.0284
Methyl Acetate	**--**	**--**	**--**	ND	ND	ND	0.225	ND	ND
Methylcyclohexane	**--**	**--**	**--**	ND	ND	ND	ND	1.31	0.0502
Methylene chloride	**0.1**	**12.0**	**500**	**0.25**	**0.13**	ND	ND	ND	0.0306
n-Butylbenzene	**--**	**--**	**--**	ND	ND	ND	ND	0.237	ND
Toluene	**0.7**	**36.0**	**500**	ND	ND	ND	ND	ND	0.194
m-Xylene/p-Xylene	**--**	**--**	**--**	ND	ND	ND	ND	ND	0.413
o-Xylene	**--**	**--**	**--**	ND	ND	ND	ND	ND	ND
Total Xylene	**0.26**	**--**	**500**	ND	ND	ND	ND	ND	ND
p-Cymene (p-isopropyltoluene)		**--**		ND	ND	ND	ND	ND	ND
1,2,4-Trimethylbenzene	**3.60**	**--**	**190**	ND	ND	ND	ND	**8.43**	0.786
1,3,5-Trimethylbenzene	**8.40**	**--**	**190**	ND	ND	ND	ND	1.22	ND
Polycyclic Aromatic Hydrocarbons (PAHs) - mg/kg									
Benzo(a)anthracene	**1**	**1**	**5.6**	ND	ND	ND	ND	ND	ND
Benzo(b)fluoranthene	**1**	**1**	**5.6**	ND	ND	ND	0.0747	ND	ND
Benzo(g,h,i)pyrene	**100**	**100**	**500**	ND	ND	ND	0.289	ND	0.852
Benzo(a)pyrene	**1**	**1**	**1**	ND	ND	ND	0.0757	ND	ND
Chrysene	**1**	**1**	**56**	ND	ND	ND	0.144	ND	0.473
Dibenz(a,h)anthracene	**0.33**	**0.33**	**0.56**	ND	ND	ND	0.0968	ND	ND
Fluoranthene	**100**	**--**	**500**	ND	ND	ND	ND	ND	ND
Indeno(1,2,3-cd)pyrene	**0.5**	**0.5**	**5.6**	ND	ND	ND	0.0691	ND	ND
Phenanthrene	**100**	**--**	**500**	ND	ND	ND	ND	ND	1.63
Pyrene	**--**	**--**	**500**	ND	ND	ND	0.0762	1.94	1.33
Total PAHs	***--***	***--***	***500***	*ND*	*ND*	*ND*	*0.8255*	*1.94*	*4.285*
Total Lead (mg/kg)									
Arsenic	**13**	**13**	**16**	**13.6**	5.76	5.72	**21.3**	**53.9**	**21.5**
Lead	**63**	**63**	**1000**	24.9	33.6	27.6	**216**	**1290**	**422**

Notes:

1. Only those parameters detected at a minimum of one sample location are presented in this table; all other compounds were reported as non-detect
2. Values per 6NYCRR Part 375 Soil Cleanup Objectives (SCOs)
3. Sample location names changed to CA (Creek Area) to distinguish from other samples

Definitions:

ND = Parameter not detected above laboratory detection limit

E = Result exceeded calibration range

"--" = No value available for the parameter or parameter not analyzed for

Bold	= Result exceeds Unrestricted Use SCOs
Bold	= Result exceeds Protection of Ecological Resources
Bold	= Result exceeds Commercial Use SCOs

TABLE 16

STANDARDS, CRITERIA, AND GUIDANCE (SCGs)

251 HOMER STREET REDEVELOPMENT SITE
OLEAN, NEW YORK

Citation	Title	Regulatory Agency
General		
29CFR 1910.120	Hazardous Waste Operations and Emergency Response	US Dept. of Labor, OSHA
29CFR 1910.1000	OSHA General Industry Air Contaminants Standard	US Dept. of Labor, OSHA
29CFR 1926	Safety and Health Regulations for Construction	US Dept. of Labor, OSHA
Not Applicable	Analytical Services Protocol	NYSDEC
6NYCRR Part 608	Use and Protection of Waters	NYSDEC
6NYCRR Part 621	Uniform Procedures Regulations	NYSDEC
6NYCRR Parts 750-757	State Pollutant Discharge Elimination System	NYSDEC
Not Applicable	New York State Stormwater Management Design Manual	NYSDEC
Section 404	Clean Water Act	USACE
Soil/Sediment		
6NYCRR Part 375	Environmental Remediation Programs	NYSDEC
DEC Policy CP-51	Soil Cleanup Guidance	NYSDEC
NYSDEC, June 2014	Technical Guidance for Screening Contaminated Sediments: LEL/SEL	NYSDEC
Groundwater		
6NYCRR Part 700-705	Surface Water and Ground Water Classification Standards	NYSDEC
TOGS 1.1.1	Ambient Water Quality Standards and Guidance Values	NYSDEC
TOGS 2.1.3	Primary and Principal Aquifer	NYSDEC
Air		
DER-10 Appendix 1B	Fugitive Dust Suppression and Particulate Monitoring Program at Inactive Hazardous Waste Sites	NYSDEC
NYSDOH, October 2006	Final - Guidance for Evaluating Soil Vapor Intrusion in the State of NY	NYSDOH
Solid Waste		
6NYCRR 360	Solid Waste Management Facilities	NYSDEC
6NYCRR 364	Waste Transporters	NYSDEC

TABLE 17

REMAINING SAMPLES ABOVE COMMERCIAL SOIL CLEANUP OBJECTIVES

251 HOMER STREET REDEVELOPMENT SITE
OLEAN, NEW YORK

Parameters[1]	Commercial SCOs[2] (mg/kg)	SS-4	SS-7	SS-11	SS-13	SS-15	SS-16	SS-18	SS-19	SS-Ditch-2	SS-Ditch-3	TP-1 (2-4)	TP-2 (7-9)	TP-3 (4-6)	TP-7 (2.5-4.0)	TP-16 (4.5-7.0)	TP-33 (4-9)	TP-36 (5-7)	TP-37 (4.5-6.5)	TP-41 (0-5)	MW-1 (6-8)	MW-6 (4-8)	MW-9 (2-4)	MW-14 (6-8)
		May-11	May-11	May-11	May-11	May-11	Apr-12	Apr-12	Apr-12	May-11	Apr-12	Nov-09	May-11	Nov-09	May-11	May-11	May-11	May-11	May-11	May-11	May-11	May-11	May-12	May-12
TCL Volatile Organic Compounds (VOCs) - mg/kg																								
2-Butanone (MEK)	**500**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Acetone	**500**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND	NA	0.15	ND	ND	ND	ND	ND	0.11 J	ND	ND	0.33
Benzene	**44**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND	NA	ND	ND	ND	0.21 NJ	ND	ND	ND	ND	ND	0.0051 J
Ethylbenzene	**390**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND	NA	ND	0.11 J	ND	0.17	0.13 J	0.22 J	ND	ND	ND	0.012
Xylenes, Total	**500**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND	NA	ND	0.19 NJ	0.13 J	1.1	ND	1.8	0.0055 J	ND	ND	0.09 NJ
TCL Semi-Volatile Organic Compounds (SVOCs) - mg/kg																								
Benzo(a)anthracene	**5.6**	ND	ND	ND	ND	ND	0.025 J	1.4 J	0.095 J	0.77 J	ND	NA	**30**	NA	ND	ND	ND	**13**	ND	ND	ND	ND	ND	**10 J**
Benzo(b)fluoranthene	**5.6**	ND	0.43 DJ	0.1 DJ	ND	ND	0.052 J	1.7 J	0.14 J	1.3 J	ND	NA	**23**	NA	**8.6 J**	**13 J**	1.8 J	**7.5 J**	ND	ND	ND	ND	ND	ND
Benzo(k)fluoranthene	**56**	ND	ND	0.047 DJ	ND	ND	0.029 J	0.83 J	0.065 J	0.83 J	ND	NA	14	NA	ND	ND	ND	1.4 J	ND	ND	ND	ND	ND	ND
Benzo(a)pyrene	**1**	ND	0.6 DJ	0.093 DJ	**1.1 DJ**	**1.6 DJ**	0.031 J	**1.2 J**	0.1 J	0.89 J	ND	NA	**23**	NA	ND	ND	**1.7 J**	**17**	**1.6 J**	**2.3 J**	ND	0.82 J	ND	ND
Chrysene	**56**	0.93 DJ	ND	0.1 DJ	0.88 DJ	ND	0.043 J	1.2 J	0.11 J	0.83 J	ND	NA	27	NA	ND	ND	2.6 J	13	1.3 J	2.5 J	ND	0.72 J	ND	20 J
Dibenzofuran	**--**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	8.8 J	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Dibenz(a,h)anthracene	**0.56**	ND	ND	ND	ND	**2.9 DJ**	ND	ND	ND	ND	ND	NA	**4 J**	NA	ND	ND	ND	**7.4 J**	**1 J**	**1.7 J**	ND	0.46 J	ND	ND
Indeno(1,2,3-cd)pyrene	**500**	ND	0.27 DJ	0.047 DJ	0.41 DJ	2.7 DJ	0.022 J	0.39 J	0.032 J	0.86 J	ND	NA	11	NA	ND	ND	1.1 J	5.2 J	0.58 J	1.5 J	ND	0.32 J	ND	ND
TAL Metals - mg/kg																								
Arsenic	**16**	**27**	**42.1**	**17.9**	**30.3**	**19.9**	**39.6**	9.1	**23.5**	**22.5**	**18.6 J**	NA	**24.1**	NA	15.3	**24.7**	**17.9**	**55.7**	**17**	**31**	**17.1**	**17.2**	**17**	**20.1**
Chromium	**1,500**	16.8 J	199 J	20.1 J	16.4 J	14.7 J	19.4 J	11.4 J	20.6 J	28.1 J	27.6 J	NA	13.0	NA	8.0	27.5	51.5	11.4	6.8	14.3	12.4	12.1	12.4 J	17 J
Copper	**270**	64.2 J	217 J	32.4 J	51.7 J	50.4 J	24.6 J	18.1 J	34.1 J	66.5 J	54.3 J	NA	37.7 J	NA	32.7 J	46.5 J	30.8 J	103 J	32.9 J	83.3 J	19.3	45.5	36.3 J	42.6 J
Lead	**1,000**	338	852	45.9	319	155	90.8 J	20.3 J	58.4 J	96.7 J	61.7 J	**7800**	**1240 J**	**7300**	90.6 J	363 J	386 J	191 J	11.7 J	335 J	17.7	141	405 J	167 J
Manganese	**10,000**	467	358	806	581	211	576 J	733 J	1300 J	1400 J	799 J	NA	2010 J	NA	168 J	326 J	291 J	570 J	57.9 J	281 J	744	461	103 J	363 J
Nickel	**310**	20.9	22.7	34.6	27.4	22.3	28	15.4	33	40.5 J	36.7 J	NA	17 J	NA	13.7 J	16 J	16.8 J	36.5 J	13.4 J	43.7 J	23.7	22.1	8.7	17.8
Selenium	**1,500**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Zinc	**10,000**	85.3 J	178 J	94.1	97.6	75.6	87.5 J	68.6 J	90.8 J	236	243	NA	77.9 J	NA	70.3 J	121 J	75.8 J	60.4 J	18.3 J	131 J	51.5	62.2	44.3 J	56 J
Mercury	**2.8**	0.73	1.2	0.081	0.12	0.085	0.033	ND	0.12	0.2	0.62 J	NA	0.08	NA	0.23	0.74	0.14	0.048	0.053	0.12	ND	0.12	0.77	0.12
Organochlorine Pesticides - mg/kg																								
4,4'-DDE	**62**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.034 J	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Notes:

1. Only those parameters detected at a minimum of one sample location are presented in this table; all other compounds were reported as non-detect.
2. Values per NYSDEC Part 375 Soil Cleanup Objectives (SCOs).

Definitions:

mg/kg = milligrams per kilogram
ug/kg = micrograms per kilogram
ND = Parameter not detected above laboratory detection limit.
NA = Sample not analyzed for parameter.
"--" = No SCO available.
J = Estimated value; result is less than the sample quantitation limit but greater than zero.
D = All compounds were identified in an analyisis at the secondary dilution factor.
BOLD = Result exceeds Commercial SCOs

TABLE 18

COST ESTIMATE FOR TRACK 1 UNRESTRICTED USE ALTERNATIVE

251 HOMER STREET REDEVELOPMENT SITE
OLEAN, NEW YORK

Item	Quantity	Units	Unit Cost	Total Cost
Impacted Soil/Fill Removal				
Soil/Fill Excavation & Hauling	484387	CY	$ 25	$ 12,109,680
Disposal at TSDF (1.5 tons per CY)	726581	TON	$ 40	$ 29,063,232
Post-Excavation Confirmatory Sampling	200	EA	$ 325	$ 65,000
Subtotal:				**$ 41,237,912**
Site Restoration				
Import, Backfill, Place & Compact	484387	CY	$ 22	$ 10,656,518
Backfill Characterization Sampling	70	EA	$ 900	$ 63,000
Subtotal:				**$ 10,719,518**
Excavation Groundwater Management				
Treatment System Operation and Maintenance	1	LS	$ 150,000	$ 150,000
Subtotal:				**$ 150,000**
LNAPL Removal				
Equipment Installation and Maintenance	1	LS	$ 15,000	$ 15,000
Subtotal:				**$ 15,000**
Subtotal Capital Cost				**$ 52,122,430**
Contractor Mobilization/Demobilization (5%)				$ 2,606,122
Health and Safety (2%)				$ 1,042,449
Engineering/Contingency (35%)				$ 18,242,851
Total Capital Cost for Alternative 2				**$ 74,020,000**

TABLE 19

COST ESTIMATE FOR TRACK 4 COMMERCIAL USE ALTERNATIVE
(Completed IRMs, Cover System, IC/ECs)

251 HOMER STREET REDEVELOPMENT SITE
OLEAN, NEW YORK

Item	Quantity	Units	Unit Cost	Total Cost
Monitoring Well Replacement, Repair, and Abandonment				
Replace: MW-6R, MW-8R, and MW-12R Repair: MW-7 and MW-10 Abandon: MW-2, MW-3, MW-4, MW-9, MW-13	1	LS	$ 25,000	$ 25,000
Subtotal:				**$ 25,000**
Soil Cover System				
Import and Place 1-ft layer of clean backfill	26910	CY	$ 22	$ 592,029
Demarcation Fabric	10	Rolls	$ 2,000	$ 20,000
Cover Soil Characterization and Sampling	10	EA	$ 900	$ 9,000
Subtotal:				**$ 621,029**
Subtotal Capital Cost				**$ 646,029**
Contractor Mobilization/Demobilization (5%)				$ 32,301
Health and Safety (2%)				$ 12,921
Engineering/Contingency (35%)				$ 226,110
Total Capital Cost				**$ 917,361**
Annual Operation Maintenance & Monitoring (OM&M):				
Groundwater Monitoring/NAPL Removal	1	Yr	$ 27,000	$ 27,000
Filter Sock Replacement	1	Yr	$ 800	$ 800
Annual Certification	1	Yr	$ 2,000	$ 2,000
Total Annual OM&M Cost				**$ 29,800**
Number of Years (n):				30
Interest Rate (I):				5%
p/A value:				15.3725
OM&M Present Worth (PW):				**$ 458,101**
Total Present Worth (PW): Capital Cost + OM&M PW				**$ 1,376,000**

Completed IRMs	**$ 5,210,000**

Total PW Cost for Alternative 3	**$ 6,586,000**

TABLE 20

COMPARISON OF REMEDIAL ALTERNATIVES

251 HOMER STREET REDEVELOPMENT SITE
OLEAN, NEW YORK

Remedial Alternative	NYSDEC DER-10 Evaluation Criteria								
	1. Overall	2. SCGs	3. Eff & Perm	4. Reduction	5. Imp & Eff	6. Implement	7. Cost Eff	8. Community	9. Land Use
Alternative 1 - No Further Action				✓			$5.2 million	TBE	
Alternative 2 - Track 1 Cleanup	✓	✓	✓	✓			$74 million	TBE	✓
Alternative 3 - Track 4 Cleanup	✓	✓	✓	✓	✓	✓	$6.6 million	TBE	✓

Notes:

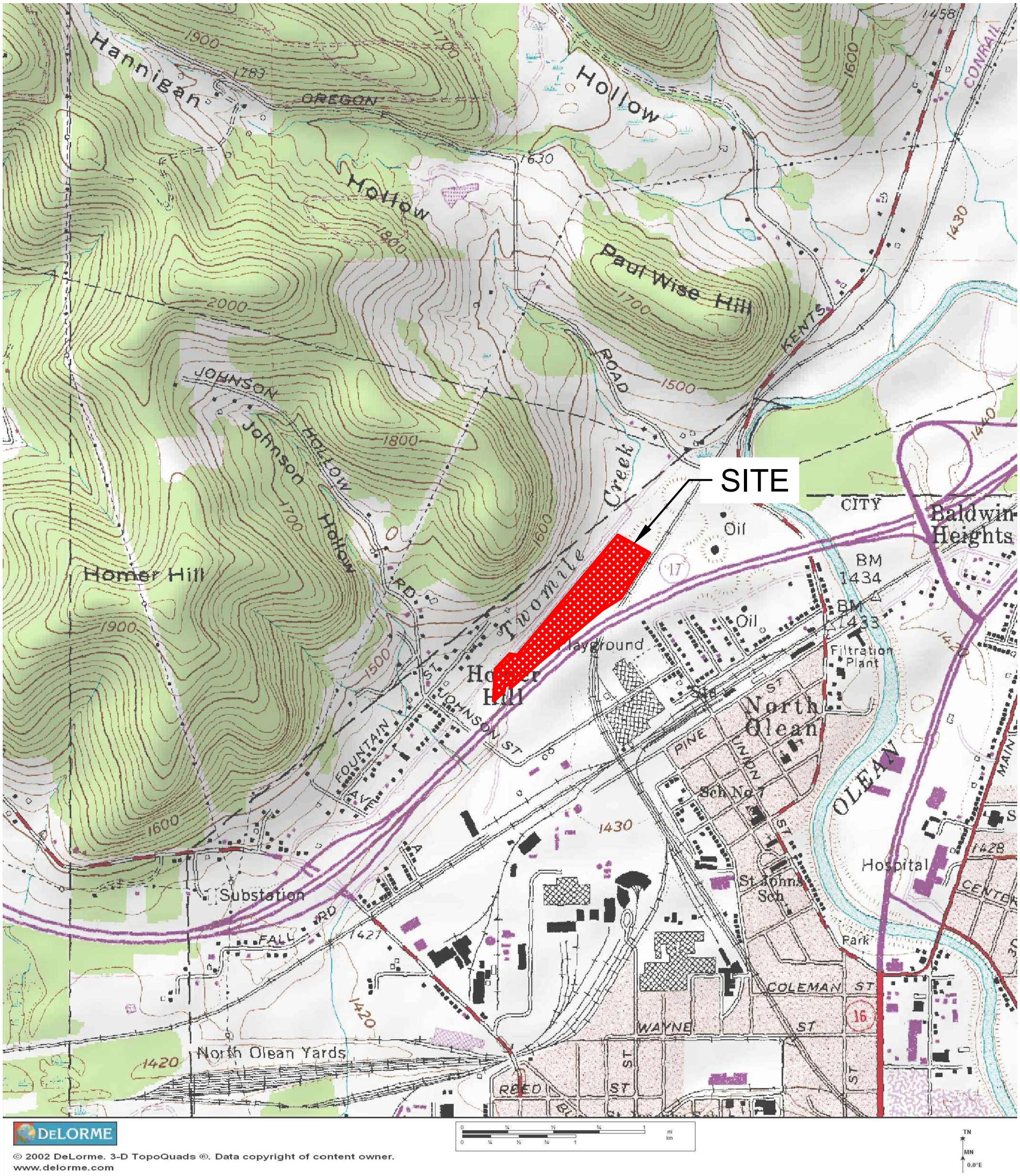
1. Overall Protectiveness of Public Health and the Environment
2. Compliance with Standards, Criteria, and Guidance (SCGs)
3. Long-Term Effectiveness and Permanence
4. Reduction of Toxicity, Mobility, or Volume of Contamination through Treatment
5. Short-Term Impacts and Effectiveness
6. Implementability (Technical and Administrative)
7. Cost Effectiveness (Costs noted include costs of the IRMs completed)
8. Community Acceptance
9. Land Use

✓ = Alternative satisfies criterion

TBE = To be evaluated following public comment period

FIGURES

FIGURE 1



BENCHMARK ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC

TURNKEY ENVIRONMENTAL RESTORATION, LLC

2558 HAMBURG TURNPIKE, SUITE 300, BUFFALO, NY 14218, (716) 856-0599

PROJECT NO.: 0311-014-001

DATE: JULY 2015

DRAFTED BY: BLR

SITE LOCATION AND VICINITY MAP

RI-IRM-AA REPORT

251 HOMER STREET REDEVELOPMENT SITE
BCP SITE NO. C905037
OLEAN, NEW YORK

PREPARED FOR

BENSON CONSTRUCTION AND DEVELOPMENT & HOMER STREET PROPERTIES, LLC

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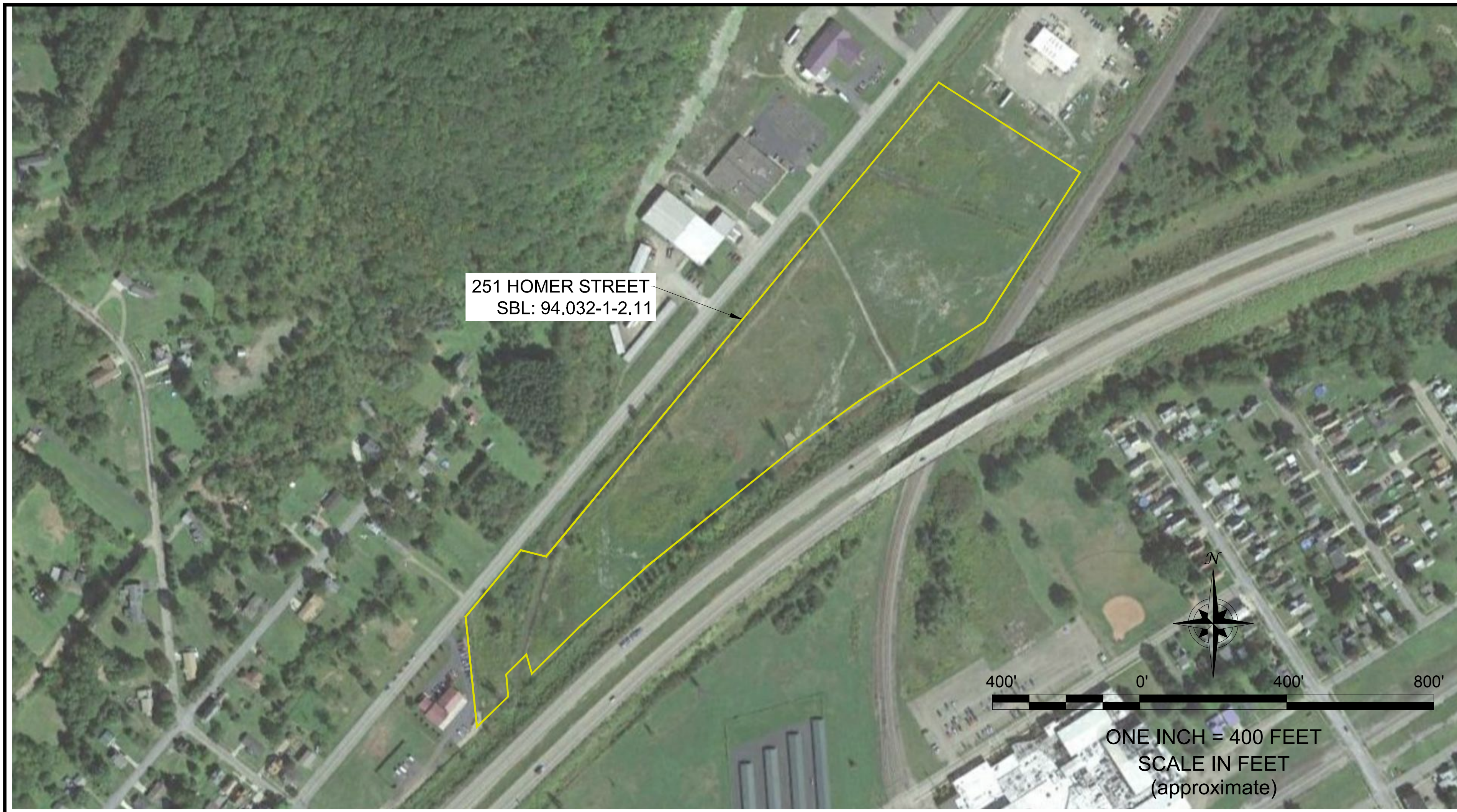
F:\CAD\TurnKey\Benson\RI-IRM-AA Report\Figure 2; Site Plan (Aerial).dwg



BENCHMARK ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC

TURNKEY ENVIRONMENTAL RESTORATION, LLC

2558 HAMBURG TURNPIKE, SUITE 300, BUFFALO, NY 14218, (716) 856-0599

PROJECT NO.: 0311-014-001

DATE: JULY 2015

DRAFTED BY: KKR

SITE PLAN (AERIAL)

RI-IRM-AA REPORT

251 HOMER STREET REDEVELOPMENT SITE
BCP SITE NO. C905037
OLEAN, NEW YORK

PREPARED FOR

BENSON CONSTRUCTION AND DEVELOPMENT & HOMER STREET PROPERTIES, LLC

FIGURE 2

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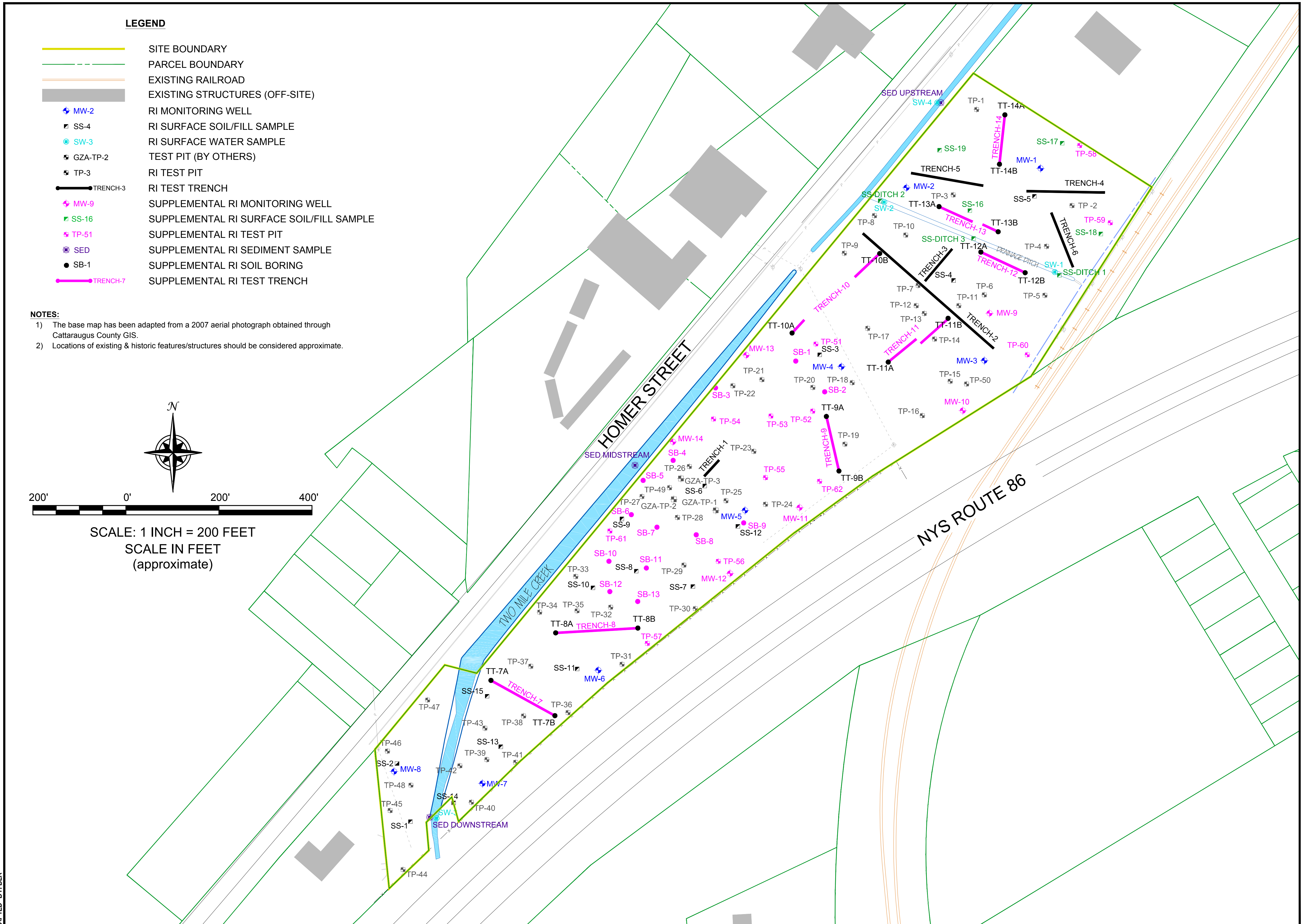
F:\CAD\TurnKey\Benson\RI-IRM-AA Report\Figure 3: Sampling Locations.dwg



DATE: JULY 2015
DRAFTED BY: BLR

BENCHMARK ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC

TURNKEY ENVIRONMENTAL RESTORATION, LLC

2558 HAMBURG TURNPIKE, SUITE 300, BUFFALO, NY 14218, (716) 856-0599

JOB NO.: 0311-014-001

SAMPLING LOCATIONS

RI-IRM-AA REPORT

251 HOMER STREET REDEVELOPMENT SITE
BCP SITE NO. C905037
OLEAN, NEW YORK

PREPARED FOR

BENSON CONSTRUCTION AND DEVELOPMENT & HOMER STREET PROPERTIES, LLC

FIGURE 3

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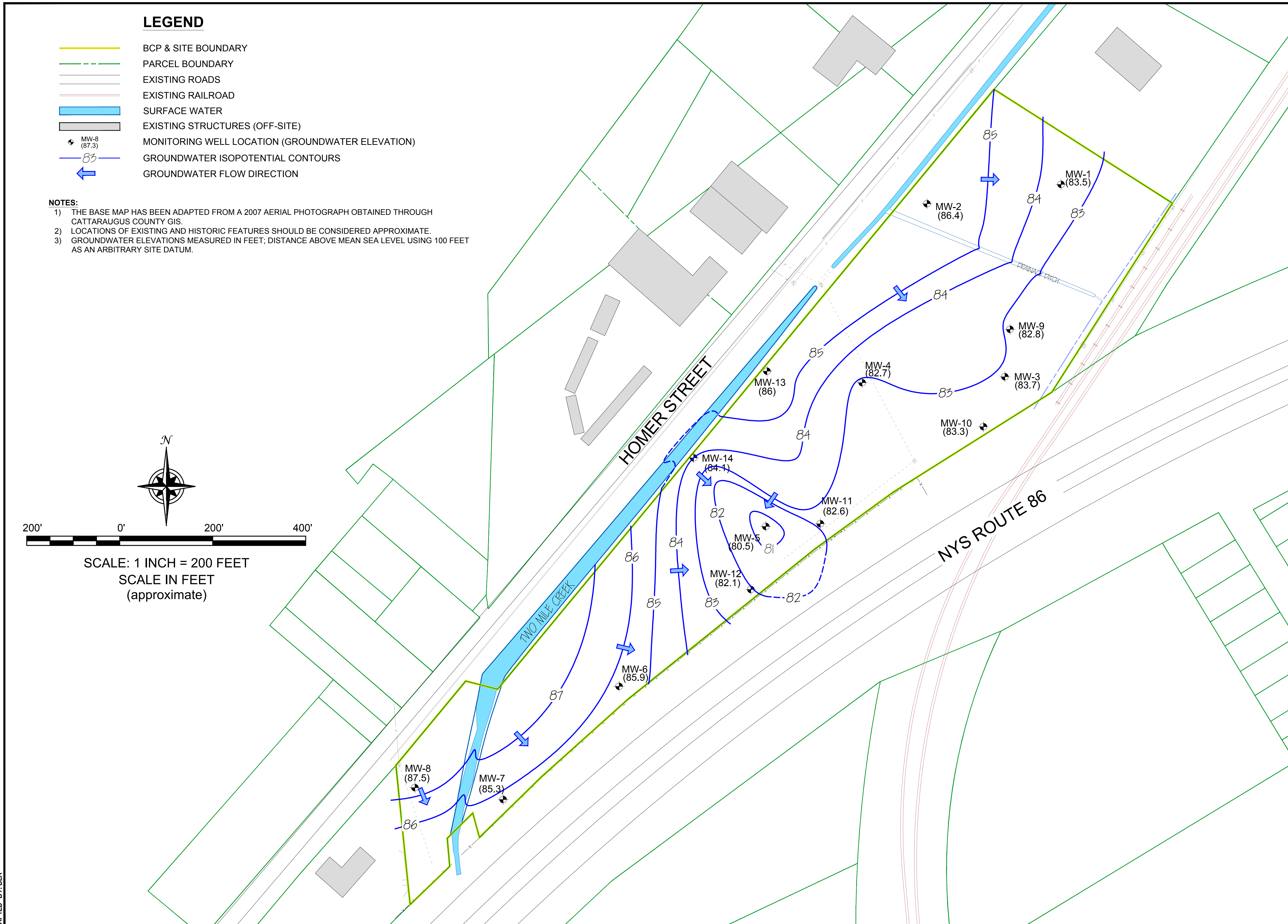


F:\CAD\TurnKey\Benson\RI-IRM-AA Report\Figure 4A; Groundwater Isopotential Map (Feb 2013).dwg

BENCHMARK ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC

TURNKEY ENVIRONMENTAL RESTORATION, LLC

2558 HAMBURG TURNPIKE, SUITE 300, BUFFALO, NY 14218, (716) 856-0599

JOB NO.: 0225-002-100

GROUNDWATER ISOPOTENTIAL MAP (FEBRUARY 2013)

RI-IRM-AA REPORT

251 HOMER STREET REDEVELOPMENT SITE
BCP SITE NO. C905037
OLEAN, NEW YORK

PREPARED FOR

BENSON CONSTRUCTION AND DEVELOPMENT & HOMER STREET PROPERTIES, LLC

FIGURE 4A

DISCLAIMER: PROPERTY OF BENCHMARK ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC. & TURNKEY ENVIRONMENTAL RESTORATION, LLC IMPORTANT: THIS DRAWING PRINT IS LOANED FOR MUTUAL ASSISTANCE AND AS SUCH IS SUBJECT TO RECALL AT ANY TIME. INFORMATION CONTAINED HEREON IS NOT TO BE DISCLOSED OR REPRODUCED IN ANY FORM FOR THE BENEFIT OF PARTIES OTHER THAN NECESSARY SUBCONTRACTORS & SUPPLIERS WITHOUT THE WRITTEN CONSENT OF BENCHMARK ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC & TURNKEY ENVIRONMENTAL RESTORATION, LLC.

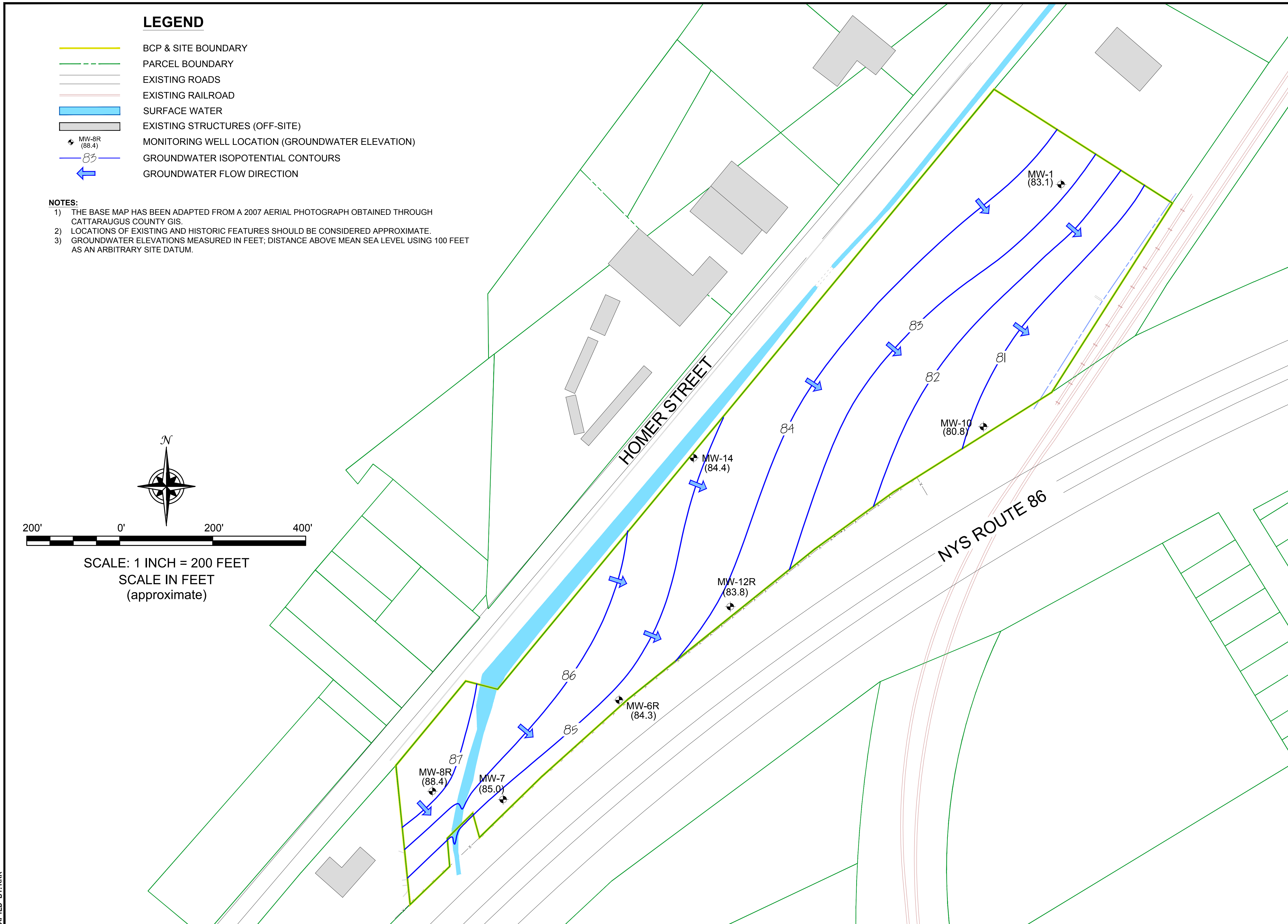
F:\CAD\TurnKey\Benson\RI-IRM-AA Report\Figure 4B; Groundwater Isopotential Map (May 2016).dwg

LEGEND

- BCP & SITE BOUNDARY
- PARCEL BOUNDARY
- EXISTING ROADS
- EXISTING RAILROAD
- SURFACE WATER
- EXISTING STRUCTURES (OFF-SITE)
- MW-8R (88.4) MONITORING WELL LOCATION (GROUNDWATER ELEVATION)
- 83 GROUNDWATER ISOPOTENTIAL CONTOURS
- GROUNDWATER FLOW DIRECTION

NOTES:

1) THE BASE MAP HAS BEEN ADAPTED FROM A 2007 AERIAL PHOTOGRAPH OBTAINED THROUGH CATTARAUGUS COUNTY GIS.
2) LOCATIONS OF EXISTING AND HISTORIC FEATURES SHOULD BE CONSIDERED APPROXIMATE.
3) GROUNDWATER ELEVATIONS MEASURED IN FEET; DISTANCE ABOVE MEAN SEA LEVEL USING 100 FEET AS AN ARBITRARY SITE DATUM.



SCALE: 1 INCH = 200 FEET
SCALE IN FEET
(approximate)

DATE: MAY 2016
DRAFTED BY: KRR

GROUNDWATER ISOPOTENTIAL MAP (MAY 2016)

RI-IRM-AA REPORT

251 HOMER STREET REDEVELOPMENT SITE
BCP SITE NO. C905037
OLEAN, NEW YORK

PREPARED FOR

BENSON CONSTRUCTION AND DEVELOPMENT & HOMER STREET PROPERTIES, LLC

BENCHMARK ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC

TURNKEY ENVIRONMENTAL RESTORATION, LLC

2558 HAMBURG TURNPIKE, SUITE 300, BUFFALO, NY 14218, (716) 856-0599

JOB NO.: 0225-002-100

FIGURE 4B

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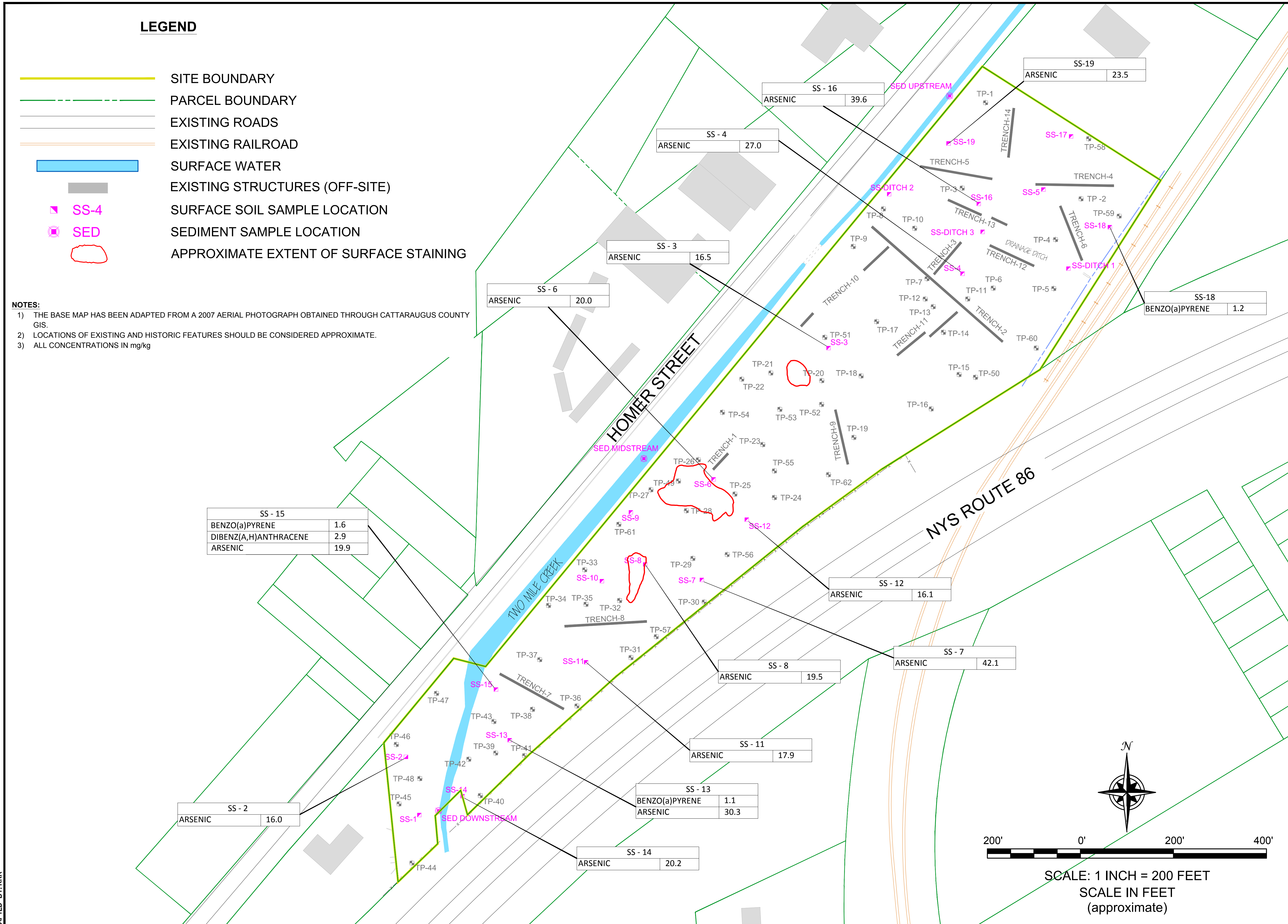
F:\CAD\TurnKey\Benson\RI-IRM-AA Report\Figure 5; Exceedances of CSCOs in Surface Soil-Fill.dwg



NOTES:

1) THE BASE MAP HAS BEEN ADAPTED FROM A 2007 AERIAL PHOTOGRAPH OBTAINED THROUGH CATTARAUGUS COUNTY GIS.
2) LOCATIONS OF EXISTING AND HISTORIC FEATURES SHOULD BE CONSIDERED APPROXIMATE.
3) ALL CONCENTRATIONS IN mg/kg

DATE: SEPTEMBER 2015
DRAFTED BY: KRR

BENCHMARK ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC
TURNKEY ENVIRONMENTAL RESTORATION, LLC
2558 HAMBURG TURNPIKE, SUITE 300, BUFFALO, NY 14218, (716) 856-0599

JOB NO.: 0311-014-001

EXCEEDANCES OF CSCOs IN SURFACE SOIL / FILL

RI-IRM-AA REPORT

251 HOMER STREET REDEVELOPMENT SITE
BCP SITE NO. C905037
OLEAN, NEW YORK

PREPARED FOR

BENSON CONSTRUCTION AND DEVELOPMENT & HOMER STREET PROPERTIES, LLC

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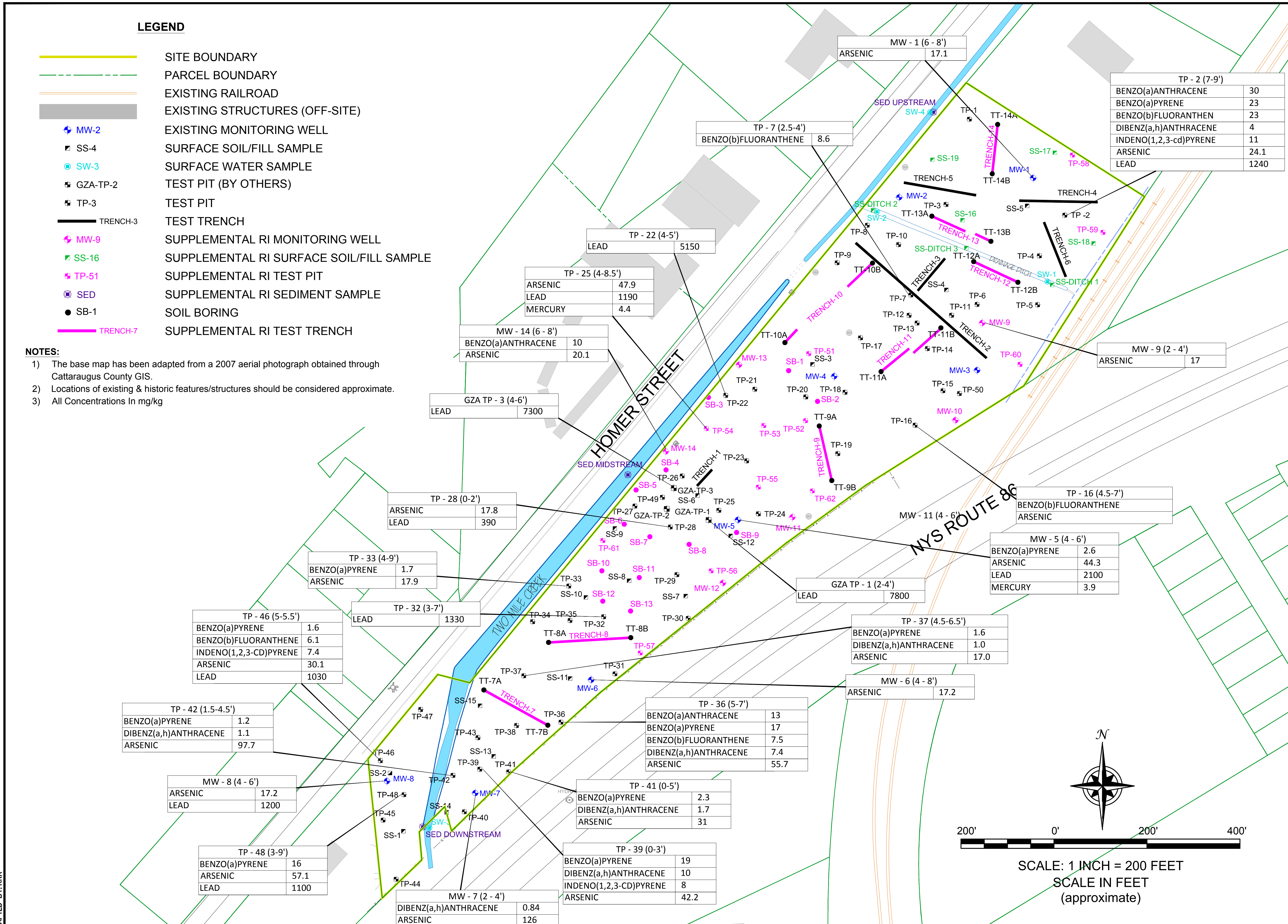
FIGURE 5

F:\CAD\TurnKey\Benson\RI-IRM-AA Report\Figure 6; Exceedances of CSCOs In Sub-Surface Soil-Fill.dwg



NOTES:
1) The base map has been adapted from a 2007 aerial photograph obtained through Cattaraugus County GIS.
2) Locations of existing & historic features/structures should be considered approximate.
3) All Concentrations In mg/kg

MW - 1 (6 - 8')	
ARSENIC	17.1

TP - 2 (7-9')	
BENZO(a)ANTHRACENE	30
BENZO(a)PYRENE	23
BENZO(b)FLUORANTHEN	23
DIBENZ(a,h)ANTHRACENE	4
INDENO(1,2,3-cd)PYRENE	11
ARSENIC	24.1
LEAD	1240

TP - 7 (2.5-4')	
BENZO(b)FLUORANTHENE	8.6

TP - 22 (4-5')	
LEAD	5150

TP - 25 (4-8.5')	
ARSENIC	47.9
LEAD	1190
MERCURY	4.4

MW - 14 (6 - 8')	
BENZO(a)ANTHRACENE	10
ARSENIC	20.1

MW - 9 (2 - 4')	
ARSENIC	17

GZA TP - 3 (4-6')	
LEAD	7300

TP - 16 (4.5-7')	
BENZO(b)FLUORANTHENE	
ARSENIC	

TP - 28 (0-2')	
ARSENIC	17.8
LEAD	390

MW - 5 (4 - 6')	
BENZO(a)PYRENE	2.6
ARSENIC	44.3
LEAD	2100
MERCURY	3.9

TP - 33 (4-9')	
BENZO(a)PYRENE	1.7
ARSENIC	17.9

GZA TP - 1 (2-4')	
LEAD	7800

TP - 32 (3-7')	
LEAD	1330

TP - 46 (5-5.5')	
BENZO(a)PYRENE	1.6
BENZO(b)FLUORANTHENE	6.1
INDENO(1,2,3-CD)PYRENE	7.4
ARSENIC	30.1
LEAD	1030

TP - 37 (4.5-6.5')	
BENZO(a)PYRENE	1.6
DIBENZ(a,h)ANTHRACENE	1.0
ARSENIC	17.0

MW - 6 (4 - 8')	
ARSENIC	17.2

TP - 42 (1.5-4.5')	
BENZO(a)PYRENE	1.2
DIBENZ(a,h)ANTHRACENE	1.1
ARSENIC	97.7

TP - 36 (5-7')	
BENZO(a)ANTHRACENE	13
BENZO(a)PYRENE	17
BENZO(b)FLUORANTHENE	7.5
DIBENZ(a,h)ANTHRACENE	7.4
ARSENIC	55.7

MW - 8 (4 - 6')	
ARSENIC	17.2
LEAD	1200

TP - 41 (0-5')	
BENZO(a)PYRENE	2.3
DIBENZ(a,h)ANTHRACENE	1.7
ARSENIC	31

TP - 48 (3-9')	
BENZO(a)PYRENE	16
ARSENIC	57.1
LEAD	1100

TP - 39 (0-3')	
BENZO(a)PYRENE	19
DIBENZ(a,h)ANTHRACENE	10
INDENO(1,2,3-CD)PYRENE	8
ARSENIC	42.2

MW - 7 (2 - 4')	
DIBENZ(a,h)ANTHRACENE	0.84
ARSENIC	126

DATE: SEPTEMBER 2015
DRAFTED BY: KRR

BENCHMARK ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC

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2558 HAMBURG TURNPIKE, SUITE 300, BUFFALO, NY 14218, (716) 856-0599

JOB NO.: 0311-014-001

EXCEEDANCES OF CSCOs IN SUB-SURFACE SOIL / FILL

RI-IRM-AA REPORT

251 HOMER STREET REDEVELOPMENT SITE
BCP SITE NO. C905037
OLEAN, NEW YORK

PREPARED FOR

BENSON CONSTRUCTION AND DEVELOPMENT & HOMER STREET PROPERTIES, LLC

FIGURE 6

DISCLAIMER: PROPERTY OF BENCHMARK ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC. & TURNKEY ENVIRONMENTAL RESTORATION, LLC IMPORTANT: THIS DRAWING PRINT IS LOANED FOR MUTUAL ASSISTANCE AND AS SUCH IS SUBJECT TO RECALL AT ANY TIME. INFORMATION CONTAINED HEREON IS NOT TO BE DISCLOSED OR REPRODUCED IN ANY FORM FOR THE BENEFIT OF PARTIES OTHER THAN NECESSARY SUBCONTRACTORS & SUPPLIERS WITHOUT THE WRITTEN CONSENT OF BENCHMARK ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC & TURNKEY ENVIRONMENTAL RESTORATION, LLC.

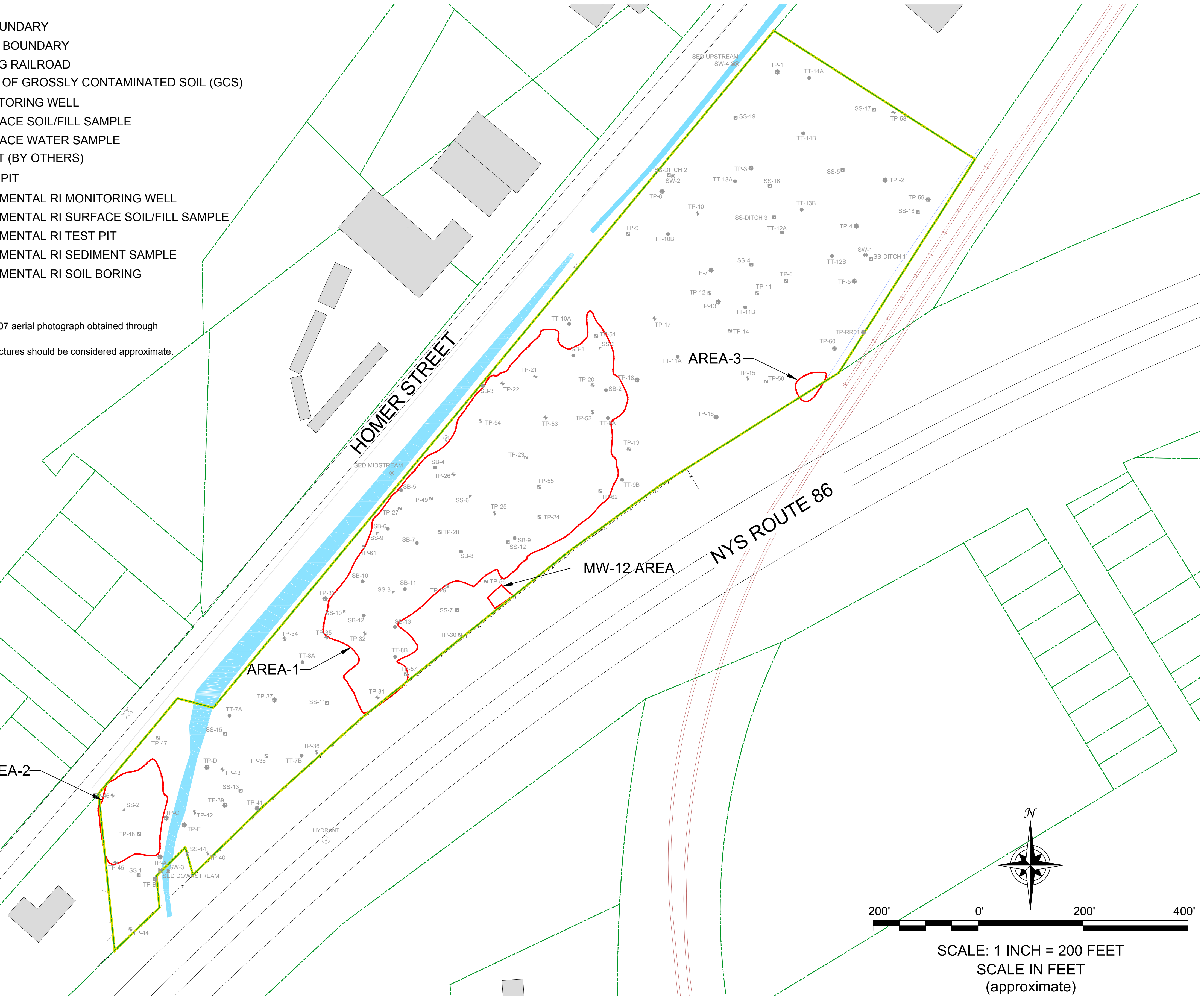
F:\CAD\TurnKey\Benson\RI-IRM-AA Report\Figure 7; Extent of GCS Impact.dwg

LEGEND

- SITE BOUNDARY
- PARCEL BOUNDARY
- EXISTING RAILROAD
- EXTENT OF GROSSLY CONTAMINATED SOIL (GCS)
- MW-2 RI MONITORING WELL
- SS-4 RI SURFACE SOIL/FILL SAMPLE
- SW-3 RI SURFACE WATER SAMPLE
- GZA-TP-2 TEST PIT (BY OTHERS)
- TP-3 RI TEST PIT
- MW-9 SUPPLEMENTAL RI MONITORING WELL
- SS-16 SUPPLEMENTAL RI SURFACE SOIL/FILL SAMPLE
- TP-51 SUPPLEMENTAL RI TEST PIT
- SED SUPPLEMENTAL RI SEDIMENT SAMPLE
- SB-1 SUPPLEMENTAL RI SOIL BORING

NOTES:

1) The base map has been adapted from a 2007 aerial photograph obtained through Cattaraugus County GIS.
2) Locations of existing & historic features/structures should be considered approximate.



SCALE: 1 INCH = 200 FEET
SCALE IN FEET
(approximate)

DATE: JULY 2015
DRAFTED BY: BLR

EXTENT OF GROSSLY CONTAMINATED SOIL

RI-IRM-AA REPORT
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FIGURE 7

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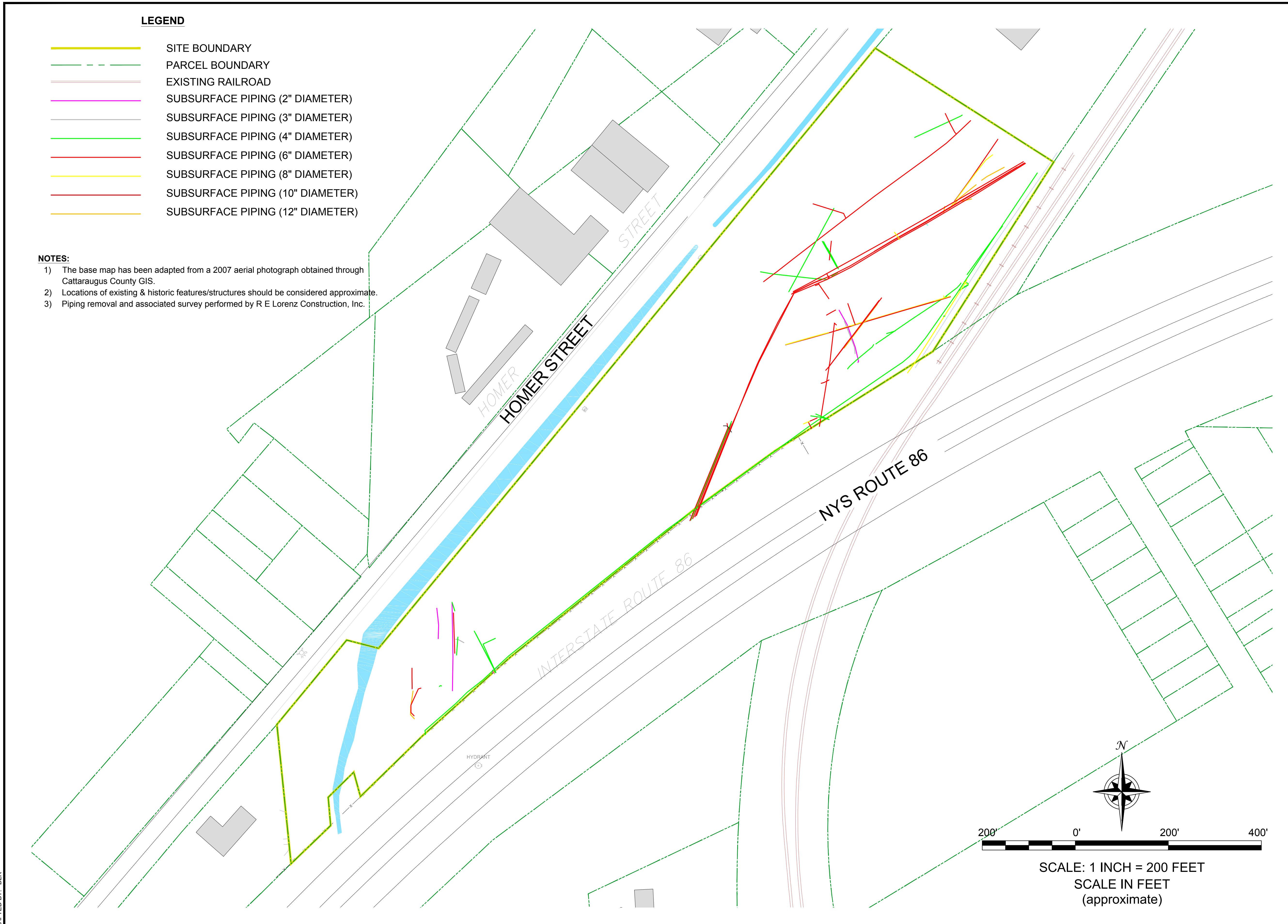

F:\CAD\TurnKey\Benson\RI-IRM-AA Report\Figure 8; Extent of Subsurface Piping.dwg

DATE: JULY 2015
DRAFTED BY: BLR

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JOB NO.: 0311-014-001

EXTENT OF SUBSURFACE PIPING

RI-IRM-AA REPORT

251 HOMER STREET REDEVELOPMENT SITE
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FIGURE 8

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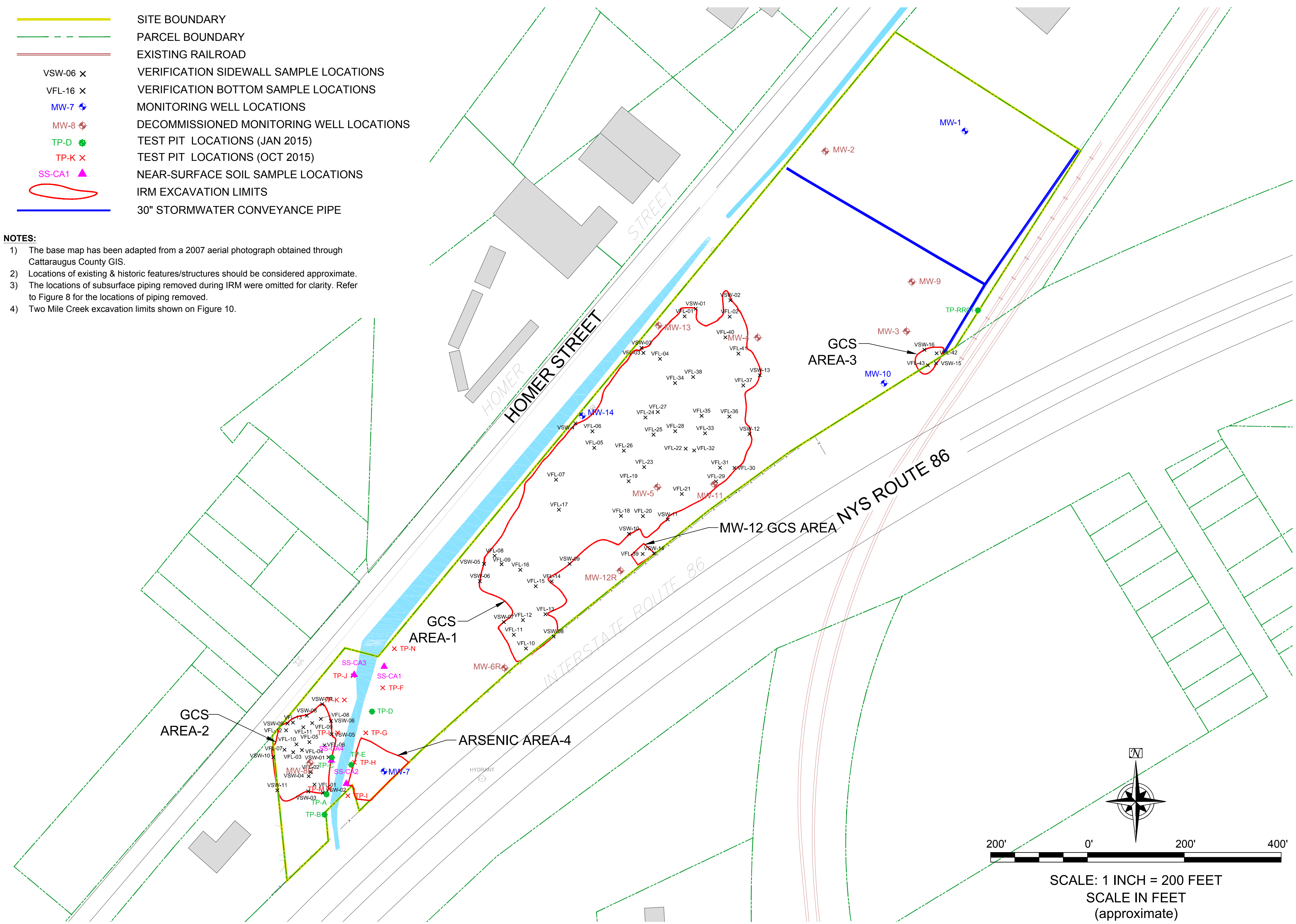
LEGEND

(yellow line)	SITE BOUNDARY
(green dash-dot line)	PARCEL BOUNDARY
(red double line)	EXISTING RAILROAD
VSW-06 ×	VERIFICATION SIDEWALL SAMPLE LOCATIONS
VFL-16 ×	VERIFICATION BOTTOM SAMPLE LOCATIONS
MW-7	MONITORING WELL LOCATIONS
MW-8	DECOMMISSIONED MONITORING WELL LOCATIONS
TP-D	TEST PIT LOCATIONS (JAN 2015)
TP-K ×	TEST PIT LOCATIONS (OCT 2015)
SS-CA1 ▲	NEAR-SURFACE SOIL SAMPLE LOCATIONS
(red outline)	IRM EXCAVATION LIMITS
(blue line)	30" STORMWATER CONVEYANCE PIPE

NOTES:

1) The base map has been adapted from a 2007 aerial photograph obtained through Cattaraugus County GIS.
2) Locations of existing & historic features/structures should be considered approximate.
3) The locations of subsurface piping removed during IRM were omitted for clarity. Refer to Figure 8 for the locations of piping removed.
4) Two Mile Creek excavation limits shown on Figure 10.



COMPLETED 2014/2015 IRM ACTIVITIES

RI-IRM-AA REPORT

251 HOMER STREET REDEVELOPMENT SITE
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FIGURE 9

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DATE: MAY 2016
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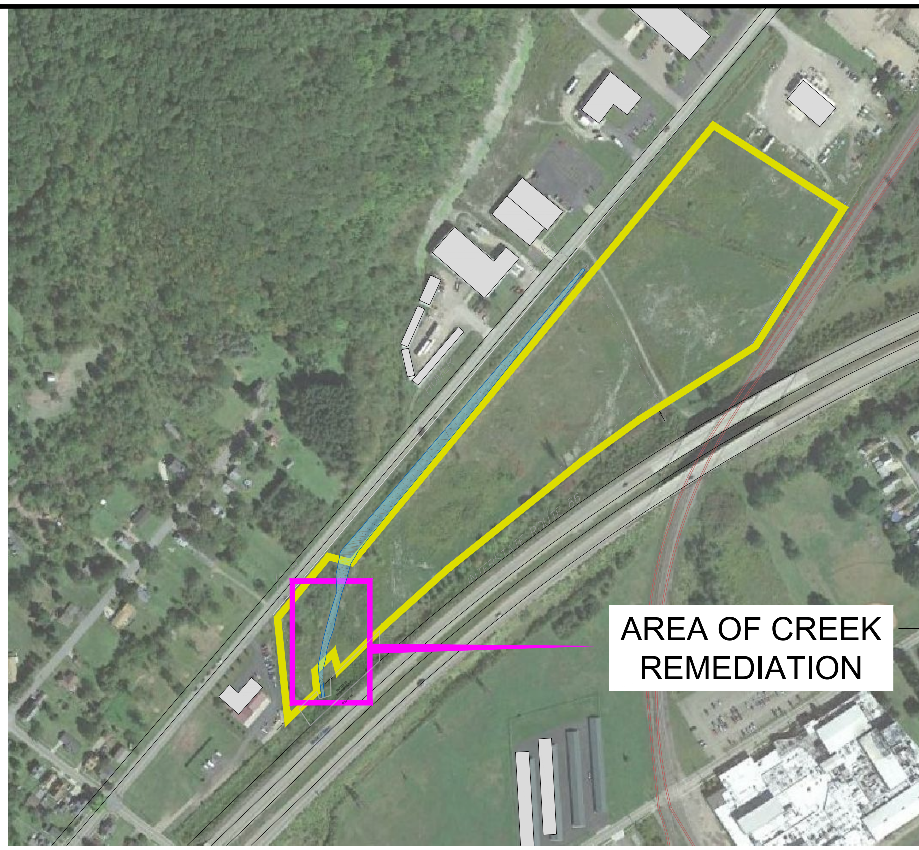
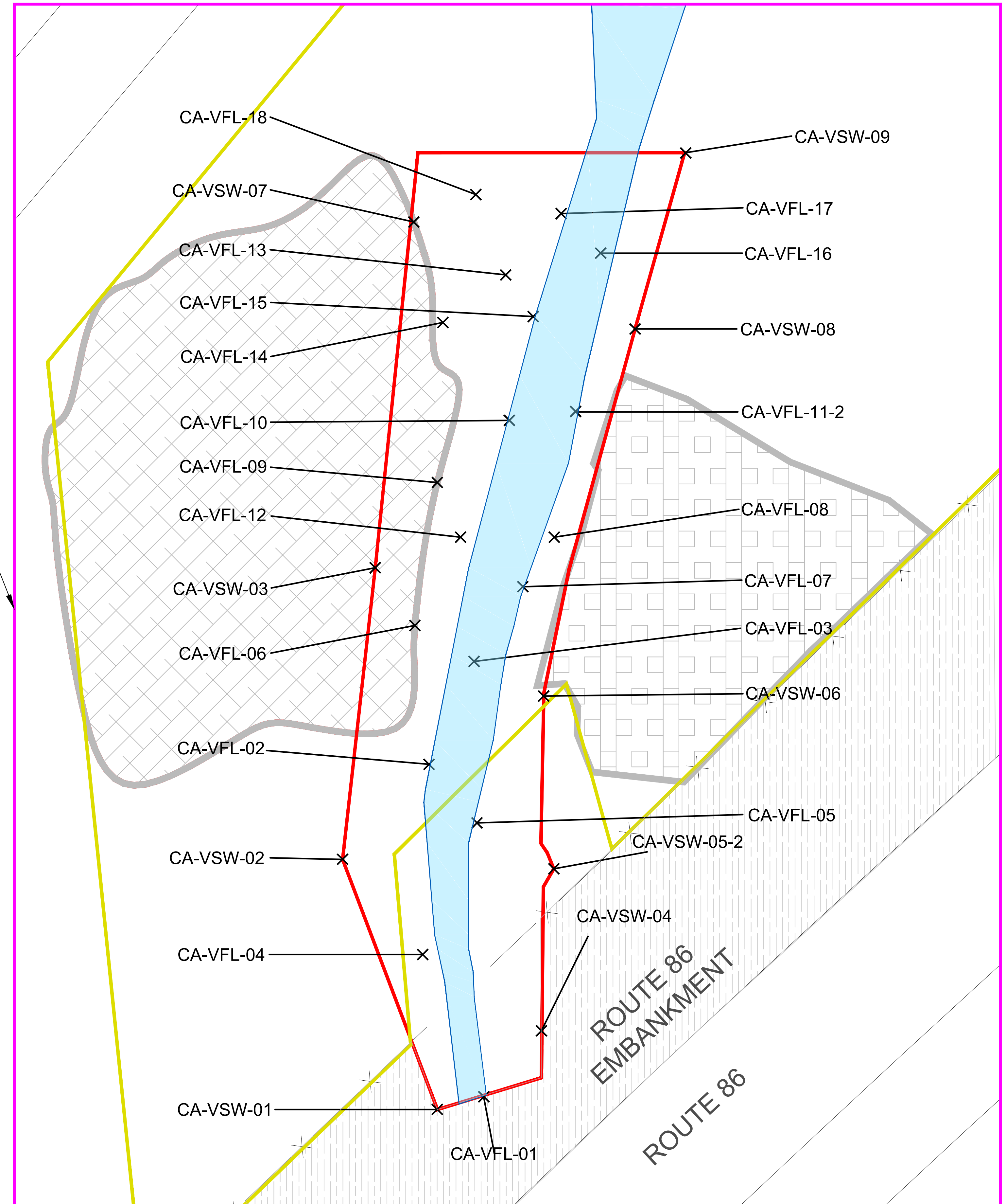
F:\CAD\TurnKey\Benson\RI-IRM-AA Report\Figure 9; Completed IRM Activities.dwg

F:\CAD\TurnKey\Benson\RI-IRM-AA Report\Figure 10; Two Mile Creek Completed 2016 IRM ActivitiesREV RFL.dwg



PLAN VIEW OF SITE
NTS



LEGEND

	PROPERTY BOUNDARY
	TWO MILE CREEK (AREA 5) EXCAVATION AND RESTORATION
	EXTENT OF GCS REMEDIAL EXCAVATION
	EXTENT OF ARSENIC REMEDIAL EXCAVATION
CA-VSW-01 ×	CREEK AREA VERIFICATION SIDEWALL SAMPLE (APRIL 2016)
CA-VFL-01 ×	CREEK AREA VERIFICATION FLOOR SAMPLE (APRIL 2016)

N

40' 0' 40' 80'

SCALE: 1 INCH = 40 FEET
SCALE IN FEET
(approximate)

DATE: MAY 2016
DRAFTED BY: RFL / KRR

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JOB NO.: 0311-014-001

COMPLETED 2016 IRM ACTIVITIES - TWO MILE CREEK

RI-IRM-AA REPORT

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FIGURE 10

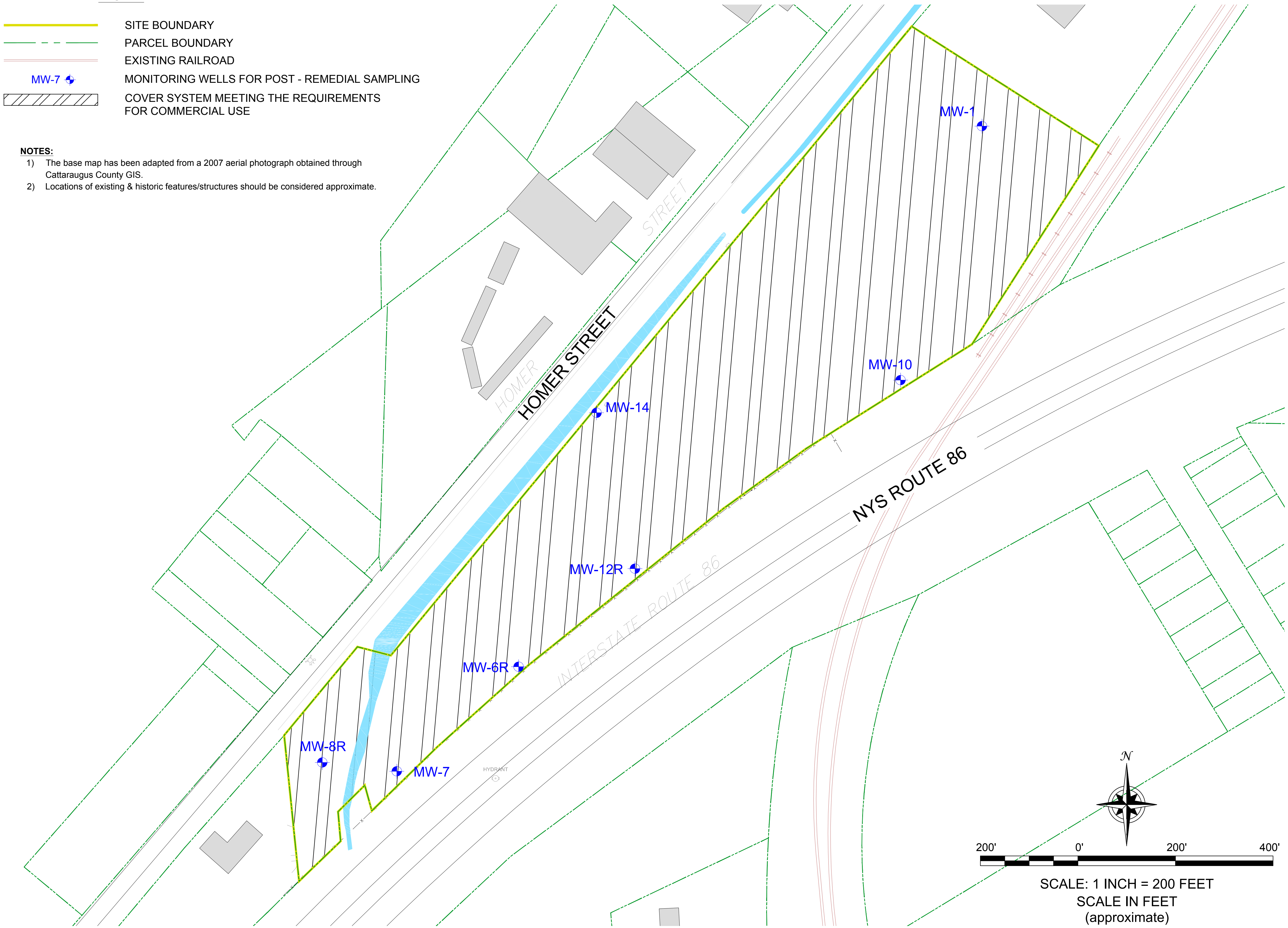
F:\CAD\TurnKey\Benson\RI-IRM-AA Report\Figure 11; Commercial Use (Track 4) Cleanup Alternative.dwg

LEGEND

- SITE BOUNDARY
- PARCEL BOUNDARY
- EXISTING RAILROAD
- MW-7 — MONITORING WELLS FOR POST - REMEDIAL SAMPLING
- COVER SYSTEM MEETING THE REQUIREMENTS FOR COMMERCIAL USE

NOTES:

1) The base map has been adapted from a 2007 aerial photograph obtained through Cattaraugus County GIS.
2) Locations of existing & historic features/structures should be considered approximate.



SCALE: 1 INCH = 200 FEET
SCALE IN FEET
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JOB NO.: 0311-014-001

COMMERCIAL USE (TRACK 4) CLEANUP ALTERNATIVE

RI-IRM-AA REPORT
251 HOMER STREET REDEVELOPMENT SITE
BCP SITE # C905037
OLEAN, NEW YORK
PREPARED FOR
BENSON CONSTRUCTION AND HOMER STREET PROPERTIES, LLC

FIGURE 11

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APPENDIX A

PREVIOUS ASSESSMENTS AND INVESTIGATIONS

(PROVIDED ELECTRONICALLY ON ENCLOSED CD)

APPENDIX B

PROJECT PHOTOGRAPHIC LOG

SITE PHOTOGRAPHS

Photo 1:

Photo 2:

Photo 3:

Photo 4:

Photo 1: **January 2011 Site Reconnaissance –** General Site condition

Photo 2: **May 2011** – General Site condition

Photo 3: Grossly Contaminated Soil (GCS)

Photo 4: GCS

SITE PHOTOGRAPHS

Photo 5:

Photo 6:

Photo 7:

Photo 8:

Photo 5: GCS

Photo 6: GCS

Photo 7: GCS in wet conditions

Photo 8: Pipe and debris on-site

SITE PHOTOGRAPHS

Photo 9:

Photo 10:

Photo 11:

Photo 12:

Photo 9: **May 2011 Remedial Investigation** – Test pit excavation

Photo 10: Test pit excavation

Photo 11: Test pit excavation

Photo 12: Clay soils noted in test pit

SITE PHOTOGRAPHS

Photo 13:

Photo 14:

Photo 15:

Photo 16:

Photo 13: Excavation of Trench 2

Photo 14: Trench excavation to expose subsurface piping

Photo 15: Deidrich D-50 track-mounted rotary drill rig for monitoring well installation

Photo 16: Well MW-1 split spoon sample

SITE PHOTOGRAPHS

Photo 17:

Photo 18:

Photo 19:

Photo 20:

Photo 17: Well MW-2 split spoon sample

Photo 18: Well MW-3 split spoon sample

Photo 19: Well MW-4 split spoon sample

Photo 20: Well MW-5 split spoon sample

SITE PHOTOGRAPHS

Photo 21:

Photo 22:

Photo 23:

Photo 24:

Photo 21: Drilling activities proximate GCS

Photo 22: Well MW-6 split spoon sample

Photo 23: Well MW-7 split spoon sample

Photo 24: Well MW-8 split spoon sample

SITE PHOTOGRAPHS

Photo 25:

Photo 26:

Photo 27:

Photo 28:

Photo 25:	**May 2012 Supplemental RI –** Well MW-9 split spoon sample
Photo 26:	Setup for soil boring SB-9
Photo 27:	Surface soil sample location SS-19
Photo 28:	Test pit TP-57 excavation

SITE PHOTOGRAPHS

Photo 29:

Photo 30:

Photo 31:

Photo 32:

Photo 29: Test Trench TT-8 pipe discovery

Photo 30: Pipe tap to observe contents

Photo 31: Pipe tap to observe contents

Photo 32: Collecting sample of pipe contents for waste characterization

SITE PHOTOGRAPHS

Photo 33:

Photo 34:

Photo 36:

Photo 35:

Photo 33	**2012/2013 Pipe Removal IRM** – Exposing pipe with excavator
Photo 34:	Exposing multiple runs of pipe in one trench
Photo 35:	Dewatering during pipe removal
Photo 36:	Lifting pipe out of trench

SITE PHOTOGRAPHS

Photo 37:

Photo 38:

Photo 39:

Photo 40:

Photo 37:	Removing pipe contents for disposal
Photo 38:	Removing pipe contents for disposal
Photo 39:	Hand excavating to expose pipe
Photo 40:	Pipe removal

SITE PHOTOGRAPHS

Photo 41:

Photo 42:

Photo 43:

Photo 44:

Photo 41: **2014/2015 Additional IRM –** GCS Area 1 excavation

Photo 42: GCS Area 1 excavation

Photo 43: GCS Area 2 excavation and dewatering

Photo 44: Final grading of GCS Area 2 following excavation

SITE PHOTOGRAPHS

Photo 45:

Photo 46:

Photo 47:

Photo 48:

Photo 45:	GCS Area 3 excavation
Photo 46:	Arsenic Area 4 excavation
Photo 47:	Cover system placement
Photo 48:	Supplemental test pit investigation along Two Mile Creek

SITE PHOTOGRAPHS

Photo 49:

Photo 50:

Photo 51:

Photo 52:

Photo 49: **2016 Supplemental IRM in Two Mile Creek** – Upstream Dam and Diversion Pump

Photo 50: Downstream dam and discharge pipe

Photo 51: Anchor trench for demarcation filter fabric

Photo 52: Excavation of Two Mile Creek

SITE PHOTOGRAPHS

Photo 53:

Photo 54:

Photo 55:

Photo 56:

Photo 53:	Excavation to native clay
Photo 54:	Placement of demarcation layer
Photo 55:	Placement of approved creek bed stone
Photo 56:	12-inch clay barrier

SITE PHOTOGRAPHS

Photo 57:

Photo 58:

Photo 59:

Photo 60:

Photo 57:	Placement of clean imported soil for creek banks
Photo 58:	Two Mile Creek backfilled with imported material
Photo 59:	Silt fencing for temporary erosion control
Photo 60	Installation of biodegradable erosion control blanket

SITE PHOTOGRAPHS

Photo 61:

Photo 62:

Photo 63:

Photo 64:

Photo 61: Hydroseed and riparian shrubs

Photo 62: Riparian shrubs and grass

Photo 63: Completed creek restoration

Photo 64: Access road and established grass with shrubs

SITE PHOTOGRAPHS

Photo 65:

Photo 66:

Photo 67:

Photo 68:

Photo 65:	Newly installed MW-8R
Photo 66:	Newly installed MW-12R
Photo 67:	Newly installed MW-6R
Photo 68:	Well Decommissioning

APPENDIX C

FIELD BOREHOLE AND TEST PIT EXCAVATION LOGS

Project No: 0225-002-100

Borehole Number: SB-1

Project: Supplemental Remedial Investigation

A.K.A.:

Client: Benson Constrution & Development, Inc.

Logged By: TAB

Site Location: 251 Homer St., Olean, NY

Checked By: BCH

TurnKey Environmental Restoration, LLC
2558 Hamburg Turnpike, Suite 300
Buffalo, NY 14218
(716) 856-0635

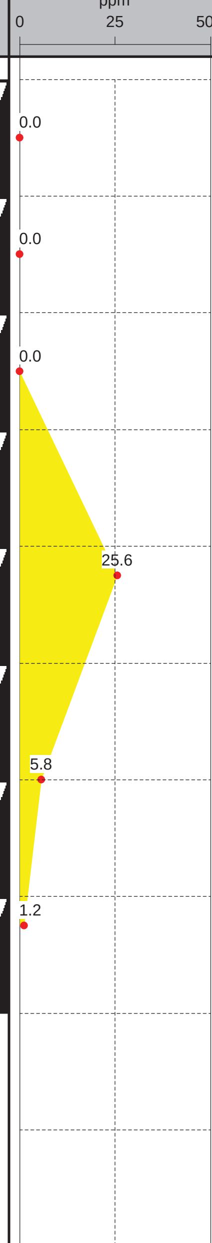
SUBSURFACE PROFILE

Depth (fbgs)	Elev. /Depth	Description (ASTM D2488: Visual-Manual Procedure)
		Ground Surface
0.0	95.2 / 0.0	***Sandy Lean Clay with Gravel*** Brown, moist, mostly medium plasticity fines, some fine sand, little fine gravel, trace coarse gravel, massive, very stiff.
	93.2 / 2.0	As above, grey.
	91.2 / 4.0	As above, firm.
5.0		
	87.7 / 7.5	***Lean Clay*** Black, soft, mostly medium plasticity fines, few fine sand, trace fine gravel, petroleum-like odor, viscous LNAPL, (8.0 - 9.0 fbgs).
	86.2 / 9.0	As above, no LNAPL, iron staining.
10.0	85.2 / 10.0	As above, very stiff.
	81.7 / 13.5	***Sandy Lean Clay with Gravel*** Grey, moist, mostly low plasticity fines, some fine sand, little fine gravel, trace coarse gravel, medium dense.
15.0		
	79.2 / 16.0	End of Borehole
20.0		

SAMPLE

Sample No.	SPT N-Value	Recovery (ft)	Symbol	Lab Sample	Well Completion Details or Remarks
S1	18	0.8			
S2	23	0.8			
S3	8	1.3			
S4	8	1.2			
S5	9	1.4			
S6	16	1.8			
S7	17	1.9			
S8	25	0.7			

PID VOCs



Drilled By: Earth Dimensions, Inc.
Drill Rig Type: Maruka, Diedrich D 50
Drill Method: 4 1/4 -inch HSA with 2-inch split spoon.
Comments: Elevations based on site datum of 100 fmsl.
Drill Date(s): 5/15/12

Hole Size: 8-inch
Stick-up: NA
Datum: Mean sea level.
Sheet: 1 of 1

Project No: 0225-002-100

Borehole Number: SB-2

Project: Supplemental Remedial Investigation

A.K.A.:

Client: Benson Constrution & Development, Inc.

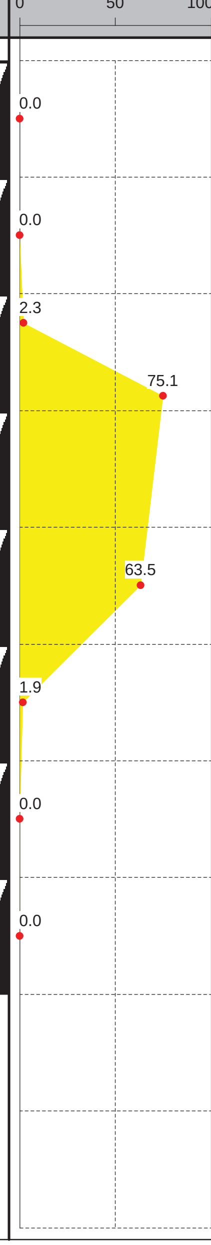
Logged By: TAB

Site Location: 251 Homer St., Olean, NY

Checked By: BCH

TurnKey Environmental Restoration, LLC
2558 Hamburg Turnpike, Suite 300
Buffalo, NY 14218
(716) 856-0635

SUBSURFACE PROFILE			SAMPLE						
Depth (ftbgs)	Elev. /Depth	Description (ASTM D2488: Visual-Manual Procedure)	Sample No.	SPT N-Value	Recovery (ft)	Symbol	PID VOCs ppm	Lab Sample	Well Completion Details or Remarks
0.0	95.1 / 0.0	Ground Surface							
	95.1 / 0.0	***Sandy Lean Clay with Gravel*** Brown, moist, mostly medium plasticity fines, some fine sand little, fine gravel, trace coarse gravel, very stiff.	S1	30	0.8		0.0		
	93.1 / 2.0	As above, stiff.	S2	12	2.0		0.0		
5.0	91.1 / 4.0	As above.	S3	12	1.3		2.3; 75.1		
	89.6 / 5.5								
	89.1 / 6.0	***Lean Clay*** Black, moist, soft, mostly medium plastic fines, few fine sand, trace fine gravel, hard, petroleum-like odor, viscous LNAPL. No recovery	S4	46	0.2				
	87.1 / 8.0	***Sandy Lean Clay with Fill*** Grey, moist, mostly medium plastic fines, some fine sand, soft, few fine gravel, very stiff, massive, orange brick.	S5	26	0.3		63.5		
10.0	85.1 / 10.0	As above, no brick, iron staining, hard.	S6	32	0.9		1.9		
	83.1 / 12.0	***Poorly Graded Sand with Silt and Gravel*** Grey, moist, mostly fine sand, few non-plastic fines, little fine gravel, trace coarse gravel, loose when disturbed, dense.	S7	46	0.0		0.0		
15.0	81.1 / 14.0	As above, wet (14.0 fbgs), medium dense.	S8	15	0.2		0.0		*First water (14.0fbgs)*
	79.1 / 16.0	End of Borehole							
20.0									



Drilled By: Earth Dimensions, Inc.
Drill Rig Type: Maruka, Diedrich D 50
Drill Method: 4 1/4 -inch HSA with 3-inch split spoon
Comments: Elevetions based on site datum of 100 fmsl.
Drill Date(s): 5/15/12

Hole Size: 8-inch
Stick-up: NA
Datum: Mean sea level.
Sheet: 1 of 1

Project No: 0225-002-100

Borehole Number: SB-3

Project: Supplemental Remedial Investigation

A.K.A.:

Client: Benson Constrution, Inc.

Logged By: TAB

Site Location: 251 Homer St. Olean, NY

Checked By: BCH

TurnKey Environmental Restoration, LLC
2558 Hamburg Turnpike, Suite 300
Buffalo, NY 14218
(716) 856-0635

SUBSURFACE PROFILE			SAMPLE						
Depth (fbgs)	Elev. /Depth	Description (ASTM D2488: Visual-Manual Procedure)	Sample No.	SPT N-Value	Recovery (ft)	Symbol	PID VOCs (ppm; scale 0, 12.5, 25)	Lab Sample	Well Completion Details or Remarks
0.0	94.1 / 0.0	Ground Surface							
		Sandy Lean Clay with Gravel Brown, moist, mostly medium plasticity fines, some fine sand, little fine gravel, trace coarse gravel, stiff, massive.	S1	14	1.4		0.0		
	92.1 / 2.0	As above, brown/grey, hard, wood debris.	S2	31	0.9		2.3		
5.0	90.1 / 4.0	As above, stiff, no wood.	S3	9	1.2		0.0		
	87.6 / 6.5	***Sandy Lean Clay*** Black, moist, mostly medium plastic fines, some fine sand, stiff, massive, petroleum-like odor.	S4	12	1.4		1.6		
	87.1 / 7.0	As above, brown/grey, few fine gravel, very stiff.	S5	24	1.5		0.0		
10.0	84.1 / 10.0	As above, low plastcity fines, hard.	S6	33	1.2		0.0		
	82.1 / 12.0	As above, very stiff,	S7	25	1.6		0.0		
15.0			S8	28			0.0		*First water (15.5 fbgs).*
	78.6 / 15.5	***Poorly Graded Sand with Silt and Gravel*** Grey, wet (15.5 fbgs), mostly fine sand, few non-plastic fines, little fine gravel, trace coarse gravel, rapid dilatancy, loose when disturbed, medium dense.							
	78.1 / 16.0	End of Borehole							
20.0									

Drilled By: Earth Dimensions, Inc.
Drill Rig Type: Maruka, Diedrich D 50
Drill Method: 4 1/4 -inch HSA with 2-inch split spoon.
Comments: Eleveations based on site datum of 100 fmsl.
Drill Date(s): 5/15/12

Hole Size: 8-inch
Stick-up:
Datum: Mean sea level.

Project No: 0225-002-100

Borehole Number: SB-4

Project: Supplemental Remedial Investigation

A.K.A.:

Client: Benson Construction & Development, Inc.

Logged By: TAB

Site Location: 251 Homer St. Olean, NY

Checked By: BCH

TurnKey Environmental Restoration, LLC
2558 Hamburg Turnpike, Suite 300
Buffalo, NY 14218
(716) 856-0635

SUBSURFACE PROFILE			SAMPLE						
Depth (fbgs)	Elev. /Depth	Description (ASTM D2488: Visual-Manual Procedure)	Sample No.	SPT N-Value	Recovery (ft)	Symbol	PID VOCs ppm (0 – 25 – 50)	Lab Sample	Well Completion Details or Remarks
0.0	93.9 / 0.0	Ground Surface							
		Sandy Lean Clay Brown, moist, mostly, low plasticity fines, some fine sand, few fine gravel, trace coarse gravel, massive, stiff.	S1	11	1.9		0.0		
	91.9 / 2.0	As above, hard.	S2	37	0.5		0.0	Sample location	
5.0	89.9 / 4.0	As above, grey, stiff, wood debris, slight petroleu- like odor.	S3	10	0.5		2.3		
	87.9 / 6.0	As above, firm, viscous LNAPL (7.0-7.5 fbgs and 7.9-8.0 fbgs).	S4	5	1.0		44		
	85.9 / 8.0	***Lean Clay*** Grey, moist, mostly medium plasticity fines, few fine sand, iron staining, massive, stiff, LNAPL (9.0 fbgs), petroleum like odor.	S5	10	1.2		14.1		
10.0	83.9 / 10.0	As above, no LNAPL.	S6	9	2.0		11.2		
	82.4 / 11.5	***Lean Clay with Sand and Organic Soil*** Brown, moist, mostly low plastcity fines, some organics soil, little fine sand, , stiff, medium toughness, medium dry strength.	S7	12	1.7		1.3		
15.0	80.4 / 13.5	***Sandy Lean Clay with Gravel*** Grey, wet (14.0 fbgs), mostly low plasticity fines, some fine sand, little fine gravel, few coarse sands, hard.	S8	32	1.3		0.0		*First water (14.0 fbgs)*
20.0	77.9 / 16.0	End of Borehole							

Drilled By: Earth Dimensions, Inc.
Drill Rig Type: Maruka, diedrich D 50
Drill Method: 4 1/4 -inch HSA contious 3-inch spoon
Comments: Elevations based on site datum of 100 fmsl.
Drill Date(s): 5/17/12

Hole Size: 8-inch
Stick-up: NA
Datum: Mean sea level.

Project No: 0225-002-100

Borehole Number: SB-5

Project: Supplemental Remedial Investigation

A.K.A.:

Client: Benson Construction & Development, Inc.

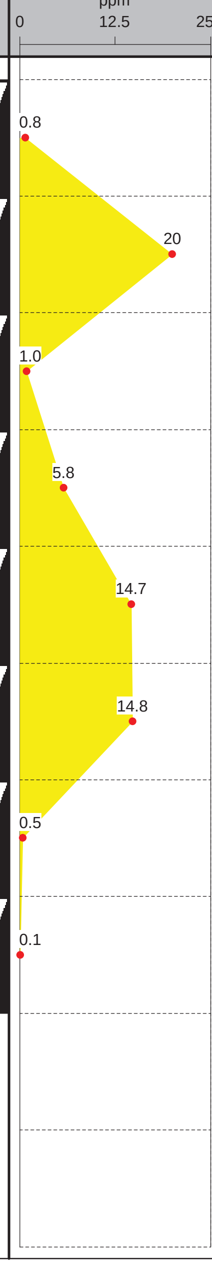
Logged By: TAB

Site Location: 251 Homer St., Olean, NY

Checked By: BCH

TurnKey Environmental Restoration, LLC
2558 Hamburg Turnpike, Suite 300
Buffalo, NY 14218
(716) 856-0635

Depth (fbgs)	Elev. /Depth	Description (ASTM D2488: Visual-Manual Procedure)	Sample No.	SPT N-Value	Recovery (ft)	PID VOCs (ppm)	Lab Sample	Well Completion Details or Remarks
0.0	95.0 / 0.0	Ground Surface						
	95.0–93.0 / 0.0–2.0	***Sandy Lean Clay*** Brown/grey, moist, mostlyn low plasticity fines, some fine sand, few fine gravel, trace coarse gravel, firm, medium toughness, medium dry strength.	S1	7	2.0	0.8		
	93.0–91.0 / 2.0–4.0	***Poorly Graded Sand with Silt and Gravel*** Black, moist, mostly fine sand, few non-plastic fines, little fine gravel, mixed with viscous LNAPL, petroleum like odor.	S2	11	0.8	20		
5.0	91.0–89.0 / 4.0–6.0	***Lean Clay*** Brown/Grey, moist, mostly medium plastic fines, few fine sand, trace fine gravel, firm, medium dry strength, medium toughness.	S3	7	0.8	1.0		
	89.0–87.0 / 6.0–8.0	As above,.	S4	7	0.5	5.8		
	87.0–85.0 / 8.0–10.0	As above, stiff, LNAPL (8.0 to 9.0 fbgs)..	S5	10	1.6	14.7		
10.0	85.0–83.0 / 10.0–12.0	***Sandy Lean Clay with Gravel*** Brown/grey, moist, mostly low plasticity fines, some fine sand, little fine gravel, hard, slight petroleum like odor.	S6	33	1.5	14.8		
	83.0–81.0 / 12.0–14.0	As above.	S7	38	1.9	0.5		
15.0	81.0–79.0 / 14.0–16.0	As above.	S8	58	2.0	0.1		
	79.0 / 16.0	End of Borehole						
20.0								



Drilled By: Earth Dimensions, Inc.
Drill Rig Type: Maruka, Diedrich D 50
Drill Method: 4 1/4 -inch HSA with 2-inch split spoon.
Comments: Elevations based on site datum of 100 fmsl.
Drill Date(s): 5/16/12

Hole Size: 8-inch
Stick-up: NA
Datum: Mean sea level.

Sheet: 1 of 1

Project No: 0225-002-100

Borehole Number: SB-6

Project: Supplemental Remedial Investigation **A.K.A.:**

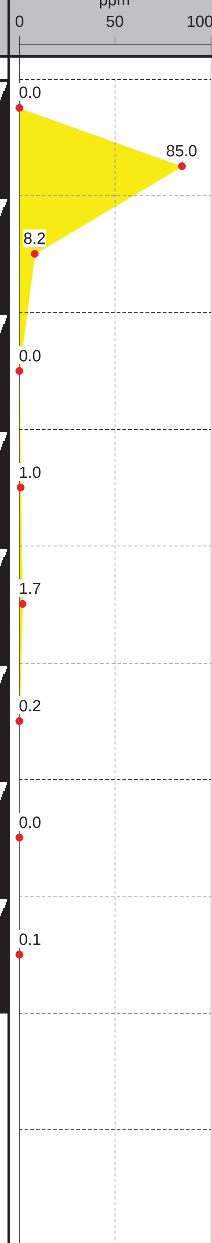
Client: Benson Construction & Development, Inc. **Logged By:** TAB

Site Location: 251 Homer St., Olean, NY **Checked By:** BCH

TurnKey Environmental Restoration, LLC
2558 Hamburg Turnpike, Suite 300
Buffalo, NY 14218
(716) 856-0635

SUBSURFACE PROFILE			SAMPLE			
Depth (ftbgs)	Elev. /Depth	Description (ASTM D2488: Visual-Manual Procedure)	Sample No.	SPT N-Value	Recovery (ft)	Symbol
0.0	94.5 / 0.0	Ground Surface				
		Sandy Lean Clay Brown, moist, mostly low plasticity fines, some fine sand, few fine gravel, trace coarse, massive, firm, medium dry strength, medium toughness.	S1	8	1,7	
	93.0 / 1.5					
	92.5 / 2.0	***Silt with Sand*** Black, mosit, mostly non-plastic fines, some fine sand, viscous LNAPL, soft.	S2	9	1.1	
		Poorly Graded Sand with Silt and Gravel with Fill Black, moist, mostly fine sand, few non-plastic fines, little fine gravel, wood debris, petroleum like odor.				
5.0	90.5 / 4.0	As above, wet (4.0 fbgs), medium dense, slight petroleum like odor.	S3	13	0.6	
	88.5 / 6.0	***Concrete***	S4	48	1.1	
	87.0 / 7.5	***Sandy Lean Clay with Organic Soil*** Black, moist, mostly low plasticity fines, some fine sand, with some organic soil, firm.	S5	6	1.8	
10.0	85.5 / 9.0	***Lean Clay*** Grey, moist, mostly medium plastic fines, few fine sand, rootlets, iron staining, medium soft, medium dry strength, medium toughness.	S6	6	1.1	
	82.5 / 12.0	***Sandy Lean Clay with Gravel*** Grey, moist, mostly low plasticity fines, some fine sand, few fine and coarse gravel, stiff.	S7	13	0.7	
15.0	80.5 / 14.0	As above, wet (14.0 fbgs), very stiff.	S8	25	1.1	
	78.5 / 16.0	End of Borehole				
20.0						

PID VOCs | Lab Sample | Well Completion Details or Remarks



First water (4.0 fbgs)

Drilled By: Earth Dimensions, Inc.
Drill Rig Type: Maruka, Diedrich D 50
Drill Method: 4 1/4 -inch HSA with 3-inch split spoon
Comments: Elevations based on site datum of 100 fmsl.
Drill Date(s): 5/17/12

Hole Size: 8-inch
Stick-up: NA
Datum: Mean sea level

Project No: 0225-002-100

Borehole Number: SB-7

Project: Supplemental Remedial Investigation

A.K.A.:

Client: Benson Construction & Development, Inc.

Logged By: TAB

Site Location: 251 Homer St., Olean, NY.

Checked By:

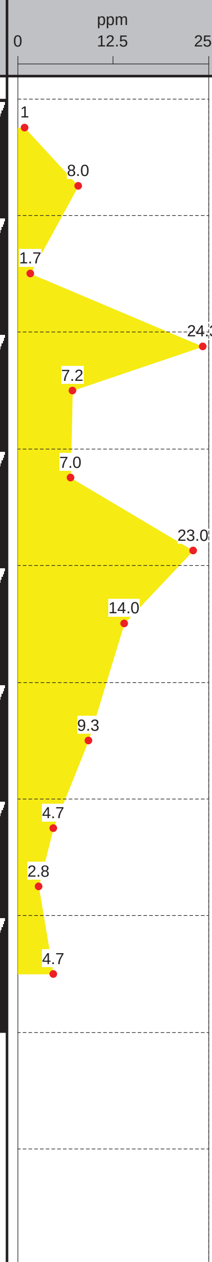
TurnKey Environmental Restoration, LLC
2558 Hamburg Turnpike, Suite 300
Buffalo, NY 14218
(716) 856-0635

SUBSURFACE PROFILE

Depth (fbgs)	Elev. /Depth	Description (ASTM D2488: Visual-Manual Procedure)
0.0	96.9 / 0.0	Ground Surface
	96.9 / 0.0 – 95.9 / 1.0	***Sandy Lean Clay*** Brown, moist, mostly low plasticity fines, some fine sand, few fine gravel, trace coarse gravel, very stiff
	95.9 / 1.0 – 94.9 / 2.0	***Fill*** Orange Brick.
	94.9 / 2.0 – 92.9 / 4.0	***Silty Sand with Gravel and Fill*** Black, moist, mostly fine sand, some non-plastic fines, little fine gravel, orange brick, slight petroleum like odor, medium dense, viscous LNAPL (4.0 fbgs).
5.0	92.9 / 4.0 – 90.9 / 6.0	***Silty Sand with gravel*** As above.
	90.9 / 6.0 – 89.4 / 7.5	As above, very dense, with LNAPL, and orange brick
	89.4 / 7.5 – 86.9 / 10.0	***Lean Clay with Organic Soil*** Brown/grey, moist, mostly medium plasticity fines, few fine sand, with some organics, petroleum like odor.
10.0	86.9 / 10.0 – 83.4 / 13.5	***Sandy Lean Clay*** Grey/Brown, moist, mostly, medium plasticity fines, some fine sand, iron staining, LNAPL in sand partings, slightly laminated, stiff, medium toughness, medium dry strength.
15.0	83.4 / 13.5 – 80.9 / 16.0 (82.9 / 14.0)	***Sandy Lean Clay with Gravel*** Grey, wet (13.5 fbgs), mostly low plasticity fines, some fine sand, little fine gravel, few coarse gravel, stiff. As above.
	80.9 / 16.0	End of Borehole
20.0		

SAMPLE

Sample No.	SPT N-Value	Recovery (ft)	Symbol	PID VOCs (ppm)	Lab Sample	Well Completion Details or Remarks
S1	28	1.0		1, 8.0		
S2	22	0.7		1.7, 24.3		
S3	21	1.3		7.2		
S4	59	1.2		7.0, 23.0		
S5	6	0.8		14.0		
S6	9	0.9		9.3		
S7	22	1.3		4.7, 2.8		
S8	17	0.9		4.7		



Drilled By: Earth Dimensions, Inc.
Drill Rig Type: Maruka, Diedrich D 50
Drill Method: 4 1/4 -inch HSA with 2-inch split spoon.
Comments: Elevations based on site datum of 100 fmsl.
Drill Date(s): 5/16/12

Hole Size: 8-inch
Stick-up: NA
Datum: Mean sea level.

Sheet: 1 of 1

Project No: 0225-002-100

Borehole Number: SB-8

Project: Supplemental Remedial Investigation

A.K.A.:

Client: Benson Construction & Development, Inc.

Logged By: TAB

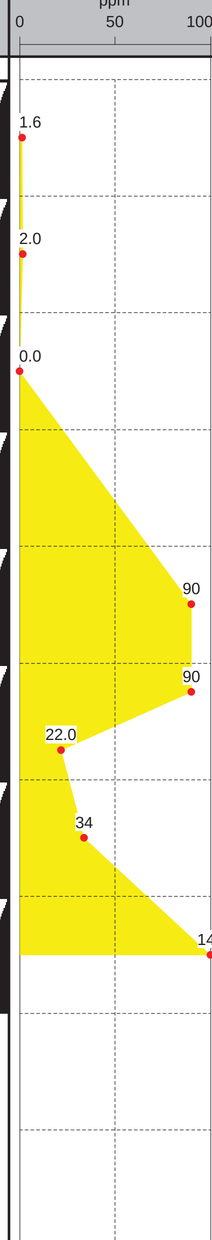
Site Location: 251 Homer St., Olean, NY

Checked By: BCH

TurnKey Environmental Restoration, LLC
2558 Hamburg Turnpike, Suite 300
Buffalo, NY 14218
(716) 856-0635

Depth (ftbgs)	Elev. /Depth	Description (ASTM D2488: Visual-Manual Procedure)	Sample No.	SPT N-Value	Recovery (ft)	Lab Sample	Well Completion Details or Remarks
0.0	0.0 / 0.0	Ground Surface					
		Silty Sand with Fill Black, mostly fine sand, little non-plastic fines, few fine gravel, cinders brick, loose, petroleum-like odor.	S1	9	1.6		
	-2.0 / 2.0	As above, medium dense.	S2	12	1.3		
5.0	-4.0 / 4.0	As above, dense.	S3	31	0.8		
	-5.5 / 5.5	**Concrete**	S4	NA	0.0		First water, (8.0 fbgs).
	-8.0 / 8.0	**Fill** Viscous LNAPL.	S5	11	1.3		
10.0	-10.0 / 10.0	As above.	S6	4	1.7		
	-11.0 / 11.0	**Lean Clay with Organic Soil** Grey, mostly, medium plasticity fines, few fine sand, some organic soil, massive, soft, petroleum like odor.					
	-12.0 / 12.0	As above.	S7	8	1.0		
15.0	-14.0 / 14.0	**Sandy Lean Clay with Gravel** Grey, wet (14.0 fbgs), mostly low plastcity fines, some fine sand, little fine gravel, trace coarse, stiff, petroleum-like odor.	S8	15	1.3		
	-16.0 / 16.0	End of Borehole					
20.0							

PID VOCs



Drilled By: Earth Dimensions, Inc.
Drill Rig Type: Maruka, Diedrich D 50
Drill Method: 4 1/4 -inch HSA with 2-inch split spoon
Comments: Elevations based on site datum of 100 fmsl.
Drill Date(s): 5/16/12

Hole Size: 8-inch
Stick-up: NA
Datum: Mean sea level.

Sheet: 1 of 1

Project No: 0225-002-100

Borehole Number: SB-9

Project: Supplemental Remedial Investigation

A.K.A.:

Client: Benson Construction & Development, Inc.

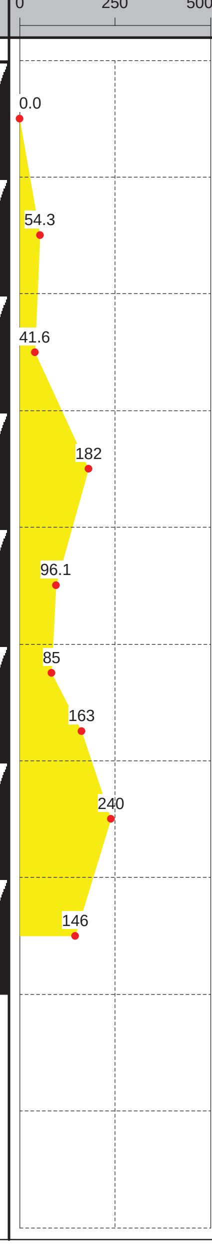
Logged By: TAB

Site Location: 251 Homer St., Olean, NY

Checked By: BCH

TurnKey Environmental Restoration, LLC
2558 Hamburg Turnpike, Suite 300
Buffalo, NY 14218
(716) 856-0635

Depth (fbgs)	Elev. /Depth	Description (ASTM D2488: Visual-Manual Procedure)	Sample No.	SPT N-Value	Recovery (ft)	Symbol	PID VOCs (ppm)	Lab Sample	Well Completion Details or Remarks
	96.9	Ground Surface							
0.0	96.9 / 0.0	**Sandy Lean Clay with Gravel** Brown, moist, mostly medium plasticity fines, some fine sand, little fine gravel, trace coarse gravel, stiff, massive, medium toughness, medium dry strength.	S1	9	1.3		0.0		
	94.9 / 2.0	**Sandy Silt with Fill** Black, moist, mostly non-plastic fines, some fine sand, trace fine gravel brick, concrete, very stiff, petroleum-like odor.	S2	25	1.0		54.3		
5.0	92.9 / 4.0	As above, hard, viscous LNAPL.	S3	32	1.4		41.6		
	90.9 / 6.0	**Lean Clay with Organic Soil** Black ,moist, mostly medium plastic fines, few fine sand, petroleum-like odor, trace fine gravel, very stiff, massive, viscous LNAPL.	S4	18	1.3		182		
	88.9 / 8.0	As above some organic material.	S5	2	1.7		96.1		
10.0	86.9 / 10.0	**Sandy Lean Clay** Grey, moist, mostly low plasticity fines, some fine sand, iron staining, stiff, rootlets	S6	11	1.1		85		
	85.9 / 11.0	**Silty Sand with Gravel** Brown/black, moist, mostly fine sand, little non-plastic fines, little fine gravel, medium dense, petroleum-like odor.					163		
	84.9 / 12.0	As above.	S7	18	0.8		240		
15.0	82.9 / 14.0	As above,(wet at 14 fbgs).	S8	18	1.0		146		
	80.9 / 16.0	End of Borehole							
20.0									



Drilled By: Earth Dimensions, Inc.
Drill Rig Type: Maruka, Diedrich D 50
Drill Method: 4 1/4 -inch HSA with 2-inch split spoon
Comments: Elevations based on site datum of 100 fmsl.
Drill Date(s): 5/16/12

Hole Size: 8-inch
Stick-up: NA
Datum: Mean sea level.

Sheet: 1 of 1

Project No: 0225-002-100

Borehole Number: SB-10

Project: Supplemental Remedial Investigation

A.K.A.:

Client: Benson Construction & Development, Inc.

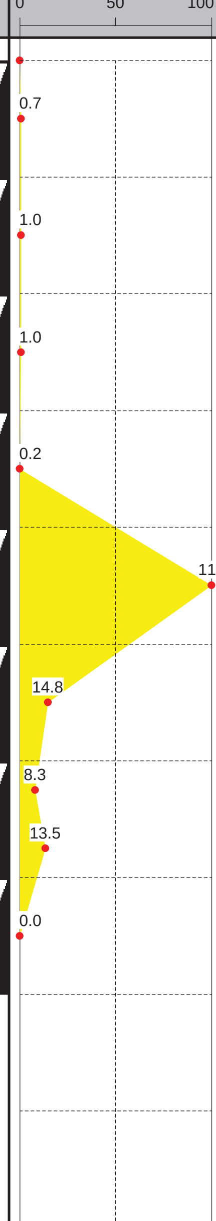
Logged By: TAB

Site Location: 251 Homer St., Olean, NY

Checked By: BCH

TurnKey Environmental Restoration, LLC
2558 Hamburg Turnpike, Suite 300
Buffalo, NY 14218
(716) 856-0635

Depth (ftbgs)	Elev. /Depth	SUBSURFACE PROFILE — Description (ASTM D2488: Visual-Manual Procedure)	Sample No.	SPT N-Value	Recovery (ft)	PID VOCs (ppm)	Lab Sample	Well Completion Details or Remarks
	95.3	Ground Surface						
0.0	95.3 / 0.0	***Sandy Lean Clay with Fill*** Brown, moist, mostly low plasticity fines, some fine sand, few fine gravel, trace coarse gravel, coal pieces, stiff, medium toughness and dry strength.	S1	11	1.8	0.7		
	93.3 / 2.0	As above, very stiff.	S2	32	1.8	1.0		
	92.8 / 2.5	***Sandy Silt with Fill*** Black, moist, mostly non-plastic fines, some fine sand, few fine gravel, dense, wood debris, orange brick.						
5.0	91.3 / 4.0	As above, slight petroleum odor, metal debris.	S3	17	0.8	1.0		
	89.3 / 6.0	***Poorly Graded Sand*** Black, wet (6.0 fbgs),mostly fine sand, trace non-plastic fines, loose, rapid dilatancey.	S4	6	0.7	0.2		*First water (6.0 fbgs).*
	87.3 / 8.0	As above, black, brown layer 2-inch thick (8.8 - 9.0 fbgs).	S5	4	1.3	110		
10.0	86.3 / 9.0	***Lean Clay*** Grey, moist, mostly medium plastic fines, little fine sand, petroleum like odor, 1-inch viscous LNAPL layer (9.0 fbgs), LNAPL in sand filled fractures, soft.						
	85.3 / 10.0	As above.	S6	4	0.6	14.8		
	83.3 / 12.0	As above, brown, firm, no LNAPL.	S7	7	0.9	8.3		
15.0	81.8 / 13.5	***Poorly Graded Sand with Gravel*** Grey, moist to wet (14.0 fbgs), mostly fine sand, some fine gravel, trace non-plastic fines, medium dense, loose when disturbed, petroleum like odor, petroleum like LNAPL (14.0 - 14.5 fbgs).				13.5		
			S8	19	0.8	0.0		
	79.3 / 16.0	End of Borehole						
20.0								



Drilled By: Earth Dimensions, Inc.
Drill Rig Type: Maruka, Diedrich D 50
Drill Method: 4 1/4 -inch HSA with 2-inch split spoon
Comments: Elevations based on site datum of 100 fmsl.
Drill Date(s): 5/18/12

Hole Size: 8-inch
Stick-up: NA
Datum: Mean Sea Level

Sheet: 1 of 1

Project No: 0225-002-100

Borehole Number: SB-11

Project: Supplemental Remedial Investigation

A.K.A.:

Client: Benson Constrution & Development, Inc.

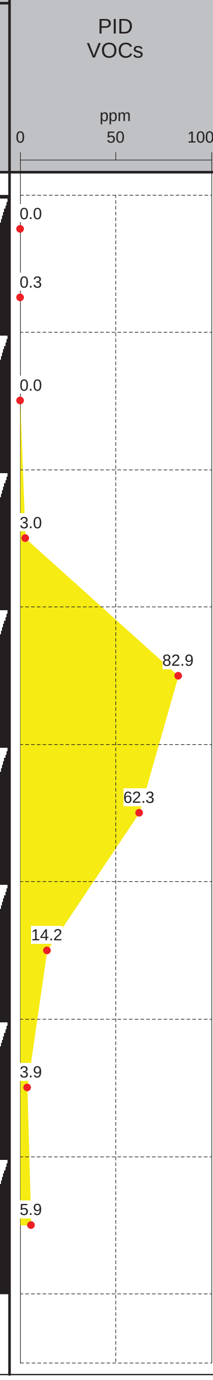
Logged By: TAB

Site Location: 251 Homer St., Olean, NY

Checked By: BCH

TurnKey Environmental Restoration, LLC
2558 Hamburg Turnpike, Suite 300
Buffalo, NY 14218
(716) 856-0635

Depth (ftbgs)	Elev. /Depth	SUBSURFACE PROFILE – Description (ASTM D2488: Visual-Manual Procedure)	Sample No.	SPT N-Value	Recovery (ft)	Lab Sample	Well Completion Details or Remarks
0.0	95.8 / 0.0	Ground Surface					
		Sandy Lean Clay Brown, moist, mostly low plasticity fines, some fine sand, few fine gravel, trace coarse gravel, very stiff.	S1	17	1.5		
	94.8 / 1.0	**Poorly Graded Sand with Silt and Fill** Black, mostly fine sand, few non-plastic fines, dense, orange brick.					
	93.8 / 2.0	As above, wood and coal pieces.	S2	35	1.3		
	91.8 / 4.0	As above, wet (4.0 fbgs), medium dense, slight petroleum-like odor, sheen.	S3	28	0.9		First water (4.0 fbgs).
5.0							
	89.8 / 6.0	As above, petroleum like odor, viscous LNAPL mixed with fines, dense.	S4	47	0.7		
	87.8 / 8.0	Black/tan, soft, viscous LNAPL	S5	4	1.0		
10.0	85.8 / 10.0	**Lean Clay with sand** Grey, moist, mostly medium plasticity fines, little fine sand, iron staining, medium toughness, medium dry strength, firm.	S6	8	1.1		
	83.8 / 12.0	As above, stiff, iron staining.	S7	12	1.4		
			S8	11	0.8		
15.0							
	80.3 / 15.5	**Sandy Lean Clay with Gravel** Grey, wet (15.5 fbgs), mostly low plasticity fines, some fine sand, little fine gravel, stiff.					
	79.8 / 16.0	End of Borehole					



Drilled By: Earth Dimensions, Inc.
Drill Rig Type: Maruka, Diedrich D 50
Drill Method: 4 1/4 -inch HSA with 2-inch split spoon
Comments: Elevations based on site datum of 100 fmsl.
Drill Date(s): 5/17/12

Hole Size: 8-inch
Stick-up: NA
Datum: Mean sea level.

Sheet: 1 of 1

Project No: 0225-002-100

Borehole Number: SB-12

Project: Supplemental Remedial Investigation

A.K.A.:

Client: Benson Constrution & Development, Inc.

Logged By: TAB

Site Location: 251 Homer St., Olean, NY

Checked By: BCH

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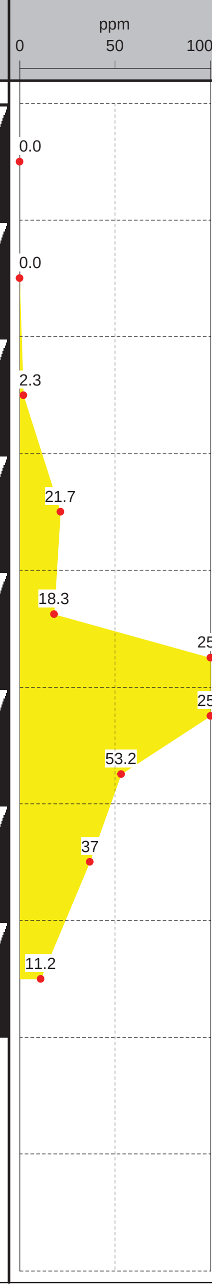
2558 Hamburg Turnpike, Suite 300
Buffalo, NY 14218
(716) 856-0635

Depth (ftbgs)	Elev. /Depth	Description (ASTM D2488: Visual-Manual Procedure)	Sample No.	SPT N-Value	Recovery (ft)	Symbol	Lab Sample	Well Completion Details or Remarks
0.0	95.9 / 0.0	Ground Surface						
	95.9 / 0.0	***Sandy Lean Clay with Fill*** Brown, moist, mostly low plasticity fines, some fine sand, few fine gravel, trace coarse gravel, stiff, medium toughness, medium dry strength, massive.	S1	15	0.7			
	93.9 / 2.0	As above, orange brick with grey	S2	8	1.2			*First water (3.5 fbgs).*
5.0	91.9 / 4.0	As above black, wet (3.5 fbgs), stiff, slight petroleum like odor, medium dense.	S3	15	0.4			
	89.9 / 6.0	***Poorly Graded Sand with Silt*** Black, wet, mostly fine sand,few non-plastic fines, loose, slght petroleum-like odor, sheen.	S4	5	1.3			
	87.9 / 8.0	As above brown (8.5-9.0 fbgs),petroleum-like odors.	S5	5	1.0			
10.0	85.9 / 10.0	***Sandy Lean Clay with Organic Soil*** Grey/brown, moist, mostly medium plasticity fines, some fine sand, some organic soil, petroleum-like odor, viscous LNAPL (10.5 fbgs), LNAPL mixed with organic soil.	S6	3	1,5			
	83.9 / 12.0	As above, firm, rootlets and wood, LNAPL in sand fine sand filled factures (12.0 -14.0 fbgs).	S7	5	1.5			
15.0			S8	12	1.5			
	80.4 / 15.5	***Sandy Lean Clay with Gravel*** Grey, wet (15.5 fbgs), mostly low plasticity fines, some fine sand, little fine gravel, stiff.						
	79.9 / 16.0	End of Borehole						
20.0								

PID VOCs



Drilled By: Earth Dimensions, Inc.
Drill Rig Type: Maruka, Diedrich D 50
Drill Method: 4 1/4 -inch HSA with 2-inch split spoon
Comments: Elevations based on site Datum of 100 fmsl.
Drill Date(s): 5/18/12

Hole Size: 8-inch
Stick-up: NA
Datum: Mean sea level.

Sheet: 1 of 1

Project No: 0225-002-100

Borehole Number: SB-13

Project: Supplemental Remdial Investigation

A.K.A.:

Client: Benson Constrution & Development, Inc.

Logged By: TAB

Site Location: 251 Homer St. Olean, NY

Checked By: BCH

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2558 Hamburg Turnpike, Suite 300
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SUBSURFACE PROFILE			SAMPLE						
Depth (fbgs)	Elev. /Depth	Description (ASTM D2488: Visual-Manual Procedure)	Sample No.	SPT N-Value	Recovery (ft)	Symbol	PID VOCs ppm (0–25–50)	Lab Sample	Well Completion Details or Remarks
	97.4	Ground Surface							
0.0	0.0	***Sandy Lean Clay with Fill*** Brown/black, moist, mostly low plasticity fines, some fine sand, few fine gravel, trace coarse gravel, very stiff, orange brick, concrete.	S1	23	1,6		2.9		*First water (3.0 fbgs).*
	95.4 / 2.0	As above, wet at (3.0 fbgs), wood and coal pieces.	S2	21	1.3		0.9		
	93.4 / 4.0	No revovery.	S3	8	0.0				
5.0	91.4 / 6.0	As above, hard.	S4	NA	0.6		0.0		
	89.4 / 8.0	***Concrete*** Slight petroleum-like odor.	S5	NA	0.9		0.9		
10.0	87.4 / 10.0	As above, wet, wood.	S6	NA	0.4		0.4		
	85.4 / 12.0	***Sandy Lean Clay*** Brown/grey, moist, mostly low plasticity fines, some fine sand, iron staining, LNAPL in sand filled fractures, stiff, slight petroleum-like odor.	S7	16	1.4		25.6		
15.0	82.4 / 15.0	***Sandy Lean Clay with Gravel*** Grey, wet (15.0 fbgs), mostly low plasticity fines, some fine sand, little fine gravel, petroleum like odor, LNAPL.	S8	21	1.5		33.0		
	81.4 / 16.0	End of Borehole							
20.0									

Drilled By: Earth Dimensions, Inc.
Drill Rig Type: Maruka, Diedrich D 50
Drill Method: 4 1/4 -inch HSA with 2-inch split spoon
Comments: Elevations based on site datum of 100 fmsl
Drill Date(s): 5/17/12

Hole Size: 8-inch
Stick-up: NA
Datum: Mean sea level.

TEST PIT EXCAVATION LOG

Project No: 0225-001-100
Project: 251 Homer Street Redevelopment Site
Client: Benson Construction and Development, LLC
Site Location: Olean NY

Test Pit I.D.: TP-1
Logged By: TAB
Checked By: BCH

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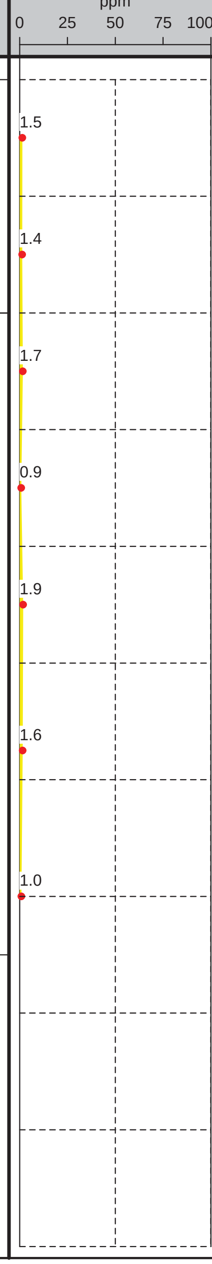
SUBSURFACE PROFILE

Depth (fbgs)	Elev. /Depth	Description (ASTM D2488: Visual-Manual Procedure)	Lithologic Symbol	PID VOCs ppm	Lab Sample	Remarks
0.0	0.0 0.0	Ground Surface ***Sandy Lean Clay with Fill*** Brown/grey, moist, mostly low plasticity fines, little fine sand, few coarse gravel, trace cobbles, cinders, brick fragments, concrete, stiff, medium toughness,		1.5 1.4		
5.0	-4.0 4.0	***Poorly Graded Sand with Gravel*** Grey, wet, mostly fine sand, trace non plastic fines, little coarse gravel, little fine gravel, loose.		1.7 0.9 1.9 1.6 1.0		*4.0 fbgs, May 9, 2011*
10.0						
15.0	-15.0 15.0	End of Test Pit				
20.0						



Excavated By: RE Lorenz
Excavator Type: Komatsu
Excavation Date(s): 5/9/11
Comments:

Length: 16.0 feet
Width: 2.0-feet
Depth: 15.0-feet

Depth to Water: 4.0-fbgs
Visual Impacts: None
Olfactory Observations: None

TEST PIT EXCAVATION LOG

Project No: 0225-001-100
Project: 251 Homer Street t Site
Client: Benson Construction and Development, LLC
Site Location: Olean NY

Test Pit I.D.: TP-2
Logged By: TAB
Checked By: BCH

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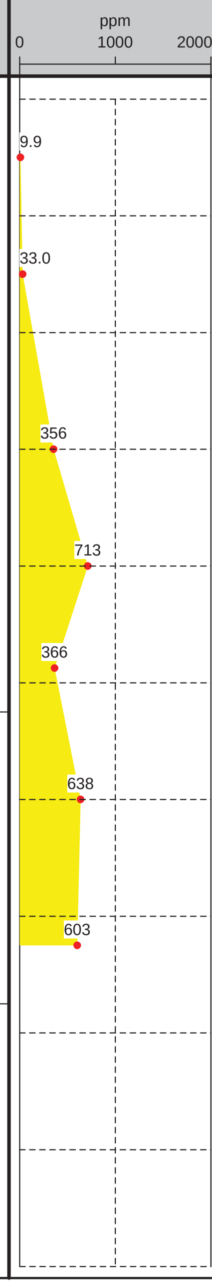
SUBSURFACE PROFILE

Depth (fbgs)	Elev. /Depth	Description (ASTM D2488: Visual-Manual Procedure)	Lithologic Symbol	PID VOCs (ppm)	Lab Sample	Remarks
0.0	0.0 / 0.0	Ground Surface				
		Sandy Lean Clay with Fill Brown/grey, moist, mostly medium plasticity fines, little fine sand, few coarse gravel (shale fragments), trace cobbles, stiff, medium toughness, massive.		9.9		
	-2.0 / 2.0	As above, no shale, rootlets, soft, concrete foundation wall (2.5 to 9.0 fbgs) on west side of test pit.		33.0		
5.0	-5.0 / 5.0	As above, petroleum-like odor.		356		
	-7.0 / 7.0	As above, wood pieces, iron staining.		713	Sample	
	-9.0 / 9.0	As above.		366		
10.0	-10.5 / 10.5	***Poorly Graded Sand with Gravel*** Grey wet (13.5 fbgs), mostly fine sand, trace non plastic fines, little coarse gravel, little fine gravel, loose, petroleum-Like odor.		638		*May 9, 2011*
				603		
15.0	-15.5 / 15.5	End of Test Pit				
20.0						



Excavated By: RE Lorenze
Excavator Type: Komatsu
Excavation Date(s): 5/9/11
Comments:

Length: 16.0 feet
Width: 2.0-feet
Depth: 15.5-feet

Depth to Water: 13.5-fbgs
Visual Impacts: None
Olfactory Observations: Petroleum-like odor.

TEST PIT EXCAVATION LOG

Project No: 0225-001-100
Project: 251 Homer Street Redevolpment Site
Client: Benson Construction and Development, LLC
Site Location: Olean NY

Test Pit I.D.: TP-3
Logged By: TAB
Checked By: BCH

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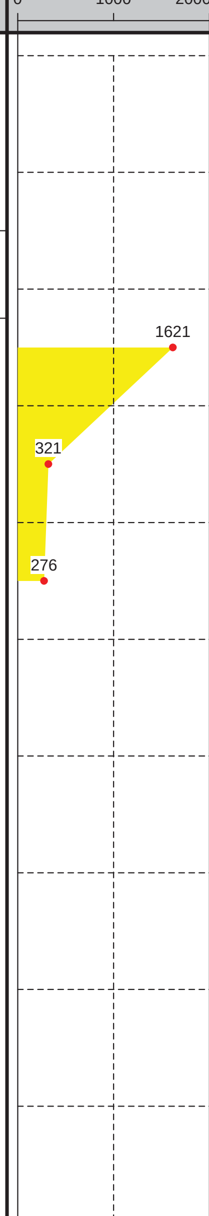
SUBSURFACE PROFILE

Depth (fbgs)	Elev. /Depth	Description (ASTM D2488: Visual-Manual Procedure)	Lithologic Symbol	PID VOCs (ppm: 0, 1000, 2000)	Lab Sample	Remarks
0.0	0.0 / 0.0	Ground Surface ***Sandy Silt with Fill*** Black/brown, wet (2.5 to 3.0 fbgs), mostly non plastic fines with some fine sand, few fine gravels, loose, orange brick, wood debris.				
	-3.0 / 3.0	***Poorly Graded Sand w/Silt and Gravel.*** Brown, moist, mostly fine sand, few non-plastic fines, little coarse coarse gravel, loose.				
5.0	-4.5 / 4.5	As above, grey, trace non-plastic fines, petroleum like odor.		1621	Sample	
	-6.0 / 6.0	As above, wet (8.0 fbgs).		321 276		8.0 fbgs 5/9/11
10.0	-10.0 / 10.0	End of Test Pit				
15.0						
20.0						



Excavated By: RE Lorenze
Excavator Type: Komatsu
Excavation Date(s): 5/9/11
Comments:

Length: 18.0 feet
Width: 2.0-feet
Depth: 10.0-feet

Depth to Water: 8.0-fbgs
Visual Impacts: None
Olfactory Observations: Petroleum-like odor.

TEST PIT EXCAVATION LOG

Project No: 0225-001-100
Project: 251 Homer Street Redevelopment Site
Client: Benson Construction and Development, LLC
Site Location: Olean NY

Test Pit I.D.: TP-4
Logged By: TAB
Checked By: BCH

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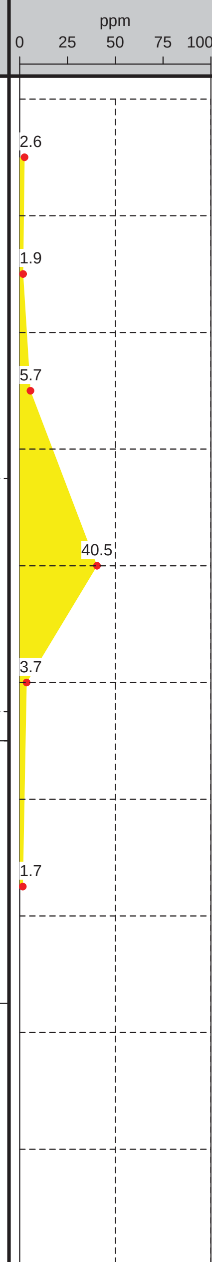
SUBSURFACE PROFILE

Depth (fbgs)	Elev. /Depth	Description (ASTM D2488: Visual-Manual Procedure)	Lithologic Symbol	Lab Sample	Remarks
0.0	0.0 / 0.0	Ground Surface			
		Sandy Lean Clay with Fill Black/brown, moist, mostly low plasticity fines, some fine sand, few fine gravel, trace cobble (shale), orange brick,wood, metal debris, footer walls (1.0 fbgs to 6.5 fbgs) petroleum-like odor.			
	-4.0 / 4.0	As above.			
5.0					
	-6.5 / 6.5	***Lean Clay*** Grey, moist, mostly medium plasticity fines, trace fine sand, iron-stained, stiff, medium toughness, slight petroluem-like odor.		Sample	
10.0					
	-10.5 / 10.5	***Sandy Lean Clay*** Grey, moist, mostly medium plasticity fines, some fine sand, few fine and coarse gravel, stiff.			
	-11.0 / 11.0	***Poorly Graded Sand w/Silt and Gravel.*** Grey, wet (13.0 fbgs), mostly fine sand with few non-plastic fines, little coarse gravel, medium dense, loose when disturbed, sheen observed.			13.0 fbgs 5/9/11
15.0	-15.5 / 15.5	End of Test Pit			
20.0					

PID VOCs



Excavated By: RE Lorenz
Excavator Type: Komatsu
Excavation Date(s): 5/9/11
Comments:

Length: 16.0 feet
Width: 2.0-feet
Depth: 15.5feet

Depth to Water: 13.0-fbgs
Visual Impacts: Sheen
Olfactory Observations: Petroleum-like odor

TEST PIT EXCAVATION LOG

Project No: 0225-001-100
Project: 251 Homer Street Redevelopment Site
Client: Benson Construction and Development, LLC
Site Location: Olean NY

Test Pit I.D.: TP-5
Logged By: TAB
Checked By: BCH

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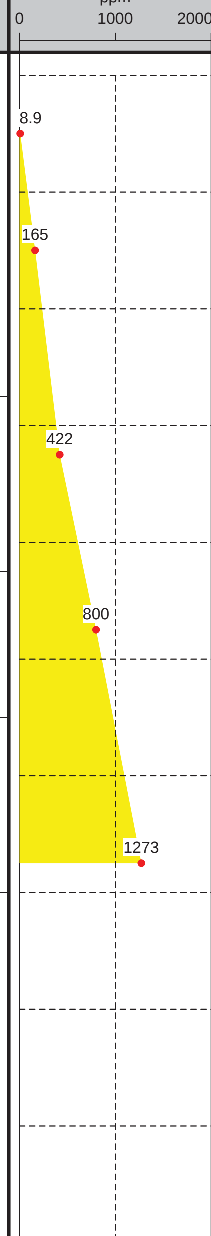
SUBSURFACE PROFILE

Depth (fbgs)	Elev. /Depth	Description (ASTM D2488: Visual-Manual Procedure)	Lithologic Symbol	PID VOCs (ppm)	Lab Sample	Remarks
0.0	0.0 / 0.0	Ground Surface				
0.0 – 5.5	0.0 / 0.0	***Sandy Lean Clay with Fill*** Black/brown, moist, mostly low plasticity fines, some fine sand, few fine gravel, trace cobbles (shale), orange brick, petroleum odor,		8.9; 165		
5.5 – 8.5	-5.5 / 5.5	***Lean Clay*** Grey, moist, mostly medium plasticity fines, trace fine sand, iron stained, stiff, massive, medium toughness, slight petroluem-like odor.		422		
8.5 – 11.0	-8.5 / 8.5	***Sandy Lean Clay*** As above (0.0-5.5 fbgs)		800	Sample	11.0 fbgs 5/9/11
11.0 – 14.0	-11.0 / 11.0	***Poorly Graded Sand with Silt and gravel*** Grey, wet (11.0 fbgs), mostly fine sand few non plastic fines, little coarse gravel, medium dense, loose when disturbed, petroleum-like odor.		1273		
14.0	-14.0 / 14.0	End of Test Pit				

Depth scale: 0.0, 5.0, 10.0, 15.0, 20.0



Excavated By: RE Lorenz
Excavator Type: Komatsu
Excavation Date(s): 5/10/11
Comments:

Length: 16.0 feet
Width: 2.0-feet
Depth: 15.5-feet

Depth to Water: 11.0-fbgs
Visual Impacts: None
Olfactory Observations: Slight petroleum-like odor.

TEST PIT EXCAVATION LOG

Project No: 0225-001-100

Project: 251 Homer Street Redevelopment Site

Client: Benson Construction and Development, LLC

Site Location: Olean NY

Test Pit I.D.: TP-6

Logged By: TAB

Checked By: BCH

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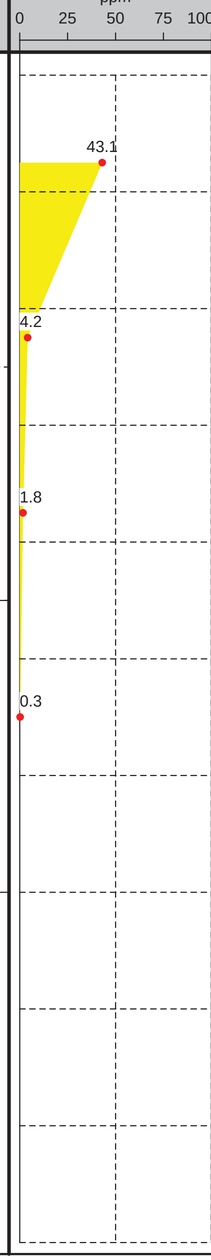
SUBSURFACE PROFILE

Depth (fbgs)	Elev. /Depth	Description (ASTM D2488: Visual-Manual Procedure)	Lithologic Symbol	PID VOCs (ppm)	Lab Sample	Remarks
		Ground Surface				
0.0	0.0 0.0	***Sandy Lean Clay with Fill*** Black/brown, moist, mostly medium plasticity fines with some fine sand, few fine gravels, trace cobbles (shale), orange brick, massive.		43.1		
5.0	-5.0 5.0	***Lean Clay w/Sand*** Grey, moist, mostly medium plasticity fines, trace fine sand grading to little, iron stained, stiff, medium toughness, massive, petroleum-like odor.		4.2 1.8		
	-9.0 9.0	***Poorly Graded Sand w/Silt and Gravel*** Grey, wet (9.0 fbgs), mostly fine sand, few non-plastic fines, little coarse gravel, medium dense, loose when disturbed, sheen observed.		0.3		*9.0 fbgs 5/9/11*
10.0						
	-14.0 14.0	End of Test Pit				
15.0						
20.0						



Excavated By: RE Lorenz
Excavator Type: Komatsu
Excavation Date(s): 5/10/11
Comments:

Length: 16.0 feet
Width: 2.0-feet
Depth: 14.0 feet

Depth to Water: 9.0-fbgs
Visual Impacts: Sheen
Olfactory Observations: Slight petroleum-like odor

TEST PIT EXCAVATION LOG

Project No: 0225-001-100
Test Pit I.D.: TP-7
Project: 251 Homer Street Redevelopment Site
Logged By: TAB
Client: Benson Construction and Development, LLC
Checked By: BCH
Site Location: Olean NY

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Buffalo, NY 14218
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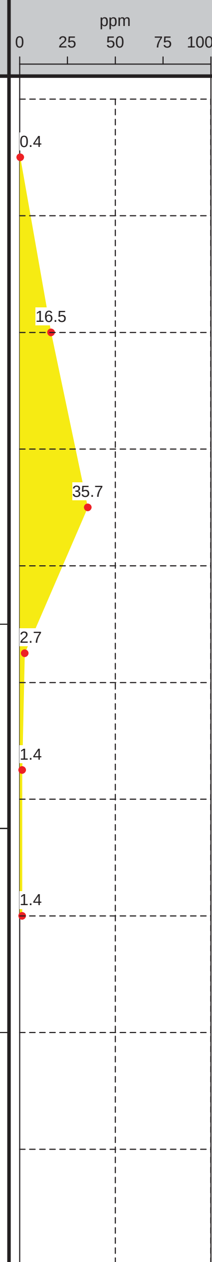
SUBSURFACE PROFILE

Depth (fbgs)	Elev. /Depth	Description (ASTM D2488: Visual-Manual Procedure)	Lithologic Symbol	Lab Sample	Remarks
	0.0 / 0.0	Ground Surface			
0.0	0.0 / 0.0	***Sandy Lean Clay with Fill*** Black/grey, moist, mostly medium plasticity fines with some fine sand, few fine gravels, trace cobbles (shale), orange brick, medium plastic, stiff, medium toughness.			
	-2.5 / 2.5	As above, black, wet (5.5-6.0 fbgs), petroleum-like odor, LNAPL observed (5.5 - 6.0 fbgs).		Sample	
5.0	-6.0 / 6.0	As above, grey, moist, iron staining, wood blocking, organic debris (roots and grasses), metal.			
10.0	-9.0 / 9.0	***Lean Clay*** Grey, moist, mostly medium plasticity fines, trace fine sand, iron staining, stiff, massive.			12.5 fbgs 5/10/11
	-12.5 / 12.5	***Poorly Graded Sand w/Silt and Gravel*** Grey, wet (12.5 fbgs), mostly fine sand, with few non-plastic fines, little coarse gravel, medium dense, loose when disturbed, sheen observed..			
15.0	-16.0 / 16.0	End of Test Pit			
20.0					

PID VOCs



Excavated By: RE Lorenze
Excavator Type: Komatsu
Excavation Date(s): 5/10/11
Comments:

Length: 16.0 feet
Width: 2.0-feet
Depth: 16.0 feet

Depth to Water: 12.5-fbgs
Visual Impacts: LNAPL.
Olfactory Observations: Petroleum-like odor

TEST PIT EXCAVATION LOG

Project No: 0225-001-100
Project: 251 Homer Street Redevelopment Site
Client: Benson Construction and Development, LLC
Site Location: Olean NY

Test Pit I.D.: TP-8
Logged By: TAB
Checked By: BCH

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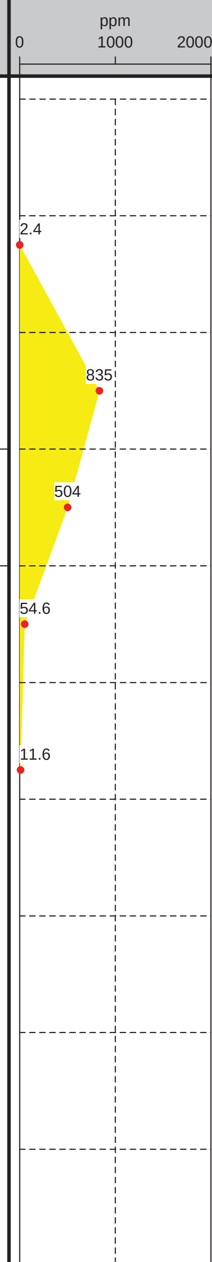
Buffalo, NY 14218
(716) 856-0635

SUBSURFACE PROFILE

Depth (fbgs)	Elev. /Depth	Description (ASTM D2488: Visual-Manual Procedure)	Lithologic Symbol	PID VOCs (ppm)	Lab Sample	Remarks
	0.0	Ground Surface				
0.0	0.0	***Sandy Lean Clay with Fill*** Grey/brown, moist, mostly low plasticity fines, some fine sand, few fine gravel, trace cobble (shale), orange brick, low plasticity, stiff, medium toughness.		2.4		
	-4.0 / 4.0	As above, grey, strong petroleum-like odor, no fill materials		835	Sample	
5.0						
	-6.0 / 6.0	***Poorly Graded Sand w/ Silt and Gravel.*** Grey, moist, mostly fine sand, few non-plastic finees, little coarse gravel, medium dense, loose when disturbed, strong petroleum-like odor.		504		
	-8.0 / 8.0	As above,wet (8.5 fbgs), LNAPL observed (8.0 to 9.0 fbgs).		54.6		8.5 fbgs 5/10/11
10.0						
	-10.5 / 10.5	As above.		11.6		
	-13.0 / 13.0	End of Test Pit				
15.0						
20.0						



Excavated By: RE Lorenz
Excavator Type: Komatsu
Excavation Date(s): 5/10/11
Comments:

Length: 16.0 feet
Width: 2.0-feet
Depth: 16.0 feet

Depth to Water: 8.5-fbgs
Visual Impacts: LNAPL.
Olfactory Observations: Petroleum-like odor.

Sheet: 1 of 1

TEST PIT EXCAVATION LOG

Project No: 0225-001-100
Project: 251 Homer Street Redevelopment Site
Client: Benson Construction and Development, LLC
Site Location: Olean NY

Test Pit I.D.: TP-9
Logged By: TAB
Checked By: BCH

TurnKey Environmental Restoration, LLC
2558 Hamburg Turnpike, Suite 300
Buffalo, NY 14218
(716) 856-0635

SUBSURFACE PROFILE

Depth (fbgs)	Elev. /Depth	Description (ASTM D2488: Visual-Manual Procedure)	Lithologic Symbol	PID VOCs (ppm) 0 25 50 75 100	Lab Sample	Remarks
	0.0 / 0.0	Ground Surface				
0.0	0.0 / 0.0	***Sandy Lean Clay with Fill*** Grey/brown, moist, mostly low plasticity fines, some fine sand, few fine gravel, trace cobble (shale), orange brick, stiff, medium toughness.		2.2		
5.0	-4.0 / 4.0	As above.		1.6		
	-8.0 / 8.0	As above, iron staining.		3.9		
10.0	-10.0 / 10.0	As above, brown.		2.5; 2.0		
	-13.5 / 13.5	As above.		1.9		15.5 fbgs 5/10/11
15.0	-15.0 / 15.0	***Poorly Graded Sand with Silt and Gravel*** Brown, wet 15.5 fbgs, mostly fine sand, few non plastic fines, little coarse gravel, medium dense, loose when disturbed,				
	-16.0 / 16.0	End of Test Pit				
20.0						

Excavated By: RE Lorenz
Excavator Type: Komatsu
Excavation Date(s): 5/10/11
Comments:

Length: 16.0 feet
Width: 2.0-feet
Depth: 16.0 feet

Depth to Water: 15.5-fbgs
Visual Impacts: none
Olfactory Observations: none

TEST PIT EXCAVATION LOG

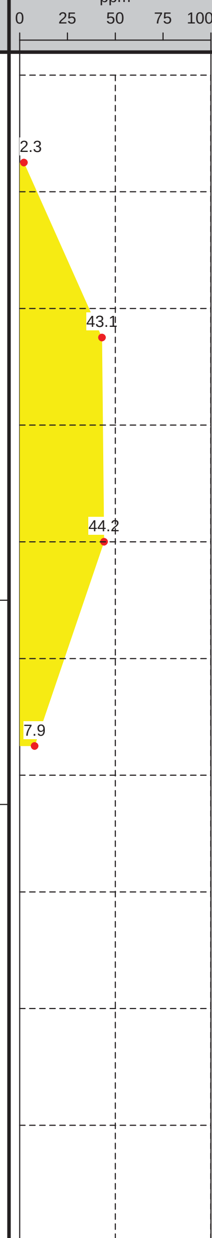
Project No: 0225-001-100
Project: 251 Homer Street Redevelopment Site
Client: Benson Construction and Development, LLC
Site Location: Olean NY

Test Pit I.D.: TP-10
Logged By: TAB
Checked By: BCH

Benchmark Environmental Engineering & Science, PLLC
2558 Hamburg Turnpike, Suite 300
Buffalo, NY 14218
(716) 856-0599

SUBSURFACE PROFILE

Depth (fbgs)	Elev. /Depth	Description (ASTM D2488: Visual-Manual Procedure)	Lithologic Symbol	PID VOCs ppm	Lab Sample	Remarks
0.0	0.0 0.0	Ground Surface ***Sandy Lean Clay with Fill*** Black/brown, moist, mostly medium plastic fines, some fine sand, few coarse gravels, trace cobbles (shale), organic material (roots, grasses 4.5 -5.5 fbgs), medium toughness.				
5.0	-5.5 5.5	As above,Grey, slight petroleum like odor.				
10.0	-9.0 9.0	***Poorly Graded Sand w/Silt and Gravel*** Grey, wet (10.0 fbgs), mostly fine sand, few non plastic fines, little coarse gravel, medium dense, loose when disturbed.				*10.0 fbgs 5/9/11*
15.0	-12.5 12.5	End of Test Pit				
20.0						



Excavated By: RE Lorenz
Excavator Type: Komatsu
Excavation Date(s): 5/9/11
Comments:

Length: 16.0 feet
Width: 2.0-feet
Depth: 12.5 feet

Depth to Water: 10.0-fbgs
Visual Impacts: None
Olfactory Observations: Slight petroleum-like odor

Sheet: 1 of 1

TEST PIT EXCAVATION LOG

Project No: 0225-001-100
Project: 251 Homer Street Redevelpment Site
Client: Benson Construction and Development, LLC
Site Location: Olean NY

Test Pit I.D.: TP-11
Logged By: TAB
Checked By: BCH

TurnKey Environmental Restoration, LLC
2558 Hamburg Turnpike, Suite 300
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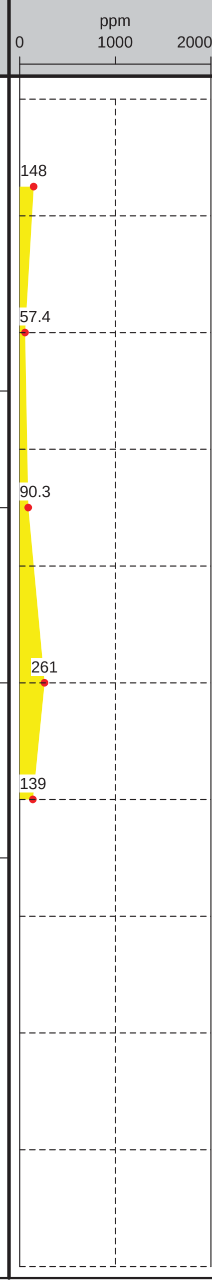
(716) 856-0635

SUBSURFACE PROFILE

Depth (fbgs)	Elev. /Depth	Description (ASTM D2488: Visual-Manual Procedure)	Lithologic Symbol	PID VOCs (ppm)	Lab Sample	Remarks
0.0	0.0 / 0.0	Ground Surface				
		Sandy silt with Fill Black, moist to wet (3.0 - 3.5fbgs), mostly non plastic fines, some fine sand, few coarse gravel, brick, wood debris, petroleum-like odor, medium dense, 6-inch steel pipe (~1.5 fbgs), no dry strength.		148; 57.4		
5.0	-5.0 / 5.0	***Sandy Lean Clay*** Grey moist, mostly medium plasticity fines, some fine sand, stiff, medium toughness and dry strength, petroleum-like odor.				
	-7.0 / 7.0	As above.		90.3		
10.0	-10.0 / 10.0	***Poorly Graded Sand w/Silt and Gravel*** Grey, wet (10.0 fbgs), mostly fine sand, few non-plastic fines, little coarse gravel, medium dense, loose when disturbed, petroleum-like odor.		261; 139	Sample	*10.0 fbgs 5/11/11*
	-13.0 / 13.0	End of Test Pit				
15.0						
20.0						



Excavated By: RE Lorenz
Excavator Type: Komatsu
Excavation Date(s): 5/11/11
Comments:

Length: 16.0 feet
Width: 2.0-feet
Depth: 13.0feet

Depth to Water: 10.0-fbgs
Visual Impacts: None
Olfactory Observations: Petroleum-like odor.

Sheet: 1 of 1

TEST PIT EXCAVATION LOG

Project No: 0225-001-100
Project: 251 Homer Street Redevelopment Site
Client: Benson Construction and Development, LLC
Site Location: Olean NY

Test Pit I.D.: TP-12
Logged By: TAB
Checked By: BCH

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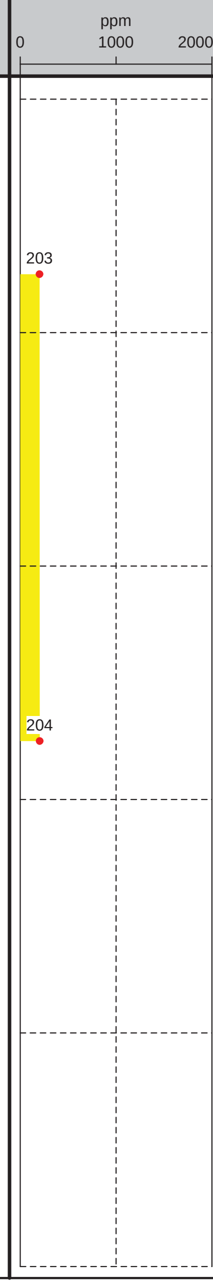
(716) 856-0635

SUBSURFACE PROFILE

Depth (fbgs)	Elev. /Depth	Description (ASTM D2488: Visual-Manual Procedure)	Lithologic Symbol	PID VOCs (ppm: 0, 1000, 2000)	Lab Sample	Remarks
	0.0	Ground Surface				
0.0	0.0	***Sandy Lean Clay with Fill*** Black, wet (4.0 fbgs), mostly low plasticity fines, some fine sand, few coarse gravels, brick and wood debris, 12-inch pipe (~ 7.0 fbgs), medium dense, brick wall north side of test pit (2.5 to 7.5 fbgs), strong petroleum-like odors, LNAPL observed (4.0 fbgs).		203		4.0 fbgs 5/11/11
5.0				204		
	-7.0 / 7.0	End of Test Pit				
10.0						



Excavated By: RE Lorenz
Excavator Type: Komatsu
Excavation Date(s): 5/11/11
Comments:

Length: 16.0 feet
Width: 2.0-feet
Depth: 7.0 feet

Depth to Water: 4.0-fbgs
Visual Impacts: LNAPL
Olfactory Observations: Strong petroleum-like odor.

TEST PIT EXCAVATION LOG

Project No: 0225-001-100
Project: 251 Homer Street Redevelopment Site
Client: Benson Construction and Development, LLC
Site Location: Olean NY

Test Pit I.D.: TP-13
Logged By: TAB
Checked By: BCH

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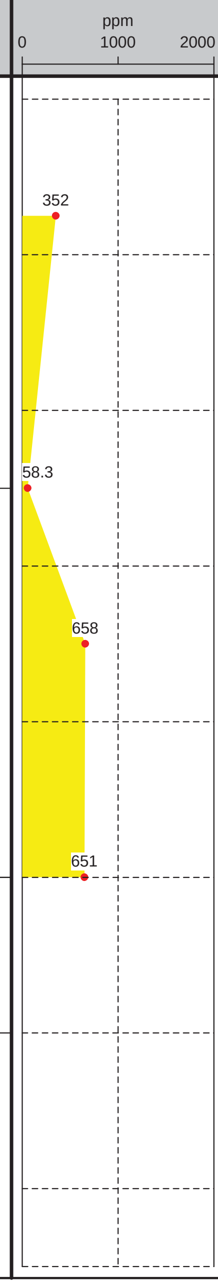
(716) 856-0635

SUBSURFACE PROFILE

Depth (fbgs)	Elev. /Depth	Description (ASTM D2488: Visual-Manual Procedure)	Lithologic Symbol	Lab Sample	Remarks
		Ground Surface			
0.0	0.0 0.0	***Sandy Silt with Fill*** Black, moist, mostly non-plastic fines, some fine sand, with few coarse gravels, orange brick, steel, medium dense, loose when disturbed.			
	-3.0 3.0	As above.			
5.0	-5.0 5.0	***Lean Clay with Sand*** Grey, moist, mostly medium plastic fines, little fine sand, medium dense, medium toughness, medium dry strength, petroleum-like odor.		Sample	
10.0	-10.0 10.0	***Poorly Graded Sand w/Silt and Gravel*** Grey, wet (10.0 fbgs), mostly fine sand, few non plastic fines, little coarse gravel, medium dense, loose when disturbed, petroleum-like odor, LNAPL observed.			10.0 fbgs 5/11/11
	-12.0 12.0	As above, LNAPL.			
	-13.0 13.0	End of Test Pit			
15.0					

PID VOCs



Excavated By: RE Lorenz
Excavator Type: Komatsu
Excavation Date(s): 5/11/11
Comments:

Length: 16.0 feet
Width: 2.0-feet
Depth: 13.0 feet

Depth to Water: 10.0-fbgs
Visual Impacts: LNAPL.
Olfactory Observations: Petroleum-like odor.

TEST PIT EXCAVATION LOG

Project No: 0225-001-100
Project: 251 Homer Street Redevelopment Site
Client: Benson Construction and Development, LLC
Site Location: Olean NY

Test Pit I.D.: TP-14
Logged By: TAB
Checked By: BCH

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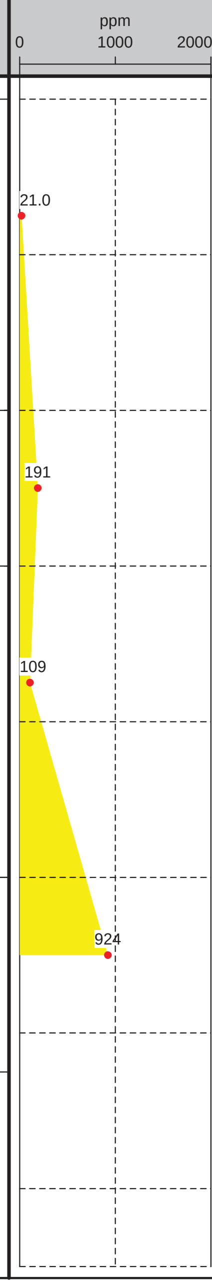
SUBSURFACE PROFILE

Depth (fbgs)	Elev. /Depth	Description (ASTM D2488: Visual-Manual Procedure)	Lithologic Symbol	PID VOCs ppm (0 – 1000 – 2000)	Lab Sample	Remarks
0.0	0.0 0.0	Ground Surface				
		Sandy Lean Clay with Fill Brown, moist, mostly low plasticity fines, some fine sand, few coarse gravel, trace cobble (shale), concrete, brick.		21.0		
5.0	-4.0 4.0	***Sandy Silt with Fill*** Black, moist, mostly non-plastic fines, some fine sand, trace coarse gravel, medium dense, loose when disturbed, orange brick, metal.		191		
	-6.0 6.0	***Lean Clay with Sand*** Grey, moist, mostly medium plastic fines, little fine sand, medium dense, medium toughness, medium dry strength, petroleum-like odor.		109		
10.0	-10.0 10.0	***Poorly Graded Sand w/Silt and Gravel.*** Grey, wet (11.0 fbgs), mostly fine sand, few non plastic fines, little coarse gravel, medium dense, loose when disturbed, petroleum-like odor, LNAPL observed on groundwater.		924		11.0 fbgs 5/11/11
	-12.5 12.5	End of Test Pit				
15.0						



Excavated By: ***RE Lorenz***
Excavator Type: ***Komatsu***
Excavation Date(s): ***5/11/11***
Comments:

Length: 16.0 feet
Width: 2.0-feet
Depth: 12.5 feet

Depth to Water: 11.0-fbgs
Visual Impacts: LNAPL
Olfactory Observations: Petroleum-like odor.

TEST PIT EXCAVATION LOG

Project No: 0225-001-100
Project: 251 Homer Street Redeveiopment Site
Client: Benson Construction and Development, LLC
Site Location: Olean NY

Test Pit I.D.: TP-15
Logged By: TAB
Checked By: BCH

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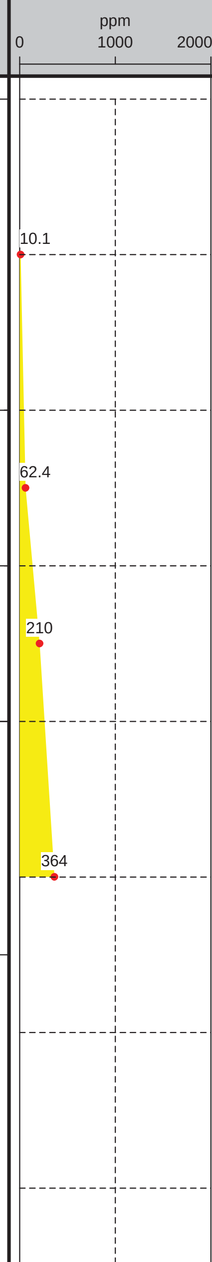
SUBSURFACE PROFILE

Depth (fbgs)	Elev. /Depth	Description (ASTM D2488: Visual-Manual Procedure)	Lithologic Symbol	Lab Sample	Remarks
	0.0	Ground Surface			
0.0	0.0 0.0	***Sandy Lean Clay with Fill*** Brown, moist, mostly low plasticity fines, some fine sand, few coarse gravel, trace cobble (shale), concrete, brick.			
	-4.0 4.0	***Sandy Silt with Fill*** Black, moist, mostly non-plastic fines, some fine sand, trace coarse gravel, medium dense, loose when disturbed, orange brick and metal debris.			
5.0					
	-6.0 6.0	***Lean Clay with Sand*** Grey, moist, mostly medium plastic fines, little fine sand, medium dense, roots, medium toughness, medium dry strength, petroleum-like odor.			
	-8.0 8.0	***Poorly Graded Sand w/Silt and Gravel.*** Grey, wet (8.0 fbgs), mostly fine sand, few non plastic fines, little coarse gravel, medium dense, loose when disturbed, petroleum like odor, LNAPL observed (8.0 fbgs).			*8.0 fbgs 5/11/11*
10.0					
	-11.0 11.0	End of Test Pit			
15.0					

PID VOCs



Excavated By: RE Lorenz
Excavator Type: Komatsu
Excavation Date(s): 5/11/11
Comments:

Length: 16.0 feet
Width: 2.0-feet
Depth: 11.0 - feet

Depth to Water: 8.0 - fbgs
Visual Impacts: LNAPL
Olfactory Observations: Petroleum-like odor.

TEST PIT EXCAVATION LOG

Project No: 0225-001-100
Project: 251 Homer Street Redevolpment Site
Client: Benson Construction and Development, LLC
Site Location: Olean NY

Test Pit I.D.: TP-16
Logged By: TAB
Checked By: BCH

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(716) 856-0635

SUBSURFACE PROFILE

Depth (fbgs)	Elev. /Depth	Description (ASTM D2488: Visual-Manual Procedure)	Lithologic Symbol	PID VOCs ppm (0 – 1000 – 2000)	Lab Sample	Remarks
0.0	0.0 / 0.0	Ground Surface				
		Sandy Lean Clay with Gravel with Fill Brown, moist, mostly low plasticity fines, some fine sand, few coarse gravel, trace cobble (shale), concrete, brick.		11.8		
5.0	-4.5 / 4.5	***Sandy Silt with Fill*** Black, moist, mostly non-plastic fines, some fine sand, trace coarse gravel, medium dense, loose when disturbed, orange brick, metal.		157	Sample	
	-7.0 / 7.0	***Lean Clay with Sand*** Grey, moist, mostly medium plastic fines, little fine sand, medium dense, rootletts, medium toughness and dry strength, petroleum-like odor.				
10.0	-8.0 / 8.0	***Poorly Graded Sand w/Silt and Gravel.*** Grey, wet (8.5 fbgs), mostly fine sand, few non-plastic fines, little coarse gravel, medium dense, loose when disturbed, petroleum-like odor, LNAPL observed.		9.3		*8.5 fbgs 5/11/11*
	-12.5 / 12.5	As above.		147		
15.0	-14.5 / 14.5	End of Test Pit				

Excavated By: RE Lorenze
Excavator Type: Komatsu
Excavation Date(s): 5/11/11
Comments:

Length: 16.0 feet
Width: 2.0-feet
Depth: 14.5 - feet

Depth to Water: 8.5 - fbgs
Visual Impacts: LNAPL
Olfactory Observations: Petroleum-like odor.

TEST PIT EXCAVATION LOG

Project No: 0225-001-100
Project: 251 Homer Street Redevelopment Site
Client: Benson Construction and Development, LLC
Site Location: Olean NY

Test Pit I.D.: TP-17
Logged By: TAB
Checked By: BCH

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SUBSURFACE PROFILE

Depth (fbgs)	Elev. /Depth	Description (ASTM D2488: Visual-Manual Procedure)	Lithologic Symbol	PID VOCs (ppm, 0–1000–2000)	Lab Sample	Remarks
0.0	0.0 / 0.0	Ground Surface				
		Sandy Lean Clay with Fill Brown, moist, mostly low plasticity fines, some fine sand, few coarse gravel, trace cobble (shale), concrete, brick.		1.6		
				8.6		
5.0	-5.0 / 5.0	As above, grey, orange brick at 7.0 fbgs.		30	Sample	
	-8.0 / 8.0	***Lean Clay with Sand*** Grey, moist, mostly medium plastic fines, little fine sand grading to some , stiff, iron staining, medium toughness, medium dry strength, slight petroleum-like, odor,		93.0		
10.0						
	-13.0 / 13.0	***Poorly Graded Sand w/Silt and Gravel.*** Grey, wet (13.5 fbgs), mostly fine sand with few fines, little coarse gravel, medium dense, loose when disturbed, petroleum-like odor, sheen observed.				13.5 fbgs 5/12/11
	-13.5 / 13.5	End of Test Pit				
15.0						

Excavated By: RE Lorenz
Excavator Type: Komatsu
Excavation Date(s): 5/11/11
Comments:

Length: 16.0 feet
Width: 2.0-feet
Depth: 14.5 - feet

Depth to Water: 13.5 - fbgs
Visual Impacts: Sheening.
Olfactory Observations: Petroleum-like odor.

TEST PIT EXCAVATION LOG

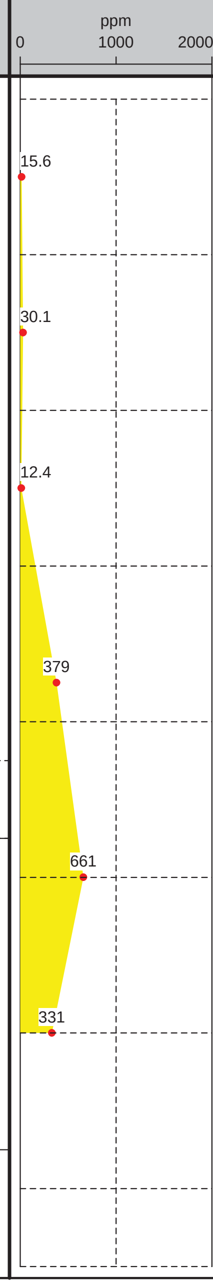
Project No: 0225-001-100
Project: 251 Homer Street Redevelopment Site
Client: Benson Construction and Development, LLC
Site Location: Olean NY

Test Pit I.D.: TP-18
Logged By: TAB
Checked By: BCH

TurnKey Environmental Restoration, LLC
2558 Hamburg Turnpike, Suite 300
Buffalo, NY 14218
(716) 856-0635

SUBSURFACE PROFILE

Depth (fbgs)	Elev. /Depth	Description (ASTM D2488: Visual-Manual Procedure)	Lithologic Symbol	PID VOCs (ppm)	Lab Sample	Remarks
0.0	0.0 / 0.0	Ground Surface				
		Sandy Lean Clay with Fill Brown, moist, mostly low plasticity fines, some fine sand, few coarse gravel, trace cobble (shale), concrete, brick.		15.6		
				30.1		
5.0				12.4	Sample	
	-6.5 / 6.5	As above, grey, 2-inch pipe at 8.0 fbgs, roots, grasses.		379		
	-8.5 / 8.5	**Lean Clay with Sand** Grey, moist, mostly medium plastic fines, little fine sand, stiff, iron staining, slight petroleum-like odor.				9.5 fbgs 5/12/11
10.0	-9.5 / 9.5	**Poorly graded Sand with Silt and Gravel** Grey, wet at (9.5 fbgs), mostly fine sand, few non-plastic fines, little coarse gravel, medium dense, loose when disturbed, petroleum-like odor, sheen observed.		661		
				331		
	-13.5 / 13.5	End of Test Pit				
15.0						



Excavated By: RE Lorenz
Excavator Type: Komatsu
Excavation Date(s): 5/12/11
Comments:

Length: 16.0 feet
Width: 2.0-feet
Depth: 13.5 - feet

Depth to Water: 9.5 - fbgs
Visual Impacts: Sheening.
Olfactory Observations: Petroleum-like odor.

Sheet: 1 of 1

TEST PIT EXCAVATION LOG

Project No: 0225-001-100
Project: 251 Homer Street Redevolpment Site
Client: Benson Construction and Development, LLC
Site Location: Olean NY

Test Pit I.D.: TP-19
Logged By: TAB
Checked By: BCH

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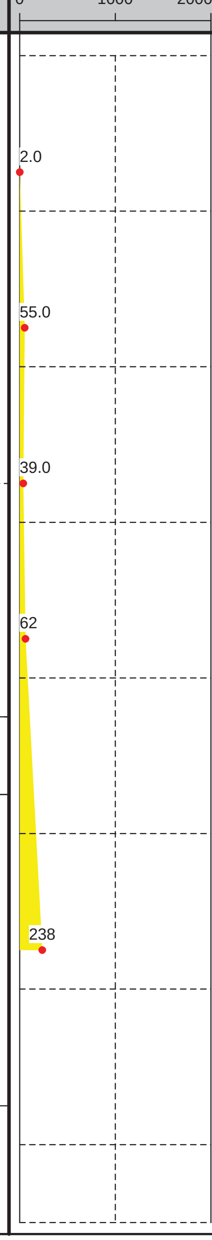
SUBSURFACE PROFILE

Depth (fbgs)	Elev. /Depth	Description (ASTM D2488: Visual-Manual Procedure)	Lithologic Symbol	PID VOCs ppm (0 / 1000 / 2000)	Lab Sample	Remarks
0.0	0.0 / 0.0	Ground Surface				
		Sandy Lean Clay with Fill Brown, moist, mostly low plasticity fines, some fine sand, few coarse gravel, trace cobble (shale), concrete, brick debris, slight petroleum-like odor.		2.0; 55.0; 39.0		
5.0	-5.5 / 5.5	***Sandy Silt with Fill*** Black, moist, mostly non-plastic fines, with some fine sand, few coarse gravels, orange brick, steel, organic material (tree branches), slight petroleum-like odor.		62		
	-8.5 / 8.5	***Sandy Lean Clay*** Grey, moist, mostly medium plastic fines, some fine sand, few coarse gravels, soft, slight petroleum-like odor.				9.5 fbgs 5/12/11
10.0	-9.5 / 9.5	***Poorly Graded Sand w/Silt and Gravel*** Grey, wet (9.5 fbgs), mostly fine sand, few non plastic fines, little coarse gravel, medium dense, loose when disturbed, petroleum-like odor, LNAPL observed.		238		
	-13.5 / 13.5	End of Test Pit				
15.0						



Excavated By: RE Lorenze
Excavator Type: Komatsu
Excavation Date(s): 5/12/11
Comments:

Length: 16.0 feet
Width: 2.0-feet
Depth: 13.5 - feet

Depth to Water: 9.5 - fbgs
Visual Impacts: LNAPL
Olfactory Observations: Petroleum-like odor.

Sheet: 1 of 1

TEST PIT EXCAVATION LOG

Project No: 0225-001-100
Project: 251 Homer Street Redevolpment Site
Client: Benson Construction and Development, LLC
Site Location: Olean NY

Test Pit I.D.: TP-20
Logged By: TAB
Checked By: BCH

TurnKey Environmental Restoration, LLC
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Buffalo, NY 14218
(716) 856-0635

SUBSURFACE PROFILE

Depth (fbgs)	Elev. /Depth	Description (ASTM D2488: Visual-Manual Procedure)	Lithologic Symbol	PID VOCs (ppm)	Lab Sample	Remarks
0.0	0.0 / 0.0	Ground Surface				
		Sandy Lean Clay with Fill Brown, moist, mostly low plasticity fines, some fine sand, few coarse gravel, trace cobble (shale), concrete, brick.		0.3		
	-3.0 / 3.0	As above, dark grey, medium plastic fines, petroleum like odor.		8.1		
5.0	-5.0 / 5.0	As above, black, orange brick, very strong petroleum-like odor, viscous LNAPL observed.		238 189	Sample	
10.0	-10.0 / 10.0	***Lean Clay with Sand*** Grey, moist, mostly medium plastic fines, little fine sand grading to some, stiff, iron staining, slight petroleum-like odor.		20.1		
	-13.0 / 13.0	***Poorly Graded Sand w/Silt and Gravel*** Grey, wet (13.0 fbgs), mostly fine sand, few non-plastic fines, little coarse gravel, medium dense, loose when disturbed, petroleum-like odor, LNAPL observed.		8.9		13.0 fbgs 5/12/11
15.0	-15.0 / 15.0	End of Test Pit				

PID VOCs scale: 0, 1000, 2000 ppm

Excavated By: RE Lorenze
Excavator Type: Komatsu
Excavation Date(s): 5/12/11
Comments:

Length: 16.0 feet
Width: 2.0-feet
Depth: 15.0 - feet

Depth to Water: 13.0 - fbgs
Visual Impacts: LNAPL.
Olfactory Observations: Petroleum-like odor.

TEST PIT EXCAVATION LOG

Project No: 0225-001-100
Project: 251 Homer Street Redevolpment Site
Client: Benson Construction and Development, LLC
Site Location: Olean NY

Test Pit I.D.: TP-21
Logged By: TAB
Checked By: BCH

TurnKey Environmental Restoration, LLC
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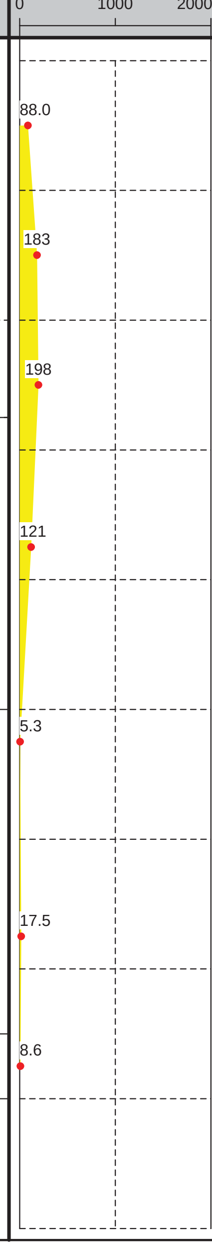
Buffalo, NY 14218
(716) 856-0635

SUBSURFACE PROFILE

Depth (fbgs)	Elev. /Depth	Description (ASTM D2488: Visual-Manual Procedure)	Lithologic Symbol	PID VOCs (ppm)	Lab Sample	Remarks
0.0	0.0 / 0.0	Ground Surface				
		Sandy Lean Clay with Fill Brown, moist, mostly low plasticity fines, some fine sand, few coarse gravel, trace cobble (shale), concrete, brick, viscous LNAPL observed.		88.0; 183		
	-4.0 / 4.0	***Sandy Silt with Fill*** Black, moist, mostly non-plastic fines, some fine sand, medium dense, loose when disturbed, orange brick, glass, viscous LNAPL observed, strong petroleu- like odor.		198	Sample	
5.0	-5.5 / 5.5	***Lean Clay with Sand*** Grey, moist, mostly medium plastic fines, little fine sand, stiff, roots, LNAPL observed, petroleum-like odor.		121		
10.0	-10.0 / 10.0	As above, black ,roots, grass.		5.3		
	-11.5 / 11.5	As above, grey.		17.5		
15.0	-15.0 / 15.0	***Poorley Granded Sand w/Silt and Gravel*** Grey, wet (15.0 fbgs), mostly fine sand, few non plastic fines, little coarse gravel, medium dense, loose when disturbed, petroleum-like odor, sheen observed.		8.6		*15.0 fbgs 5/12/11*
	-16.0 / 16.0	End of Test Pit				



Excavated By: ***RE Lorenze***
Excavator Type: ***Komatsu***
Excavation Date(s): ***5/12/11***
Comments:

Length: 16.0 feet
Width: 2.0-feet
Depth: 16.0 - feet

Depth to Water: 15.0 - fbgs
Visual Impacts: LNAPL.
Olfactory Observations: Petroleum-like odor.

TEST PIT EXCAVATION LOG

Project No: 0225-001-100
Project: 251 Homer Street Redevolpment Site
Client: Benson Construction and Development, LLC
Site Location: Olean NY

Test Pit I.D.: TP-22
Logged By: TAB
Checked By: BCH

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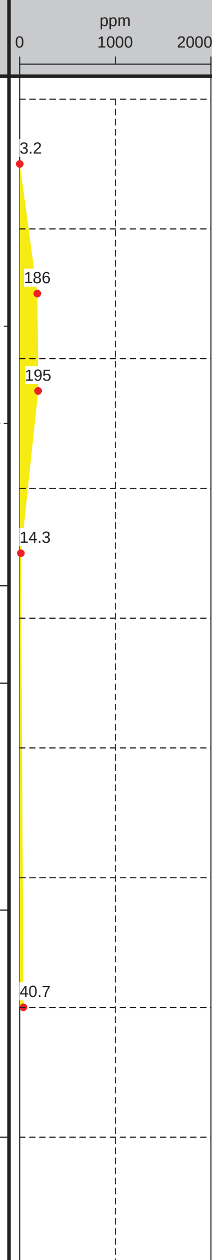
Buffalo, NY 14218
(716) 856-0635

SUBSURFACE PROFILE

Depth (fbgs)	Elev. /Depth	Description (ASTM D2488: Visual-Manual Procedure)	Lithologic Symbol	Lab Sample	Remarks
0.0	0.0 0.0	Ground Surface			
		Sandy Lean Clay with Fill Brown/grey, moist, mostly low plasticity fines, some fine sand, few coarse gravel, trace cobble (shale), concrete, brick, viscous LNAPL observed.			
	-3.5 3.5	***Sandy Silt with Fill*** Black, moist, mostly non plastic fines, some fine sand, viscous LNAPL observed, strong petroleum-like odor.		Sample	
5.0	-5.0 5.0	As above, no LNAPL observed.			
	-7.5 7.5	***Lean Clay*** Black/dark grey, moist, mostly medium plasticity fines, few fine sand, roots, grass, stiff.			
10.0	-9.0 9.0	As above, grey, medium plasticity, trace fine sand, iron mottling.			
15.0	-12.5 12.5	***Sandy Lean Clay with Gravel*** Grey, moist, mostly low plasticity fines, some fine sand, little coarse gravels, trace cobbles, stiff.			
	-16.0 16.0	End of Test Pit			

PID VOCs



Excavated By: RE Lorenze
Excavator Type: Komatsu
Excavation Date(s): 5/13/11
Comments:

Length: 16.0 feet
Width: 2.0-feet
Depth: 15.0 - feet

Depth to Water: None
Visual Impacts: LNAPL.
Olfactory Observations: Petroleum-like odor.

Sheet: 1 of 1

TEST PIT EXCAVATION LOG

Project No: 0225-001-100
Project: 251 Homer Street Redevolpment Site
Client: Benson Construction and Development, LLC
Site Location: Olean NY

Test Pit I.D.: TP-23
Logged By: TAB
Checked By: BCH

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(716) 856-0635

SUBSURFACE PROFILE

Depth (fbgs)	Elev. /Depth	Description (ASTM D2488: Visual-Manual Procedure)	Lithologic Symbol	PID VOCs ppm (0–2000)	Lab Sample	Remarks
0.0	0.0 / 0.0	Ground Surface				
		Sandy Lean Clay Brown/grey, moist, mostly low plasticity fines, some fine sand, few coarse gravel, trace cobble (shale), concrete, brick, slight petroleum-like odors.		11.1		
5.0	-4.5 / 4.5	***Sandy Silt with Fill*** Black, moist, mostly non plastic fines, some fine sand, medium dense, loose when disturbed, strong petroleum-like odor, concrete footer (4.0 fbgs)(east to west), orange brick				
	-6.0 / 6.0	As above, viscous LNAPL observed.		98.0		
10.0	-9.5 / 9.5	***Lean clay*** Dark grey, moist, medium plasticity fines, few fine sand, stiff, petroleum-like odor,		121		
	-11.5 / 11.5	***Sandy Lean Clay with Gravel*** Dark grey, wet (14.0 fbgs), mostly low plasticity fines, some fine sand, few coarse gravels, stiff, slight petroleum like odor, iron staining, medium toughness, medium dry strength, sheen observed.		65.3		14.0 fbgs 5/13/11
15.0	-14.0 / 14.0	End of Test Pit				

Excavated By: RE Lorenze
Excavator Type: Komatsu
Excavation Date(s): 5/13/11
Comments:

Length: 16.0 feet
Width: 2.0-feet
Depth: 14.0 - feet

Depth to Water: 14.0 fbgs
Visual Impacts: LNAPL.
Olfactory Observations: Petroleum-like odor.

TEST PIT EXCAVATION LOG

Project No: 0225-001-100
Project: 251 Homer Street Redevolpment Site
Client: Benson Construction and Development, LLC
Site Location: Olean NY

Test Pit I.D.: TP-24
Logged By: TAB
Checked By: BCH

TurnKey Environmental Restoration, LLC
2558 Hamburg Turnpike, Suite 300
Buffalo, NY 14218
(716) 856-0635

SUBSURFACE PROFILE

Depth (fbgs)	Elev. /Depth	Description (ASTM D2488: Visual-Manual Procedure)	Lithologic Symbol	PID VOCs ppm (0 / 1000 / 2000)	Lab Sample	Remarks
	0.0 / 0.0	Ground Surface				
0.0	0.0 / 0.0	***Sandy Lean Clay with Fill*** Brown/grey, moist, mostly low plasticity fines, some fine sand, few coarse gravel, trace cobble (shale), concrete, brick**.**		58.0		
	-3.0 / 3.0	***Sandy Silt with Fill*** Black, moist, mostly non plastic fines, some fine sand, medium dense, loose when disturbed, 2 concrete footer walls (4.0 fbgs) (~10-foot apart north to south), orange brick, glass, petroleum-like odor.		163		
5.0						
	-6.0 / 6.0	As above, roots, grass, viscous LNAPL observed.				
	-8.0 / 8.0	***Lean Clay*** Dark grey, moist, medium plasticity fines, few fine sand grading to some, stiff, petroleum-like odor,				
10.0				140		
	-12.5 / 12.5	***Poorly Graded Fine Sand w/Silt and Gravel*** Grey, wet (12.5 fbgs), mostly fine sand, few non plastic fines, little coarse gravel, medium dense, loose when disturbed, petroleum-like odor, LNAPL observed.				12.5 fbgs 5/13/11
	-13.0 / 13.0	End of Test Pit		2.4		
15.0						

Excavated By: RE Lorenze
Excavator Type: Komatsu
Excavation Date(s): 5/13/11
Comments:

Length: 16.0 feet
Width: 2.0-feet
Depth: 13.0 - feet

Depth to Water: 12.5 fbgs
Visual Impacts: LNAPL.
Olfactory Observations: Petroleum-like odor.

TEST PIT EXCAVATION LOG

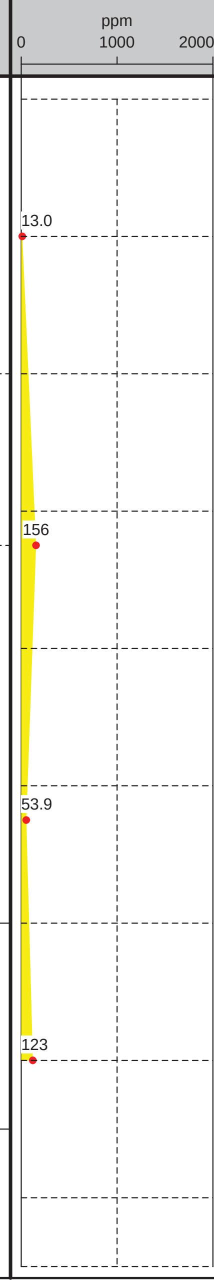
Project No: 0225-001-100
Project: 251 Homer Street Redevolpment Site
Client: Benson Construction and Development, LLC
Site Location: Olean NY

Test Pit I.D.: TP-25
Logged By: TAB
Checked By: BCH

TurnKey Environmental Restoration, LLC
2558 Hamburg Turnpike, Suite 300
Buffalo, NY 14218
(716) 856-0635

SUBSURFACE PROFILE

Depth (fbgs)	Elev. /Depth	Description (ASTM D2488: Visual-Manual Procedure)	Lithologic Symbol	PID VOCs (ppm)	Lab Sample	Remarks
0.0	0.0 / 0.0	Ground Surface				
		Sandy Lean Clay with Fill Brown/grey, moist, mostly low plasticity fines, some fine sand, few coarse gravel, trace cobble (shale), with concrete and brick debris, 4-inch pipe 4.5 fbgs.		13.0		
5.0	-4.0 / 4.0	***Sandy Silt with Fill*** Black, moist to wet (4.5 fbgs) mostly non plastic fines, some fine sand, medium dense, loose when disturbed, strong petroleum-like odor, large pieces of concrete, brick debris.				
	-6.5 / 6.5	As above, viscous LNAPL observed (6.5 to 8.5) fbgs.		156	Sample	
10.0				53.9		
	-12.0 / 12.0	***Lean Clay*** Dark grey, moist, medium plasticity fines, few fine sand grading to some, stiff, petroleum-like odor,		123		
15.0	-15.0 / 15.0	End of Test Pit				



Excavated By: RE Lorenze
Excavator Type: Komatsu
Excavation Date(s): 5/13/11
Comments:

Length: 20- feet
Width: 4.0-feet
Depth: 15.0 - feet

Depth to Water: None
Visual Impacts: LNAPL
Olfactory Observations: Petroleum-like odor.

TEST PIT EXCAVATION LOG

Project No: 0225-001-100

Project: 251 Homer Street Redevolpment Site

Client: Benson Construction and Development, LLC

Site Location: Olean NY

Test Pit I.D.: TP-26

Logged By: TAB

Checked By: BCH

TurnKey Environmental Restoration, LLC
2558 Hamburg Turnpike, Suite 300
Buffalo, NY 14218
(716) 856-0635

SUBSURFACE PROFILE

Depth (fbgs)	Elev. /Depth	Description (ASTM D2488: Visual-Manual Procedure)	Lithologic Symbol	PID VOCs (ppm) 0 / 1000 / 2000	Lab Sample	Remarks
	0.0 / 0.0	Ground Surface				
0.0	0.0 / 0.0	***Sandy Lean Clay with Fill*** Brown/grey, moist, mostly low plasticity fines, some fine sand, few coarse gravel, trace cobble (shale), concrete, brick, slight petroleum-like odors.		46.8		
5.0	-5.5 / 5.5	***Sandy Silt with Fill*** Black, moist, mostly non plastic fines, some fine sand, medium dense loose when disturbed, strong petroleum-like odor, pieces of concrete, orange brick, viscous LNAPL observed.		141		
	-8.0 / 8.0	***Lean Clay*** Dark grey, moist, medium plasticity fines, few fine sand grading to some, stiff, slight petroleum-like odor.		10.7		
10.0	-10.0 / 10.0	As above, with, grass, roots				
	-11.0 / 11.0	***Poorly Graded Sand w/ Silt and Gravel*** Grey, wet (15 fbgs), mostly fine sand, little coarse gravels, few fines, trace cobbles, loose when disturbed, medium dense, slight petroleum-like odor.		10.1		15.0 fbgs 5/13/11
15.0	-15.0 / 15.0	End of Test Pit				

Excavated By: RE Lorenze
Excavator Type: Komatsu
Excavation Date(s): 5/13/11
Comments:

Length: 18- feet
Width: 2.0-feet
Depth: 15.0 - feet

Depth to Water: 15.0 - feet
Visual Impacts: LNAPL.
Olfactory Observations: Petroleum-like odor.

TEST PIT EXCAVATION LOG

Project No: 0225-001-100
Project: 251 Homer Street Redevolpment Site
Client: Benson Construction and Development, LLC
Site Location: Olean NY

Test Pit I.D.: TP-27
Logged By: TAB
Checked By: BCH

TurnKey Environmental Restoration, LLC
2558 Hamburg Turnpike, Suite 300
Buffalo, NY 14218
(716) 856-0635

SUBSURFACE PROFILE

Depth (fbgs)	Elev. /Depth	Description (ASTM D2488: Visual-Manual Procedure)	Lithologic Symbol	PID VOCs (ppm; 0 / 1000 / 2000)	Lab Sample	Remarks
	0.0 / 0.0	Ground Surface				
0.0	0.0 / 0.0	***Sandy Lean Clay*** Brown, moist, mostly low plasticity fines, some fine sand, few coarse gravel, trace cobble(shale), concrete, brick debris, wood, slight petroleum-like odors.		4.1		
	-3.0 / 3.0	As above, viscous LNAPL observed, roots.		131		
5.0	-6.0 / 6.0	***Sandy Silt with Fill*** Black, moist, mostly non plastic fines, some fine sand,medium dense, loose when disturbed, strong petroleum-like odor, pieces of concrete, orange brick, viscous LNAPL, roots, grasses.		108		
	-7.0 / 7.0	***Sandy Lean Clay*** As above.		233	Sample	
10.0	-10.0 / 10.0	***Lean Clay*** Dark grey, moist, medium plasticity fines, few fine sand grading to some, stiff, slight petroleum-like odor, LNAPL observed.		115		
	-13.0 / 13.0	***Poorly Graded Sand w/ Silt and Gravel*** Grey, wet (13.5 fbgs), mostly fine sand, little coarse gravel, few non-plastic fines, trace cobble, loose when disturbed, medium dense, petroleum-like odor, sheen observed.		52.9		*13.5 fbgs 5/13/11*
15.0	-15.0 / 15.0	End of Test Pit				

Excavated By: RE Lorenze
Excavator Type: Komatsu
Excavation Date(s): 5/13/11
Comments:

Length: 16- feet
Width: 2.0-feet
Depth: 15.0 - feet

Depth to Water: 13.5- feet
Visual Impacts: LNAPL.
Olfactory Observations: Petroleum-like odor.

TEST PIT EXCAVATION LOG

Project No: 0225-001-100

Project: 251 Homer Street Redevolpment Site

Client: Benson Construction and Development, LLC

Site Location: Olean NY

Test Pit I.D.: TP-28

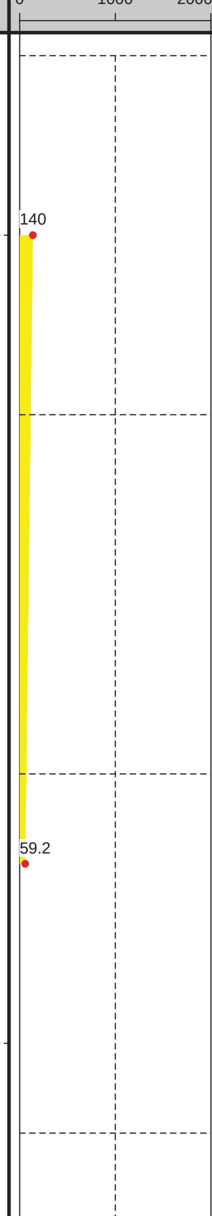
Logged By: TAB

Checked By: BCH

TurnKey Environmental Restoration, LLC
2558 Hamburg Turnpike, Suite 300
Buffalo, NY 14218
(716) 856-0635

SUBSURFACE PROFILE

Depth (fbgs)	Elev. /Depth	Description (ASTM D2488: Visual-Manual Procedure)	Lithologic Symbol	PID VOCs ppm (0 / 1000 / 2000)	Lab Sample	Remarks
	0.0 0.0	Ground Surface				
0.0		***Fill w/Sandy Lean Clay with Gravel*** Brown, moist, mostly low plasticity fines, some fine sand, few coarse gravels, trace cobbles (shale), with concrete and brick debris, petroleum-like odors.				
	-1.0 1.0	***Sandy Silt with Fill*** Black, wet (3.5fbgs), mostly non-plastic fines, some fine sand, concrete, orange brick, petroleum-like odor, viscous LNAPL observed.		140	Sample Location	
				59.2		*3.5 fbgs, 5/16/11*
5.0						
	-5.5 5.5	End of Test Pit				



Excavated By: RE Lorenze
Excavator Type: Komatsu
Excavation Date(s): 5/16/11
Comments:

Length: 16- feet
Width: 2.0-feet
Depth: 5.5- feet

Depth to Water: 3.5 fbgs
Visual Impacts: LNAPL.
Olfactory Observations: Petroleum-like odor.

TEST PIT EXCAVATION LOG

Project No: 0225-001-100
Test Pit I.D.: TP-29
Project: 251 Homer Street Redevolpment Site
Logged By: TAB
Client: Benson Construction and Development, LLC
Checked By: BCH
Site Location: Olean NY

TurnKey Environmental Restoration, LLC
2558 Hamburg Turnpike, Suite 300
Buffalo, NY 14218
(716) 856-0635

SUBSURFACE PROFILE

Depth (fbgs)	Elev. /Depth	Description (ASTM D2488: Visual-Manual Procedure)	Lithologic Symbol	PID VOCs ppm (0 / 1000 / 2000)	Lab Sample	Remarks
0.0	0.0 / 0.0	Ground Surface				
	0.0	**Sandy Lean Clay with Gravel** Brown, moist, mostly low plasticity fines, some fine sand, few coarse gravels, trace cobbles (shale), concrete, brick, petroleum-like odors.				1.0 fbgs perched 5/13/11
	-1.0 / 1.0	**Sandy Silt with Fill** Black, wet (1.0 fbgs), mostly non-plastic fines, some fine sand, strong petroleum-like odor, medium dense, loose when disturbed, concrete, orange brick, sheen observed.				
	-1.5 / 1.5	End of Test Pit				

Excavated By: RE Lorenze
Excavator Type: Komatsu
Excavation Date(s): 5/16/11
Comments:

Length: 16- feet
Width: 2.0-feet
Depth: 1.5- feet

Depth to Water: 1.0 feet perched
Visual Impacts: Sheening
Olfactory Observations: Petroleum-like odor.

TEST PIT EXCAVATION LOG

Project No: 0225-001-100

Project: 251 Homer Street Redevolpment Site

Client: Benson Construction and Development, LLC

Site Location: Olean NY

Test Pit I.D.: TP-30

Logged By: TAB

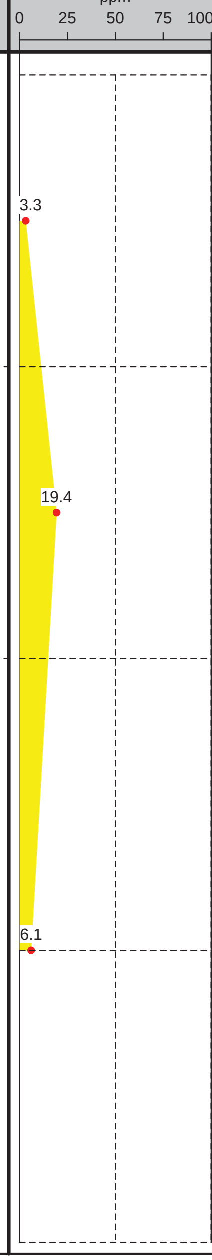
Checked By: BCH

BENCHMARK ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC

Benchmark Environmental Engineering & Science, PLLC
2558 Hamburg Turnpike, Suite 300
Buffalo, NY 14218
(716) 856-0599

SUBSURFACE PROFILE

Depth (fbgs)	Elev. /Depth	Description (ASTM D2488: Visual-Manual Procedure)	Lithologic Symbol	PID VOCs (ppm)	Lab Sample	Remarks
0.0	0.0 / 0.0	Ground Surface ***Fill w/Sandy Lean Clay with Gravel*** Brown, moist, mostly low plasticity fines, some fine sand, few coarse gravels, trace cobbles (shale), with concrete and brick debris, petroleum odors.		3.3		
	-2.0 / 2.0	***Sandy Silt with Fill*** Black, moist, mostly non plastic fines, some fine sand, pieces of concrete debris, orange brick debris, petroleum like odor.		19.4		*4.0 fbgs, 5/16/11*
5.0	-4.0 / 4.0	As above, wet at 4.0 fbgs, mostly fine sand, trace fines, petroleum like odor, sheen observed.		6.1		
	-7.0 / 7.0	End of Test Pit				



Excavated By: RE Lorenze
Excavator Type: Komatsu
Excavation Date(s): 5/16/11
Comments:

Length: 9 - feet
Width: 2.0-feet
Depth: 7.0- feet

Depth to Water: 4.0 fbgs
Visual Impacts: Sheen.
Olfactory Observations: Petroleum-like odor.

Sheet: 1 of 1

TEST PIT EXCAVATION LOG

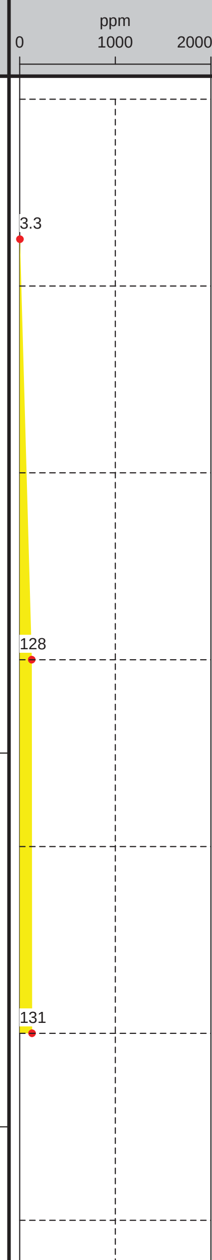
Project No: 0225-001-100
Project: 251 Homer Street Redevolpment Site
Client: Benson Construction and Development, LLC
Site Location: Olean NY

Test Pit I.D.: TP-31
Logged By: TAB
Checked By: BCH

TurnKey Environmental Restoration, LLC
2558 Hamburg Turnpike, Suite 300
Buffalo, NY 14218
(716) 856-0635

SUBSURFACE PROFILE

Depth (fbgs)	Elev. /Depth	Description (ASTM D2488: Visual-Manual Procedure)	Lithologic Symbol	PID VOCs (ppm)	Lab Sample	Remarks
0.0	0.0 0.0	Ground Surface ***Sandy Silt with Fill*** Brown/black, moist, mostly non-plastic fines, some fine sand, medium dense loose when disturbed, strong petroleum-like odor,concrete, orange brick.		3.3		
	-3.0 3.0	As above, viscous LNAPL observed.		128		
5.0						
	-7.0 7.0	***Lean Clay with Sand*** Grey, wet (11.0 fbgs), mostly low plasticity fines, with little fine sand, few coarse gravels, soft, petroleum-like odor.		131		
10.0						
	-11.0 11.0	End of Test Pit				11.0 fbgs 5/16/11



Excavated By: RE Lorenze
Excavator Type: Komatsu
Excavation Date(s): 5/16/11
Comments:

Length: 9 - feet
Width: 2.0-feet
Depth: 11.0- feet

Depth to Water: 11.0 fbgs
Visual Impacts: LNAPL.
Olfactory Observations: Petroleum-like odor.

TEST PIT EXCAVATION LOG

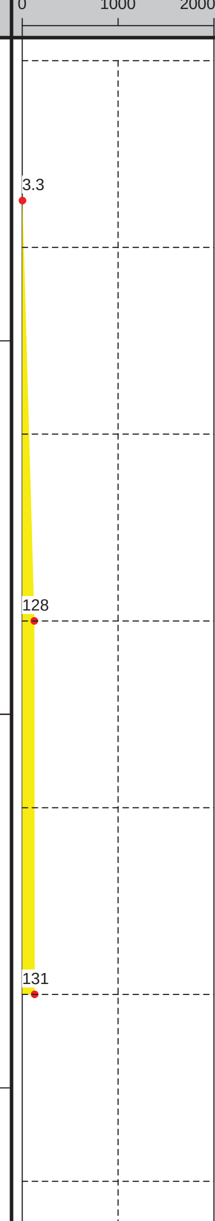
Project No: 0225-001-100
Project: 251 Homer Street Redevolpment Site
Client: Benson Construction and Development, LLC
Site Location: Olean NY

Test Pit I.D.: TP-32
Logged By: TAB
Checked By: BCH

TurnKey Environmental Restoration, LLC
2558 Hamburg Turnpike, Suite 300
Buffalo, NY 14218
(716) 856-0635

SUBSURFACE PROFILE

Depth (fbgs)	Elev. /Depth	Description (ASTM D2488: Visual-Manual Procedure)	Lithologic Symbol	PID VOCs (ppm)	Lab Sample	Remarks
0.0	0.0 0.0	Ground Surface ***Sandy Silt with Fill*** Brown/black, wet (3.0 fbgs), mostly non-plastic fines, some fine sand, medium dense, loose when disturbed, strong petroleum-like odor, concrete, orange brick.		3.3		3.0 fbgs 5/16/11
	-3.0 3.0	***Fill*** Tan/brown/white, viscous LNAPL observed.		128	Sample	
5.0						
	-7.0 7.0	***Lean Clay with Sand*** Black/dark grey, moist, mostly medium plasticity fines, with little fine sand, stiff, medium toughness, petroleum-like odor.		131		
10.0						
	-11.0 11.0	End of Test Pit				



Excavated By: RE Lorenze
Excavator Type: Komatsu
Excavation Date(s): 5/16/11
Comments:

Length: 9.0 - feet
Width: 2.0-feet
Depth: 11.0- feet

Depth to Water: none
Visual Impacts: LNAPL.
Olfactory Observations: Strong petroleum-like odor.

TEST PIT EXCAVATION LOG

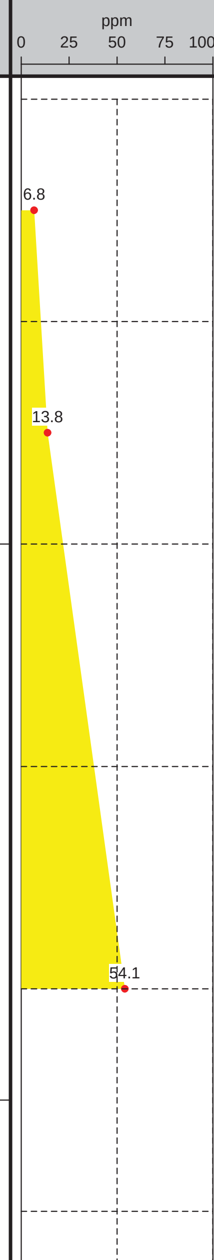
Project No: 0225-001-100
Project: 251 Homer Street Redevolpment Site
Client: Benson Construction and Development, LLC
Site Location: Olean NY

Test Pit I.D.: TP-33
Logged By: TAB
Checked By: BCH

TurnKey Environmental Restoration, LLC
2558 Hamburg Turnpike, Suite 300
Buffalo, NY 14218
(716) 856-0635

SUBSURFACE PROFILE

Depth (fbgs)	Elev. /Depth	Description (ASTM D2488: Visual-Manual Procedure)	Lithologic Symbol	PID VOCs	Lab Sample	Remarks
0.0	0.0 / 0.0	Ground Surface				
		Sandy Lean Clay Brown/grey, moist, mostly low plasticity fines, some fine sand, few coarse gravel, stiff.				
	-4.0 / 4.0	***Sandy Silt with Fill*** Black, wet (8.0 fbgs), mostly non-plastic fines, some fine sand, medium dense, losse when disturbed, orange brick, grass, 8-inch steel pipe (7.5 fbgs), petroleum-like odor, LNAPL observed.				8.0 fbgs 5/16/11
5.0						
	-9.0 / 9.0	End of Test Pit				
10.0						



Excavated By: RE Lorenze
Excavator Type: Komatsu
Excavation Date(s): 5/16/11
Comments:

Length: 20.0 - feet
Width: 2.0-feet
Depth: 9.0 - feet

Depth to Water: 8.0 - feet
Visual Impacts: LNAPL.
Olfactory Observations: Petroleum-like odor.

TEST PIT EXCAVATION LOG

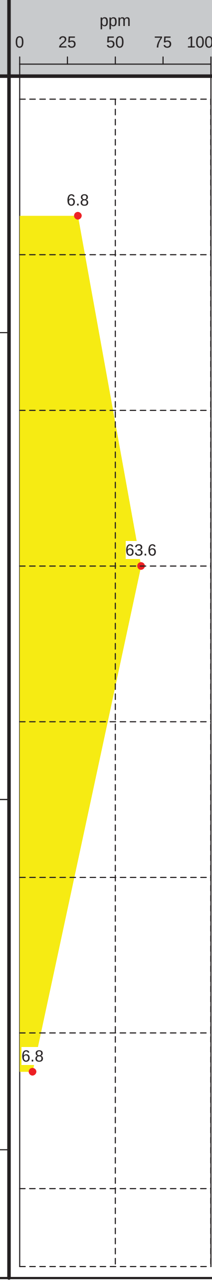
Project No: 0225-001-100
Project: 251 Homer Street Redevolpment Site
Client: Benson Construction and Development, LLC
Site Location: Olean NY

Test Pit I.D.: TP-34
Logged By: TAB
Checked By: BCH

TurnKey Environmental Restoration, LLC
2558 Hamburg Turnpike, Suite 300
Buffalo, NY 14218
(716) 856-0635

SUBSURFACE PROFILE

Depth (fbgs)	Elev. /Depth	Description (ASTM D2488: Visual-Manual Procedure)	Lithologic Symbol	PID VOCs ppm (0 25 50 75 100)	Lab Sample	Remarks
0.0	0.0	Ground Surface				
	0.0 0.0	***Sandy Lean Clay*** Brown/grey, moist, mostly low plasticity fines, some fine sand, few coarse gravels, stiff.		6.8		
	-3.0 3.0	***Sandy Silt with Fill*** Black, wet (4.0 fbgs), mostly non-plastic fines, some fine sand, medium dense, lose when disturbed, orange brick, concrete foundation (3.0 fbgs), petroleum-like odor.		63.6		*4.0 fbgs 5/16/11*
5.0						
	-9.0 9.0	***Lean Clay*** Grey, moist, mostly medium plasticity fines, few fine sands, stiff, iron stained, petroleum-like odor.		6.8		
10.0						
	-13.5 13.5	End of Test Pit				
15.0						



Excavated By: RE Lorenze
Excavator Type: Komatsu
Excavation Date(s): 5/16/11
Comments:

Length: 17.0 - feet
Width: 2.0-feet
Depth: 13.5- feet

Depth to Water: 4.0 fbgs
Visual Impacts: Sheen
Olfactory Observations: Petroleum-like odor.

TEST PIT EXCAVATION LOG

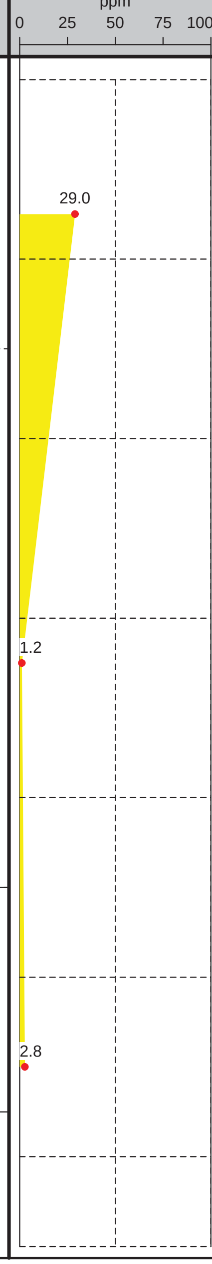
Project No: 0225-001-100
Project: 251 Homer Street Redevolpment Site
Client: Benson Construction and Development, LLC
Site Location: Olean NY

Test Pit I.D.: TP-35
Logged By: TAB
Checked By: BCH

TurnKey Environmental Restoration, LLC
2558 Hamburg Turnpike, Suite 300
Buffalo, NY 14218
(716) 856-0635

SUBSURFACE PROFILE

Depth (fbgs)	Elev. /Depth	Description (ASTM D2488: Visual-Manual Procedure)	Lithologic Symbol	PID VOCs (ppm)	Lab Sample	Remarks
	0.0	Ground Surface				
0.0	0.0 0.0	***Sandy Lean Clay with Fill*** Brown/grey, moist, mostly low plasticity fines, some fine sand, few coarse gravels, stiff.		29.0		3.0 fbgs 5/16/11
	-3.0 3.0	***Sandy Silt with Fill*** Black, wet (3.0 fbgs), mostly non plastic fines, some fine sand, medium dense, lose when disturbed, orange brick, black fabric, wood fragmernts.		1.2		
5.0						
	-9.0 9.0	***Sandy Lean*** Grey, moist, mostly medium plasticity fines, few fine sands, stiff, iron staining.		2.8		
10.0						
	-11.5 11.5	End of Test Pit				



Excavated By: RE Lorenze
Excavator Type: Komatsu
Excavation Date(s): 5/16/11
Comments:

Length: 16.0 - feet
Width: 2.0-feet
Depth: 11.5- feet

Depth to Water: 3.0 fbgs
Visual Impacts: none
Olfactory Observations: none

TEST PIT EXCAVATION LOG

Project No: 0225-001-100

Project: 251 Homer Street Redevolpment Site

Client: Benson Construction and Development, LLC

Site Location: Olean NY

Test Pit I.D.: TP-36

Logged By: TAB

Checked By: BCH

TurnKey Environmental Restoration, LLC
2558 Hamburg Turnpike, Suite 300
Buffalo, NY 14218
(716) 856-0635

SUBSURFACE PROFILE

Depth (fbgs)	Elev. /Depth	Description (ASTM D2488: Visual-Manual Procedure)	Lithologic Symbol	PID VOCs (ppm) 0 / 1000 / 2000	Lab Sample	Remarks
0.0	0.0 0.0	Ground Surface ***Sandy Lean Clay*** Brown/grey, moist, mostly low plasticity fines, some fine sand, few coarse gravels, stiff, petroleum-like odors.		1.5 54.3		
5.0	-5.0 5.0	***Sandy Silt with Fill*** Black, moist, mostly non plastic fines, some fine sand, medium dense, lose when disturbed, orange brick, 6-inch steel pipe (6.0 fbgs).		173	Sample	
	-7.0 7.0	***Sandy Lean Clay*** Grey, moist, mostly medium plasticity fines, few fine sands, stiff, iron staining, petroleum-like odor.		24.8		
10.0						
	-11.0 11.0	***Poorly Graded Sand w/ Silt and Gravel*** Grey wet (11.5 fbgs), mostly fine sand, few non-plastic fines, little coarse gravel, trace cobbles, loose, petroleum like-odor, LNAPL observed (11.5 fbgs).		75.7		11.5 fbgs 5/17/11
	-11.5 11.5	End of Test Pit				

Excavated By: RE Lorenze
Excavator Type: Komatsu
Excavation Date(s): 5/17/11
Comments:

Length: 13.0 - feet
Width: 2.0-feet
Depth: 11.5- feet

Depth to Water: 11.5- feet
Visual Impacts: LNAPL.
Olfactory Observations: Petroleum-like odors.

TEST PIT EXCAVATION LOG

Project No: 0225-001-100
Test Pit I.D.: TP-37
Project: 251 Homer Street Redevolpment Site
Logged By: TAB
Client: Benson Construction and Development, LLC
Checked By: BCH
Site Location: Olean NY

TurnKey Environmental Restoration, LLC
2558 Hamburg Turnpike, Suite 300
Buffalo, NY 14218
(716) 856-0635

SUBSURFACE PROFILE

Depth (fbgs)	Elev. /Depth	Description (ASTM D2488: Visual-Manual Procedure)	Lithologic Symbol	PID VOCs ppm (0 – 1000 – 2000)	Lab Sample	Remarks
0.0	0.0 0.0	Ground Surface				
		Sandy Silt with Fill Brown, moist, mostly non-plastic fines, some fine sand, medium dense, orange brick, steel plate, tree stumps.		2.4 6.5		
	-4.5 4.5	***Cement/Orange Brick Floor***		202		
5.0	-5.0 5.0	***Sandy Silt with Fill*** Black, wet (5.0 fbgs), mostly fine sand, some non-plastic fines, medium dense loose when disturbed, possible pipe at 5.5 fbgs, LNAPL observed (5.0 fbgs), petroleum-like odor,			Sample	*5.0 fbgs 5/17/11*
	-6.0 6.0	***Sandy Lean Clay*** Grey, moist, mostly medium plasticity fines, few fine sands, stiff, iron staining, petroleum-like odor.				
	-6.5 6.5	End of Test Pit				

Excavated By: RE Lorenze
Excavator Type: Komatsu
Excavation Date(s): 5/17/11
Comments:

Length: 9.0 - feet
Width: 4.0 - feet
Depth: 6.5- feet

Depth to Water: 5.0- fbgs
Visual Impacts: LNAPL.
Olfactory Observations: Petroleum-like odors.

TEST PIT EXCAVATION LOG

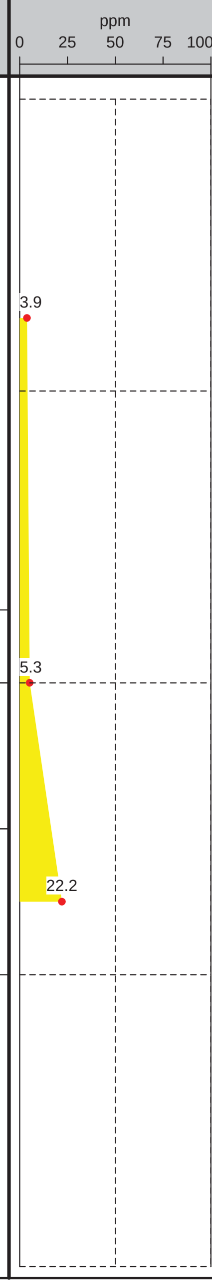
Project No: 0225-001-100
Project: 251 Homer Street Redevolpment Site
Client: Benson Construction and Development, LLC
Site Location: Olean NY

Test Pit I.D.: TP-38
Logged By: TAB
Checked By: BCH

TurnKey Environmental Restoration, LLC
2558 Hamburg Turnpike, Suite 300
Buffalo, NY 14218
(716) 856-0635

SUBSURFACE PROFILE

Depth (fbgs)	Elev. /Depth	Description (ASTM D2488: Visual-Manual Procedure)	Lithologic Symbol	PID VOCs (ppm)	Lab Sample	Remarks
0.0	0.0 0.0	Ground Surface				
		Sandy Silt with Fill Brown, moist, mostly non-plastic fines, some fine sand, medium dense lose when disturbed, orange brick.		3.9		
	-3.5 3.5	***Cement***				
	-4.0 4.0	***Sandy Silt with Fill*** As above, black, wet (4.0 fbgs), LNAPL observed (4.0 fbgs), petroleum-like odor.		5.3		4.0 fbgs 5/17/11
5.0	-5.0 5.0	***Sandy Lean Clay*** Grey, moist, mostly medium plasticity fines, few fine sands, stiff, iron staining, petroleum-like odor.		22.2		
	-6.0 6.0	End of Test Pit				



Excavated By: RE Lorenze
Excavator Type: Komatsu
Excavation Date(s): 5/17/11
Comments:

Length: 8.0 - feet
Width: 2.0 - feet
Depth: 6.0- feet

Depth to Water: 4.0- fbgs
Visual Impacts: LNAPL.
Olfactory Observations: Petroleum-like odors.

Sheet: 1 of 1

TEST PIT EXCAVATION LOG

Project No: 0225-001-100
Project: 251 Homer Street Redevolpment Site
Client: Benson Construction and Development, LLC
Site Location: Olean NY

Test Pit I.D.: TP-39
Logged By: TAB
Checked By: BCH

TurnKey Environmental Restoration, LLC
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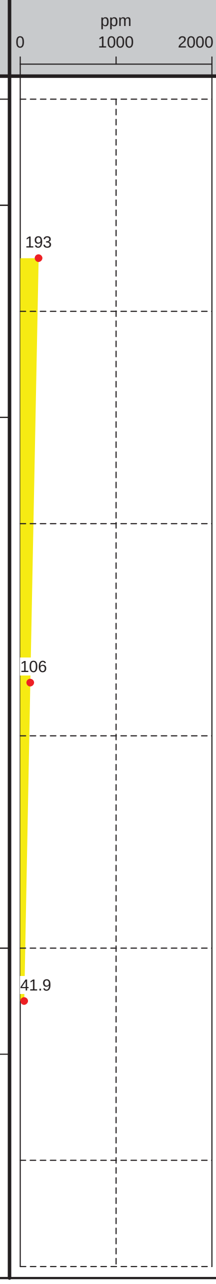
Buffalo, NY 14218
(716) 856-0635

SUBSURFACE PROFILE

Depth (fbgs)	Elev. /Depth	Description (ASTM D2488: Visual-Manual Procedure)	Lithologic Symbol	PID VOCs (ppm)	Lab Sample	Remarks
0.0	0.0 0.0	Ground Surface				
		Sandy Lean Clay with Fill Grey, moist, mostly low plasticity fines, some fine sand, few coarse gravel, orange brick, concrete.				
	-1.0 1.0	***Sandy Silt with Fill*** Black, moist, mostly non-plastic fines, some fine sand, loose when disturbed, medium dense, orange brick, petroleum-like odors.		193	Sample	
	-3.0 3.0	***Sandy Lean Clay*** Grey, moist, mostly medium plasticity fines, few fine sands, stiff, iron staining, roots, petroleum-like odor.		106		
5.0						
	-8.0 8.0	***Poorly Graded Sand with Gravel*** Grey, wet (8.0 fbgs), mostly fine sand, few fines, little coarse gravels, medium dense, loose, LNAPL observed (8.0 fbgs), petroleum-like odors.		41.9		8.0 fbgs 5/17/11
	-9.0 9.0	End of Test Pit				
10.0						



Excavated By: RE Lorenze
Excavator Type: Komatsu
Excavation Date(s): 5/17/11
Comments:

Length: 12.0 - feet
Width: 2.0 - feet
Depth: 9.0- feet

Depth to Water: 8.0 fbgs
Visual Impacts: LNAPL.
Olfactory Observations: Petroleum-like odors.

TEST PIT EXCAVATION LOG

Project No: 0225-001-100

Project: 251 Homer Street Redevolpment Site

Client: Benson Construction and Development, LLC

Site Location: Olean NY

Test Pit I.D.: TP-40

Logged By: TAB

Checked By: BCH

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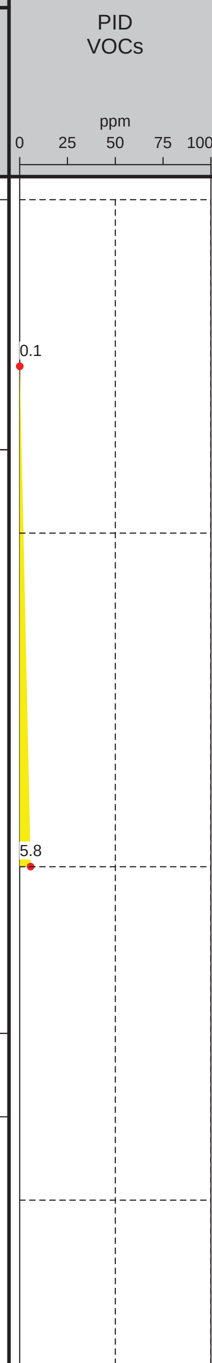
(716) 856-0635

SUBSURFACE PROFILE

Depth (fbgs)	Elev. /Depth	Description (ASTM D2488: Visual-Manual Procedure)	Lithologic Symbol	PID VOCs (ppm)	Lab Sample	Remarks
0.0	0.0 0.0	Ground Surface				
		Sandy Lean Clay with Fill Brown/grey, moist, mostly low plasticity fines, some fine sand, few coarse gravel, orange brick, concrete.		0.1		
	-1.5 1.5	***Sandy Silt with Fill*** Reddish/brown/black, wet (4.0 fbgs), mostly non-plastic fines, some fine sand, loose, medium dense, orange brick, wood.		5.8		*4.0 fbgs 5/17/11*
5.0	-5.0 5.0	***Sandy Lean Clay*** Grey, moist, mostly medium plasticity fines, few fine sands, stiff, iron staining, roots, petroleum-like odor.				
	-5.5 5.5	End of Test Pit				



Excavated By: RE Lorenze
Excavator Type: Komatsu
Excavation Date(s): 5/17/11
Comments:

Length: 8.0 - feet
Width: 2.0 - feet
Depth: 5.5- feet

Depth to Water: 4.0- fbgs
Visual Impacts: None
Olfactory Observations: Petroleum-like odor

TEST PIT EXCAVATION LOG

Project No: 0225-001-100
Project: 251 Homer Street Redevolpment Site
Client: Benson Construction and Development, LLC
Site Location: Olean NY

Test Pit I.D.: TP-41
Logged By: TAB
Checked By: BCH

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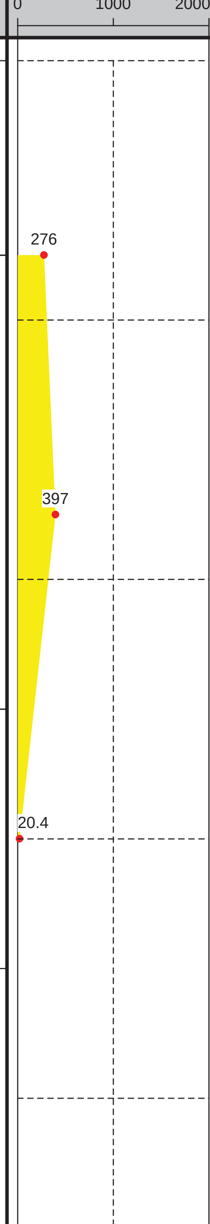
Buffalo, NY 14218
(716) 856-0635

SUBSURFACE PROFILE

Depth (fbgs)	Elev. /Depth	Description (ASTM D2488: Visual-Manual Procedure)	Lithologic Symbol	PID VOCs (ppm)	Lab Sample	Remarks
0.0	0.0 0.0	Ground Surface				
		Sandy Lean Clay with Fill Brown/grey, moist, mostly low plasticity fines, some fine sand, few coarse gravel, orange brick, concrete.				
	-1.5 1.5	***Sandy Silt with Fill*** Black, wet (4.0 fbgs), mostly non-plastic fines, some fine sand, few fine gravel, loose, medium dense, orange brick, wood, strong petroleum-like odors, LNAPL observed (4.0 fbgs).		276 397	Sample	*4.0 fbgs 5/17/11*
5.0	-5.0 5.0	***Sandy Lean Clay*** Grey, moist, mostly medium plasticity fines, few fine sands, stiff, iron staining, roots, petroleum-like odor.		20.4		
	-7.0 7.0	End of Test Pit				



Excavated By: RE Lorenze
Excavator Type: Komatsu
Excavation Date(s): 5/17/11
Comments:

Length: 10.0 - feet
Width: 2.0 - feet
Depth: 7.0 feet

Depth to Water: 4.0 fbgs
Visual Impacts: LNAPL.
Olfactory Observations: Petroleum-like odors.

TEST PIT EXCAVATION LOG

Project No: 0225-001-100
Project: 251 Homer Street Redevolpment Site
Client: Benson Construction and Development, LLC
Site Location: Olean NY

Test Pit I.D.: TP-42
Logged By: TAB
Checked By: BCH

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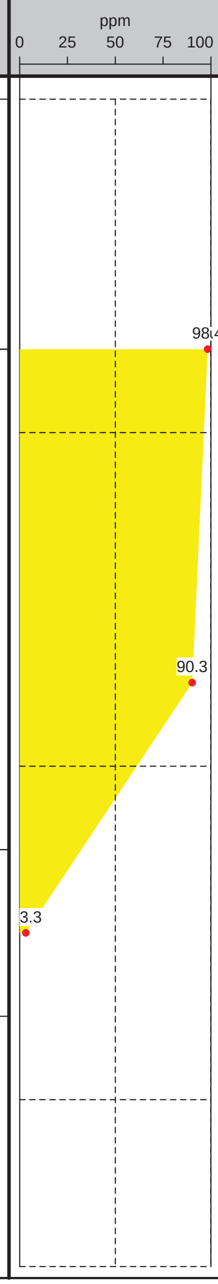
Buffalo, NY 14218
(716) 856-0635

SUBSURFACE PROFILE

Depth (fbgs)	Elev. /Depth	Description (ASTM D2488: Visual-Manual Procedure)	Lithologic Symbol	PID VOCs (ppm)	Lab Sample	Remarks
0.0	0.0 / 0.0	Ground Surface				
		Sandy Lean Clay with Fill Brown/grey, moist, mostly low plasticity fines, some fine sand, few coarse gravels, with orange brick and concrete.				
	-1.5 / 1.5	***Sandy Silt with Fill*** Black, wet (3.0 fbgs), mostly non-plastic fines, some fine sand, few fine gravel, loose, medium dense, orange brick, wood, strong petroleum-like odor, LNAPL observed (3.0 fbgs).		98.4; 90.3	Sample	3.0 fbgs 5/17/11
5.0	-4.5 / 4.5	***Sandy Lean Clay*** Grey, moist, mostly medium plasticity fines, few fine sands, stiff, iron staining, roots, petroleum-like odor.		3.3		
	-5.5 / 5.5	End of Test Pit				



Excavated By: RE Lorenze
Excavator Type: Komatsu
Excavation Date(s): 5/17/11
Comments:

Length: 10.0 - feet
Width: 2.0 - feet
Depth: 5.5feet

Depth to Water: 3.0 fbgs
Visual Impacts: LNAPL.
Olfactory Observations: Petroleum-like odors.

Sheet: 1 of 1

TEST PIT EXCAVATION LOG

Project No: 0225-001-100

Project: 251 Homer Street Redevolpment Site

Client: Benson Construction and Development, LLC

Site Location: Olean NY

Test Pit I.D.: TP-43

Logged By: TAB

Checked By: BCH

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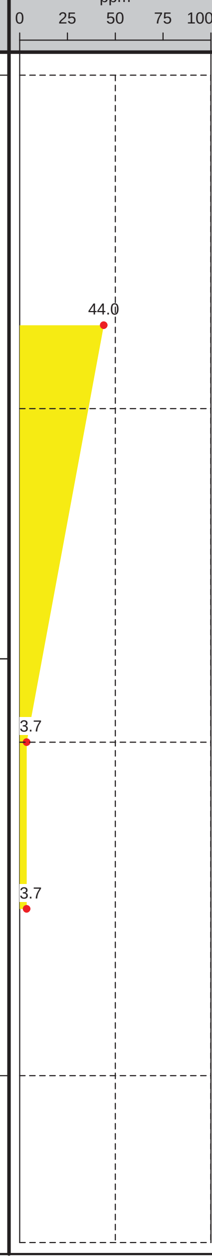
SUBSURFACE PROFILE

Depth (fbgs)	Elev. /Depth	Description (ASTM D2488: Visual-Manual Procedure)	Lithologic Symbol	PID VOCs ppm	Lab Sample	Remarks
0.0	0.0 0.0	Ground Surface ***Sandy Silt with Fill*** Black, wet (2.5 fbgs), mostly non-plastic fines, some fine sand, few fine gravels, loose, medium dense, orange brick, wood, strong petroleum-like odors, LNAPL observed (2.5 fbgs).		44.0	Sample	2.5 fbgs perched 5/17/11
	-3.5 3.5	***Lean Clay*** Grey, moist, mostly medium plasticity fines, few fine sands, stiff, iron staining, roots, petroleum-like odor.		3.7 3.7		
5.0						
	-6.0 6.0	End of Test Pit				



Excavated By: RE Lorenze
Excavator Type: Komatsu
Excavation Date(s): 5/17/11
Comments:

Length: 8.0 - feet
Width: 2.0 - feet
Depth: 6.0 - feet

Depth to Water: 2.5- fbgs
Visual Impacts: LNAPL.
Olfactory Observations: Petroleum-like odors.

TEST PIT EXCAVATION LOG

Project No: 0225-001-100
Project: 251 Homer Street Redevolpment Site
Client: Benson Construction and Development, LLC
Site Location: Olean NY

Test Pit I.D.: TP-44
Logged By: TAB
Checked By: BCH

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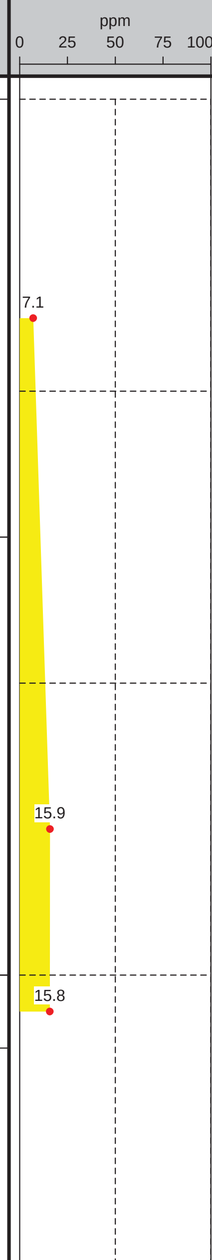
SUBSURFACE PROFILE

Depth (fbgs)	Elev. /Depth	Description (ASTM D2488: Visual-Manual Procedure)	Lithologic Symbol	Lab Sample	Remarks
	0.0	Ground Surface			
0.0	0.0	***Sandy Lean Clay with Fill*** Brown/grey, mostly low plasticity fines, some fine sand, few coarse gravels, stiff, slight petroleum-like odor.			
	-3.0 / 3.0	***Silty Sand with Fill*** Brown/grey, wet (3.0 fbgs) mostly low plasticity fines, some fine sand, few coarse gravels, stiff, orange brick, slight petroleum-like odor, LNAPL observed (3.0 fbgs).		Sample	3.0 fbgs 5/17/11
5.0					
	-6.0 / 6.0	***Lean Clay*** Grey, moist, mostly medium plasticity fines, few fine sands, stiff, iron staining, roots, petroleum-like odor.			
	-6.5 / 6.5	End of Test Pit			

PID VOCs



Excavated By: RE Lorenze
Excavator Type: Komatsu
Excavation Date(s): 5/17/11
Comments:

Length: 8.0 - feet
Width: 2.0 - feet
Depth: 6.0 - feet

Depth to Water: 3.0
Visual Impacts: LNAPL.
Olfactory Observations: Petroleum-like odors.

TEST PIT EXCAVATION LOG

Project No: 0225-001-100
Project: 251 Homer Street Redevolpment Site
Client: Benson Construction and Development, LLC
Site Location: Olean NY

Test Pit I.D.: TP-45
Logged By: TAB
Checked By: BCH

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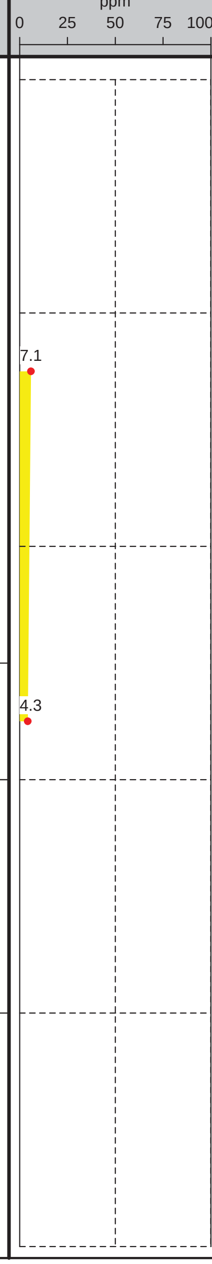
SUBSURFACE PROFILE

Depth (fbgs)	Elev. /Depth	Description (ASTM D2488: Visual-Manual Procedure)	Lithologic Symbol	PID VOCs ppm	Lab Sample	Remarks
0.0	0.0 0.0	Ground Surface				
		Sandy Lean Clay with Fill Brown/grey, mostly low plasticity fines, some fine sand, few coarse gravels, stiff, orange brick, slight petroleum-like odor.		7.1		
5.0	-5.0 5.0	***Silty Sand with Fill*** Black, moist, mostly non plastic fines, some fine sand, very loose, LNAPL observed (5.0 fbgs), petroleum-like odor.		4.3		6.0 fbgs 5/18/11
	-6.0 6.0	***Silty Sand with Gravel and Fill*** Black/red, wet (6.0 fbgs), mostly non-plastic fines, some fine sand little fine gravel, very loose, LNAPL on groundwater.				
	-8.0 8.0	End of Test Pit				
10.0						



Excavated By: RE Lorenze
Excavator Type: Komatsu
Excavation Date(s): 5/18/11
Comments:

Length: 10.0 - feet
Width: 2.0 - feet
Depth: 8.0 - feet

Depth to Water: 6.0 fbgs
Visual Impacts: LNAPL
Olfactory Observations: Petroleum-like odors.

TEST PIT EXCAVATION LOG

Project No: 0225-001-100
Project: 251 Homer Street Redevolpment Site
Client: Benson Construction and Development, LLC
Site Location: Olean NY

Test Pit I.D.: TP-46
Logged By: TAB
Checked By: BCH

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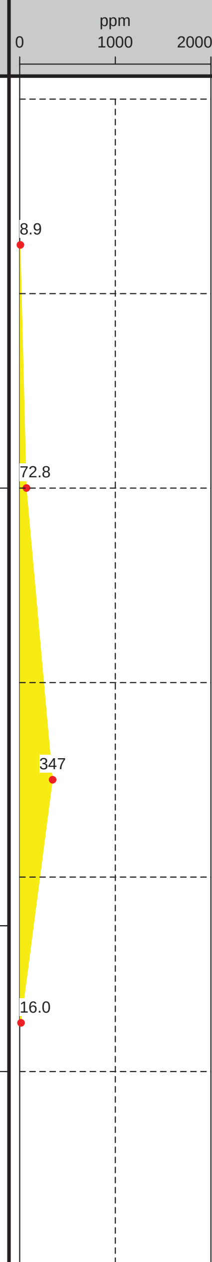
SUBSURFACE PROFILE

Depth (fbgs)	Elev. /Depth	Description (ASTM D2488: Visual-Manual Procedure)	Lithologic Symbol	PID VOCs (ppm)	Lab Sample	Remarks
0.0	0.0 0.0	Ground Surface				
		Sandy Lean Clay with Fill Brown/grey, mostly low plasticity fines, some fine sand, few coarse gravels, stiff, orange brick, slight petroleum-like odor.		8.9		
	-4.0 4.0	***Silty Sand with Fill*** Black, wet (5.0 fbgs), mostly non-plastic fines, some fine sand, few fine gravel, very loose, orange brick LNAPL observed (5.0 fbgs).		72.8		
5.0				347	Sample	5.0 fbgs 5/17/11
	-8.5 8.5	***Sandy Lean Clay*** Dark grey/brown, mostly medium plastic fines, few fine sands, roots, stiff, petroleum-like odors.		16.0		
10.0	-10.0 10.0	End of Test Pit				



Excavated By: RE Lorenze
Excavator Type: Komatsu
Excavation Date(s): 5/18/11
Comments:

Length: 10.0 - feet
Width: 2.0 - feet
Depth: 8.0 - feet

Depth to Water: 5.0- feet, perched.
Visual Impacts: LNAPL.
Olfactory Observations: Petroleum-like odors.

TEST PIT EXCAVATION LOG

Project No: 0225-001-100
Project: 251 Homer Street Redevolpment Site
Client: Benson Construction and Development, LLC
Site Location: Olean NY

Test Pit I.D.: TP-47
Logged By: TAB
Checked By: BCH

TurnKey Environmental Restoration, LLC
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(716) 856-0635

SUBSURFACE PROFILE

Depth (fbgs)	Elev. /Depth	Description (ASTM D2488: Visual-Manual Procedure)	Lithologic Symbol	PID VOCs (ppm)	Lab Sample	Remarks
0.0	0.0 / 0.0	Ground Surface				
		Sandy Lean Clay Brown/grey, mostly low plasticity fines, some fine sand, few coarse gravels, stiff, orange brick.		0.0; 0.0		
5.0	-5.0 / 5.0	***Sandy Silt with Fill*** Black, moist, mostly non plastic fines, some fine sand, medium dense, loose whern disturbed, orange brick, wood.		0.0		
	-8.0 / 8.0	***Sandy Lean Clay*** Grey, moist, mostly medium plasticity fines, few fine sand, stiff, medium toughness.		0.0; 0.0		
10.0						
	-13.5 / 13.5	***Poorly Graded Sand with Gravel*** Brown, moist, mostly fine sand, few fines, little coarse gravel, trace cobbles, medium dense loose when disturbed.				
15.0	-15.0 / 15.0	End of Test Pit				

PID VOCs scale (ppm): 0, 25, 50, 75, 100

Excavated By: RE Lorenze
Excavator Type: Komatsu
Excavation Date(s): 5/18/11
Comments:

Length: 15.0- feet
Width: 2.0 - feet
Depth: 15.0 - feet

Depth to Water: None.
Visual Impacts: None.
Olfactory Observations: None.

TEST PIT EXCAVATION LOG

Project No: 0225-001-100
Project: 251 Homer Street Redevolpment Site
Client: Benson Construction and Development, LLC
Site Location: Olean NY

Test Pit I.D.: TP-48
Logged By: TAB
Checked By: BCH

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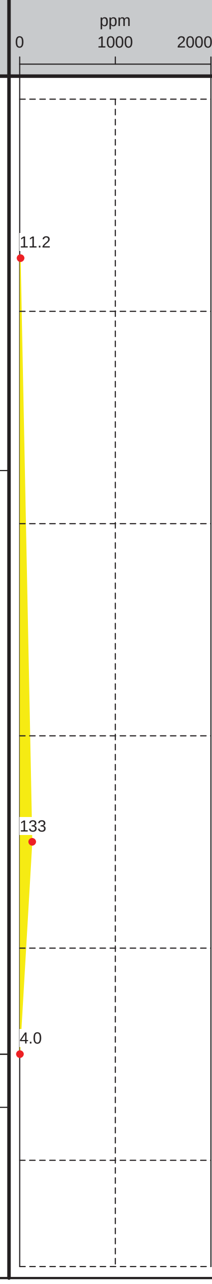
Buffalo, NY 14218
(716) 856-0635

SUBSURFACE PROFILE

Depth (fbgs)	Elev. /Depth	Description (ASTM D2488: Visual-Manual Procedure)	Lithologic Symbol	PID VOCs (ppm)	Lab Sample	Remarks
0.0	0.0 0.0	Ground Surface ***Sandy Lean Clay with Fill*** Brown/grey, mostly low plasticity fines, some fine sand, few coarse gravels, stiff, orange brick, slight petroleum-like odor.		11.2		
	-3.5 3.5	***Sandy Silt with Fill*** Black, wet (5.0 fbgs), mostly non plastic fines, some fine sand, few fine gravel, orange brick, very loose, petroleum LNAPL observed (5.0 fbgs).		133	Sample	5.0 fbgs 5/17/11
5.0						
	-9.0 9.0	***Sandy Lean Clay*** Dark grey/brown, mostly medium plastic fines, few fine sands, roots, stiff, petroleum-like odors.		4.0		
	-9.5 9.5	End of Test Pit				
10.0						



Excavated By: RE Lorenze
Excavator Type: Komatsu
Excavation Date(s): 5/18/11
Comments: Material to loose to confirm bottom.

Length: 10.0 - feet
Width: 2.0 - feet
Depth: 9.0 - feet

Depth to Water: 5.0-fbgs
Visual Impacts: LNAPL.
Olfactory Observations: Petroleum-like odors.

TEST PIT EXCAVATION LOG

Project No: 0225-001-100
Project: 251 Homer Street Redevolpment Site
Client: Benson Construction and Development, LLC
Site Location: Olean NY

Test Pit I.D.: TP-49
Logged By: TAB
Checked By: BCH

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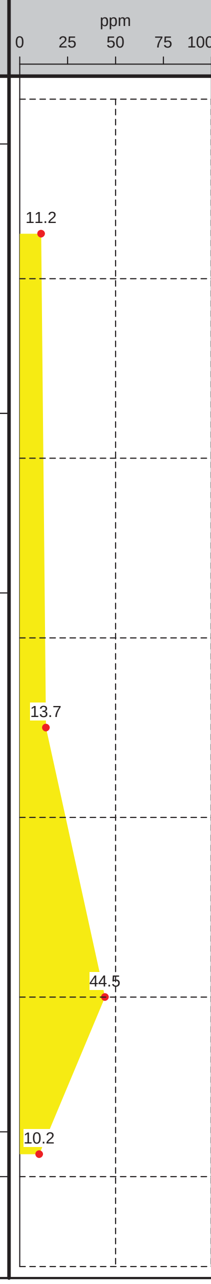
SUBSURFACE PROFILE

Depth (fbgs)	Elev. /Depth	Description (ASTM D2488: Visual-Manual Procedure)	Lithologic Symbol	PID VOCs	Lab Sample	Remarks
	0.0 0.0	Ground Surface				
0.0	-0.5 0.5	***Observed Surface Product***				
	-3.5 3.5	***Sandy Lean Clay with Fill*** Brown/grey, mostly low plasticity fines, some fine sand, few coarse gravels, stiff, orange brick debris, petroleum-like odor, viscous LNAPL.				
5.0	-5.5 5.5	***Well Graded Sand with Fill*** Black,some fine sand, trace non-plastic fines, viscous LNAPL petroleum-like odor.				
10.0	-11.5 11.5	As above, mostly fine sand mixed, viscous LNAPL, (10.5 - 12.0 fbgs) concrete on north end of test pit.				
	-12.0 12.0	***Sandy Lean Clay*** Dark grey/brown, mostly medium plastic fines, few fine sands, roots, stiff, petroleum odors.				
		End of Test Pit				



Excavated By: RE Lorenze
Excavator Type: Komatsu
Excavation Date(s): 5/19/11
Comments: Side wall collapse could not confirm bottom.

Length: 12.0 - feet
Width: 4.0 - feet
Depth: 12.0- feet?

Depth to Water: None
Visual Impacts: Viscous LNAPL.
Olfactory Observations: Petroleum-like odors.

TEST PIT EXCAVATION LOG

Project No: 0225-001-100
Test Pit I.D.: TP-50
Project: 251 Homer Street Redevolpment Site
Logged By: TAB
Client: Benson Construction and Development, LLC
Checked By: BCH
Site Location: Olean NY

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SUBSURFACE PROFILE

Depth (fbgs)	Elev. /Depth	Description (ASTM D2488: Visual-Manual Procedure)	Lithologic Symbol	PID VOCs ppm (0 / 1000 / 2000)	Lab Sample	Remarks
	0.0 / 0.0	Ground Surface				
0.0	0.0	***Sandy Lean Clay with Gravel and Fill*** Brown/black, moist, mostly low plasticity fines, some fine sand, few coarse gravels, trace cobbles (shale), with concrete, brick.				
5.0						
	-5.5 / 5.5	***Poorly Graded Sand with Silt and Gravel*** Grey, wet (6.0 fbgs), mostly fine sand, few non-plastic fines, little coarse gravel, trace cobbles, medium dense, loose when disturbed, petroleum-like odor, LNAPL (6.0 fbgs).				6.0 fbgs 5/23/11
	-7.0 / 7.0	End of Test Pit				

Excavated By: RE Lorenze
Excavator Type: Komatsu
Excavation Date(s): 5/23/11
Comments:

Length: 10.0 feet
Width: 2.0-feet
Depth: 7.0 - feet

Depth to Water: 6.0 - fbgs
Visual Impacts: LNAPL.
Olfactory Observations: Petroleum-like odor.

TEST PIT EXCAVATION LOG

Project No: 0225-002-100
Project: Supplemental Remedial Investigation
Client: Benson Construction & Development, Inc.
Site Location: 251 Homer St. Olean, NY

Test Pit I.D.: TP-51
Logged By: TAB
Checked By: BCH

TurnKey Environmental Restoration, LLC
2558 Hamburg Turnpike, Suite 300
Buffalo, NY 14218
(716) 856-0635

SUBSURFACE PROFILE

Depth (fbgs)	Elev. /Depth	Description (ASTM D2488: Visual-Manual Procedure)	Lithologic Symbol	PID VOCs (ppm)	Lab Sample	Remarks
0.0	95.0 / 0.0	Ground Surface				
		Sandy Lean Clay with Gravel and Fill Brown, moist, mostly low plasticity fines, some fine sand, little fine gravel, few cobbles, massive, medium toughness, medium dry strength, orange brick.		0.0		
				3.2		
	91.5 / 3.5	As above, black, cinders, wood, petroleum like odor.		162.3		
5.0				82.3		
	86.0 / 9.0	***Sandy Lean Clay*** Grey, moist, mostly medium plastic fines, some fine sand, Iron staining, stiff, slight petroleum like odor, medium toughness, medium dry strength.		12.0		
10.0				3.5		
	82.0 / 13.0	***Poorly Graded Sand with Gravel*** Grey/brown, moist to wet (14.0 fbgs), mostly fine sand, some fine gravel, little coarse gravel, few cobbles, trace non-plastic fines, sheen, petroleum like odor.		90.1		
	81.0 / 14.0	End of Test Pit				*First water (14.0 fbgs).*
15.0						
20.0						

Excavated By: Benson Construction & Dev., Inc.
Excavator Type: John Deer 135D
Excavation Date(s): 4/30/12
Comments:

Length: 20-feet
Width: 2-feet
Depth: 14-feet

Depth to Water: 14.0 fbgs
Visual Impacts: Sheen.
Olfactory Observations: Petroleum-like odor.

TEST PIT EXCAVATION LOG

Project No: 0225-002-100
Project: Supplemental Remedial Investigation
Client:
Site Location: 251 Homer St. Olean, NY

Test Pit I.D.: TP-52
Logged By: TAB
Checked By:

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2558 Hamburg Turnpike, Suite 300
Buffalo, NY 14218
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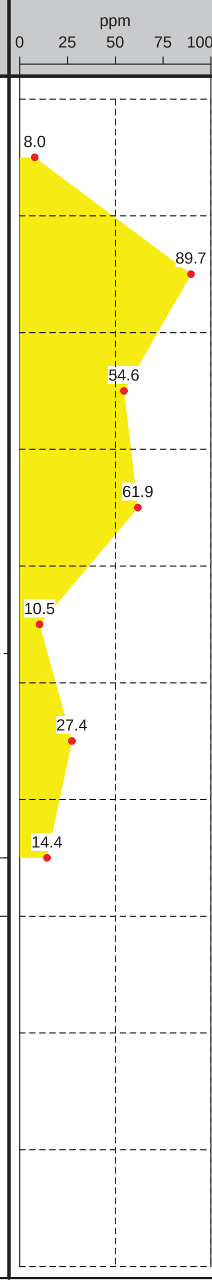
SUBSURFACE PROFILE

Depth (fbgs)	Elev. /Depth	Description (ASTM D2488: Visual-Manual Procedure)	Lithologic Symbol	PID VOCs (ppm)	Lab Sample	Remarks
0.0	0.0 0.0	Ground Surface ***Sandy Lean Clay with Gravel and Fill*** Brown/black, mostly low plasticity fines, some fine sand, little fine gravel, few cobbles (shale), orange brick, viscous LNAPL (1.0 fbgs - 4.0 fbgs), petroleum - like odor.				
	-4.0 4.0	As above, grey, mostly medium plastic fines.				
5.0						
10.0	-9.5 9.5	***Sandy Lean Clay*** As above, Iron staining, slight-petroleum like odor.				
	-13.0 13.0	***Poorly Graded Sand with Silt and Gravel*** Grey/brown, moist, mostly fine sand, few non-plastic fines, some fine gravel, little coarse gravel, few cobbles, medium dense, loose when disturbed.				
	-14.0 14.0	End of Test Pit				
15.0						
20.0						



Excavated By: Benson Construction & Development, Inc.ıth: 22-feet
Excavator Type: John Deer 135D
Excavation Date(s): 5 1 12
Comments:
Width: 2-feet
Depth: 14-feet
Depth to Water: NA
Visual Impacts: Viscous LNAPL (1-4 fbgs).
Olfactory Observations: Petroleum-like odor.

TEST PIT EXCAVATION LOG

Project No: 0225-002-100

Project: Supplemental Remedial Investigation

Client: Benson Construction & Development, Inc.

Site Location: 251 Homer St., Olean, NY

Test Pit I.D.: TP-53

Logged By: TAB

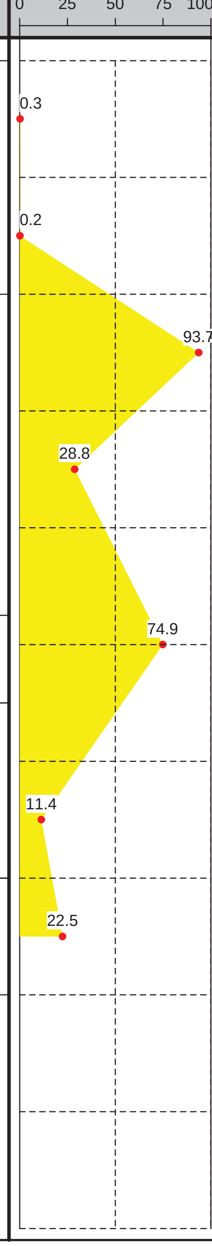
Checked By: BCH

TurnKey Environmental Restoration, LLC
2558 Hamburg Turnpike, Suite 300
Buffalo, NY 14218
(716) 856-0635

SUBSURFACE PROFILE

Depth (fbgs)	Elev. /Depth	Description (ASTM D2488: Visual-Manual Procedure)	Lithologic Symbol	Lab Sample	Remarks
	96.3	Ground Surface			
0.0	0.0	***Sandy Lean Clay with Gravel and Fill*** Brown, moist, mostly low plasticity, fines some fine sand, little fine gravel, few cobbles (shale), massive, medium toughness, medium dry strength, orange brick.			
	92.3 / 4.0	As above, black, viscous LNAPL (4.0 - 7.0 fbgs), petroleum- like odor.			
5.0					
	89.3 / 7.0	As above, brown, petroleum like odor, no viscous LNAPL.			
	86.8 / 9.5	***Sandy Lean Clay with Organic Soil*** Black, moist, mostly medium plastic fines, little fine sand, some organic soil, viscous LNAPL mixed with fines, stiff.			
10.0					
	85.3 / 11.0	***Sandy Lean clay*** Grey, moist, mostly medium plastic fines, some fine sand Iron staining, stiff, slight petro odor, medium toughness medium dry strength.			
	82.3 / 14.0	***Poorley Graded Sand with Silt and Gravel*** Grey, moist to wet (16.0) fbgs, mostly fine sand, some fine gave, little coarse gravel, trace cobbles few non-plastic fines, petroleum like odor, sheen.			
15.0					
	80.3 / 16.0	End of Test Pit			*First water, (16.0 fbgs).*
20.0					

PID VOCs (ppm)



Excavated By: Benson Construction & Dev, Inc.
Excavator Type: John Deer 135D
Excavation Date(s): 5/1/12
Comments:

Length: 20-feet
Width: 2-feet
Depth: 16-feet

Depth to Water: 16.0 fbgs
Visual Impacts: Viscous LNAPL (4-7 fbgs & 9-11.5 fbgs), sheen.
Olfactory Observations: Petroleum-like odor.

Sheet: 1 of 1

TEST PIT EXCAVATION LOG

Project No: 0225-002-100
Project: Supplemental Remedial Investigation
Client: Benson Construction & Development, Inc.
Site Location: 251 Homer St., Olean, NY

Test Pit I.D.: TP-54
Logged By: TAB
Checked By: BCH

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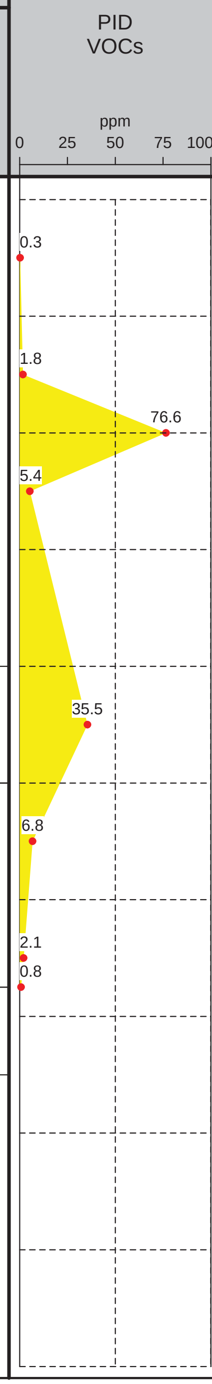
(716) 856-0635

SUBSURFACE PROFILE

Depth (fbgs)	Elev. /Depth	Description (ASTM D2488: Visual-Manual Procedure)	Lithologic Symbol	PID VOCs (ppm)	Lab Sample	Remarks
	94.2	Ground Surface				
0.0	0.0	***Sandy Lean Clay with Gravel and Fill*** Brown, moist, mostly low plasticity fines, some fine sand, little fine gravel, few cobbles (shale), orange brick,medium toughness, medium dry strength.		0.3; 1.8		
	90.2 / 4.0			76.6		
	89.7 / 4.5	As above, black viscous LNAPL (4.0-4.5), petroleum like odor.				
5.0		As above, no viscous LNAPL..		5.4		
	87.2 / 7.0	As above. brown with trace viscous LNAPL.				
	86.2 / 8.0	***Lean Clay*** Grey, moist, mostly medium plastic fines, few fine sand, stiff, massive, medium toughness, medium dry strength, iron staining, petroleum-like odor.		35.5		
10.0	84.2 / 10.0	***Sandy Lean Clay with Gravel and Organic Soil*** Grey, moist, mostly medium plastic fines, some fine sand, little fine gravel, iron staining, organic soil, stiff, slight petroleum-like odor, medium toughness medium dry strength.		6.8; 2.1		
	80.7 / 13.5	***Poorly Graded Sand with Silt and Gravel*** Grey, moist to wet (16.0) fbgs, mostly fine sand, some fine gravel, little coarse gravel, trace cobbles, few non-plastic fines, petroleum like odor, sheen.		0.8		
15.0	79.2 / 15.0	End of Test Pit				
20.0						



Excavated By: Benson Construction & Dev, Inc.
Excavator Type: John Deer 135D
Excavation Date(s): 5/1/12
Comments:

Length: 25-feet
Width: 2-feet
Depth: 15-feet

Depth to Water: NA
Visual Impacts: Viscous LNAPL (4.0-4.5 fbgs) and (7.0-8.0 fbgs).
Olfactory Observations: Petroleum-like odor.

Sheet: 1 of 1

TEST PIT EXCAVATION LOG

Project No: 0225-002-100
Project: Supplemental Remedial Investigation
Client: Benson Construction & development, Inc.
Site Location: 251 Homer St. Olean NY

Test Pit I.D.: TP-55
Logged By: TAB
Checked By: BCH

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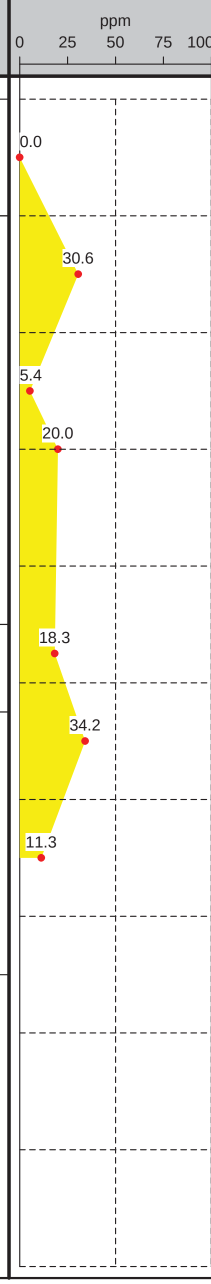
SUBSURFACE PROFILE

Depth (fbgs)	Elev. /Depth	Description (ASTM D2488: Visual-Manual Procedure)	Lithologic Symbol	PID VOCs (ppm)	Lab Sample	Remarks
	96.0 / 0.0	Ground Surface				
0.0		***Sandy Lean Clay with Gravel*** Brown, moist, mostly low plasticity fines, some fine sand, little fine gravel, few cobbles (shale), medium dense, massive, medium toughness, medium dry strength.		0.0		
	94.0 / 2.0	***Sandy Silt with Fill*** Black, moist to wet (5.0 - 5.5 fbgs), mostly non-plastic fines, some fine sand, few fine gravel, brick, wood, steel debris, medium dense, loose when disturbed, toughness none, dry strength none, trace viscous LNAPL (7.5 - 9.0 fbgs).		30.6		
5.0				5.4		
				20.0		
	87.0 / 9.0	***Sandy Lean Clay with Gravel*** Grey, moist, mostly medium plastic fines, some fine sand, little coarse gravel, few cobbles, petroleum like odor, stiff.		18.3		
10.0	85.5 / 10.5	***Poorly Graded Sand with Silt and Gravel*** Grey, moist, mostly fine sand, some fine gravel, little coarse gravel, trace cobbles, few non-plastic fines, petroleum like odor.		34.2		
				11.3		
15.0	81.0 / 15.0	End of Test Pit				
20.0						



Excavated By: Benson Construction & development, Inc. ***Length: 22 - feet***
Excavator Type: John Deere 135D ***Width: 2 - feet***
Excavation Date(s): 5 1 12 ***Depth: 15 - feet***
Comments:

Depth to Water: No water.
Visual Impacts: Viscous LNAPL
Olfactory Observations: Petroleum-like odors

TEST PIT EXCAVATION LOG

Project No: 0225-002-100
Project: Supplemental Remedial Investigation
Client: Benson constructtion inc
Site Location: 251 Homer St., Olean NY

Test Pit I.D.: TP-56
Logged By: TAB
Checked By: BCH

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2558 Hamburg Turnpike, Suite 300
Buffalo, NY 14218
(716) 856-0635

SUBSURFACE PROFILE

Depth (fbgs)	Elev. /Depth	Description (ASTM D2488: Visual-Manual Procedure)	Lithologic Symbol	PID VOCs ppm (0 25 50 75 100)	Lab Sample	Remarks
0.0	95.5 0.0	Ground Surface				
		Sandy Lean Clay with Gravel Brown, moist, mostly low plasticity fines, some fine sand, little fine gravel, few cobbles (shale), stiff, massive, medium toughness, medium dry strength.		0.1		
	94.5 1.0	***Silt with Sand and Fill*** Black, moist to wet (3.5 fbgs), mostly non-plastic fines, with some fine sand, brick, wood, steel, glass bottles, medium dense, loose when disturbed, no dry strength or toughness, LNAPL.		0.3		*First water, (3.5 fbgs).*
	91.5 4.0	End of Test Pit				
5.0						
10.0						

Excavated By: Benson Construction & Dev, Inc.
Excavator Type: John Deere 135D
Excavation Date(s): 5/1/12
Comments:

Length: 38 - feet
Width: 2 - feet
Depth: 4 - feet

Depth to Water: 3.5 fbgs
Visual Impacts: LNAPL.
Olfactory Observations: Petroleum-like odor.

TEST PIT EXCAVATION LOG

Project No: 0225-002-100
Project: Supplemental Remedial Investigation
Client: Benson Construction & Development, Inc.
Site Location: 251 Homer St. Olean NY

Test Pit I.D.: TP-57
Logged By: TAB
Checked By: BCH

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(716) 856-0635

SUBSURFACE PROFILE

Depth (fbgs)	Elev. /Depth	Description (ASTM D2488: Visual-Manual Procedure)	Lithologic Symbol	PID VOCs ppm (0–100)	Lab Sample	Remarks
	97.5	Ground Surface				
0.0	97.5 / 0.0	***Sandy Silt with Gravel and Fill*** Brown, moist, mostly non-plastic fines, some fine sand, little fine gravel, brick, wood, steel, medium dense, loose when disturbed, no toughness, no dry strength..		0.0		
	96.5 / 1.0	***Poorly Graded Sand with Fill*** Black, moist to wet (3.5 fbgs), mostly fine sand, trace non-plastic fines, brick, wood, steel, medium dense loose when disturbed.		0.1		*First watrer (3.5 fbgs).*
5.0	92.5 / 5.0	End of Test Pit				
10.0						

Excavated By: ***Benson Construction & Development, Inc.*** ***Length: 20 - feet***
Excavator Type: John Deere 135D ***Width: 2 - feet***
Excavation Date(s): 5/1/12 ***Depth: 5 - feet***
Comments:

Depth to Water: 3.5 fbgs
Visual Impacts: LNAPL.
Olfactory Observations: Petroleum-like odor.

TEST PIT EXCAVATION LOG

Project No: 0225-002-100

Project: Supplemental Remedial Investigation

Client: Benson Consruction & Development, Inc.

Site Location: 251 Homer St, Olean NY.

Test Pit I.D.: TP-58

Logged By: TAB

Checked By: BCH

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Buffalo, NY 14218
(716) 856-0635

SUBSURFACE PROFILE

Depth (fbgs)	Elev. /Depth	Description (ASTM D2488: Visual-Manual Procedure)	Lithologic Symbol	PID VOCs ppm (0 – 1000 – 2000)	Lab Sample	Remarks
0.0	0.0 / 0.0	Ground Surface				
		Sandy Lean Clay with Gravel and Fill Brown, moist, mostly low plasticity fines, some fine sand, little fine gravel, few cobbles, massive, stiff, orange brick, medium toughness, medium dry strength.		0.0 0.0		
5.0	-4.0 / 4.0	***Sandy Lean Clay with Gravel*** Dark grey with black, moist, mostly medium plastic fines, some fine sand, little coarse gravels, medium toughness, medium dry strength, stiff.		0.0		
	-6.0 / 6.0	As above, iron staining.		0.4		
10.0	-8.0 / 8.0	***Poorly Graded Sand with Silt and Gravel*** Grey, moist to wet (12,5 fbgs), mostly fine sand, some fine gravel, little coarse, few cobbles, medium dense, few non-plastic fines, loose when disturbed, LNAPL.		1.1 3.1 387		*First water (12.5 fbgs).*
15.0	-13.0 / 13.0	End of Test Pit				
20.0						

Excavated By: Benson Construction & Dev, Inc.
Excavator Type: John Deere 135D
Excavation Date(s): 4/30/12
Comments:

Length: 17 - feet
Width: 2 - feet
Depth: 13 - feet

Depth to Water: 12.5 fbgs
Visual Impacts: LNAPL 12.5 fbgs
Olfactory Observations: Petroleum-like odor.

TEST PIT EXCAVATION LOG

Project No: 0225-002-100

Project: Supplemental Remedial Investigation

Client: Benson Construction & Development, Inc.

Site Location: 251 Homer St. Olean. NY

Test Pit I.D.: TP-59

Logged By: TAB

Checked By:

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Buffalo, NY 14218
(716) 856-0635

SUBSURFACE PROFILE

Depth (fbgs)	Elev. /Depth	Description (ASTM D2488: Visual-Manual Procedure)	Lithologic Symbol	PID VOCs ppm (0 / 1000 / 2000)	Lab Sample	Remarks
0.0	0.0 / 0.0	Ground Surface				
		Silty Sand with Gravel and Fill Dark Brown, moist, mostly fine sand, some non-plastic fines, little fine and coarse gravel, asphalt, wood, brick, medium dense, loose when disturbed.		1.1		
				0.9		
	-4.0 / 4.0	As above, black, wet (4.5 - 5.0 fbgs), sheen.				
5.0				0.4		
	-6.0 / 6.0	***Sandy Lean Clay*** Grey, moist, mostly medium plastic fines, some fine sand, iron staining, stiff, medium toughness, medium dry strength, massive.		1.9		
				1.2		
10.0				8.2	Sample Location	
	-12.0 / 12.0	***Poorly Graded Sand with Silt and Gravel*** Grey, moist to wet (15.0 fbgs), mostly fine sand, some fine gravel, little coarse gravels, few cobbles, few non-plastic fines, medium dense, loose when disturbed.		1.2		*First water (15.0 fbgs).*
15.0	-15.0 / 15.0	End of Test Pit				
20.0						

Excavated By: Benson Construction & Dev, Inc.
Excavator Type: John Deere 135D
Excavation Date(s): 4/30/12
Comments:

Length: 17 - feet
Width: 3 - feet
Depth: 15 - feet

Depth to Water: 15.0 fbgs
Visual Impacts: Sheen.
Olfactory Observations: None.

TEST PIT EXCAVATION LOG

Project No: 0225-002-100
Project: Supplemental Remedial Investigation
Client: Benson Construction & Development, Inc.
Site Location: 251 Homer St., Olean, NY.

Test Pit I.D.: TP-60
Logged By: TAB
Checked By: BCH

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Buffalo, NY 14218
(716) 856-0635

SUBSURFACE PROFILE

Depth (fbgs)	Elev. /Depth	Description (ASTM D2488: Visual-Manual Procedure)	Lithologic Symbol	PID VOCs (ppm; 0 – 1000 – 2000)	Lab Sample	Remarks
0.0	0.0 0.0	Ground Surface ***Gravelly Lean Clay with sand and Fill*** Brown, moist, mostly low plasticity fines, some fine sand, little fine gravel, few cobbles, orange brick, stiff, massive, medium toughness, medium dry strength.		5.0 3.2		
	-4.0 4.0	***Sandy Lean Clay with Fill*** Dark brown/black, moist, mostly medium plastic fine, some fine sand, brick, cinders, 4-inch pipe (6.0 fbgs) running north south, 4-inch pipe and 2-inch pipe (7.0 fbgs) running east west, 4-foot by 4-foot steel approximately (6.0 fbgs) far east end of test pit.		1.9		
5.0						
	-7.0 7.0	***Poorly Graded Sand with Silt and Gravel*** Grey, moist to wet (10.0 fbgs), mostly fine sand, some fine gravel, little coarse gravel, few non-plastic fines, sheen, medium dense, loose when disturbed, petroleum-like odor.		1.3 129.4	Sample Location	*First water (10.0 fbsg)*
10.0	-10.0 10.0	End of Test Pit				

Excavated By: Benson Construction & Dev, Inc.
Excavator Type: John Deer 135D
Excavation Date(s): 4/30/12
Comments:

Length: 35 - feet
Width: 4 - feet
Depth: 10 - feet

Depth to Water: 10 - feet
Visual Impacts: Sheen.
Olfactory Observations: Petroleum-like odor.

TEST PIT EXCAVATION LOG

Project No: 0225-002-100
Project: Supplemental Remedial Investigation
Client: Benson Construction & Development, Inc.
Site Location: 251 Homer St., Olean, NY

Test Pit I.D.: TP-61
Logged By: TAB
Checked By: BCH

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Buffalo, NY 14218
(716) 856-0635

SUBSURFACE PROFILE

Depth (fbgs)	Elev. /Depth	Description (ASTM D2488: Visual-Manual Procedure)	Lithologic Symbol	PID VOCs ppm (0–100)	Lab Sample	Remarks
0.0	94.3 / 0.0	Ground Surface				
		Sandy Lean Clay with Gravel Brown, moist, mostly low plasticity fines, some fine sand, little fine gravel, few cobbles (shale), stiff, massive, medium toughness, medium dry strength.		0.0		
	92.3 / 2.0	***Sandy Lean Clay*** Black/grey, moist, mostly medium plasticity fines, with some fine sand, wood, massive, iron staining, medium toughness, stiff, medium dry strength.		0.0		
5.0				0.1	Sample Location	
	86.3 / 8.0	As above, no black.		0.0		
10.0				0.0		
	82.3 / 12.0	***Gravelly Lean Clay with Sand*** Grey, moist to wet (15.0 fbgs), mostly low plasticity fines, some fine sand, little fine gavel, few coarse gravel, firm.		0.0		
				0.0		
15.0						*First water (15.0 fbgs).*
	78.8 / 15.5	End of Test Pit				
20.0						

Excavated By: Benson Construction & Development, Inc.
Excavator Type: John Deer 135D
Excavation Date(s): 5 1 12
Comments:

Length: 22 - Feet
Width: 2 - Feet
Depth: 15.5 - Feet

Depth to Water: 15.0 fbgs
Visual Impacts: NA
Olfactory Observations: NA

TEST PIT EXCAVATION LOG

Project No: 0225-002-100

Project: Supplemental Remedial Investigation

Client: Benson Construction & Development, Inc.

Site Location: 251 Homer St., Olean, NY

Test Pit I.D.: TP-62

Logged By: TAB

Checked By:

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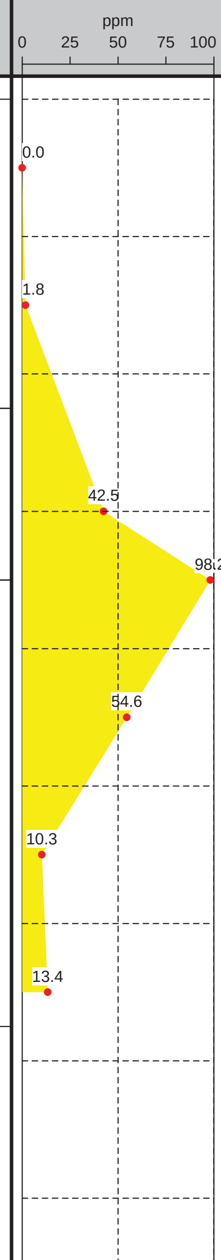
(716) 856-0635

SUBSURFACE PROFILE

Depth (fbgs)	Elev. /Depth	Description (ASTM D2488: Visual-Manual Procedure)	Lithologic Symbol	PID VOCs (ppm)	Lab Sample	Remarks
	96.0 / 0.0	Ground Surface				
0.0		***Gravelly Lean Clay with Sand*** Brown, moist, mostly low plasticity fines, some fine sand, little fine gravel, few cobbles, massive, stiff, medium toughness, medium dry strength.				
5.0	91.5 / 4.5	***Sandy Silt with Gravel and Fill*** Black, moist, mostly non-plastic fines, with some fine sand, little fine and coarse gravel, brick, wood, steel, concrete foundations both ends of test pit (East and West), trace viscous LNAPL (6.5 - 7.0 fbgs).				
	89.0 / 7.0	***Poorly Graded Sand with Silt and Gravel*** Brown/grey (10.0 fbgs), moist, mostly fine sand, little fine gavel, little coarse gravel, trace cobbles few non-plastic fines, petroleum like odor.				
10.0						
	82.5 / 13.5	End of Test Pit				
15.0						



Excavated By: Benson Construction & Dev, Inc.
Excavator Type: John Deere135D
Excavation Date(s): 5 3 12
Comments:

Length: 22 - feet.
Width: 2 - feet
Depth: 13.5 - feet

Depth to Water: No groundwater.
Visual Impacts: Viscous LNAPL
Olfactory Observations: Petroleum-like odor.

Sheet: 1 of 1

SUMMARY OF 2015 CREEK AREA GEOLOGY AND FIELD OBSERVATIONS

251 HOMER STREET REDEVELOPMENT SITE

OLEAN, NEW YORK

Test Pit Location	Imported Cover Soil (fbgs)	Clay (fbgs)	Depth of Test Pit (fbgs)	Soil/Fill Description	Remarks
TP-A	NE	8.0	8.0	0-8' Brown silt, black gravel w/slight sheen Gray clay at 8.0'	Sample Submitted
TP-B	NE	7.5	7.5	0-7.5' Gray clay, trace gravel, slight sheen	Sample Submitted
TP-C	NE	7.0	7.0	0-7' Brown/gray clay, very slight sheen	Sample Submitted
TP-D	NE	5.0	5.0	0-5' Brown gravel and brown/gray clay, very slight sheen Gray clay at 5.0'	Sample Submitted
TP-E	NE	4.5	4.5	0-4.5' Gray clay, trace gravel, very slight sheen Gray clay at 4.5'	Sample Submitted
TP-F	1	4	5	0-1' Cover Soils, 1-4' Cinders, no sheen, no odors or sheen, water at 3 feet.	Sample submitted labelled as TP-1 (1-4') renamed to TP-F (1-4')
TP-G	1	NE	5	0-1' Cover Soils, 1-5', 1-2' Cinders no odors or sheen; 3-5' gray-black cinders, petroleum odor and sheen on water at 3.5'	
TP-H	1	4	10	0-1' Cover Soils, 1-4', gray-black cinders and gravel, petroleum odor and sheen on water	
TP-I	2	6	10	0-2', Cover soils, 2-6' gray silt no odors or sheen, perched water; 3-6' sample for analytical testing	Sample submitted labelled as TP-4 (3-6') renamed to TP-I (3-6')
TP-J	1	3.5	4	0-1' Cover Soils, 1-3.5', Gray cinders slight petroleum odor	
TP-K	NE	6	10	Topsoil (0-1'); 1-6'' Brick and cinders, no odors or sheen, water at 4'	
TP-L	NE	6	7	0-2', Gravel no odors or sheen; 2-3', Cinders no odor or sheen; 3-6' black cinders, petroleum odor and sheen on water at 4'	
TP-M	2	6	10	0-2' Cover soils (gravel); 2-3' gray cinders, no odors or sheen; 3-6' gray-black cinders with brick, petroleum odors, no sheen water at 6'	
TP-N	1	3.5	4	1-3.5', Gray cinders slight petroleum odor	

Definitions:

NE = not encountered

Soils to be removed as part of the remediation.

APPENDIX D

MONITORING WELL COMPLETION LOGS

Project No: 0225-001-100

Borehole Number: MW-1

Project: 251 Homer Street Redevolpment Site | **A.K.A.:**

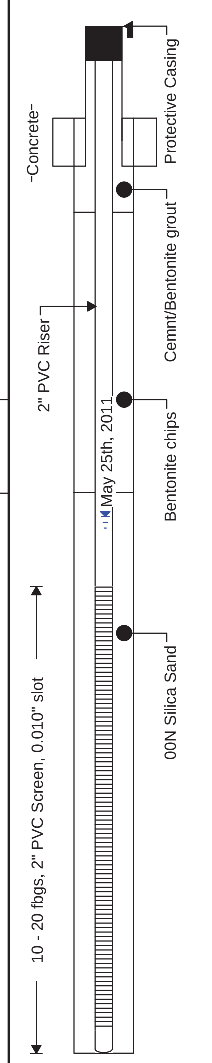
Client: Benson Construction and Development, LLC | **Logged By:** TAB

Site Location: Olean NY | **Checked By:** BCH

TurnKey Environmental Restoration, LLC
2558 Hamburg Turnpike, Suite 300
Buffalo, NY 14218
(716) 856-0635

Depth (fbgs)	Elev. /Depth	Description (ASTM D2488: Visual-Manual Procedure)	Sample No.	SPT N-Value	Recovery (ft)	Symbol	PID VOCs (ppm)	Lab Sample
-2.0								
	0.0 / 0.0	Ground Surface						
		Lean clay with Sand Brown/grey, moist, mostly low plasticity fines, little fine sand, rootlets, trace coarse gravel, very stiff.	S1	17	0.9		0.1	
	-2.0 / 2.0	As above.						
3.0		***Organic Soil with Sand and Fill*** Black, moist, mostly organic fines, little fine sand, slight petroleum like odor, medium dense, low plasticity, loose, cinders.	S2	9	0.9		3.8	
	-4.0 / 4.0	***Sandy Lean Clay with Fill*** Brown/grey, moist, mostly medium plasticity fines, few fine sand, rootlets, cinders, Iron mottling at bottom, slight petroleum-like odor, soft.	S3	7	1.2		5.3	
	-6.0 / 6.0		S4	18	1.8		772	Sample
	-7.0 / 7.0	As above, no cinders.						
8.0	-8.0 / 8.0	***Poorly Graded Sand*** Grey, moist, mostly fine sand, few fine gravel, trace low plasticity fines, few coarse gravels, medium dense, petroleum-like odor.	S5	22	1.2		673	
	-10.0 / 10.0	As above, wet (8.0 fbgs), LNAPL observed (8.0 fbgs). As above, very dense, no LNAPL.	S6	50	0.4		158	
13.0	-12.0 / 12.0	***Poorly Graded Gravel*** Grey/brown, wet, mostly coarse gravel (sub-rounded), trace fine sand and fines, medium dense.	S7	28	0.2			
	-14.0 / 14.0	***Poorly Graded Sand with Silt and Gravel*** Grey, wet, mostly fine sand, little coarse gravel, little fine gravel, few non plastic fines, rapid dilatancy, medium dense.	S8	27	1.3		4.3	
	-16.0 / 16.0	***Poorly Graded Sand with Gravel.*** Grey, wet, mostly fine sand, little coarse gravel, little fine gravel, trace non plastic fines, dense.	S9	39	0.9		4.0	
18.0	-18.0 / 18.0	***Poorly Graded Gravel*** As 12.0 - 14.0 fbgs above, dense.	S10	35	0..5		4.5	
	-20.0 / 20.0	End of Borehole						

Well Completion Details or Remarks



Drilled By: Earth Dimensions
Drill Rig Type: Deitrch D 50 on Maruka Carrier
Drill Method: 4.25-inch HSA w/ Continuous Split Spoon
Comments:
Drill Date(s): 5/25/11

Hole Size: 8.5- inch
Stick-up:
Datum: Mean Sea level
Sheet: 1 of 1

Project No: 0225-001-100

Borehole Number: MW-2

Project: 251 Homer Street Redevolpment Site

A.K.A.:

Client: Benson Construction and Development, LLC

Logged By: TAB

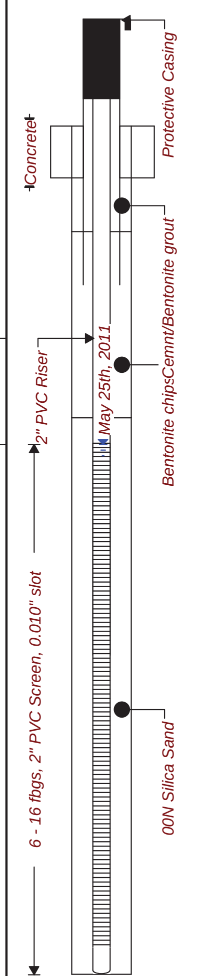
Site Location: Olean NY

Checked By: BCH

TurnKey Environmental Restoration, LLC
2558 Hamburg Turnpike, Suite 300
Buffalo, NY 14218
(716) 856-0635

SUBSURFACE PROFILE			SAMPLE				PID VOCs	Lab Sample
Depth (fbgs)	Elev. /Depth	Description (ASTM D2488: Visual-Manual Procedure)	Sample No.	SPT N-Value	Recovery (ft)	Symbol	ppm (0 – 12.5 – 25)	
-2.0								
	0.0 0.0	Ground Surface						
		Lean Clay with Sand Brown/grey moist, mostly low plasticity fines, little fine sand, rootlets, trace coarse gravel, very stiff.	S1	17	1.4		1.0	
	-2.0 2.0	As above.	S2	25	1.4		1.6	
3.0	-2.5 2.5	***Lean Clay*** Brown/grey, moist, mostly low plasticity fines, few fine sand, rootlets, very stiff to hard.						
			S3	53	1.4		1.5	Sample
	-5.0 5.0	***Silty Sand with Gravel*** Brown, moist, mostly fine sand little non plastic fines little fine gravel, loose when disturbed, very dense.						
	-6.0 6.0	As above, wet (6.0 fbgs).	S4	57	0.9		1.4	
	-7.0 7.0	As above						
8.0	-8.0 8.0	As above, dense.	S5	32	1.2		1.8	
	-10.0 10.0	As above, grey.	S6	31	0.9		0.3	
	-12.0 12.0	***Sandy Lean Clay with Gravel*** Brown, wet, mostly low plasticity fines, some fine sand, little fine gravel, trace coarse gravel, medium dense.	S7	19	1.3		0.2	
13.0								
	-14.0 14.0	As above, hard.	S8	79	1.3		0.3	
	-16.0 16.0	***Lean Clay*** Brown, moist, mostly medium plastic fines, trace fine sand, very stiff, laminated, medium toughness	S9	28	1.1		0.0	
18.0	-18.0 18.0	End of Borehole						

Well Completion Details or Remarks



Drilled By: Earth Dimensions
Drill Rig Type: Deitrch D 50 0n Maruka Carrier
Drill Method: 4.25-inch HSA, Continuous SS
Comments:
Drill Date(s): 5/25/11 - 5/26/11

Hole Size: 8-1/2 inch
Stick-up:
Datum: Mean Sea level

Sheet: 1 of 1

Project No: 0225-001-100

Borehole Number: MW-3

Project: 251 Homer Street Redevolpment Site

A.K.A.:

Client: Benson Construction and Development, LLC

Logged By: TAB

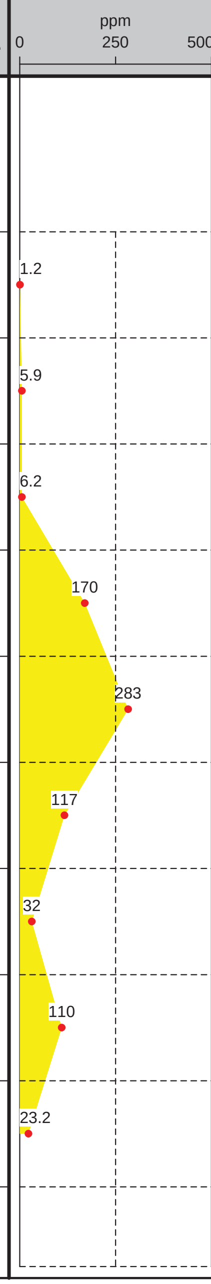
Site Location: Olean NY

Checked By: BCH

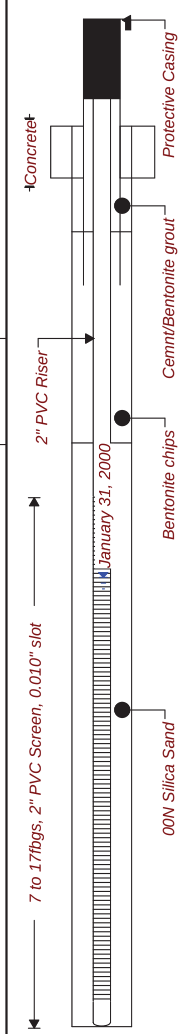
TurnKey Environmental Restoration, LLC
2558 Hamburg Turnpike, Suite 300
Buffalo, NY 14218
(716) 856-0635

SUBSURFACE PROFILE			SAMPLE					
Depth (fbgs)	Elev. /Depth	Description (ASTM D2488: Visual-Manual Procedure)	Sample No.	SPT N-Value	Recovery (ft)	Symbol	PID VOCs (ppm)	Lab Sample
-2.0								
	0.0 / 0.0	Ground Surface						
	0.0 / 0.0	***Lean Clay with Sand and Fill*** Brown/grey moist, mostly low plasticity fines, little fine sand, rootlets, few coarse gravel, cinders, very stiff.	S1	18	1.1		1.2	
3.0	-2.0 / 2.0	As above.	S2	23	1.4		5.9	
	-3.5 / 3.5	***Poorly Graded Sand with Silt*** Black, moist, mostly fine sand, few non plastic fines, loose.	S3	8	1.1		6.2	Sample
	-4.5 / 4.5	***Lean Clay*** Brown/grey, moist, mostly medium plasticity fines, few fine sand, rootlets, massive, iron staining, firm.						
	-5.5 / 5.5, -6.0 / 6.0	***Poorly Graded Sand with Silt and Gravel*** Grey, wet (6.0 fbgs), mostly fine sand, few non-plastic fines, little fine to coarse gravel, medium dense, loose when disturbed, rapid dilatancy, Petroleum-like odors, LNAPL observed.	S4	19	1.0		170	
8.0	-8.0 / 8.0	As above, dense. As above, sheen.	S5	27	1,0		283	
	-10.0 / 10.0	As above.	S6	43	1.3		117	
13.0	-12.0 / 12.0	As above, very dense.	S7	58	1.0		32	
	-14.0 / 14.0	As above, dense.	S8	35	0.6		110	
	-16.0 / 16.0	As above.	S9	34	1.1		23.2	
18.0	-18.0 / 18.0	End of Borehole						

PID VOCs



Well Completion Details or Remarks



Drilled By: Earth Dimensions
Drill Rig Type: Deitrch D 50 0n Maruka Carrier
Drill Method: 4.25-inch HSA, continuous SS.
Comments:
Drill Date(s): 5/26/11

Hole Size: 8.5-inch
Stick-up:
Datum: Mean Sea level

Project No: 0225-001-100

Borehole Number: MW-4

Project: 251 Homer Street Redevolpment Site

A.K.A.:

Client: Benson Construction and Development, LLC

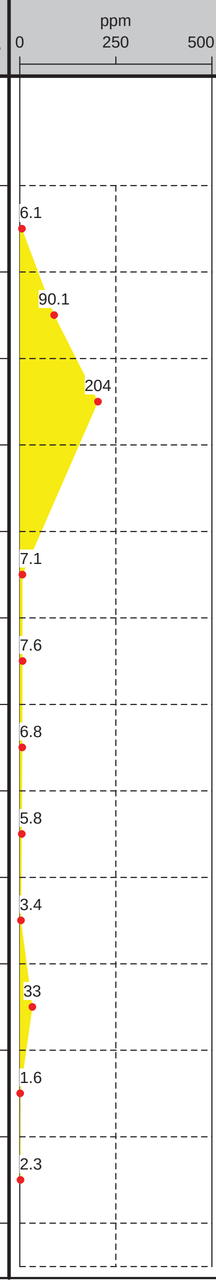
Logged By: TAB

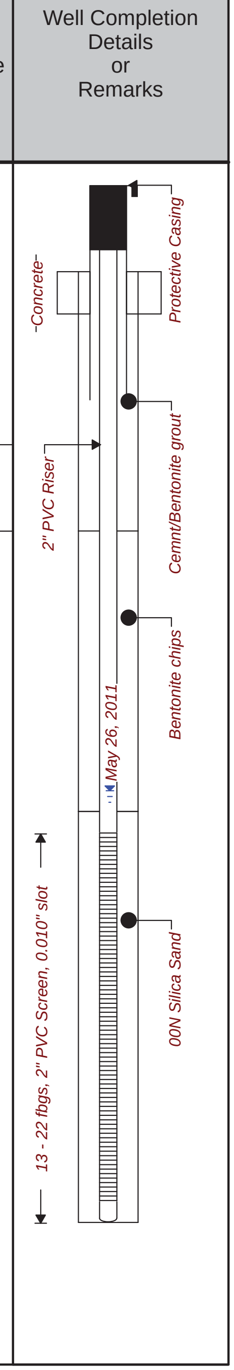
Site Location: Olean NY

Checked By: BCH

TurnKey Environmental Restoration, LLC
2558 Hamburg Turnpike, Suite 300
Buffalo, NY 14218
(716) 856-0635

Depth (fbgs)	Elev. /Depth	Description (ASTM D2488: Visual-Manual Procedure)	Sample No.	SPT N-Value	Recovery (ft)	Symbol	Lab Sample
-2.0							
	0.0 / 0.0	Ground Surface					
	0.0 – -2.0 / 2.0	***Lean Clay with Sand and Fill*** Brown/grey, moist, mostly low plasticity fines, little fine sand, rootlets, few, coarse gravel, cinders, stiff.	S1	11	1.3		
3.0	-2.0 / 2.0 – -4.0 / 4.0	***Silt with Sand and Fill*** Black, moist, mostly non plastic fines, little fine sand, few fine gravel, orange brick, dense, petroleum odor.	S2	46	1.1		
	-4.0 / 4.0 – -6.0 / 6.0	As above, medium dense.	S3	22	1.8		Sample
	-6.0 / 6.0 – -8.0 / 8.0	As above, very dense.	S4	50 / 3	0.1		
8.0	-8.0 / 8.0 – -10.0 / 10.0	***Lean Clay with Sand*** Grey, moist, mostly medium plasticity fines, little fine sand iron staining, firm, massive.	S5	8	1.2		
	-10.0 / 10.0 – -12.0 / 12.0	As above, brown, very stiff.	S6	23	1.1		
13.0	-12.0 / 12.0 – -14.0 / 14.0	***Poorly Graded Sand with Silt and Gravel*** Grey, wet (12 fbgs), mostly fine sand, few fines, little fine gravel, trace coarse gravel, medium dense, loose when disturbed, rapid dilatancy.	S7	16	1.2		
	-14.0 / 14.0 – -16.0 / 16.0		S8	23	1.2		
	-16.0 / 16.0 – -18.0 / 18.0	***Poorly graded Sand with gravel*** Grey, wet, mostly fine sand, little fine gravel, trace coarse gravel, trace non-plastic fines. As above some, dense.	S9	42	1.0		
18.0	-18.0 / 18.0 – -20.0 / 20.0	As above very hard, no odors.	S10	49	1.3		
	-20.0 / 20.0 – -22.0 / 22.0	As above, brown, loose when disturbed.	S11	42	1.4		
23.0	-22.0 / 22.0 – -24.0 / 24.0	***Lean Clay*** Grey, moist, mostly medium plasticity fines, trace fine sand, stiff, varved, medium toughness, medium dry strength.	S12	14	1.4		
		End of Borehole					





Drilled By: Earth Dimensions
Drill Rig Type: Deitrch D 50 0n Maruka Carrier
Drill Method: 4.25-inch HSA, continuous ss
Comments:
Drill Date(s): 5/26/11

Hole Size: 8.5-inch
Stick-up:
Datum: Mean Sea level

Sheet: 1 of 1

Project No: 0225-001-100

Borehole Number: MW-5

Project: 251 Homer Street Redevolpment Site

A.K.A.:

Client: Benson Construction and Development, LLC

Logged By: TAB

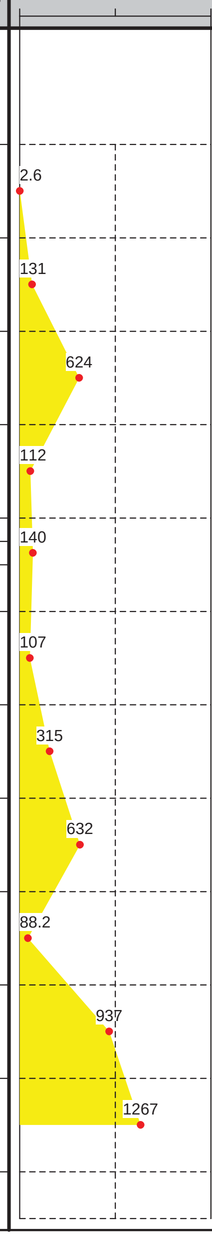
Site Location: Olean NY

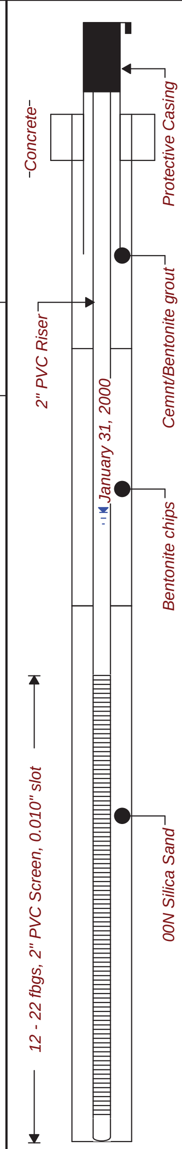
Checked By: BCH

TurnKey Environmental Restoration, LLC
2558 Hamburg Turnpike, Suite 300
Buffalo, NY 14218
(716) 856-0635

Elev. /Depth	Description (ASTM D2488: Visual-Manual Procedure)	Sample No.	SPT N-Value	Recovery (ft)	Symbol	PID VOCs (ppm)	Lab Sample
0.0 / 0.0	Ground Surface						
0.0 / 0.0	***Lean Clay with Sand and Fill*** Brown/grey, moist, mostly low plasticity fines, little fine sand, rootlets, few coarse gravel, cinders, stiff.	S1	12	1.0		2.6	
-2.0 / 2.0	As above. ***Silt with Sand and Fill*** Black, moist, mostly non-plastic fines, little fine sand, few fine gravel, orange brick, loose, petroleum-like odor, visscous LNAPL observed.	S2	10	1.6		131	
-4.0 / 4.0	As above.	S3	18	1.2		624	Sample
-6.0 / 6.0	As above.	S4	29	1.8		112	
-8.0 / 8.0	***Concrete (Suspected)***	S5	100	0.4		140	
	No recovery .	S6	4 / 10	0.0			
-10.0 / 10.0	***Poorly Graded sand with Silt and Gravel*** Grey, wet (10.0 fbgs) mostly, fine sand, few non plastic fines, little fine gravel, rapid dilatancey, loose, petroleum-like odor, LNAPL observed,	S7	15	0.3		107	
-12.0 / 12.0	As above,wet mostly coarse sand, some fine gravel, few fine sand, loose when disturbed.	S8	23	0.2		315	
-14.0 / 14.0	As above, no LNAPL.	S9	32	0.7		632	
-16.0 / 16.0	As above, medium dense.	S10	28	1.1		88.2	
-18.0 / 18.0	As above.	S11	30	0.6		937	
-20.0 / 20.0	As above, very dense.	S12	69	1.1		1267	
-22.0 / 22.0	End of Borehole						

Depth (fbgs): -2.0, 3.0, 8.0, 13.0, 18.0, 23.0





Drilled By: Earth Dimensions
Drill Rig Type: Deitrch D 50 0n Maruka Carrier
Drill Method: 4.25-inch HSA, continuous ss.
Comments:
Drill Date(s): 5/26/11

Hole Size: 8.5-inch
Stick-up:
Datum: Mean Sea level

Sheet: 1 of 1

Project No: 0225-001-100

Borehole Number: MW-6

Project: 251 Homer Street Redevolpment Site

A.K.A.:

Client: Benson Construction and Development, LLC

Logged By: TAB

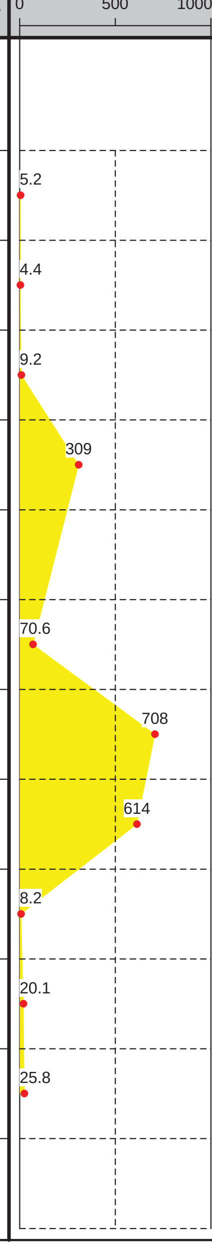
Site Location: Olean NY

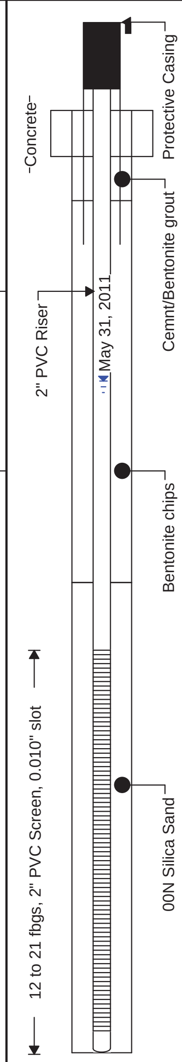
Checked By: BCH

TurnKey Environmental Restoration, LLC
2558 Hamburg Turnpike, Suite 300
Buffalo, NY 14218
(716) 856-0635

Elev. /Depth	Description (ASTM D2488: Visual-Manual Procedure)	Sample No.	SPT N-Value	Recovery (ft)	PID VOCs (ppm)	Lab Sample
0.0 / 0.0	Ground Surface					
0.0 to -2.0 / 0.0 to 2.0	**Sandy Lean Clay with Fill** Brown/black moist, mostly low plasticity fines, some fine sand, trace coarse gravel, rootlets, orange brick.	S1	6	0.9	5.2	
-2.0 to -4.0 / 2.0 to 4.0	**Silt with Sand and Fill** Brown/Black,wet (2.0 fbgs), mostly non-plastic fines, some fine sand, orange brick and cinders.	S2	5	0.8	4.4	
-4.0 to -6.0 / 4.0 to 6.0	As above, wood, petroleum like odor. As above.	S3	14	0.8	9.2	
-6.0 to -8.0 / 6.0 to 8.0	**Silty Sand With Gravel and Fill** Black/grey, wet, mostly fine sand, some fine gravel and coarse sand, little non-plastic fines, grey lean clay (7.5 Fbgs, 0.3-inch), wood, orange brick, petroleum-like odor, LNAPL.	S4	8	0.6	309	Sample
-8.0 to -10.0 / 8.0 to 10.0	**No recovery**	S5	9	0.0		
-10.0 to -12.0 / 10.0 to 12.0	**Poorly Graded sand with Silt and Gravel.** Grey, wet, mostly fine sand, some fine gravel, few non-plastic fines, loose when disturbed, petroleum-like odor.	S6	21	0.9	70.6	
-12.0 to -14.0 / 12.0 to 14.0	As above.	S7	24	0.8	708	
-14.0 to -16.0 / 14.0 to 16.0	**Poorly Graded Sand with Gravel** Grey, wet, mostly fine sand, little fine gravel, trace non-plastic fines, loose when disturbed, petroleum-like odor.	S8	20	1.6	614	
-16.0 to -18.0 / 16.0 to 18.0	As above, very dense.	S9	121	1.3	8.2	
-18.0 to -20.0 / 18.0 to 20.0	As Above, dense.	S10	40	1.2	20.1	
-20.0 to -21.0 / 20.0 to 21.0	As above, dense.	S11	34	1.6	25.8	
-21.0 to -22.0 / 21.0 to 22.0	**Lean Clay** Grey, moist, mostly low plasticity fines grading to medium plasticity, trace fine sand stiff laminated at bottom.					
-22.0 / 22.0	End of Borehole					

Depth (fbgs) scale: -2.0, 3.0, 8.0, 13.0, 18.0, 23.0



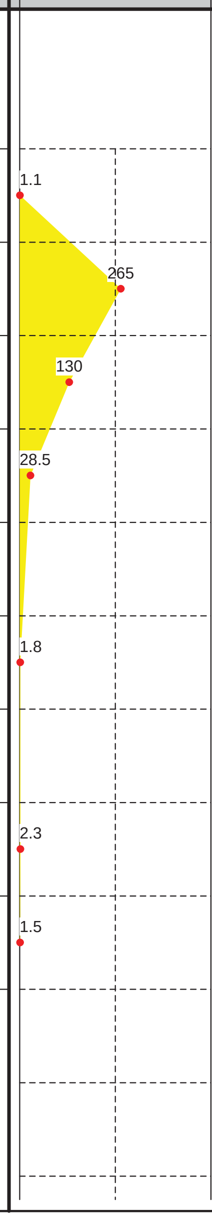


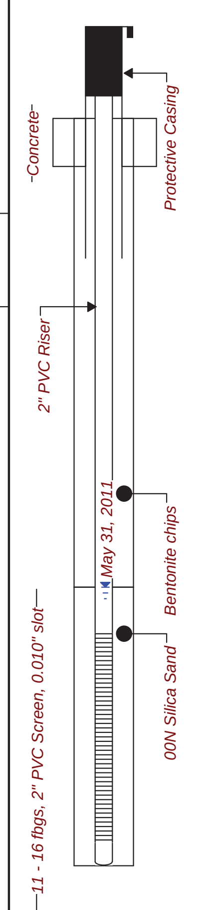
Drilled By: Earth Dimensions	***Hole Size: 8.5-inch***
Drill Rig Type: Deitrch D 50 0n Maruka Carrier	***Stick-up:***
Drill Method: 4.25-inch HSA, continuous ss	***Datum: Mean Sea level***
Comments:	
Drill Date(s): 5/31/11	***Sheet: 1 of 1***

Project No: 0225-001-100	**Borehole Number: MW-7**
Project: 251 Homer Street Redevolpment Site	***A.K.A.:***
Client: Benson Construction and Development, LLC	***Logged By:*** TAB
Site Location: Olean NY	***Checked By:*** BCH

TurnKey Environmental Restoration, LLC
2558 Hamburg Turnpike, Suite 300
Buffalo, NY 14218
(716) 856-0635

SUBSURFACE PROFILE			SAMPLE				PID VOCs ppm	Lab Sample	Well Completion Details or Remarks
Depth (fbgs)	Elev. /Depth	Description (ASTM D2488: Visual-Manual Procedure)	Sample No.	SPT N-Value	Recovery (ft)	Symbol	0 250 500		
-2.0									
	0.0 0.0	Ground Surface							
	-2.0 2.0	***Sandy Silt with Fill*** Brown/black, moist, mostly non plastic fines, some fine sand, trace coarse gravel, rootlets, orange brick. loose when disturbed, medium dense.	S1	11	1.8		1.1		
3.0	-4.0 4.0	As above wet (3.5 fbgs), petroleum like odor.	S2	27	1.4		265	Sample Location	
	-5.0 5.0	As above, loose.	S3	7	0.3		130		
	-6.0 6.0	***Lean Clay*** Grey, moist, medium plasticity fines, few fine sand, roots, brick, stiff, medium dry strength and toughness.							
8.0	-8.0 8.0	As above, iron staining.	S4	20	1.5		28.5		
	-10.0 10.0	***No recovery*** No recovery.	S5	16	1.4				
	-12.0 12.0	***Poorly Graded Sand with Silt and Gravel*** Grey, wet (10 fbgs), mostly fine sand, some fine gravel, few non-plastic fines, loose when disturbed, dense.	S6	45	0.9		1.8		
13.0	-14.0 14.0	***No recovery*** No recovery.	S7	82	0.0				
	-16.0 16.0	***Poorly Graded Sand w/ Silt and Gravel*** As 10 to 12 fbgs, very dense.	S8	76	1.4		2.3		
18.0	-18.0 18.0	***Lean Clay*** Grey, moist, mostly medium plasticity fines, trace fine sand, very stiff, laminated at bottom.	S9	16	1.2		1.5		
		End of Borehole							





Drilled By: Earth Dimensions
Drill Rig Type: Deitrch D 50 0n Maruka Carrier
Drill Method: 4.25-inch HSA, continuous ss
Comments:
Drill Date(s): 5/31/11

Hole Size: 8.5 inch
Stick-up:
Datum: Mean Sea level

Project No: 0225-001-100

Borehole Number: MW-8

Project: 251 Homer Street Redevolpment Site

A.K.A.:

Client: Benson Construction and Development, LLC

Logged By: TAB

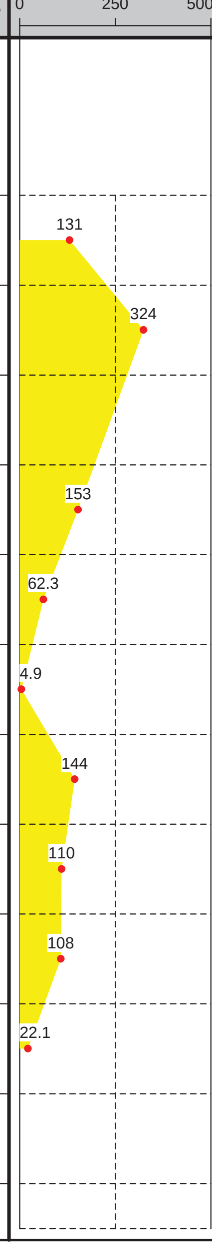
Site Location: Olean NY

Checked By: BCH

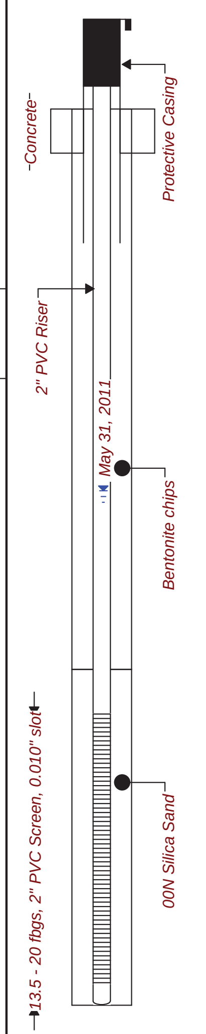
TurnKey Environmental Restoration, LLC
2558 Hamburg Turnpike, Suite 300
Buffalo, NY 14218
(716) 856-0635

SUBSURFACE PROFILE			SAMPLE				Lab Sample
Depth (fbgs)	Elev. /Depth	Description (ASTM D2488: Visual-Manual Procedure)	Sample No.	SPT N-Value	Recovery (ft)	Symbol	
-3.0							
	0.0 / 0.0	Ground Surface					
		Sandy Lean Clay Brown/grey, moist, mostly low plasticity fines, little fine sand, roots stiff.	S1	11	1.4		
2.0	-2.0 / 2.0	***Poorly Graded Sand with Fill*** Black, moist, mostly fine sand, trace non plastic fines, loose when disturbed, petroleum like odor. As above wet (3.0 fbgs), LNAPL obseved.	S2	11	1.6		
	-4.0 / 4.0	***Poorly Graded Sand with Gravel with Fill*** Black, wet, mostly fine sand, few fine gravel, trace non plastic fines, loose when disturbed, petroleum-like odor, viscous LNAPL observed.	S3	3	1.0		Sample location
7.0	-6.0 / 6.0	As above.	S4	4	0.3		
	-8.0 / 8.0	As above. ***Sandy Lean Clay*** Grey/brown, moist, mostly medium plastic fines, trace fine sand, rootlets, iron staing, stiff, medium toughness and dry strength.	S5	2	1.0		
	-10.0 / 10.0	As above.	S6	19	0.9		
12.0	-12.0 / 12.0	***Poorly Graded Sand w/ Silt and Gravel*** Brown, wet, mostly fine sand, little fine gravels, few non plastic fines, loose when disturbed, petroleum like odor.	S7	45	0.7		
	-14.0 / 14.0	As above	S8	61	1.1		
17.0	-16.0 / 16.0	As above	S9	63	0.0		
	-18.0 / 18.0	As above.	S10	43	0.8		
	-20.0 / 20.0	***Lean Clay*** Grey, moist, mostly high plasticity fines trace fine sand stiff, laminnated.	S11	11	1.5		
22.0	-22.0 / 22.0	End of Borehole					

PID VOCs



Well Completion Details or Remarks



Drilled By: Earth Dimensions
Drill Rig Type: Deitrch D 50 0n Maruka Carrier
Drill Method: 4.25-inch HSA, continuous ss
Comments:
Drill Date(s): 5/31/11

Hole Size: 8.5- inch
Stick-up:
Datum: Mean Sea level

Project No: 0225-002-100

Borehole Number: MW-9

Project: Supplemental Investigation

A.K.A.:

Client: Benson Construction & Development, Inc.

Logged By: TAB

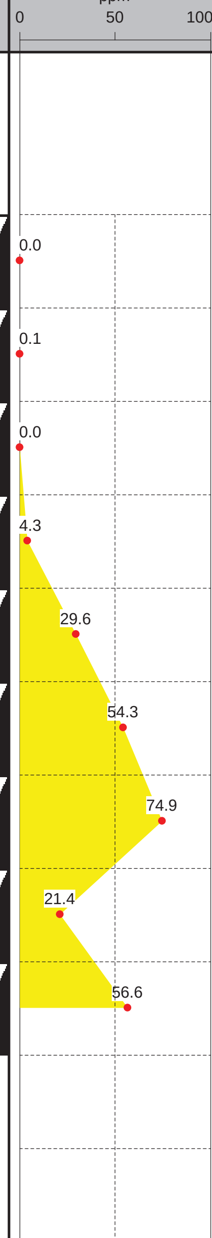
Site Location: 251 Homer St. Olean, NY

Checked By: BCH

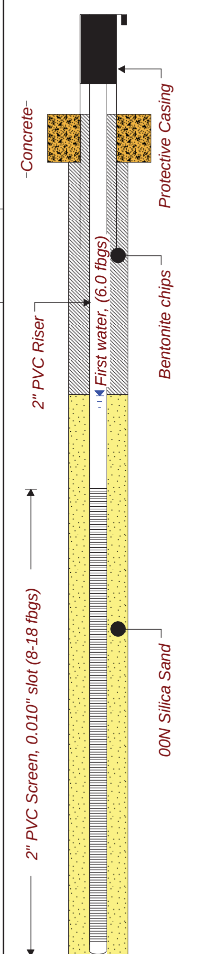
TurnKey Environmental Restoration, LLC
2558 Hamburg Turnpike, Suite 300
Buffalo, NY 14218
(716) 856-0635

SUBSURFACE PROFILE			SAMPLE				PID VOCs ppm	Lab Sample
Depth (ftbgs)	Elev. /Depth	Description (ASTM D2488: Visual-Manual Procedure)	Sample No.	SPT N-Value	Recovery (ft)	Symbol		
-3.0								
	92.2 / 0.0	Ground Surface						
		Silty Sand with Fill Black, moist, mostly fine sand, some non-plastic fines, few fine gravel, glass, orange brick, medium dense, loose when disturbed.	S1	14	1.1		0.0	
2.0	90.2 / 2.0	As above.	S2	11	1.9		0.1	Sample Location
	88.2 / 4.0	***Sandy Lean Clay*** Grey, moist, mostly medium plastic fines, some fine sand, soft, iron staining, medium toughness, medium dry strength.	S3	5	1.9		0.0	
7.0	86.2 / 6.0	As above, wet (6.0 fbgs) slight petroleum like odor.	S4	6	1.8		4.3	
	84.2 / 8.0	***Poorly Graded Sand with Gravel*** Grey, wet, mostly fine sand, trace non-plastic fines, little fine gravel, rapid dilatancy, medium dense, slight petroleum like odor.	S5	15	0.5		29.6	
	82.2 / 10.0	As above.	S6	27	1.4		54.3	
12.0	80.2 / 12.0	As above, trace coarse gravel, strong petroleum like odor.	S7	44	2.0		74.9	
	78.2 / 14.0	As above.	S8	NA	0.5		21.4	
17.0	76.2 / 16.0	***Poorly Graded Sand with Clay and Gravel*** Grey, wet, mostly fine sand, some coarse sand, little fine grave, few non-plastic fines, trace low plasticity fines, low toughness, no dry strength, petroleum like odor, LNAPL (16.0 fbgs).	S7	80	2.0		56.6	
	74.2 / 18.0	End of Borehole						
22.0								

PID VOCs



Well Completion Details or Remarks



Drilled By: Earth Dimensions, Inc.
Drill Rig Type: Maruka, Diedrich D 50
Drill Method: 4 1/4 -inch HSA with 3-inch split-spoon
Comments: Elevations based on site datum of 100 fmsl.
Drill Date(s): 5/10/12

Hole Size: 8-inch
Stick-up: 2.14 - feet
Datum: Mean sea level.

Sheet: 1 of 1

Project No: 0225-002-100

Borehole Number: MW-10

Project: Supplemental Remedial Investigation

A.K.A.:

Client: Benson Construction & Development, Inc.

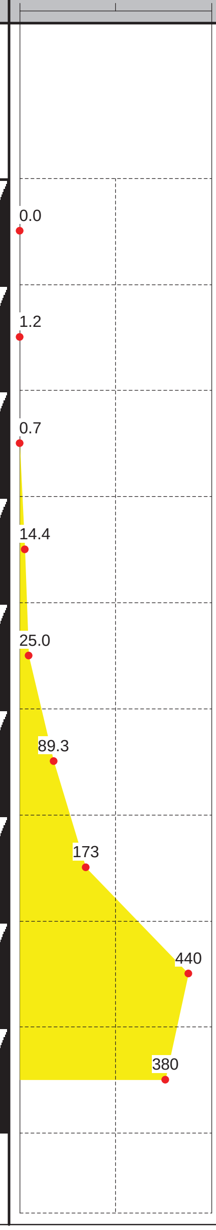
Logged By: TAB

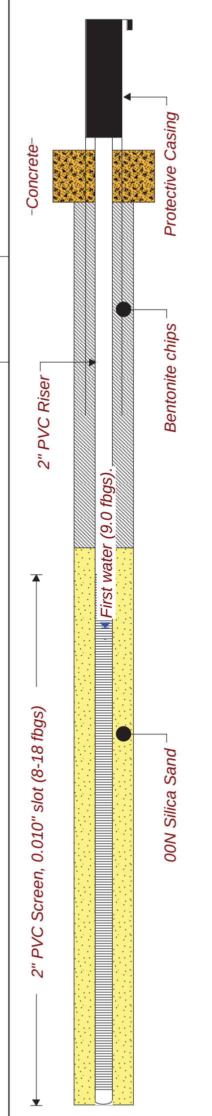
Site Location: 251 Homer St. Olean, NY

Checked By: BCH

TurnKey Environmental Restoration, LLC
2558 Hamburg Turnpike, Suite 300
Buffalo, NY 14218
(716) 856-0635

SUBSURFACE PROFILE			SAMPLE				PID VOCs	Lab Sample	Well Completion Details or Remarks
Depth (fbgs)	Elev. /Depth	Description (ASTM D2488: Visual-Manual Procedure)	Sample No.	SPT N-Value	Recovery (ft)	Symbol	ppm (0 / 250 / 500)		
-2.0									
	92.7 / 0.0	Ground Surface							
		Sandy Lean Clay with Fill Black, moist, mostly medium plasticity fines, some fine sand, few fine gravel, glass, orange brick, Stiff.	S1	12	1.1		0.0		
3.0	90.7 / 2.0	As above.	S2	24	2.0		1.2	Sample Location	
	88.7 / 4.0	***Sandy Lean Clay with Gravel*** Grey, moist, mostly medium plastic fines, some fine sand few fine gravel, very stiff, trace coarse gravel.	S3	29	1.4		0.7		
	86.7 / 6.0	As above, slight petroleum odor.	S4	29	1.0		14.4		
8.0	85.2 / 7.5	***Poorly Graded Sand with Silt and Gravel*** Grey, moist to wet (9.0 fbgs), mostly fine sand, few non-plastic fines, little fine gravel, medium dense, petroleum-like odor.	S5	19	1.6		25.0		
	82.7 / 10.0	As above, trace coarse gravel, dense.	S6	39	1.0		89.3		
13.0	80.7 / 12.0	As above.	S7	47	1.1		173		
	78.7 / 14.0	***Poorly Graded Sand with Gravel*** Grey, wet, mostly medium sand,little fine gravel, trace coarse gravel, trace non-plastic fines, rapid dilatancey, very dense, petroleum-like odor.	S8	68	2.0		440		
	76.7 / 16.0	As above.	S7	62	1.3		380		
18.0	74.7 / 18.0	End of Borehole							





Drilled By: Earth Dimensions, Inc.
Drill Rig Type: Maruka, Diedrich D 50
Drill Method: 4 1/4 -inch HSA with 3-inch split spoon.
Comments: Elevations based on site datum of 100 fmsl.
Drill Date(s): 5/10/12

Hole Size: 8-inch
Stick-up: 2.43 feet
Datum: Mean Sea Level

Sheet: 1 of 1

Project No: 0225-002-100

Borehole Number: MW-11

Project: Supplemental Remedial Investigation

A.K.A.:

Client: Benson Construction & Development, Inc.

Logged By: TAB

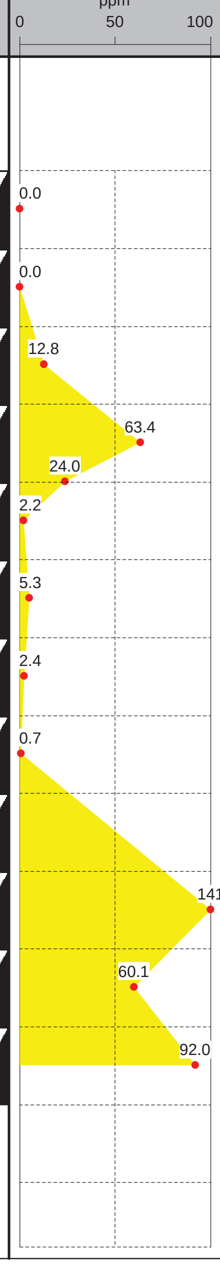
Site Location: 251 Homer St, Olean, NY

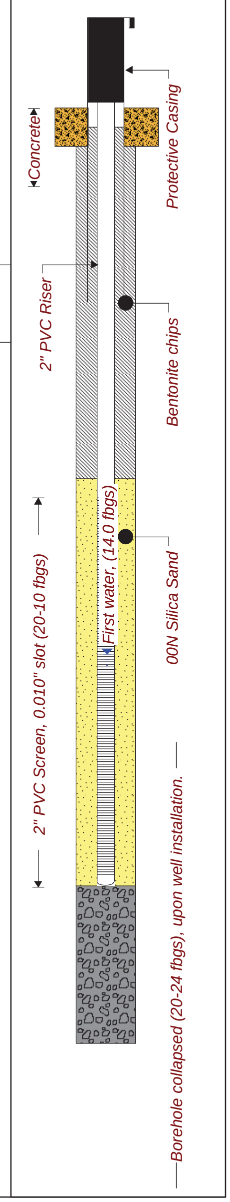
Checked By: BCH

TurnKey Environmental Restoration, LLC
2558 Hamburg Turnpike, Suite 300
Buffalo, NY 14218
(716) 856-0635

SUBSURFACE PROFILE			SAMPLE					
Depth (ftbgs)	Elev. /Depth	Description (ASTM D2488: Visual-Manual Procedure)	Sample No.	SPT N-Value	Recovery (ft)	Symbol	Lab Sample	Well Completion Details or Remarks
-2.0								
	96.8 / 0.0	Ground Surface						
		Sandy Lean Clay with Gravel and Fill Brown, moist, mostly low plasticity fines, some fine sand, few fine gravel, trace coarse gravel, very stiff.	S1	16	1.6			
3.0	94.8 / 2.0	As above, orange brick.	S2	100 / 5	0.4			
	92.8 / 4.0	***Silty Sand with Fill*** Black, moist, mostly fine sand, some non-plastic fines, few fine gravel, orange brick, wood debris, dense, slight petroleum odor.	S3	43	2.0		Sample Location	
8.0	90.8 / 6.0	As above, slight petroleum-like odor, (7.5 - 8.5 fbgs), viscous LNAPL mixed with fines, medium dense.	S4	25	1.3			
	87.8 / 9.0	***Sandy Lean Clay with Gravel*** Brown, moist, mostly low plasticity, fines some fine sand, little fine gravel, trace coarse gravel, medium dense, medium toughness, medium dry strength, slight petroleum odor.	S5	19	1.9			
	86.8 / 10.0		S6	34	1.2			
13.0	84.8 / 12.0	***Poorly Graded Sand with Silt and Gravel*** Brown, moist, mostly fine sand, few non-plastic fines, little fine gravel, trace coarse gravel, medium dense, slight petroleum odor,	S7	25	1.7			
	82.8 / 14.0	As above.	S8	30	0.5			
	80.8 / 16.0	***Poorly Graded Sand with Gravel*** Brown, wet (14.0 fbgs), mostly fine sand, little fine gravel, trace coarse gravel, trace non-plastic fines, medium dense, rapid dilatancey.	S7	21	0.22			
18.0	78.8 / 18.0	No recovery.	S8	18	1.1			
	76.8 / 20.0	As above, black/grey, petroleum like odor. As above.	S9	19	1.1			
23.0	74.8 / 22.0	As above, dense.	S10	35	1.4			
	72.8 / 24.0	End of Borehole						

PID VOCs (ppm)





Drilled By: Earth Dimensions, Inc.
Drill Rig Type: Maruka, diedrich D 50
Drill Method: 4 1/4 -inch HSA with 3-inch split spoon
Comments: Elevations based on site datum of 100 fmsl.
Drill Date(s): 5/11/12

Hole Size: 8-inch
Stick-up: 2.35 - feet
Datum: Mean sea level

Sheet: 1 of 1

Project No: 0225-02-100

Borehole Number: MW-12

Project: Supplemental Remedial Investigation

A.K.A.:

Client: Benson Construction & Development, Inc.

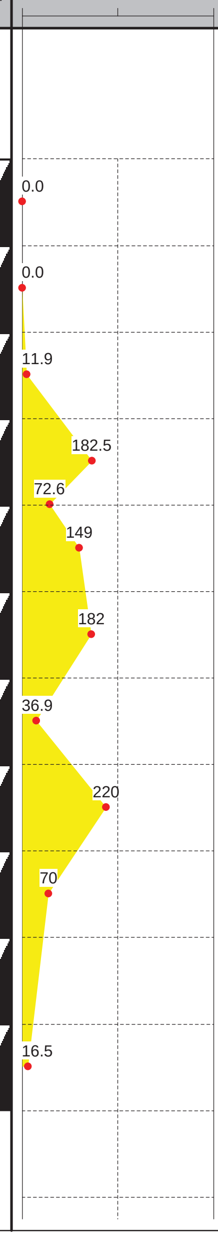
Logged By: TAB

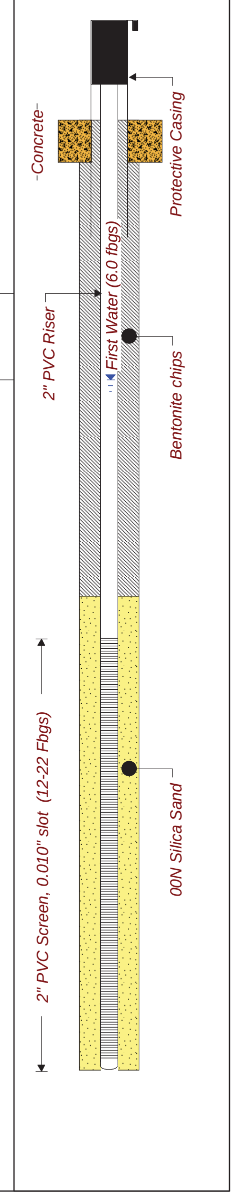
Site Location: 251 Homer St., Olean, NY

Checked By: BCH

TurnKey Environmental Restoration, LLC
2558 Hamburg Turnpike, Suite 300
Buffalo, NY 14218
(716) 856-0635

SUBSURFACE PROFILE			SAMPLE					
Depth (fbgs)	Elev. /Depth	Description (ASTM D2488: Visual-Manual Procedure)	Sample No.	SPT N-Value	Recovery (ft)	Symbol	Lab Sample	Well Completion Details or Remarks
-2.0								
	96.3 / 0.0	Ground Surface						
	0.0	***Sandy Lean Clay with Gravel Fill*** Brown, moist, mostly low plasticity fines, some fine sand, few fine gravel, trace coarse gravel, roots, orange brick, stiff to hard..	S1	13	1.4			
3.0	94.3 / 2.0	As above.	S2	36	0.7			
	92.3 / 4.0	***Poorly Graded Sand with Fill*** Black, moist, mostly fine sand, trace non-plastic fines, orange brick, wood debris, slight petroleum odor, medium dense, sheen.	S3	22	1.7		Sample Location	
8.0	90.3 / 6.0	As above, wet (6.0 fbgs), trace LNAPL, stron petroleum like odor.	S4	14	1.9			
	87.3 / 9.0	***Sandy Lean Clay*** Grey, wet, mostly medium plastic fines, some fine sand, trace fine gavel, medium toughness, medium dry strength, firm, petroleum-like odor.	S5	6	1.6			
	86.3 / 10.0		S6	32	1.6			
13.0	84.3 / 12.0	***Poorly Graded Sand with Silt and Gravel*** Grey, wet, mostly fine sand, few non-plastic fines, little fine gravel, trace coarse gravel, rapid dilatancy, dense, LNAPL, petroleum like odor.	S7	18	1,8			
	82.3 / 14.0	***Sandy Lean Clay*** Grey, moist, mostly low plasticity fines, some fine sand, few fine gravel, trace coarse gravel, very stiff, petroleum-like odor.	S8	21	1.1			
	80.3 / 16.0	***Poorly Graded Sand with Silt and Gravel*** As (10-12 fbgs) above, LNAPL.	S7	NA	0.7			
18.0	78.3 / 18.0	As above, no LNAPL. No recovery.	S8	NA	0.0			
	76.3 / 20.0	***Poorly Graded Sand with Gravel*** Grey, wet, mostly medium sand, some fine gravels, trace non-plastic fines, rapid dilatancy, very dense, slight petroleum-like odor.	S9	NA	0.8			
	74.3 / 22.0	End of Borehole						
23.0								





Drilled By: Earth Dimensions, Inc.
Drill Rig Type: Maruka, Diedrich D 50
Drill Method: 4 1/4 -inch HSA contious 3-inch spoon
Comments: Elevations based on site datum of 100 fmsl.
Drill Date(s): 5/11/12

Hole Size: 8-inch
Stick-up: 2.29
Datum: Mean sea level.

Sheet: 1 of 1

Project No: 0225-002-100

Borehole Number: MW-13

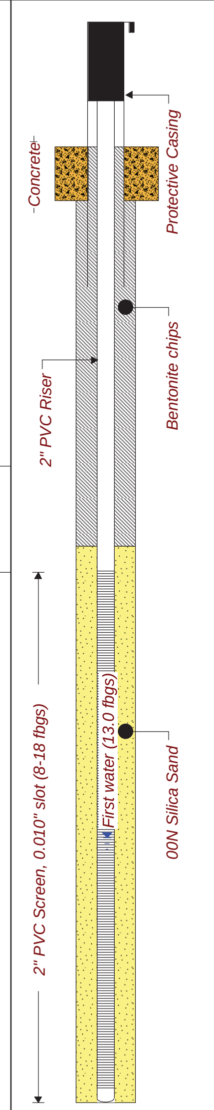
Project: Supplemental Remedial Investigation | **A.K.A.:**

Client: Benson Construction & Development | **Logged By:** TAB

Site Location: 251 Homer St., Olean, NY | **Checked By:** BCH

TurnKey Environmental Restoration, LLC
2558 Hamburg Turnpike, Suite 300
Buffalo, NY 14218
(716) 856-0635

SUBSURFACE PROFILE			SAMPLE						
Depth (fbgs)	Elev. /Depth	Description (ASTM D2488: Visual-Manual Procedure)	Sample No.	SPT N-Value	Recovery (ft)	Symbol	PID VOCs ppm (0 – 12.5 – 25)	Lab Sample	Well Completion Details or Remarks
-2.0									
	94.7 / 0.0	Ground Surface							
	94.7 / 0.0	***Sandy Lean Clay with Gravel*** Brown, moist, mostly medium plasticity fines, some fine sand, little fine gravel, trace coarse gravel stiff, medium toughness, medium dry strength.	S1	24	2.0		0.0		
3.0	92.7 / 2.0	As above.	s2	78	0.7		0.0		
	90.7 / 4.0	As above, black, slight petroleum-like odor.	S3	7	0.4		0.9		
	88.7 / 6.0	***Sandy Lean Clay with gravel*** Grey, moist, mostly medium plasticity fines, little fine sand, few fine gravel, trace coarse gravel, organic soil (6.5 to 7.0 fbgs), slight petroleum-like odor.	S4	17	1.8		3.2	Sample location.	
8.0	86.7 / 8.0	As above, massive, iron staining, trace fine gravel.	S5	12	1.9		0.0		
	84.7 / 10.0	As above, hard.	S6	35	1.8		0.1		
13.0	82.7 / 12.0	As above, wet (13.0 fbgs).	S7	50	0.8		0.0		
	80.7 / 14.0	***Poorly Graded Gravel with Sand*** Brown, mostly fine gravel, few coarse gravel (shale), little fine sand few non-plastic fines, very dense, healed horizontal factures with low plasticity fines, suspected top of weathered rock,	S8	52	0.8		0.0		
	78.7 / 16.0	Spoon refusal, augered to18.0 fbgs and set well.	S7	100 / 2	0.0				
18.0	76.7 / 18.0	End of Borehole							



Drilled By: Earth Dimensions, Inc.
Drill Rig Type: Marurka, Diedrich D50
Drill Method: 4 1/4 -inch HSA contious 3-inch spoon
Comments: Elevations based on site datum of 100 fmsl.
Drill Date(s): 5/14/12

Hole Size: 8-inch
Stick-up: 2.61-feet
Datum: Mean sea level.

Sheet: 1 of 1

Project No: 0225-002-100

Borehole Number: MW-14

Project: Supplemental Remedial Investigation

A.K.A.:

Client: Benson Construction & development, Inc.

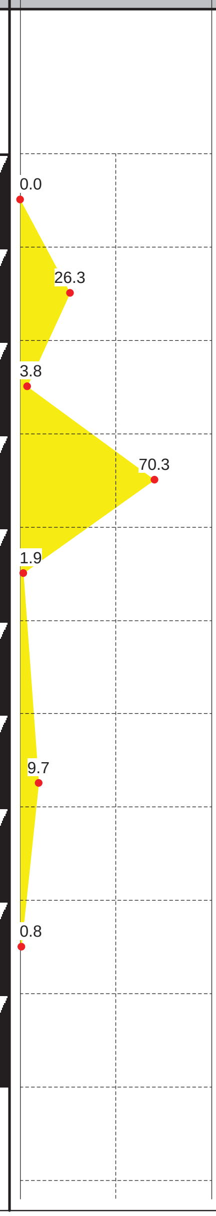
Logged By: TAB

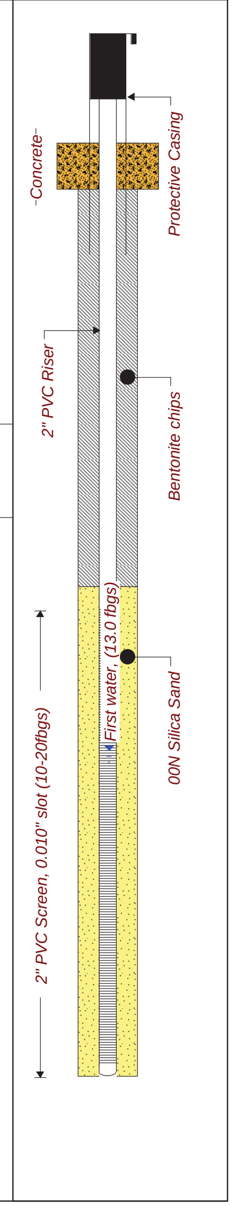
Site Location: 251 Homer St., Olean, NY

Checked By: BCH

TurnKey Environmental Restoration, LLC
2558 Hamburg Turnpike, Suite 300
Buffalo, NY 14218
(716) 856-0635

SUBSURFACE PROFILE			SAMPLE				PID VOCs	Lab Sample	Well Completion Details or Remarks
Depth (ftbgs)	Elev. /Depth	Description (ASTM D2488: Visual-Manual Procedure)	Sample No.	SPT N-Value	Recovery (ft)	Symbol	ppm 0 50 100		
-2.0									
	94.0 / 0.0	Ground Surface							
		Sandy Lean Clay with Gravel and Fill Grey, moist, mostly medium plasticity fines, some fine sand, little fine gravel, few coarse gravel stiff, rootlets, wood debris	S1	11	2.0		0.0		
3.0	92.0 / 2.0	As above black, petroleum-like odors (3.7 fbgs).	S2	23	1.5		26.3		
	90.0 / 4.0	As above, stiff, slight petroleum odor, pieces of fabric.	S3	13	1.1		3.8		
	88.0 / 6.0	As above black grey, hard, wood pieces, petroleum-like odor, viscous, LNAPL (7.2-7.5 fbgs).	S4	36	1.1		70.3	Sample Location	
8.0	86.0 / 8.0	**Lean Clay** Grey, moist, mostly medium plastic fines, few fine sand, massive, iron staining, slight petroleum-like odor, rootletss, medium toughness and dry strength, stiff.	S5	10	1.8		1.9		
	84.0 / 10.0	As above, hard.	S6	38	1.5				
13.0	81.0 / 13.0	**Sandy Lean Clay** Grey, wet (13.0 fbgs), mostly low plasticity fines, some fine sand,few fine gravel, very stiff to hard.	S7	43	1.6		9.7		
	80.0 / 14.0	No recovery.	S8	NA	0.3				
	78.0 / 16.0	**Silty Sand with gravel** Grey, wet, mostly fine sand, some non-plastic fines, little fine gravel, few coarse gravel, very dense, loose when disturbed, rapid dilatancy.	S7	98	0.6		0.8		
18.0	76.0 / 18.0	**Sandy Lean Clay with Gravel.** Grey, wet, mostly low plasticity fines, some fine sand, little fine gravel, few coarse gravel, hard.	S8	65	1.1				
	74.0 / 20.0	End of Borehole							



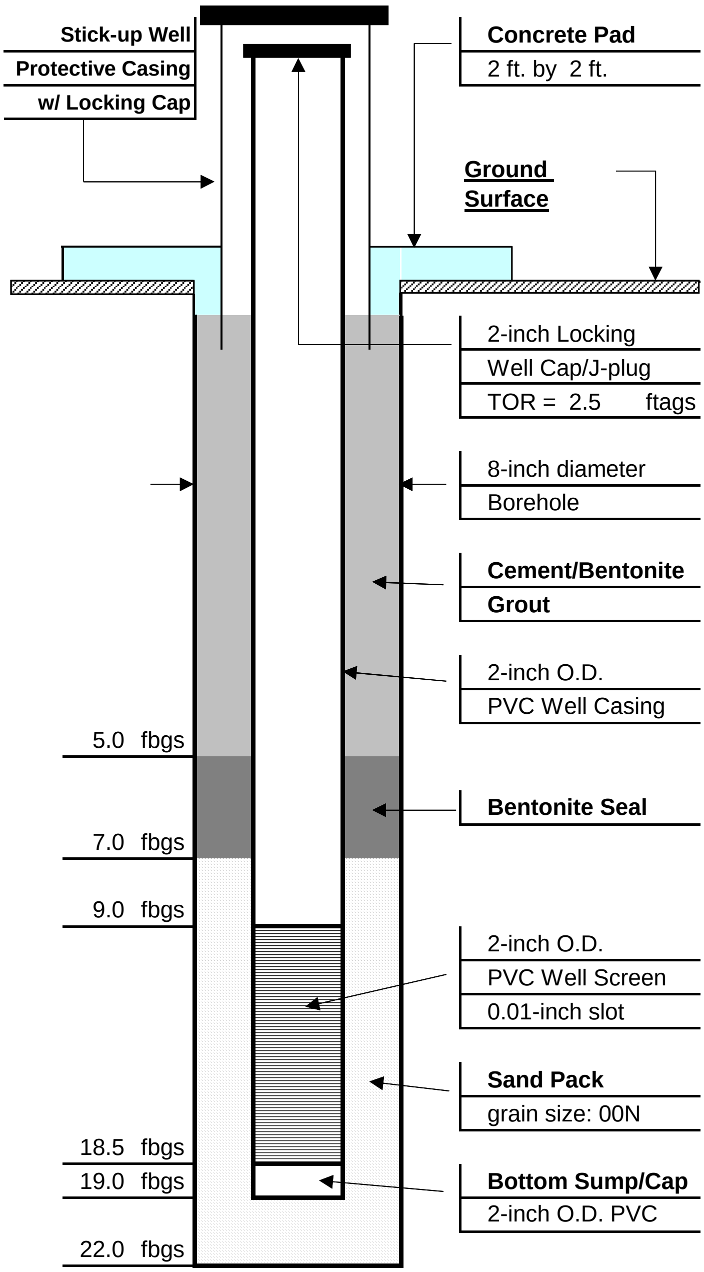


Drilled By: Earth Dimensions, Inc.
Drill Rig Type: Maruka, diedrich D 50
Drill Method: 4 1/4 -inch HSA contious 3-inch spoon.
Comments: Elevations beased on site datum of 100 fmsl.
Drill Date(s): 5/14/12

Hole Size: 8-inch
Stick-up: 2.38-feet
Datum: Mean sea level.

STICK-UP MONITORING WELL COMPLETION DETAIL

Project Name:	**251 Homer Street Redevelopment Site**	WELL NUMBER:	**MW-6R**
Client:	**Benson Construction and Development, LLC**	Date Installed:	**05/10/16**
Boring Location:	**Olean, NY**	Project Number:	**0311-014-001**



Driller Information

Company:	Earth Dimensions
Driller:	Philip Bence
Helper:	Harold Kleever
Permit Number:	
Drill Rig Type:	Diedrich D50 on Marooka Carrier

Well Information

Land Surface Elevation:	TBD	fmsl (approximate)
Drilling Method:	Rotary	
Soil Sample Collection Method:	Continuos SS	
Drilling Fluid:	*Water*	
Fluid Loss During Drilling:	*0*	gallons (approximate)

Material of Well Construction

Casing:	Steel
Screen:	PVC
Sump:	PVC
Sand Pack:	00N Silica Sand
Annular Seal:	Cement/Bentonite

Well Development

Well Purpose:	Monitoring	
Technique(s):	PVC Bailer	
Date Completed:	05/16/16	
BM/TK Personnel:	CCB	
Total Volume Purge:	19	gallons
Static Water Level (SWL):	13	fbTOR
Pump Depth:	bottom of well	
Purge Duration:	89	minutes
Yield:		gpm
Specific Capacity:	0.00	gpm/ft

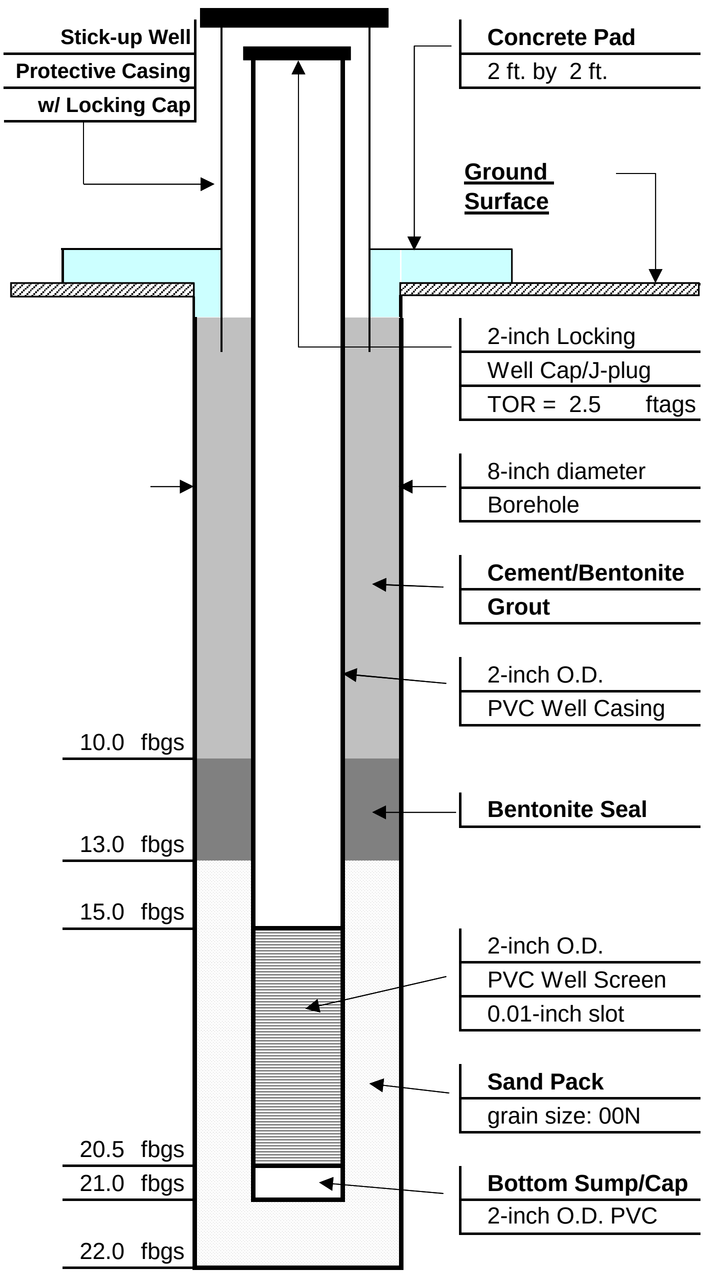
Comments:

			saturated thickness: SWL - stickup =	10.17	fbgs
Total Depth =	21.50	fbTOR	Total Depth - SWL =	8.83	feet
stick-up =	2.5	feet			
Total Depth =	19.00	fbgs			

PREPARED BY: Caroline Bukowski DATE: 05/10/16

STICK-UP MONITORING WELL COMPLETION DETAIL

Project Name:	**251 Homer Street Redevelopment Site**	WELL NUMBER:	**MW-8R**
Client:	**Benson Construction and Development, LLC**	Date Installed:	**05/11/16**
Boring Location:	**Olean, NY**	Project Number:	**0311-014-001**



Driller Information

Company:	Earth Dimensions
Driller:	Philip Bence
Helper:	Harold Kleever
Permit Number:	
Drill Rig Type:	Diedrich D50 on Marooka Carrier

Well Information

Land Surface Elevation:	TBD	fmsl (approximate)
Drilling Method:	Rotary	
Soil Sample Collection Method:	Continuos SS	
Drilling Fluid:	*Water*	
Fluid Loss During Drilling:	*0*	gallons (approximate)

Material of Well Construction

Casing:	Steel
Screen:	PVC
Sump:	PVC
Sand Pack:	00N Silica Sand
Annular Seal:	Cement/Bentonite

Well Development

Well Purpose:	Monitoring	
Technique(s):	PVC Bailer	
Date Completed:	05/13/16	
BM/TK Personnel:	CCB	
Total Volume Purge:	24	gallons
Static Water Level (SWL):	10	fbTOR
Pump Depth:	bottom of well	
Purge Duration:	118	minutes
Yield:		gpm
Specific Capacity:	0.00	gpm/ft

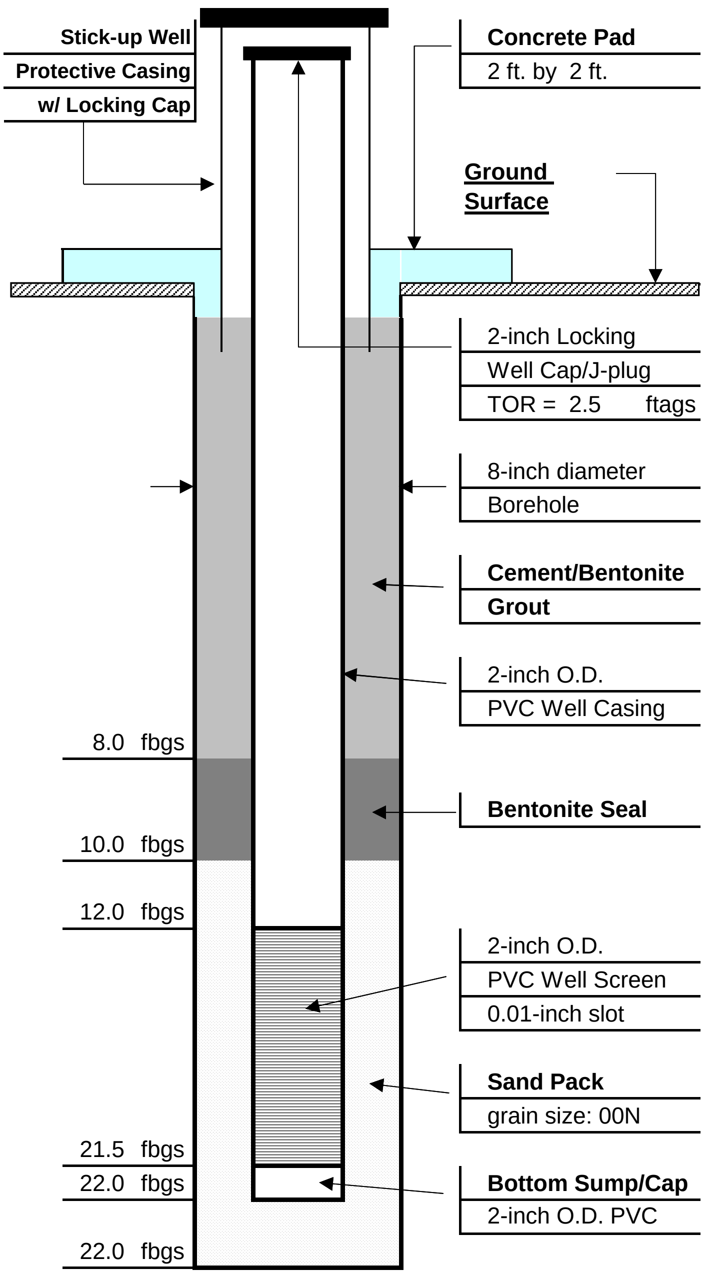
Comments:

			saturated thickness: SWL - stickup =	7.47	fbgs
Total Depth =	23.50	fbTOR	Total Depth - SWL =	13.53	feet
stick-up =	2.5	feet			
Total Depth =	21.00	fbgs			

PREPARED BY: Caroline Bukowski DATE: 05/12/16

STICK-UP MONITORING WELL COMPLETION DETAIL

Project Name:	**251 Homer Street Redevelopment Site**	WELL NUMBER:	**MW-12R**
Client:	**Benson Construction and Development, LLC**	Date Installed:	**5/10/2016 - 5/11/2016**
Boring Location:	**Olean, NY**	Project Number:	**0311-014-001**



Driller Information

Company:	Earth Dimensions
Driller:	Philip Bence
Helper:	Harold Kleever
Permit Number:	
Drill Rig Type:	Diedrich D50 on Marooka Carrier

Well Information

Land Surface Elevation:	TBD	fmsl (approximate)
Drilling Method:	Rotary	
Soil Sample Collection Method:	Continuos SS	
Drilling Fluid:	*Water*	
Fluid Loss During Drilling:	*0*	gallons (approximate)

Material of Well Construction

Casing:	Steel
Screen:	PVC
Sump:	PVC
Sand Pack:	00N Silica Sand
Annular Seal:	Cement/Bentonite

Well Development

Well Purpose:	Monitoring	
Technique(s):	PVC Bailer	
Date Completed:	05/16/16	
BM/TK Personnel:	CCB	
Total Volume Purge:	18	gallons
Static Water Level (SWL):	15	fbTOR
Pump Depth:	bottom of well	
Purge Duration:	66	minutes
Yield:		gpm
Specific Capacity:	0.00	gpm/ft

Comments:

			saturated thickness: SWL - stickup =	12.34	fbgs
Total Depth =	24.50	fbTOR	Total Depth - SWL =	9.66	feet
stick-up =	2.5	feet			
Total Depth =	22.00	fbgs			

PREPARED BY: Caroline Bukowski DATE: 05/11/16

APPENDIX E

LABORATORY ANALYTICAL DATA PACKAGES

2011 RI
2012 SUPPLEMENTAL RI
2015 TEST PIT SOIL SAMPLES
END POINT SOIL SAMPLES

(PROVIDED ELECTRONICALLY ON ENCLOSED CD)

APPENDIX F

GROUNDWATER DEVELOPMENT AND SAMPLING FIELD FORMS

TurnKey Environmental Restoration, LLC

EQUIPMENT CALIBRATION LOG

PROJECT INFORMATION:

Project Name: **251 Homer Street Site**
Project No.: 0225-001-100
Client: Benson Construction & Development LLC

Date: June 3, 2011

Instrument Source: [X] BM [ ] Rental

METER TYPE	UNITS	TIME	MAKE/MODEL	SERIAL NUMBER	CAL. BY	STANDARD	POST CAL. READING	SETTINGS
[X] pH meter	units	900	Myron L Company Ultra Meter 6P	606987 [X] 6212375 [ ]		4.00	4.03	
						7.00	6.98	
						10.01	10.01	
[X] Turbidity meter	NTU	900	Hach 2100P Turbidimeter	06120C020523 [ ] 07110C026405 [X]		< 0.4	0.24	
						20	19.9	
						100	98.5	
						800	789	
[X] Sp. Cond. meter	uS mS	900	Myron L Company Ultra Meter 6P	606987 [X] 6212375 [ ]		2764 mS @ 25 °C	2770	
[ ] PID	ppm		MinRAE 2000			open air zero		MIBK response factor = 1.0
						____ ppm Iso. Gas		
[X] Dissolved Oxygen	ppm	1400	HACH Model HQ30d			100% Satuartion	✓	
[ ] Particulate meter	mg/m^3					zero air		
[ ] Oxygen	%					open air		
[ ] Hydrogen sulfide	ppm					open air		
[ ] Carbon monoxide	ppm					open air		
[ ] LEL	%					open air		
[ ] Radiation Meter	uR/H					background area		
[ ]								

ADDITIONAL REMARKS:

PREPARED BY: TAB **DATE:** 6/3/11

TurnKey Environmental Restoration, LLC

WATER SAMPLE COLLECTION LOG

PROJECT INFORMATION

Project Name:	251 Homer Street Site
Project No.:	0025-001-100
Client:	Benson Construction & Development LLC
Location:	2510 Homer St

SAMPLE DESCRIPTION

I.D.: SW~~4~~ /

Matrix: ☑ SURFACE WATER ☐ STORM ☐ SEEP ☐ OTHER ☐ INFLUENT ☐ EFFLUENT

SAMPLE INFORMATION

Date Collected: 6/3/11

Time Collected: 1520

Sample Type: ☐ POINT ☐ GRAB ☐ COMPOSITE

Date Shipped to Lab:

Collected By: TAB

Sample Collection Method: ☐ DIRECT DIP ☐ SS / POLY. DIPPER ☐ PERISTALTIC PUMP ☐ POLY. DISP. BAILER ☐ ISCO SAMPLER ☐ OTHER

SAMPLING INFORMATION

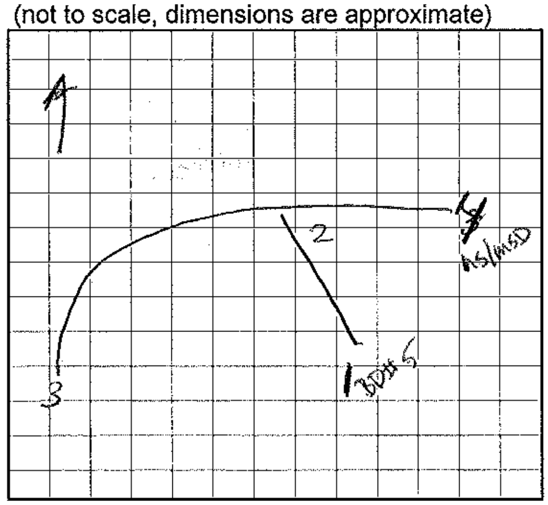
Weather: ~~68°F~~ Sunny 5-10 W

Air Temperature: 68°F

Parameter	First	Last	Units
pH	7.12	7.14	units
Temp.	26.5	25.5	°C
Cond.	348.0	347.3	mS
Turbidity	12.5	12.9	NTU
Eh / ORP	0	0	mV
D.O.	5.00	4.34	ppm
Odor	None	None	olfactory
Appearance	Clr	Clr	visual

LOCATION SKETCH

(not to scale, dimensions are approximate)



EXACT LOCATION (if applicable)

Northing (ft)	Easting (ft)	Surface Elevation (fmsl)

SAMPLE DESCRIPTION (appearance, olfactory):

SAMPLE ANALYSIS (depth, laboratory analysis required):

ADDITIONAL REMARKS: BD #5 TAKEN

PREPARED BY: TAB **DATE:** 6/3/11

TurnKey Environmental Restoration, LLC

WATER SAMPLE COLLECTION LOG

PROJECT INFORMATION

Project Name: 251 Homer Street Site
Project No.: 0025-001-100
Client: Benson Construction & Development LLC
Location: 2510 Homer St

SAMPLE DESCRIPTION

I.D.: **SW-2**

Matrix: ☑ SURFACE WATER ☐ STORM ☐ SEEP ☐ OTHER ☐ INFLUENT ☐ EFFLUENT

SAMPLE INFORMATION

Date Collected: 6/3/11
Time Collected: 1510
Date Shipped to Lab:
Collected By: AK

Sample Type: ☐ POINT ☒ GRAB ☐ COMPOSITE

Sample Collection Method: ☒ DIRECT DIP ☐ SS / POLY. DIPPER ☐ PERISTALTIC PUMP ☐ POLY. DISP. BAILER ☐ ISCO SAMPLER ☐ OTHER

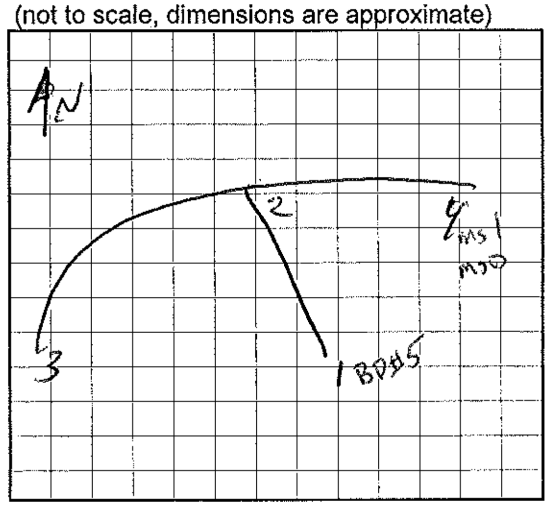
SAMPLING INFORMATION

Weather: Sunny 10-15 mph
Air Temperature: 68°F

Parameter	First	Last	Units
pH	7.64	7.82	units
Temp.	24.8	24.7	°C
Cond.	129.1	125.1	mS
Turbidity	7.37	5.89	NTU
Eh / ORP	0	-25	mV
D.O.	7.75	8.59	ppm
Odor	None	"	olfactory
Appearance	Clear	"	visual

LOCATION SKETCH

(not to scale, dimensions are approximate)



EXACT LOCATION (if applicable)

Northing (ft)	Easting (ft)	Surface Elevation (fmsl)

SAMPLE DESCRIPTION (appearance, olfactory):

SAMPLE ANALYSIS (depth, laboratory analysis required):

ADDITIONAL REMARKS:

PREPARED BY: TAB **DATE:** 6/3/11

WATER SAMPLE COLLECTION LOG

PROJECT INFORMATION

Project Name: 251 Homer Street Site

Project No.: 0025-001-100

Client: Benson Construction & Development LLC

Location: 2510 Homer St

SAMPLE DESCRIPTION

I.D.: ~~SW-1~~ SW-4

Matrix: ☑ SURFACE WATER ☐ STORM ☐ SEEP ☐ OTHER ☐ INFLUENT ☐ EFFLUENT

SAMPLE INFORMATION

Date Collected: 6/3/11

Time Collected: 1418

Date Shipped to Lab:

Collected By: TAB

Sample Type: ☐ POINT ☒ GRAB ☐ COMPOSITE

Sample Collection Method: ☒ DIRECT DIP ☐ SS / POLY. DIPPER ☐ PERISTALTIC PUMP ☐ POLY. DISP. BAILER ☐ ISCO SAMPLER ☐ OTHER

SAMPLING INFORMATION

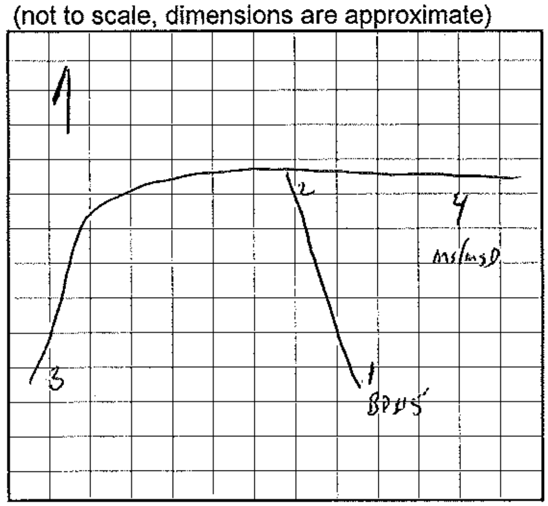
Weather: 5-10 w Bright sun

Air Temperature: 68°F

Parameter	First	Last	Units
pH	7.42	7.37	units
Temp.	23.1	23.0	°C
Cond.	130.8	127.1	mS
Turbidity	10.7	8.76	NTU
Eh / ORP	-107	-26	mV
D.O.	8.43	8.16	ppm
Odor	No	No	olfactory
Appearance	Clr	clr	visual

LOCATION SKETCH

(not to scale, dimensions are approximate)



EXACT LOCATION (if applicable)

Northing (ft)	Easting (ft)	Surface Elevation (fmsl)

SAMPLE DESCRIPTION (appearance, olfactory): clr No odor

SAMPLE ANALYSIS (depth, laboratory analysis required):

ADDITIONAL REMARKS: MS/MSD TAKEN

PREPARED BY: TAB **DATE:** 6/3/11

WATER SAMPLE COLLECTION LOG

TurnKey Environmental Restoration, LLC

PROJECT INFORMATION

Project Name: 251 Homer Street Site

Project No.: 0025-001-100

Client: Benson Construction & Development LLC

Location: 2510 Homer St

SAMPLE DESCRIPTION

I.D.: **SW-3**

Matrix: ☑ SURFACE WATER ☐ STORM ☐ SEEP ☐ OTHER ☐ INFLUENT ☐ EFFLUENT

SAMPLE INFORMATION

Date Collected: 6/3/11

Sample Type: ☒ POINT ☐ GRAB ☐ COMPOSITE

Time Collected: 1600

Date Shipped to Lab:

Collected By: TAB

Sample Collection Method: ☒ DIRECT DIP ☐ SS / POLY. DIPPER ☐ PERISTALTIC PUMP ☐ POLY. DISP. BAILER ☐ ISCO SAMPLER ☐ OTHER

SAMPLING INFORMATION

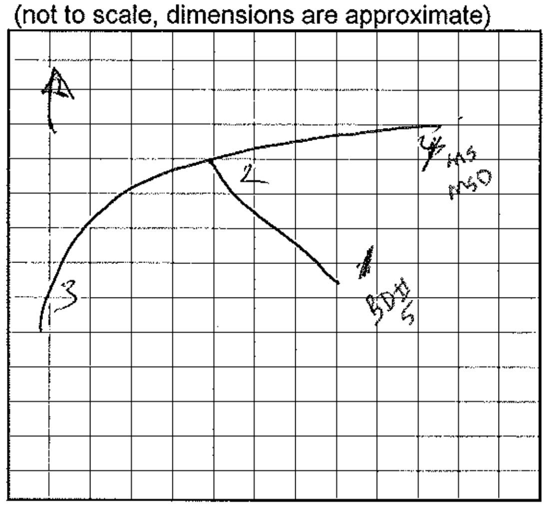
Weather: Sun. 5-10 mph W

Air Temperature: 66°F

Parameter	First	Last	Units
pH	7.42	7.33	units
Temp.	23.1	22.3	°C
Cond.	158.7	184.3	mS
Turbidity	8.1	11.4	NTU
Eh / ORP	2	3	mV
D.O.	6.83	6.62	ppm
Odor	NoNE	"	olfactory
Appearance	Clear	"	visual

LOCATION SKETCH

(not to scale, dimensions are approximate)



EXACT LOCATION (if applicable)

Northing (ft)	Easting (ft)	Surface Elevation (fmsl)

SAMPLE DESCRIPTION (appearance, olfactory):

SAMPLE ANALYSIS (depth, laboratory analysis required):

ADDITIONAL REMARKS:

PREPARED BY: TAB

DATE: 6/3/11

TurnKey Environmental Restoration, LLC

EQUIPMENT CALIBRATION LOG

PROJECT INFORMATION:

Project Name: **251 Homer Street Site**

Project No.: 0225-001-100

Client: Benson Construction & Development LLC

Date: June 2, 2011

Instrument Source: [X] BM [ ] Rental

METER TYPE	UNITS	TIME	MAKE/MODEL	SERIAL NUMBER	CAL. BY	STANDARD	POST CAL. READING	SETTINGS
[X] pH meter	units	900	Myron L Company Ultra Meter 6P	606987 [X] 6212375 [ ]	TAB	4.00 7.00 10.01	4.00 6.99 9.96	
[X] Turbidity meter	NTU	900	Hach 2100P Turbidimeter	06120C020523 [ ] 07110C026405 [X]	TAB	< 0.4 20 100 800	0.18 20.3 99.3 800.0	
[X] Sp. Cond. meter	uS mS	900	Myron L Company Ultra Meter 6P	606987 [X] 6212375 [ ]	TAB	1413 mS @ 25 °C	1413	
[ ] PID	ppm		MinRAE 2000			open air zero _____ ppm Iso. Gas		MIBK response factor = 1.0
[X] Dissolved Oxygen	ppm	~~900~~	HACH Model HQ30d			100% Satuartion		
[ ] Particulate meter	mg/m^3					zero air		
[ ] Oxygen	%					open air		
[ ] Hydrogen sulfide	ppm					open air		
[ ] Carbon monoxide	ppm					open air		
[ ] LEL	%					open air		
[ ] Radiation Meter	uR/H					background area		
[ ]								

ADDITIONAL REMARKS:

PREPARED BY: TAB **DATE:** 6/2/11

TurnKey Environmental Restoration, LLC

EQUIPMENT CALIBRATION LOG

PROJECT INFORMATION:

Project Name: **251 Homer Street Site**
Project No.: 0225-001-100
Client: Benson Construction & Development LLC

Date: June 3, 2011

Instrument Source: [X] BM [ ] Rental

METER TYPE	UNITS	TIME	MAKE/MODEL	SERIAL NUMBER	CAL. BY	STANDARD	POST CAL. READING	SETTINGS
[X] pH meter	units	900	Myron L Company Ultra Meter 6P	606987 [X] 6212375 [ ]		4.00	4.03	
						7.00	6.98	
						10.01	10.01	
[X] Turbidity meter	NTU	900	Hach 2100P Turbidimeter	06120C020523 [ ] 07110C026405 [X]		< 0.4	0.24	
						20	19.9	
						100	98.5	
						800	789	
[X] Sp. Cond. meter	uS mS	900	Myron L Company Ultra Meter 6P	606987 [X] 6212375 [ ]		2764 mS @ 25 °C	2770	
[ ] PID	ppm		MinRAE 2000			open air zero		MIBK response factor = 1.0
						______ ppm Iso. Gas		
[X] Dissolved Oxygen	ppm	1400	HACH Model HQ30d			100% Satuartion	✓	
[ ] Particulate meter	mg/m^3					zero air		
[ ] Oxygen	%					open air		
[ ] Hydrogen sulfide	ppm					open air		
[ ] Carbon monoxide	ppm					open air		
[ ] LEL	%					open air		
[ ] Radiation Meter	uR/H					background area		
[ ]								

ADDITIONAL REMARKS:

PREPARED BY: TAB **DATE:** 6/3/11

TurnKey Environmental Restoration, LLC

GROUNDWATER FIELD FORM

Project Name: Benson Construction & Development LLC   Date: June 2, 2011

Location: 251 Homer Street   Project No.: 0225-001-100   Field Team: TAB / AK

Well No. MW-1	Diameter (inches): 2"	Sample Date / Time: —
Product Depth (fbTOR): —	Water Column (ft): 14.50	DTW when sampled: —
DTW (static) (fbTOR): 9.30	One Well Volume (gal): 2.36	Purpose: ☑ Development ☐ Sample ☐ Purge & Sample
Total Depth (fbTOR): 23.80	Total Volume Purged (gal): 13.5	Purge Method: Bailer

Time		Water Level (fbTOR)	Acc. Volume (gallons)	pH (units)	Temp. (deg. C)	SC (uS)	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Appearance & Odor
1126	0	Initial	—	5.77	13.3	908.5	502	—	-24	Turbid, sl. petro
1133	1	9.66	2.25	6.37	13.2	897.6	>1000	—	-104	Turbid sl. petro
11[illegible]	2	9.60	4.5	6.47	11.3	897.1	>1000	—	-112	" "
1147	3	9.68	6.75	6.61	11.5	910.5	>1000	—	-120	" "
1151	4	9.65	9.0	6.56	11.5	906.0	>1000	—	-114	" "
1154	5	9.58	11.25	6.59	11.4	908.8	>1000	—	-107	" "
1157	6	9.56	13.50	6.57	11.1	913.5	>100		-106	" "
	7									
	8									
	9									
	10									

Sample Information:

	S1									
	S2									

Well No. MW-2	Diameter (inches): 2"	Sample Date / Time: —
Product Depth (fbTOR): —	Water Column (ft): 12.26	DTW when sampled: —
DTW (static) (fbTOR): 6.61	One Well Volume (gal): 1.99	Purpose: ☑ Development ☐ Sample ☐ Purge & Sample
Total Depth (fbTOR): 18.87	Total Volume Purged (gal): 14.0	Purge Method: Bailer

Time		Water Level (fbTOR)	Acc. Volume (gallons)	pH (units)	Temp. (deg. C)	SC (uS)	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Appearance & Odor
1221	0	Initial	—	6.92	12.0	980.6	>1,000	—	-128	Turbid, ~~sl. Petro~~
1225	1	7.66	2.00	6.76	11.8	917.2	>1,000	—	-103	" , "
1231	2	8.00	4.0	6.62	12.6	877.5	>1000	—	-92	"
1236	3	7.22	6.0	6.69	12.7	844.2	>1000	—	-87	"
1242	4	7.41	8.0	6.66	11.8	827.1	>1000	—	-80	"
1248	5	7.46	10.0	6.59	12.6	787.3	>1000	—	-72	"
1254	6	7.38	12.0	6.62	12.9	780.4	>1000	—	-66	"
125[illegible]	7	7.43	14.0	6.60	12.6	787.5	>1000	—	-62	"
	8									
	9									
	10									

Sample Information:

	S1									
	S2									

REMARKS:

Note: All measurements are in feet, distance from top of riser.

Volume Calculation

Diam.	Vol. (g/ft)
1"	0.041
2"	0.163
4"	0.653
6"	1.469

Stabilization Criteria

Parameter	Criteria
pH	± 0.1 unit
SC	± 3%
Turbidity	± 10%
DO	± 0.3 mg/L
ORP	± 10 mV

PREPARED BY: TAB

TurnKey Environmental Restoration, LLC

GROUNDWATER FIELD FORM

Project Name: Benson Construction & Development LLC — Date: June 2, 2011

Location: 251 Homer Street — Project No.: 0225-001-100 — Field Team:

Well No. MW-3	Diameter (inches): 2	Sample Date / Time: June 3, 2011
Product Depth (fbTOR): —	Water Column (ft): ~~[illegible]~~ 11.25	DTW when sampled:
DTW (static) (fbTOR): ~~[illegible]~~ 8.74	One Well Volume (gal): [illegible]	Purpose: ☑ Development ☐ Sample ☐ Purge & Sample
Total Depth (fbTOR): ~~[illegible]~~ 19.99	Total Volume Purged (gal): 1.83	Purge Method:

Time		Water Level (fbTOR)	Acc. Volume (gallons)	pH (units)	Temp. (deg. C)	SC (uS)	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Appearance & Odor
1130	0	Initial	—	7.03	16.2	522.2	366	—	-102	clr, petro turbid
1132	1	~~1.75~~ 8.91	1.75	6.81	12.9	518.7	>1000	—	-104	sheen product, petro
1137	2	9.0	3.5	6.73	11.9	521.3	>1000	—	-106	"
1140	3	9.10	5.25	6.67	11.6	517.3	>1000	—	-108	" No product blebs
1146	4	9.10	7.0	6.69	12.3	517.4	>1000	—	-110	"
1153	5	9.30	8.75	6.78	12.9	517.2	>1000	—	-112	"
1158	6	9.00	10.50	6.76	12.1	511.4	>1000	—	-107	"
	7									
	8									
	9									
	10									

Sample Information:

	S1									
	S2									

Well No. MW-4	Diameter (inches): 2	Sample Date / Time: June 2
Product Depth (fbTOR): —	Water Column (ft): 12.65	DTW when sampled:
DTW (static) (fbTOR): 11.93	One Well Volume (gal): 2.06	Purpose: ☑ Development ☐ Sample ☐ Purge & Sample
Total Depth (fbTOR): 24.58	Total Volume Purged (gal):	Purge Method:

Time		Water Level (fbTOR)	Acc. Volume (gallons)	pH (units)	Temp. (deg. C)	SC (uS)	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Appearance & Odor
1446	0	Initial	—	8.06	13.3	2073	706	—	-179	~~[illegible]~~ Low odor (petro)
1449	1	12.32	2.00	7.44	11.1	1645	—	—	-148	Turbid "
1456	2	12.35	4.00	6.85	11.7	1090	—	—	-135	" "
1501	3	12.36	6.00	6.77	11.7	1054	—	—	-128	" "
1505	4	12.36	8.00	6.66	11.6	950.3	—	—	-119	" "
1511	5	12.33	10.00	6.67	11.9	935.3	—	—	-119	" "
1516	6	12.28	12.00	6.68	11.3	928.3	—	—	-115	" No odor
	7									
	8									
	9									
	10									

Sample Information:

	S1									
	S2									

REMARKS:

Note: All measurements are in feet, distance from top of riser.

Volume Calculation

Diam.	Vol. (g/ft)
1"	0.041
2"	0.163
4"	0.653
6"	1.469

Stabilization Criteria

Parameter	Criteria
pH	± 0.1 unit
SC	± 3%
Turbidity	± 10%
DO	± 0.3 mg/L
ORP	± 10 mV

PREPARED BY:

GROUNDWATER FIELD FORM

TurnKey Environmental Restoration, LLC

Project Name: Benson Construction & Development LLC   Date: 6/3/11
Location: 251 Homer Street   Project No.: 0225-001-100   Field Team: TAD/AL

Well No. 13.49 MW-5			Diameter (inches): 2			Sample Date / Time: –			
Product Depth (fbTOR): ~~[illegible]~~			Water Column (ft): 10.88			DTW when sampled: –			
DTW (static) (fbTOR): 13.51			One Well Volume (gal): 1.77			Purpose: ☑ Development ☐ Sample ☐ Purge & Sample			
Total Depth (fbTOR): 24.39			Total Volume Purged (gal):			Purge Method: Bailer			
Time	**Water Level (fbTOR)**	**Acc. Volume (gallons)**	**pH (units)**	**Temp. (deg. C)**	**SC (uS)**	**Turbidity (NTU)**	**DO (mg/L)**	**ORP (mV)**	**Appearance & Odor**
1245	0 Initial	–	6.52	17.9	1432	152	–	-61	Sl. Turbid + product + sheen petro odor
1256	1 14.77/14.79	1.75	6.57	15.3	1496	>1000	–	-108	Turbid
1257	2 13.66	3.50	6.70	13.1	1506	>1000	–	-136	"
1304	3 13.66	5.25	6.80	14.9	1474	>1000	–	-100	"
1312	4 13.59	7.0	6.63	12.1	1486	>1000	–	-113	"
1319	5 13.55	8.75	6.71	12.2	1484	>1000	–	-127	"
1324	6 13.66	10.50	6.68	12.1	1466	>1000	–	-123	"
1331	7 13.55	12.25	6.69	11.2	1469	>1000	–	-124	"
	8								
	9								
	10								
Sample Information:									
	S1								
	S2								

Pour Water

Well No. MW-6			Diameter (inches): 2			Sample Date / Time: June 3, 2011			
Product Depth (fbTOR): —			Water Column (ft): ~~[illegible]~~ 14.28			DTW when sampled:			
DTW (static) (fbTOR): ~~[illegible]~~ 9.10			One Well Volume (gal): ~~[illegible]~~ 2.32			Purpose: ☑ Development ☐ Sample ☐ Purge & Sample			
Total Depth (fbTOR): ~~[illegible]~~ 23.38			Total Volume Purged (gal):			Purge Method:			
Time	**Water Level (fbTOR)**	**Acc. Volume (gallons)**	**pH (units)**	**Temp. (deg. C)**	**SC (uS)**	**Turbidity (NTU)**	**DO (mg/L)**	**ORP (mV)**	**Appearance & Odor**
1022	0 Initial	–	6.83	12.9	1885	105	—	-71	clear, Sl petrol odor
1026	1 10.06	2.25	6.99	11.6	1840	>1,000	—	-108	Turbid, "
1030	2 10.04	4.50	7.01	11.7	1837	>1,000	—	-119	Turbid "
1036	3 10.06	6.75	7.07	13.1	1857	>1,000	—	-135	Turbid w/ slight sheen "
1040	4 9.87	~~[illegible]~~ 9.00	7.08	11.5	1849	>1,000	—	-133	" "
1046	5 9.85	11.25	7.13	11.1	1848	>1,000	—	-140	" No sheen "
1050	6 10.02	13.50	7.06	11.8	1861	>1,000	—	-138	" "
	7								
	8								
	9								
	10								
Sample Information:									
	S1								
	S2								

REMARKS:

Note: All measurements are in feet, distance from top of riser.

Volume Calculation

Diam.	Vol. (g/ft)
1"	0.041
2"	0.163
4"	0.653
6"	1.469

Stabilization Criteria

Parameter	Criteria
pH	± 0.1 unit
SC	± 3%
Turbidity	± 10%
DO	± 0.3 mg/L
ORP	± 10 mV

PREPARED BY: TAD

TurnKey Environmental Restoration, LLC

GROUNDWATER FIELD FORM

Project Name: Benson Construction & Development LLC　　Date: June 2, 2011

Location: 251 Homer Street　　Project No.: 0225-001-100　　Field Team:

Well No. MW-7	Diameter (inches): 2	Sample Date / Time: June 3,
Product Depth (fbTOR): —	Water Column (ft): ~~12.08~~ 11.95	DTW when sampled:
DTW (static) (fbTOR): ~~6.55~~ 6.68	One Well Volume (gal): ~~1.97~~ 1.94	Purpose: ☑ Development ☐ Sample ☐ Purge & Sample
Total Depth (fbTOR): 18.63	Total Volume Purged (gal):	Purge Method:

Time		Water Level (fbTOR)	Acc. Volume (gallons)	pH (units)	Temp. (deg. C)	SC (uS)	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Appearance & Odor
945	0	Initial	—	~~7~~ 6.91	13.2	1136	16.4	—	-74	clear, sl Petrol smell
948	1	7.61	2.00	6.51	12.3	1145	>1,000	—	-83	Turbid, "
952	2	8.91	4.00	6.50	11.2	1150	>1,000	—	-83	" "
955	3	7.70	6.00	6.52	11.3	1149	>1,000	—	-84	" "
959	4	8.65	8.00	6.57	11.7	1150	>1,000	—	-85	" "
1002	5	8.04	10.00	6.56	11.3	1148	>1,000	—	-82	" No odor
1006	6	8.04	12.00	6.56	11.1	1154	>1,000	—	-83	" "
	7									
	8									
	9									
	10									
Sample Information:										
	S1									
	S2									

Well No. MW-8	Diameter (inches): 2	Sample Date / Time:
Product Depth (fbTOR):	Water Column (ft): 13.82	DTW when sampled:
DTW (static) (fbTOR): 9.22	One Well Volume (gal): 2.25	Purpose: ☑ Development ☐ Sample ☐ Purge & Sample
Total Depth (fbTOR): 23.04	Total Volume Purged (gal):	Purge Method:

Time		Water Level (fbTOR)	Acc. Volume (gallons)	pH (units)	Temp. (deg. C)	SC (uS)	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Appearance & Odor
1336	0	Initial	2.25	6.51	15.2	2206	164	—	-70	Clear, LT Petrol odor
1339	1	16.27	4.50	6.35	13.6	2050	>1,000	—	-65	Turbid "
1344	2	18.39	6.75	6.29	12.8	2197	>1,000	—	-63	" "
1348	3	19.80	9.00	6.34	13.1	1949	>1,000	—	-62	" "
1352	4	20.14	11.25	6.42	13.1	1963	>1,000	—	-63	" "
1407	5	18.05	13.50	6.35	13.7	2020	>1,000	—	-54	" "
1412	6	21.36	15.75	6.39	13.1	1864	>1,000	—	-56	" "
1419	7	20.32	18.00	6.47	12.5	1685	>1,000	—	-58	" "
1425	8	19.13	20.25	6.45	13.0	1845	"	—	-58	" No odor
	9									
	10									
Sample Information:										
	S1									
	S2									

REMARKS:

Note: All measurements are in feet, distance from top of riser.

Volume Calculation

Diam.	Vol. (g/ft)
1"	0.041
2"	0.163
4"	0.653
6"	1.469

Stabilization Criteria

Parameter	Criteria
pH	± 0.1 unit
SC	± 3%
Turbidity	± 10%
DO	± 0.3 mg/L
ORP	± 10 mV

PREPARED BY:

TurnKey Environmental Restoration, LLC

EQUIPMENT CALIBRATION LOG

PROJECT INFORMATION:

Project Name: **251 Homer Street Site**
Project No.: 0225-001-100
Client: Benson Construction & Development LLC

Date: June 6, 2011

Instrument Source: [X] BM [ ] Rental

	METER TYPE	UNITS	TIME	MAKE/MODEL	SERIAL NUMBER	CAL. BY	STANDARD	POST CAL. READING	SETTINGS
[X]	pH meter	units	9:30	Myron L Company Ultra Meter 6P	606987 [X] 6212375 [ ]	TAB	4.00	4.02	4.00
							7.00	7.02	7.00
							10.01	9.98	10.01
[X]	Turbidity meter	NTU	9:30	Hach 2100P Turbidimeter	06120C020523 [ ] 07110C026405 [X]	TAB	< 0.4	0.26	0.1
							20	21.3	20
							100	98.7	100
							800	799	800
[X]	Sp. Cond. meter	uS mS	9:30	Myron L Company Ultra Meter 6P	606987 [X] 6212375 [ ]	TAB	1413 mS @ 25 °C	1415	
[ ]	PID	ppm		MinRAE 2000			open air zero		MIBK response factor = 1.0
							_____ ppm Iso. Gas		
[X]	Dissolved Oxygen	ppm	9:30	HACH Model HQ30d			100% Satuartion	✓	
[ ]	Particulate meter	mg/m^3					zero air		
[ ]	Oxygen	%					open air		
[ ]	Hydrogen sulfide	ppm					open air		
[ ]	Carbon monoxide	ppm					open air		
[ ]	LEL	%					open air		
[ ]	Radiation Meter	uR/H					background area		
[ ]									

ADDITIONAL REMARKS:

PREPARED BY: AK TAB **DATE:** 6/6/11

TurnKey Environmental Restoration, LLC

EQUIPMENT CALIBRATION LOG

PROJECT INFORMATION:

Project Name: **251 Homer Street Site**

Project No.: 0225-001-100

Client: Benson Construction & Development LLC

Date: June 7, 2011

Instrument Source: [X] BM [ ] Rental

METER TYPE	UNITS	TIME	MAKE/MODEL	SERIAL NUMBER	CAL. BY	STANDARD	POST CAL. READING	SETTINGS
[X] pH meter	units	930	Myron L Company Ultra Meter 6P	606987 [X] 6212375 [ ]	TAB	4.00	3.95	4.0
						7.00	7.05	7.0
						10.01	10.03	10.0
[X] Turbidity meter	NTU	930	Hach 2100P Turbidimeter	06120C020523 [ ] 07110C026405 [X]	TAB	< 0.4	0.28	0.1
						20	20.0	20
						100	99	100
						800	~~[illegible]~~ 812	800
[X] Sp. Cond. meter	uS mS	930	Myron L Company Ultra Meter 6P	606987 [X] 6212375 [ ]	TAB	2764 mS @ 25 °C	2764	
[ ] PID	ppm		MinRAE 2000			open air zero _____ ppm Iso. Gas		MIBK response factor = 1.0
[X] Dissolved Oxygen	ppm	930	HACH Model HQ30d			100% Satuartion	✓	
[ ] Particulate meter	mg/m^3					zero air		
[ ] Oxygen	%					open air		
[ ] Hydrogen sulfide	ppm					open air		
[ ] Carbon monoxide	ppm					open air		
[ ] LEL	%					open air		
[ ] Radiation Meter	uR/H					background area		
[ ]								

ADDITIONAL REMARKS:

PREPARED BY: TAB AK **DATE:** 6/7/11

TurnKey Environmental Restoration, LLC

GROUNDWATER FIELD FORM

Project Name: Benson Construction & Development LLC | Date: 6/6/11

Location: 251 Homer Street | Project No.: 0225-001-100 | Field Team: TAB/AK

Well No. MW-1		Diameter (inches): 2"	Sample Date / Time: 6/6/11
Product Depth (fbTOR):		Water Column (ft): 13.1	DTW when sampled: 9.95
DTW (static) (fbTOR): 9.88		One Well Volume (gal): 2.13	Purpose: ☐ Development ☐ Sample ☑ Purge & Sample
Total Depth (fbTOR): 22.98		Total Volume Purged (gal):	Purge Method: Mini-Typhoon

Time	Water Level (fbTOR)	Acc. Volume (gallons)	pH (units)	Temp. (deg. C)	SC (uS)	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Appearance & Odor
1430	0 Initial	0	6.53	17.0	860.9	>1,000	0.73	-68	Turbid No odor
1434	1 9.95	1.0	6.59	15.2	859.1	>1,000	1.13	-79	" "
1438	2 9.94	1.75	6.57	14.9	866.2	>1,000	1.05	-83	" St petro
1439	3 9.94	2.75	6.58	13.7	868.4	>1,000	1.18	-82	" "
1441	4 9.95	3.25	6.57	13.4	866.1	>1,000	1.29	-81	" "
1444	5 9.95	3.5	6.61	13.2	865.5	>1,000	1.29	-79	" "
~~1504~~	6 ~~9.95~~	~~3.95~~							
	7								
	8								
	9								
	10								
Sample Information:									
1445	S1 9.95	3.75	6.58	13.8	868.4	>1,000	1.20	-80	" "
1504	S2 9.95	5.00	6.69	16.7	835.9	241	1.23	-83	" "

Well No. MW-2		Diameter (inches): 2"	Sample Date / Time: June 6, 2011
Product Depth (fbTOR):		Water Column (ft): 11.69	DTW when sampled: 7.40
DTW (static) (fbTOR): 7.19		One Well Volume (gal): 1.90	Purpose: ☐ Development ☐ Sample ☑ Purge & Sample
Total Depth (fbTOR): 18.88		Total Volume Purged (gal):	Purge Method: Mini-Typhoon

Time	Water Level (fbTOR)	Acc. Volume (gallons)	pH (units)	Temp. (deg. C)	SC (uS)	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Appearance & Odor
1036	0 Initial	0.25	7.28	14.7	667.2	>1000	1.45	-25	Brown wet No odor
1038	1 7.41	1.0	6.68	12.6	509.0	>1000	1.22	-30	" "
1041	2	1.5	6.42	13.6	539.2	>1,000	1.31	-21	" "
1047	3	2.0	6.33	13.7	583.0	>1,000	~~1.88~~ 1.63	-24	" "
1050	4 7.46	2.3	6.34	13.3	599.1	>1,000	1.26	-28	" "
1054	5 7.36	2.5	6.37	13.8	619.5	903	1.89	-29	" "
1057	6 7.36	2.7	6.42	14.5	631.0	840	1.60	-35	" "
1101	7 7.40	3.0	6.47	13.5	629.3	696	1.54	-37	" "
	8								
	9								
	10								
Sample Information:									
1104	S1 7.40	~~3.03~~ 3.2	6.54	14.2	655.5	558	2.19	-40	" "
1120	S2 7.53	4.0	6.84	14.8	679.6	164	1.65	-30	" "

REMARKS: Blind Dup #6 MW-1

Note: All measurements are in feet, distance from top of riser.

Volume Calculation

Diam.	Vol. (g/ft)
1"	0.041
2"	0.163
4"	0.653
6"	1.469

Stabilization Criteria

Parameter	Criteria
pH	± 0.1 unit
SC	± 3%
Turbidity	± 10%
DO	± 0.3 mg/L
ORP	± 10 mV

PREPARED BY: TAB

TurnKey Environmental Restoration, LLC

GROUNDWATER FIELD FORM

Project Name: Benson Construction & Development LLC | Date: 6/6/11
Location: 251 Homer Street | Project No.: 0225-001-100 | Field Team: DAB AK

Well No.	MW-4	Diameter (inches):	2"	Sample Date / Time:	June 6, 2011
Product Depth (fbTOR):		Water Column (ft):	12.13	DTW when sampled:	12.61
DTW (static) (fbTOR):	12.46	One Well Volume (gal):	1.98	Purpose:	☐ Development ☐ Sample ☑ Purge & Sample
Total Depth (fbTOR):	24.59	Total Volume Purged (gal):		Purge Method:	Mini-Typhoon

Time		Water Level (fbTOR)	Acc. Volume (gallons)	pH (units)	Temp. (deg. C)	SC (uS)	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Appearance & Odor
1200	0	Initial	0.0	6.82	18.3	961.2	>1000	0.67	-40	Brown, no odor
1205	1	12.63	1.0	6.65	16.9	918.0	>1000	0.69	-83	" "
1210	2	12.59	1.5	6.67	15.3	895.6	>1,000	0.91	-88	" "
1214	3	12.58	2.0	6.69	15.1	895.5	>1,000	1.01	-89	" "
1218	4	12.63	2.5	6.67	14.1	882.6	>1,000	0.93	-89	" sl petrol
1222	5	12.61	4.0	6.70	13.8	873.6	1,000	0.72	-88	" "
	6									
	7									
	8									
	9									
	10									
Sample Information:										
1225	S1	12.61	4.5	6.68	13.8	869.3	1000	0.85	-88	"
1253	S2	12.66	5.25	6.72	20.2	856.1	12.3	0.81	-68	"

Well No.	MW-3	Diameter (inches):	2"	Sample Date / Time:	1252 6/7/11
Product Depth (fbTOR):		Water Column (ft):	10.55	DTW when sampled:	9.58
DTW (static) (fbTOR):	9.47	One Well Volume (gal):	1.72	Purpose:	☐ Development ☐ Sample ☑ Purge & Sample
Total Depth (fbTOR):	~~[illegible]~~ 20.02	Total Volume Purged (gal):		Purge Method:	Mini Typhoon

Time		Water Level (fbTOR)	Acc. Volume (gallons)	pH (units)	Temp. (deg. C)	SC (uS)	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Appearance & Odor
12.38	0	Initial	0.00	7.08	16.6	548.9	55.2	1.21	-37	Clear No odor
1240	1	9.55	0.25	6.72	13.3	538.1	16.8	0.88	-55	" "
1242	2	9.56	0.50	6.61	13.3	538.7	8.5	0.86	-56	" "
1243	3	9.59	1.0	6.58	12.3	537.8	7.35	0.97	-54	" "
1245	4	9.58	1.5	6.54	12.6	535.9	6.45	1.09	-65	" "
1248	5	9.58	2.0	6.52	12.9	536.4	5.94	0.97	-68	" "
1249	6	9.58	2.5	6.54	13.6	544.3	5.10	1.26	-69	" "
	7									
	8									
	9									
	10									
Sample Information:										
1252	S1	9.58	3.0	6.57	13.0	540.5	4.65	1.08	-72	" "
1259	S2	9.63	3.5	6.67	13.9	535.4	5.37	1.14	-74	" "

REMARKS: MW-4 MS/MSD taken

Note: All measurements are in feet, distance from top of riser.

Volume Calculation

Diam.	Vol. (g/ft)
1"	0.041
2"	0.163
4"	0.653
6"	1.469

Stabilization Criteria

Parameter	Criteria
pH	± 0.1 unit
SC	± 3%
Turbidity	± 10%
DO	± 0.3 mg/L
ORP	± 10 mV

PREPARED BY: TAB

GROUNDWATER FIELD FORM

Project Name: Benson Construction & Development LLC — Date: 6/7/11
Location: 251 Homer Street — Project No.: 0225-001-100 — Field Team: TAB/AK

Well No. MW-5			Diameter (inches): 2"			Sample Date / Time: June 7, 2011			
Product Depth (fbTOR):			Water Column (ft): 10.39			DTW when sampled: 14.07			
DTW (static) (fbTOR): 14.03			One Well Volume (gal): 1.69			Purpose: ☐ Development ☐ Sample ☑ Purge & Sample			
Total Depth (fbTOR): 24.42			Total Volume Purged (gal):			Purge Method: Mini - Typhoon			
Time	Water Level (fbTOR)	Acc. Volume (gallons)	pH (units)	Temp. (deg. C)	SC (uS)	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Appearance & Odor
1331	0 Initial	0.0	6.26	16.7	1544	333	1.23	533	Clear sb petrol odor
1333	1 14.16	0.5	6.37	12.9	1618	205	1.07	-40	" "
1335	2 14.16	2.0	6.33	13.4	1609	59.5	1.16	-66	" "
1337	3 14.04	2.5	6.35	15.0	1611	26.3	1.15	-79	" "
1340	4 14.04	3.0	6.47	14.2	1623	15.7	1.30	-85	" "
1344	5 14.06	3.5	6.46	14.6	1616	15.1	1.44	-81	" "
1346	6 14.07	4.0	6.46	12.5	1621	22.6	0.99	-93	
	7								
	8								
	9								
	10								
Sample Information:									
1351	S1 1407	4.5	6.40	13.5	1604	12.8	1.00	-97	" "
1358	S2 1412	4.75	6.51	14.7	1603	9.18	0.83	-105	" Strong Petrol

Well No. MW-6			Diameter (inches): 2"			Sample Date / Time: June 7, 2011			
Product Depth (fbTOR):			Water Column (ft): 14.03			DTW when sampled: 9.76			
DTW (static) (fbTOR): 9.20			One Well Volume (gal): 2.29			Purpose: ☐ Development ☐ Sample ☑ Purge & Sample			
Total Depth (fbTOR): 23.23			Total Volume Purged (gal):			Purge Method: Mini - Typhoon			
Time	Water Level (fbTOR)	Acc. Volume (gallons)	pH (units)	Temp. (deg. C)	SC (uS)	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Appearance & Odor
1123	0 Initial	0.00	6.38	13.3	1919	>1,000	6.34	0	turbid, petrol odor
1125	1 9.51	0.25	6.64	11.5	1934	>1,000	1.22	-36	" "
1128	2 9.53	0.50	6.67	10.6	1960	>1,000	2.17	-49	" "
1130	3 9.55	0.75	6.69	10.7	1948	1,000	1.05	-57	" "
1133	4 9.55	1.50	6.70	10.4	1956	870	1.20	-66	" "
1136	5 9.55	2.0	6.72	11.0	1960	690	1.14	-71	" "
1137	6 9.51	2.5	6.75	11.2	1958	372	1.07	-75	" "
	7								
	8								
	9								
	10								
Sample Information:									
1140	S1 9.46	3.0	6.78	12.8	1959	555	1.53	-81	" "
1154	S2 9.55	3.4	6.92	13.6	1932	205	1.38	-86	" "

REMARKS: MW-5 Slight sheen seen in the bucket

Note: All measurements are in feet, distance from top of riser.

Volume Calculation

Diam.	Vol. (g/ft)
1"	0.041
2"	0.163
4"	0.653
6"	1.469

Stabilization Criteria

Parameter	Criteria
pH	± 0.1 unit
SC	± 3%
Turbidity	± 10%
DO	± 0.3 mg/L
ORP	± 10 mV

PREPARED BY: TAB

TurnKey Environmental Restoration, LLC

GROUNDWATER FIELD FORM

Project Name:	Benson Construction & Development LLC	Date:	6/6/11
Location: 251 Homer Street	Project No.: 0225-001-100	Field Team:	TAB/AK

Well No. MW-7		Diameter (inches): 2"		Sample Date / Time: 6/7/2011
Product Depth (fbTOR):		Water Column (ft): 11.82		DTW when sampled: 7.31
DTW (static) (fbTOR): 6.81		One Well Volume (gal): 1.93		Purpose: ☐ Development ☐ Sample ☑ Purge & Sample
Total Depth (fbTOR): 18.63		Total Volume Purged (gal):		Purge Method: Mini-Typhoon

Time		Water Level (fbTOR)	Acc. Volume (gallons)	pH (units)	Temp. (deg. C)	SC (uS)	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Appearance & Odor
1030	0	Initial	0	5.34	12.9	1139	>1000	1.99	118	cloudy no odor
1035	1	7.11	0.5	5.74	11.6	1162	>1000	1.82	103	" "
1037	2	7.11	0.75	5.86	11.2	1165	320	1.58	86	" "
1039	3	7.03	1.0	5.95	11.8	1165	135	1.92	60	" "
1041	4	7.22	1.25	6.01	10.8	1160	55.6	1.42	44	" "
1043	5	7.23	1.5	6.07	10.8	1162	32.1	1.42	26	clear "
1045	6	7.27	1.75	6.10	10.7	1161	28.3	1.43	14	" "
D	7									
	8									
	9									
	10									
Sample Information:										
1047	S1	7.31	2.0	6.15	10.7	1160	35.2	1.59	3	" "
1059	S2	7.34	[illegible]	6.33	11.4	1152	28.6	1.06	-28	" "

Well No. MW-8		Diameter (inches): 2"		Sample Date / Time: 6/6/11
Product Depth (fbTOR):		Water Column (ft): 13.38		DTW when sampled: 12.36
DTW (static) (fbTOR): 9.65		One Well Volume (gal): 2.18		Purpose: ☐ Development ☐ Sample ☑ Purge & Sample
Total Depth (fbTOR): 23.03		Total Volume Purged (gal):		Purge Method: Mini-Typhoon

Time		Water Level (fbTOR)	Acc. Volume (gallons)	pH (units)	Temp. (deg. C)	SC (uS)	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Appearance & Odor
1321	0	Initial	0	6.53	20.0	2027	278	1.19	-47	Clear Petro-odor
1325	1	11.99	1.0	6.44	16.0	1974	245	0.91	-52	" "
1326	2	12.05	1.2	6.44	15.4	1960	203	1.11	-49	" "
1328	3	12.16	1.5	6.39	16.3	1994	192	1.16	-39	" "
1330	4	12.21	2.0	6.40	15.5	2002	191	1.05	-50	" "
1332	5	12.29	2.25	6.38	15.7	2012	140	0.98	-52	" "
1335	6	12.33	2.5	6.38	16.1	2010	134	1.29	-53	" "
D	7									
	8									
	9									
	10									
Sample Information:										
1337	S1	12.36	2.75	6.35	14.7	2004	412	2.07	-52	" "
1356	S2	12.51	3.00	6.38	18.8	1958	27	1.56	-71	~~[illegible]~~ " "

REMARKS: MW-8 Metal samples taken when turb. was 28 NTU

Note: All measurements are in feet, distance from top of riser.

Volume Calculation

Diam.	Vol. (g/ft)
1"	0.041
2"	0.163
4"	0.653
6"	1.469

Stabilization Criteria

Parameter	Criteria
pH	± 0.1 unit
SC	± 3%
Turbidity	± 10%
DO	± 0.3 mg/L
ORP	± 10 mV

PREPARED BY: TAB

Groundwater Field Forms.xls
MW-7, MW-8

251 HOMER STREET SITE

GWM - WELL DEVELOPMENT

FIELD SHEETS

0225-001-100

BENCHMARK
ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC

GROUNDWATER FIELD FORM

Project Name: 251 Homer Street Site | Date: 5/15/2012
Location: 251 Homer Street Olean, NY | Project No.: 0225-001-100 | Field Team: SPF

Well No. MW-11		Diameter (inches): 2"		Sample Date / Time: -	
Product Depth (fbTOR):	~~7.75~~	Water Column (ft):	4.76	DTW when ~~sampled~~ stabilized:	22.56 (0.04)
DTW (static) (fbTOR):	17.76	One Well Volume (gal):	0.78	Purpose:	[x] Development [ ] Sample [ ] Purge & Sample
Total Depth (fbTOR):	22.52	Total Volume Purged (gal):	2.75	Purge Method:	Bailer (disposable)

Time	Water Level (fbTOR)	Acc. Volume (gallons)	pH (units)	Temp. (deg. C)	SC (uS)	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Appearance & Odor
1005	0 Initial	<0.25	6.35	10.9	1556	>1000	0.80	-50	Turbid, dk grey, petro odor
1012	1 18.02	1.00	6.66	11.2	1508	"	0.67	-73	" sl. sheen
1020	2 18.55	1.75	6.83	11.8	1442	"	0.11	-109	Turbid, dk grey, petro odor
1030	3 18.44	2.75	6.75	11.5	1463	"	0.20	-91	"
	4								
	5								
	6								
	7								
	8								
	9								
	10								

Sample Information:

	S1								
	S2								

Well No. MW-12		Diameter (inches): 2"		Sample Date / Time: -	
Product Depth (fbTOR):	-	Water Column (ft):	6.60	DTW when ~~sampled~~ stabilized:	24.49 (0.07)
DTW (static) (fbTOR):	17.82	One Well Volume (gal):	1.08	Purpose:	[x] Development [ ] Sample [ ] Purge & Sample
Total Depth (fbTOR):	24.42	Total Volume Purged (gal):	6.00	Purge Method:	Bailer (disposable)

Time	Water Level (fbTOR)	Acc. Volume (gallons)	pH (units)	Temp. (deg. C)	SC (uS)	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Appearance & Odor
1055	0 Initial	<0.25	6.85	12.9	4193	>1000	0.43	-37	Turbid, brown/grey, petro odor
1110	1 18.02	1.25	6.74	11.8	3825	"	0.55	-8	sheen on sed
1119	2 18.11	2.50	6.79	11.6	3760	"	0.24	-72	"
1128	3 18.04	3.50	6.78	11.2	3678	"	0.17	-67	"
1138	4 18.03	4.75	6.79	11.3	3911	"	0.42	-58	"
1147	5 18.07	6.00	6.76	11.2	3914	"	0.31	-60	"
	6								
	7								
	8								
	9								
	10								

Sample Information:

	S1								
	S2								

REMARKS: MW-11 - sheen, no product
MW-12 - sheen, ~~no product~~ trace of product

Note: All water level measurements are in feet, distance from top of riser.

Volume Calculation

Diam.	Vol. (g/ft)
1"	0.041
2"	0.163
4"	0.653
6"	1.469

Stabilization Criteria

Parameter	Criteria
pH	± 0.1 unit
SC	± 3%
Turbidity	± 10%
DO	± 0.3 mg/L
ORP	± 10 mV

PREPARED BY: SPF

BENCHMARK ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC

GROUNDWATER FIELD FORM

Project Name: 251 Homer Street Site — Date: 5/15/2012

Location: 251 Homer Street Olean, NY — Project No.: 0225-001-100 — Field Team: SPF

Well No. MW-13		Diameter (inches): 2"		Sample Date / Time: –	
Product Depth (fbTOR):	–	Water Column (ft):	7.10	DTW when sampled:	Stabilized: 20.23 (Δ.10)
DTW (static) (fbTOR):	12.03	One Well Volume (gal):	1.16	Purpose:	☑ Development ☐ Sample ☐ Purge & Sample
Total Depth (fbTOR):	20.13	Total Volume Purged (gal):	6.0	Purge Method:	PVC Bailer

Time		Water Level (fbTOR)	Acc. Volume (gallons)	pH (units)	Temp. (deg. C)	SC (uS)	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Appearance & Odor
1002	0	Initial	<0.25	6.55	14.8	1401	>1000	0.69	-75	Turbid, grey sed, earthy odor
1012	1	12.90	1.25	6.77	11.6	1159	"	6.70	-60	"
1020	2	12.96	2.50	6.81	11.7	1160	"	1.26	-42	"
1032	3	12.98	3.75	6.83	11.7	1149	"	1.78	-36	"
1042	4	13.04	5.00	6.82	11.6	1155	"	1.80	-33	"
	5									
	6									
	7									
	8									
	9									
	10									
Sample Information:										
	S1									
	S2									

Well No. MW-14		Diameter (inches): 2"		Sample Date / Time: –	
Product Depth (fbTOR):	–	Water Column (ft):	8.14	DTW when sampled:	stabilized: 21.64 (Δ.01)
DTW (static) (fbTOR):	13.49	One Well Volume (gal):	1.33	Purpose:	☑ Development ☐ Sample ☐ Purge & Sample
Total Depth (fbTOR):	21.63	Total Volume Purged (gal):	5.50	Purge Method:	PVC Bailer

Time		Water Level (fbTOR)	Acc. Volume (gallons)	pH (units)	Temp. (deg. C)	SC (uS)	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Appearance & Odor
1128	0	Initial	<0.25	7.10	11.4	977.9	>1000	0.11	-2	Turbid, grey sed., earthy odor
1138	1	14.91	1.50	7.04	11.5	841.1	"	0.72	-61	"
1149	2	15.65	2.85	7.08	11.4	849.3	"	0.57	-89	"
1202	3	15.34	4.20	7.11	11.5	840.6	"	0.33	-102	"
1215	4	15.32	5.50	7.12	11.6	834.7	"	0.40	-98	"
	5									
	6									
	7									
	8									
	9									
	10									
Sample Information:										
	S1									
	S2									

9

REMARKS: MW-14: No product

MW-13: No product

Note: All water level measurements are in feet, distance from top of riser.

Volume Calculation

Diam.	Vol. (g/ft)
1"	0.041
2"	0.163
4"	0.653
6"	1.469

Stabilization Criteria

Parameter	Criteria
pH	± 0.1 unit
SC	± 3%
Turbidity	± 10%
DO	± 0.3 mg/L
ORP	± 10 mV

PREPARED BY:

Groundwater Field Form.xls
GWFF - BM

BENCHMARK
ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC

GROUNDWATER FIELD FORM

Project Name: 251 Homer Street Site

Date: 5/15/2012

Location: 251 Homer Street Olean, NY

Project No.: 0225-001-100

Field Team: SPF

Well No.			Diameter (inches):			Sample Date / Time:			
Product Depth (fbTOR):			Water Column (ft):			DTW when sampled:			
DTW (static) (fbTOR):			One Well Volume (gal):			Purpose: ☑ Development ☐ Sample ☐ Purge & Sample			
Total Depth (fbTOR):			Total Volume Purged (gal):			Purge Method:			
Time	Water Level (fbTOR)	Acc. Volume (gallons)	pH (units)	Temp. (deg. C)	SC (uS)	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Appearance & Odor
	0 Initial								
	1								
	2								
	3								
	4								
	5								
	6								
	7								
	8								
	9								
	10								
Sample Information:									
	S1								
	S2								

Well No.			Diameter (inches):			Sample Date / Time:			
Product Depth (fbTOR):			Water Column (ft):			DTW when sampled:			
DTW (static) (fbTOR):			One Well Volume (gal):			Purpose: ☑ Development ☐ Sample ☐ Purge & Sample			
Total Depth (fbTOR):			Total Volume Purged (gal):			Purge Method:			
Time	Water Level (fbTOR)	Acc. Volume (gallons)	pH (units)	Temp. (deg. C)	SC (uS)	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Appearance & Odor
	0 Initial								
	1								
	2								
	3								
	4								
	5								
	6								
	7								
	8								
	9								
	10								
Sample Information:									
	S1								
	S2								

REMARKS:

Note: All water level measurements are in feet, distance from top of riser.

Volume Calculation

Diam.	Vol. (g/ft)
1"	0.041
2"	0.163
4"	0.653
6"	1.469

Stabilization Criteria

Parameter	Criteria
pH	± 0.1 unit
SC	± 3%
Turbidity	± 10%
DO	± 0.3 mg/L
ORP	± 10 mV

PREPARED BY:

TurnKey Environmental Restoration, LLC

GROUNDWATER FIELD FORM

Project Name: Benson Construction & Development LLC | Date: 5/22/12

Location: 251 Homer Street | Project No.: 0225-001-100 | Field Team: TAB / SG

Well No. MW-1		Diameter (inches): 2"		Sample Date / Time: 5/22/12	
Product Depth (fbTOR):	—	Water Column (ft):	9.48	DTW when sampled:	
DTW (static) (fbTOR):	13.52	One Well Volume (gal):	1.53	Purpose: ☐ Development ☑ Sample ☐ Purge & Sample	
Total Depth (fbTOR):	23.00	Total Volume Purged (gal):		Purge Method: Low Flow	

Time	Water Level (fbTOR)	Acc. Volume (gallons)	pH (units)	Temp. (deg. C)	SC (uS)	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Appearance & Odor
1053	0 Initial	<0.25	7.23	15.3	958.4	800	1.16	-102	sl sheen petro
1055	1 13.63	0.50	6.72	13.1	915.3	788	1.86	-106	"
1056	2 13.64	1.0	6.54	12.8	901.5	860	0.87	-105	"
1059	3 13.62	1.50	6.49	12.7	881.0	725	0.81	-104	"
1101	4 13.61	2.0	6.45	12.8	849.6	408	1.15	-104	"
1103	5 13.58	2.25	6.47	12.2	848.8	296	1.24	-100	"
	6								
	7								
	8								
	9								
	10								
Sample Information:									
1105	S1 13.59	3.0	6.48	13.1	832.3	220	1.08	-97	"
1115	S2 13.59	3.5	6.52	13.5	801.3	77.1	1.20	-98	"

Well No. MW-2		Diameter (inches): 2"		Sample Date / Time: 5/22/12	
Product Depth (fbTOR):	—	Water Column (ft):	9.09	DTW when sampled:	
DTW (static) (fbTOR):	9.81	One Well Volume (gal):	1.48	Purpose: ☐ Development ☑ Sample ☐ Purge & Sample	
Total Depth (fbTOR):	18.90	Total Volume Purged (gal):		Purge Method: Low - Flow	

Time	Water Level (fbTOR)	Acc. Volume (gallons)	pH (units)	Temp. (deg. C)	SC (uS)	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Appearance & Odor
1132	0 Initial	<0.25	7.71	14.4	1022	212	2.05	-79	sl Turbid No od.
1134	1 10.16	0.50	7.41	12.3	997.3	238	1.25	-71	"
1136	2 10.32	1.0	7.02	11.8	907.7	85.2	2.10	-37	"
1137	3 10.41	1.5	6.90	12.1	896.7	53.9	2.37	-39	"
1139	4 10.46	1.7	6.69	11.3	872.5	25.8	2.51	-29	"
1140	5 10.53	2.25	6.68	10.8	880.0	18.8	2.05	-26	"
1142	6 10.56	2.50	6.63	10.6	876.2	19.6	2.23	-23	
~~1143~~	7 ~~10.55~~	~~3.0~~	~~6.5~~						
	8								
	9								
	10								
Sample Information:									
1143	S1 10.55	3.0	6.53	11.8	883.9	23.2	2.47	-19	
1150	S2 10.55	3.50	6.41	11.7	901.1	13.2	2.06	-17	

REMARKS:

Note: All measurements are in feet, distance from top of riser.

Volume Calculation

Diam.	Vol. (g/ft)
1"	0.041
2"	0.163
4"	0.653
6"	1.469

Stabilization Criteria

Parameter	Criteria
pH	± 0.1 unit
SC	± 3%
Turbidity	± 10%
DO	± 0.3 mg/L
ORP	± 10 mV

PREPARED BY: TAB

GROUNDWATER FIELD FORM

TurnKey Environmental Restoration, LLC

Project Name: Benson Construction & Development LLC | Date: 5/21/12

Location: 251 Homer Street | Project No.: 0225-001-100 | Field Team: TAB/SPP

Well No. MW-3		Diameter (inches): 2"		Sample Date / Time: 5/22/12 13:08	
Product Depth (fbTOR):	—	Water Column (ft):	6.11	DTW when sampled:	14.22
DTW (static) (fbTOR):	13.92	One Well Volume (gal):	0.99	Purpose: ☐ Development ☑ Sample ☐ Purge & Sample	
Total Depth (fbTOR):	20.03	Total Volume Purged (gal):	2.0	Purge Method:	low-flow

Time		Water Level (fbTOR)	Acc. Volume (gallons)	pH (units)	Temp. (deg. C)	SC (uS)	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Appearance & Odor
12:54	0	Initial	6.25	7.34	12.9	614.4	>1000	1.28	-94	Turbid brown, sheen, petro-like odor
12:56	1	14.25	.25	7.06	12.1	612.3	"	1.52	-101	"
12:58	2	14.29	.5	7.00	11.5	609.2	323	2.02	-104	"
13:01	3	14.32	0.75	6.91	11.3	612.2	46.7	1.86	-106	"
13:04	4	14.22	1.25	6.89	11.0	620.0	27.9	1.40	-104	"
	5									
	6									
	7									
	8									
	9									
	10									
Sample Information:										
13:08	S1	14.22	1.75	6.88	12.2	612.5	30.7	1.84	-99.6	" SL Turbid, petro
13:19	S2	14.22	2.0	6.90	11.7	607.2	12.7	1.67	-96	

Well No. MW-4		Diameter (inches): 2"		Sample Date / Time: 5/21/12	
Product Depth (fbTOR):	—	Water Column (ft):	8.18	DTW when sampled:	
DTW (static) (fbTOR):	16.35	One Well Volume (gal):	1.33	Purpose: ☐ Development ☑ Sample ☐ Purge & Sample	
Total Depth (fbTOR):	24.53	Total Volume Purged (gal):		Purge Method:	Low-Flow Mini-monsoon

Time		Water Level (fbTOR)	Acc. Volume (gallons)	pH (units)	Temp. (deg. C)	SC (uS)	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Appearance & Odor
1534	0	Initial	6.25	6.63	13.5	~~83~~ 914.8	591	0.85	-96	Turbid brown/No odor
1536	1	16.62	0.50	6.57	12.3	910.4	546	0.95	-93	"
1538	2	16.61	1.00	6.55	12.3	901.4	>1000	0.95	-92	"
1540	3	16.63	1.50	6.54	12.0	901.0	587	1.16	-92	"
	4						~~[illegible]~~			
	5									
	6									
	7									
	8									
	9									
	10									
Sample Information:										
1542	S1	16.73	1.75	6.54	11.7	903.7	253	0.93	-90	"
1557	S2	16.72	2.0	6.52	13.1	896.8	86.2	0.83	-87	"

REMARKS:

Note: All measurements are in feet, distance from top of riser.

Volume Calculation

Diam.	Vol. (g/ft)
1"	0.041
2"	0.163
4"	0.653
6"	1.469

Stabilization Criteria

Parameter	Criteria
pH	± 0.1 unit
SC	± 3%
Turbidity	± 10%
DO	± 0.3 mg/L
ORP	± 10 mV

PREPARED BY: TAB

TurnKey Environmental Restoration, LLC

GROUNDWATER FIELD FORM

Project Name: Benson Construction & Development LLC | Date: 5/21/12
Location: 251 Homer Street | Project No.: 0225-001-100 | Field Team: TAB, SF

Well No. MW-14			Diameter (inches): 2"			Sample Date / Time: 5/21/12 12:45			
Product Depth (fbTOR): –			Water Column (ft): 7.85			DTW when sampled: 14.73			
DTW (static) (fbTOR): 14.05			One Well Volume (gal): 1.27			Purpose: ☐ Development ☑ Sample ☐ Purge & Sample			
Total Depth (fbTOR): 21.90			Total Volume Purged (gal): 4.80			Purge Method: Mini-Monsoon Low flow			
Time	Water Level (fbTOR)	Acc. Volume (gallons)	pH (units)	Temp. (deg. C)	SC (uS)	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Appearance & Odor
1230	0 Initial	<0.25	7.49	11.5	856.2	>1000	0.16	-89	Turbid, sl. petro odor
1233	1 14.94	1.50	7.20	11.7	877.9	"	0.20	-120	Turbid, no odor
1238	2 14.96	2.50	7.08	12.0	895.8	"	0.59	-100	"
1240	3 14.61	3.00	7.03	11.8	884.6	"	0.98	-100	"
1243	4 14.68	3.25	7.01	11.6	879.8	"	1.00	-101	"
	5								
	6								
	7								
	8								
	9								
	10								
Sample Information:									
1245	S1 14.73	3.50	6.99	11.7	874.8	"	1.13	-103	"
1257	S2 14.88	4.5	6.94	14.4	841.6	"	0.58	-107	"

Well No. MW-6			Diameter (inches): 2"			Sample Date / Time: 5-21-12 1200			
Product Depth (fbTOR): 12.52			Water Column (ft): 10.69			DTW when sampled: 12.95			
DTW (static) (fbTOR): 12.53			One Well Volume (gal): 1.74			Purpose: ☐ Development ☑ Sample ☐ Purge & Sample			
Total Depth (fbTOR): 23.22			Total Volume Purged (gal): 6.50			Purge Method: Low-Flow Mini-Monsoon			
Time	Water Level (fbTOR)	Acc. Volume (gallons)	pH (units)	Temp. (deg. C)	SC (uS)	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Appearance & Odor
1146	0 Initial	<0.25	7.00	11.9	1723	>1000	0.80	-130	Turbid, petro odor
1149	1 12.91	2.00	7.09	12.1	1744	"	0.53	-140	sl. sheen
1153	2 13.09	3.75	7.09	11.6	1753	"	0.70	-142	"
1156	3 13.15	5.50	7.09	11.6	1754	"	0.88	-142	"
	4								
	5								
	6								
	7								
	8								
	9								
	10								
Sample Information:									
1200	S1 12.95	6.00	7.09	11.5	1753	"	1.08	-142	"
1215	S2 13.01	6.50	7.13	12.1	1760	"	1.48	-129	"

REMARKS: MW-6: Bailed due to sl. product
Trace of product recovered

MW-14 Blind Dup taken

Note: All measurements are in feet, distance from top of riser.

Volume Calculation

Diam.	Vol. (g/ft)
1"	0.041
2"	0.163
4"	0.653
6"	1.469

Stabilization Criteria

Parameter	Criteria
pH	± 0.1 unit
SC	± 3%
Turbidity	± 10%
DO	± 0.3 mg/L
ORP	± 10 mV

PREPARED BY: TAB / SPP

TurnKey Environmental Restoration, LLC

GROUNDWATER FIELD FORM

Project Name: Benson Construction & Development LLC — Date: 5-21-12
Location: 251 Homer Street — Project No.: 0225-001-100 — Field Team: TAB/SPF

Well No. MW-7		Diameter (inches): 2"	Sample Date / Time: 5-21-12 1112
Product Depth (fbTOR):	-	Water Column (ft): 8.98	DTW when sampled: 10.32
DTW (static) (fbTOR):	9.65	One Well Volume (gal): 1.46	Purpose: ☐ Development ☑ Sample ☐ Purge & Sample
Total Depth (fbTOR):	18.63	Total Volume Purged (gal): 4.50	Purge Method: Low-Flow

Time		Water Level (fbTOR)	Acc. Volume (gallons)	pH (units)	Temp. (deg. C)	SC (uS)	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Appearance & Odor
1100	0	Initial	<0.25	6.07	10.2	1150	197	1.55	-107	Mod turb, no odor
1103	1	10.15	1.00	6.27	10.9	1168	273	1.53	-90	"
1105	2	10.22	1.50	6.40	11.2	1166	146	1.38	-85	Sl. sulfur odor
1107	3	10.28	2.00	6.47	11.4	1172	73.6	1.05	-85	"
1109	4	10.28	2.50	6.52	11.5	1170	74.6	1.40	-84	"
1110	5	10.30	3.00	6.54	11.4	1171	77.5	1.17	-81	"
#	6					#				
	7									
	8									
	9									
	10									
Sample Information:										
1112	S1	10.32	3.25	6.57	11.6	1179	57.5	1.18	-90	Sl. turbid, no odor
1129	S2	10.48	4.50	6.74	11.8	1173	40.0	1.14	-91	"

Well No. MW-8		Diameter (inches): 2"	Sample Date / Time: 5-22-12
Product Depth (fbTOR):	-	Water Column (ft): 10.67	DTW when sampled:
DTW (static) (fbTOR):	12.41	One Well Volume (gal): 1.74	Purpose: ☐ Development ☑ Sample ☐ Purge & Sample
Total Depth (fbTOR):	23.08	Total Volume Purged (gal):	Purge Method: Mini-Monsoon Low-Flow

Time		Water Level (fbTOR)	Acc. Volume (gallons)	pH (units)	Temp. (deg. C)	SC (uS)	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Appearance & Odor
14:09	0	Initial	<0.25	7.48	13.5	1473	106	1.44	-104	Sl. turbid, no odor
14:12	1	15.92	0.50	6.86	12.1	1197	129	1.66	-62	"
14:15	2	15.77	1.00	6.61	12.1	1146	94.5	1.97	-55	"
14:17	3	17.40	2.00	6.54	12.0	1173	84.8	1.78	-43	"
14:19	4	17.62	2.50	6.47	11.9	1232	83.5	1.60	-41	"
14:21	5	18.21	3.00	6.34	11.8	1573	25.2	2.00	-51	"
14:23	6	19.29	3.50	6.38	11.9	1672	21.2	1.50	-52	"
14:25	7	19.32	4.50	6.42	11.7	1439	20.7	1.68	-60	"
14:27	8	19.38	5.50	6.50	11.9	1479	11.5	1.44	-61	"
	9									
	10									
Sample Information:										
14:29	S1	19.31	5.75	6.52	11.7	1460	20.4	1.52	-60	"
14:37	S2	19.31	6.50	6.57	11.9	1485	4.94	2.01	-61	clear, no odor

REMARKS: MW-7: MS/MSD taken

Note: All measurements are in feet, distance from top of riser.

Volume Calculation

Diam.	Vol. (g/ft)
1"	0.041
2"	0.163
4"	0.653
6"	1.469

Stabilization Criteria

Parameter	Criteria
pH	± 0.1 unit
SC	± 3%
Turbidity	± 10%
DO	± 0.3 mg/L
ORP	± 10 mV

PREPARED BY: TAB | SPF

TurnKey Environmental Restoration, LLC

GROUNDWATER FIELD FORM

Project Name: Benson Construction & Development LLC Date: 5-22-12

Location: 251 Homer Street Project No.: 0225-001-100 Field Team: TAB/SPF

Well No. MW-9	Diameter (inches): 2"	Sample Date / Time: 5-22-12
Product Depth (fbTOR): -	Water Column (ft): 8.34	DTW when sampled:
DTW (static) (fbTOR): 12.81	One Well Volume (gal): 1.36	Purpose: ☐ Development ☑ Sample ☐ Purge & Sample
Total Depth (fbTOR): 21.15	Total Volume Purged (gal):	Purge Method: Disposable Bailer

Time		Water Level (fbTOR)	Acc. Volume (gallons)	pH (units)	Temp. (deg. C)	SC (uS)	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Appearance & Odor
1215	0	Initial	<0.25	7.90	11.9	448.6	774	-	-72	Mod. turbidity, petro odor
1218	1	12.87	1.50	7.47	10.9	465.5	>1000	-	-72	Turbid, "
1224	2	12.82	3.00	7.41	10.9	493.8	"	-	-77	"
1228	3	12.86	4.50	7.07	10.7	512.9	"	-	-83	"
	4						"			
	5									
	6									
	7									
	8									
	9									
	10									
Sample Information:										
1230	S1	12.90	5.00	7.06	10.6	512.2	"	-	-84	"
1240	S2	12.96	5.50	7.29	10.5	522.1	"	-	-94	"

Well No. MW-10	Diameter (inches): 2"	Sample Date / Time:
Product Depth (fbTOR): -	Water Column (ft): 6.77	DTW when sampled:
DTW (static) (fbTOR): 13.26	One Well Volume (gal): 1.10	Purpose: ☐ Development ☑ Sample ☐ Purge & Sample
Total Depth (fbTOR): 20.03	Total Volume Purged (gal):	Purge Method: Low Flow

Time		Water Level (fbTOR)	Acc. Volume (gallons)	pH (units)	Temp. (deg. C)	SC (uS)	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Appearance & Odor
1334	0	Initial	<0.25	7.29	14.5	573.9	>1000	1.37	-96	Turbid No odor
1337	1	13.45	0.75	7.19	11.6	576.1	>1000	0.84	-78	"
1338	2	13.61	1.50	7.07	11.3	573.1	513	1.37	-76	Slow sl Petro
1340	3	13.65	2.50	7.06	11.6	572.6	569	1.58	-75	"
1342	4	13.68	2.78	7.02	11.8	573.2	491	1.54	-74	"
	5									
	6									
	7									
	8									
	9									
	10									
Sample Information:										
1345	S1	13.68	3.0	7.01	13.1	574.1	216	1.35	-74	"
1347	S2	13.68	3.5	6.99	11.6	572.2	224	1.01	-74	"

REMARKS: MW-9: Trace of product. Sampled via Manual bailer. No DO taken due to product.

Note: All measurements are in feet, distance from top of riser.

Volume Calculation

Diam.	Vol. (g/ft)
1"	0.041
2"	0.163
4"	0.653
6"	1.469

Stabilization Criteria

Parameter	Criteria
pH	± 0.1 unit
SC	± 3%
Turbidity	± 10%
DO	± 0.3 mg/L
ORP	± 10 mV

PREPARED BY: TAB

GROUNDWATER FIELD FORM

TurnKey Environmental Restoration LLC

Project Name: Benson Construction & Development LLC — Date: 5-21-12

Location: 251 Homer Street — Project No.: 0225-001-100 — Field Team: TAB, PWW, SFP

Well No. MW-11		Diameter (inches): 2"		Sample Date / Time: 5-21-12	
Product Depth (fbTOR):	—	Water Column (ft):	4.93	DTW when sampled:	18.03
DTW (static) (fbTOR):	17.85	One Well Volume (gal):	.80	Purpose:	☐ Development ☑ Sample ☐ Purge & Sample
Total Depth (fbTOR):	22.78	Total Volume Purged (gal):	2.0	Purge Method:	low flow

Time		Water Level (fbTOR)	Acc. Volume (gallons)	pH (units)	Temp. (deg. C)	SC (uS)	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Appearance & Odor
1447	0	Initial	<0.25	6.58	13.6	1508	>1000	0.26	-90	Turbid, petro odor, sheen
1451	1	17.98	0.50	6.55	11.8	1509	"	0.14	-90	"
1453	2	18.02	0.75	6.58	11.5	1513	"	0.41	-89	"
1456	3	18.02	1.00	6.51	11.2	1515	"	0.40	-91	"
	4									
	5									
	6									
	7									
	8									
	9									
	10									
Sample Information:										
1458	S1	18.03	1.50	6.51	11.2	1515	"	0.67	-91	"
1510	S2	18.02	2.00	6.55	11.5	1492	"	0.90	-89	"

Well No. MW-12		Diameter (inches): 2"		Sample Date / Time: 5-21-12	
Product Depth (fbTOR):	—	Water Column (ft):	5.62	DTW when sampled:	18.12
DTW (static) (fbTOR):	17.93	One Well Volume (gal):	0.91	Purpose:	☐ Development ☑ Sample ☐ Purge & Sample
Total Depth (fbTOR):	23.55	Total Volume Purged (gal):	5	Purge Method:	Low flow

Time		Water Level (fbTOR)	Acc. Volume (gallons)	pH (units)	Temp. (deg. C)	SC (uS)	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Appearance & Odor
1348	0	Initial	<0.25	6.65	11.7	3946	>1000	0.57	-54	Turbid, petro odor, sl. sheen
1415	1	18.18	~~0~~.50	7.15	11.9	4151	"	0.80	-57	"
1422	2	18.16	2.50	6.78	11.4	4019	"	1.01	-62	"
1427	3	18.12	4.0	6.62	11.5	4096	"	.87	-64	"
1428	4	18.12	4.5	6.63	11.5	4012	"	1.02	-65	"
	5									
	6									
	7									
	8									
	9									
	10									
Sample Information:										
14:30	S1	18.12	5.0	6.60	11.6	3815	"	1.37	-64	"
14:35	S2	18.14	5.0	6.60	12.0	3833	227	1.31	-70	"

REMARKS:

Note: All measurements are in feet, distance from top of riser.

Volume Calculation

Diam.	Vol. (g/ft)
1"	0.041
2"	0.163
4"	0.653
6"	1.469

Stabilization Criteria

Parameter	Criteria
pH	± 0.1 unit
SC	± 3%
Turbidity	± 10%
DO	± 0.3 mg/L
ORP	± 10 mV

PREPARED BY: TAB | SPF

TurnKey Environmental Restoration, LLC

GROUNDWATER FIELD FORM

Project Name: Benson Construction & Development LLC — Date: 5-21-12

Location: 251 Homer Street — Project No.: 0225-001-100 — Field Team: TAB/SPF

Well No. MW-13	Diameter (inches): 2"	Sample Date / Time: 5-21-12
Product Depth (fbTOR): -	Water Column (ft): 7.42	DTW when sampled:
DTW (static) (fbTOR): 12.86	One Well Volume (gal): 1.21	Purpose: ☐ Development ☑ Sample ☐ Purge & Sample
Total Depth (fbTOR): 20.28	Total Volume Purged (gal):	Purge Method: Low-Flow mini-monsoon

Time	Water Level (fbTOR)	Acc. Volume (gallons)	pH (units)	Temp. (deg. C)	SC (uS)	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Appearance & Odor
13.11	0 Initial	<0.25	6.58	15.0	1043	>1000	0.98	-86	Brown sed No odor
1314	1 13.35	0.50	6.52	12.4	1047	>1000	1.14	-83	"
1315	2 13.52	1.0	6.51	11.4	1063	>1000	0.66	-76	"
1316	3 13.60	1.50	6.52	11.5	1075	>1000	0.87	-74	"
	4 13.63								
	5								
	6								
	7								
	8								
	9								
	10								
Sample Information:									
1318	S1 13.63	1.75	6.54	11.2	1117	>1000	0.43	-72	"
1325	S2 13.84	2.25	6.64	11.3	1188	>1000	0.75	-73	"

Well No. MW-~~14~~5	Diameter (inches):	Sample Date / Time:
Product Depth (fbTOR): ~~0~~ 18.05	Water Column (ft):	DTW when sampled:
DTW (static) (fbTOR): 21.05	One Well Volume (gal):	Purpose: ☐ Development ☑ Sample ☐ Purge & Sample
Total Depth (fbTOR): 24.40	Total Volume Purged (gal):	Purge Method:

Time	Water Level (fbTOR)	Acc. Volume (gallons)	pH (units)	Temp. (deg. C)	SC (uS)	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Appearance & Odor
	0 Initial								
	1								
	2								
	3								
	4								
	5								
	6								
	7								
	8								
	9								
	10								
Sample Information:									
	S1								
	S2								

REMARKS: MW-5: Did not sample due to product

• Five (5) total drums of purge water & Decon, development, sampling water.

Note: All measurements are in feet, distance from top of riser.

Volume Calculation

Diam.	Vol. (g/ft)
1"	0.041
2"	0.163
4"	0.653
6"	1.469

Stabilization Criteria

Parameter	Criteria
pH	± 0.1 unit
SC	± 3%
Turbidity	± 10%
DO	± 0.3 mg/L
ORP	± 10 mV

PREPARED BY: TAB/SPF

251 HOMER STREET SITE

GWM-EQUIPMENT CALIBRATION

LOGS

0225-001-100

BENCHMARK
ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC

EQUIPMENT CALIBRATION LOG

PROJECT INFORMATION:

Project Name: 251 Homer Street Site
Project No.: 0225-001-100
Client: Benson Construction

Date: 5-15-12

Instrument Source: [X] BM [ ] Rental

METER TYPE	UNITS	TIME	MAKE/MODEL	SERIAL NUMBER	CAL. BY	STANDARD	POST CAL. READING	SETTINGS
[X] pH meter	units	940	Myron L Company Ultra Meter 6P	606987 [ ] 6212375 [X]	SPF	4.00	4.00	ok✓
						7.00	7.02	
						10.01	10.02	
[X] Turbidity meter	NTU	950	Hach 2100P Turbidimeter	06120C020523 [ ] 07110C026405 [X]	SPF	< 0.4	0.42	ok✓
						20	19.9	
						100	99.5	
						800	803	
[X] Sp. Cond. meter	uS mS	945	Myron L Company Ultra Meter 6P	606987 [ ] 6212375 [X]	SPF	2764 mS @ 25 °C	2762	ok✓
[ ] PID	ppm		MinRAE 2000			open air zero		MIBK response factor = 1.0
						___ ppm Iso. Gas		
[X] Dissolved Oxygen	ppm	940	HACH Model HQ30d		SPF	100% Satuartion✓	90.3% slope	ok✓
[ ] Particulate meter	mg/m³					zero air		
[ ] Oxygen	%					open air		
[ ] Hydrogen sulfide	ppm					open air		
[ ] Carbon monoxide	ppm					open air		
[ ] LEL	%					open air		
[ ] Radiation Meter	uR/H					background area		
[ ]								

ADDITIONAL REMARKS:

PREPARED BY: Sean Fallon **DATE:** 5-15-12

TurnKey Environmental Restoration, LLC

EQUIPMENT CALIBRATION LOG

PROJECT INFORMATION:

Project Name: 251 Homer Street

Project No.: 0

Client: Benson Construction, Inc.

Date: 5/21/12

Instrument Source: ☒ BM ☐ Rental

METER TYPE	UNITS	TIME	MAKE/MODEL	SERIAL NUMBER	CAL. BY	STANDARD	POST CAL. READING	SETTINGS
☒ pH meter	units	1005	Myron L Company Ultra Meter 6P	606987 ☐ 6212375 ☒	SPF	4.00	3.99	OK✓
						7.00	7.03	
						10.01	9.98	
☒ Turbidity meter	NTU	1010	Hach 2100P Turbidimeter	06120C020523 ☐ 07110C026405 ☒	SPF	< 0.4	0.40	OK✓
						20	20.8	
						100	103	
						800	794	
☒ Sp. Cond. meter	uS mS	1010	Myron L Company Ultra Meter 6P	606987 ☐ 6212375 ☒	SPF	1413 mS @ 25 °C	1416	OK✓
☐ PID	ppm		MinRAE 2000			open air zero _____ ppm Iso. Gas		MIBK response factor = 1.0
☒ Dissolved Oxygen	ppm	1015	HACH Model HQ30d		SPF	100% Satuartion	92.5% slope	OK✓
☐ Particulate meter	mg/m^3					zero air		
☐ Oxygen	%					open air		
☐ Hydrogen sulfide	ppm					open air		
☐ Carbon monoxide	ppm					open air		
☐ LEL	%					open air		
☐ Radiation Meter	uR/H					background area		
☐								

ADDITIONAL REMARKS:

PREPARED BY: TAB/SPF **DATE:** 5/21/12

TURNKEY ENVIRONMENTAL RESTORATION, LLC

EQUIPMENT CALIBRATION LOG

PROJECT INFORMATION:

Project Name: 251 Homer Street

Project No.: 0225-001-100

Client: Benson Construction, Inc

Date: 5-22-12

Instrument Source: ☒ BM ☐ Rental

	METER TYPE	UNITS	TIME	MAKE/MODEL	SERIAL NUMBER	CAL. BY	STANDARD	POST CAL. READING	SETTINGS
☒	pH meter	units	945	Myron L Company Ultra Meter 6P	606987 ☐ 6212375 ☒	TAB/SPF	4.00 7.00 10.01	4.01 6.94 9.96	OK ✓
☒	Turbidity meter	NTU		Hach 2100P Turbidimeter	06120C020523 ☐ 07110C026405 ☒	TAB/SPF	< 0.4 20 100 800	0.21 21.5 105 786	OK ✓
☒	Sp. Cond. meter	uS mS	950	Myron L Company Ultra Meter 6P	606987 ☐ 6212375 ☒	TAB/SPF	2764 mS @ 25 °C	2763	OK ✓
☐	PID	ppm		MinRAE 2000			open air zero _____ ppm Iso. Gas		MIBK response factor = 1.0
☒	Dissolved Oxygen	ppm	945	HACH Model HQ30d		TAB/SPF	100% Satuartion	91.0% Slope	OK ✓
☐	Particulate meter	mg/m^3					zero air		
☐	Oxygen	%					open air		
☐	Hydrogen sulfide	ppm					open air		
☐	Carbon monoxide	ppm					open air		
☐	LEL	%					open air		
☐	Radiation Meter	uR/H					background area		
☐									

ADDITIONAL REMARKS:

PREPARED BY: TAB/SPF **DATE:** 5-22-12

APPENDIX G

DATA USABILITY SUMMARY REPORTS (DUSRS)

Data Validation Services

120 Cobble Creek Road   P.O. Box 208
North Creek, NY 12853

Phone 518-251-4429
Facsimile 518-251-4428

September 2, 2011

Michael Lesakowski
Benchmark Env. Engineers
2558 Hamburg Turnpike Suite 300
Buffalo, NY   14218

RE: **D**ata **U**sability **S**ummary **R**eport for the 251 Homer Street Site
TAL-Buffalo SDG Nos. 480-4809, 480-5183, 480-5348, and 480-5725

Dear Mr. Lesakowski:

Review has been completed for the data packages noted above, generated by TestAmerica Laboratory, that pertain to samples collected between 05/09/11 and 06/27/11 at the 251 Homer Street site. Nine soil samples and two field duplicates were processed for TCL volatiles, TCL semivolatiles, TCL pesticides, TCL PCBs, TCL herbicides, DRO, GRO, and TAL metals. Twenty-five soil samples and a field duplicate were analyzed for TCL volatiles, TCL semivolatiles, DRO, GRO, and TAL metals; four of these samples and the field duplicate were also analyzed for PCBs. Three soil samples and a field duplicate were analyzed for TCL semivolatiles, TCL pesticides, TCL PCBs, and TCL herbicides. Twelve soil samples were analyzed for TCL semivolatiles and TAL metals. Twelve aqueous samples and two aqueous field duplicates were analyzed for TCL volatiles, TCL semivolatiles, DRO, GRO, and total and dissolved TAL metals. Four of the aqueous samples and one of the field duplicates were also analyzed for PCBs. The analytical methods utilized are those of the USEPA SW846 6000/7000/8000.

The data packages submitted contain full deliverables for validation, but this usability report is generated from review of the summary form information, with review of sample raw data, and limited review of associated QC raw data. Full validation has not been performed. However, the reported summary forms have been reviewed for application of validation qualifiers, using guidance from the USEPA Region 2 validation SOPs, the USEPA National Functional Guidelines for Data Review, the specific laboratory methodologies, and professional judgment, as affects the usability of the data. The following items were reviewed:

* Laboratory Narrative Discussion
* Custody Documentation
* Holding Times
* Surrogate and Internal Standard Recoveries
* Matrix Spike Recoveries/Duplicate Correlations
* Field Duplicate Correlations
* Preparation/Calibration Blanks
* Control Spike/Laboratory Control Samples

* Instrumental Tunes
* Calibration/Low Level Standards
* ICP Serial Dilution
* Instrument IDLs
* Sample Result Verification

Those items listed above which show deficiencies are discussed within the text of this narrative. All of the other items were determined to be acceptable for the DUSR level review.

In summary, sample analyses were primarily conducted in compliance with the required analytical protocols. With the following exceptions, sample results are usable either as reported or with qualification/edit:

- herbicide results in TP-46(5-5.5) and BLIND DUP#2 are rejected due to matrix effects.
- pesticide results in MW-27(2-4) are rejected due to matrix effects
- the result for barium in a sample is edited upward to a concentration above the SCO, reflecting the value from the location field duplicate
- the mercury result in one sample is qualified as estimated, and flagged (by highlighting) to be considered as potentially above the SCO concentration due to matrix effect

Due to matrix interferences and/or poor compound identification, many of the reported low level volatile and semivolatile detections in the soil samples have been qualified as tentative in identification or edited to non-detection. All filtered fraction metals have been qualified as estimated due to delay of preservation.

Copies of the sample identification summaries and the laboratory case narratives are attached to this text, and should be reviewed in conjunction with this report. Also included with the report are client results tables annotated to reflect the qualifications recommended within this report.

The following text discusses quality issues of concern.

<u>Chains-of-Custody</u>

The timeframe between sample collection and laboratory receipt exceeded the required timeframe of two days for some of the samples reported in SDGs 480-5348 and 480-5725. Technical holding times were met, and condition at laboratory receipt was acceptable. A memorandum to the file should be made regarding the condition and custody of the samples during the interim.

The down-arrow is missing from the 05/12/11 collection date on the custody reported in SDG 480-4809.

The final receipt entries were not present on the custody pertaining to samples collected 06/01/11 and reported in SDG 480-5348.

The temperature at laboratory receipt was not present on the custody for aqueous samples collected 06/03/11. The login form states that the temperature was within an acceptable range; full validation would require resubmission of the full login information.

Blind Duplicate Evaluations

Blind field duplicates were collected at locations TP-25(4-8.5), TP-46(5-5.5), SS-7, SED-1, MW-1, and SW-1. The correlations to the parent sample results were within validation guidelines, with the following exceptions, results for which are to be qualified as indicated:

- barium varied more than five-fold (139%RPD) for TP-25(4-8.5). Although the parent value is below the SCO, the field duplicate value is more than two fold higher than that limit. Therefore, the barium concentration at that location cannot be assumed to be below the SCO. The parent sample result has been edited to reflect the field duplicate concentration and qualified as estimated
- calcium, copper, iron, and mercury results in TP-46(5-5.5) are qualified as estimated in the parent sample and duplicate
- toluene correlation in SED-1 varied an order of magnitude. The parent sample shows the higher concentration, and was analyzed twice (initial and dilution), with consistent results. The parent sample results are also supported by that sample's GRO value, as well as the GRO value of the field duplicate. Results for that compound in the parent sample have been qualified as estimated in value.
- metals in SED-1 were consistently higher in the parent sample. The following elements show correlations (54%RPD to 70%RPD) that are above the validation guidelines, and have been qualified as estimated in the parent sample and its duplicate: aluminum, calcium, chromium, copper, iron, magnesium, manganese, nickel, potassium, and vanadium

General

The laboratory has created their own flags and definitions, some of which are not consistent with those of the NYSDEC ASP, utilizing the ASP flags with alternate definitions.

TCL Volatile Analyses by EPA 8260B

Results for analytes flagged as "E" by the laboratory are derived from the dilution analyses of those samples.

The following results are to be qualified as tentative in identification and estimated in value due to spectral matrix interferences:

- isopropylbenzene in TP-5(8.5-11), TP-20(5-8), TP-28(0-2), and TP-48(3-9)
- benzene, cyclohexane, and isopropylbenzene in TP-36(5-7)
- isopropylbenzene, benzene, m,p-xylene, and toluene in TP-21(4-6)
- benzene and isopropylbenzene in TP-22(4-5), TP-32(3-7), TP-46(5-5.5), and BLIND DUP #2
- cyclohexane and isopropylbenzene in TP-27(7-10)
- isopropylbenzene and m,p-xylene in TP-13(6-8) and TP-39(0-3)
- cyclohexane, isopropylbenzene and m,p-xylene in TP-8(4-6)
- m,p-xylene in TP-16(4.5-5)
- cyclohexane in TP-3(4-6.5)
- ethylbenzene and o-xylene in MW-8(2-4)

The following results are edited to non-detection due to incorrect identification or very poor mass spectral quality:

- cyclohexane in Blind Dup #1
- benzene in TP-39(0-3) and TP-41(0-5)
- 2-hexanone in TP-21(4-6)
- 1,2-dibromo-3-chloropropane and isopropylbenzene in TP-16(4.5-7.0)
- 1,2-dibromo-3-chloropropane in TP-21(4-6)
- m,p-xylene, ethylbenzene, and isopropylbenzene in TP-37(4.5-6.5)
- 4-methyl-2-pentanone in MW-5(4-6)
- methyl acetate in MW-1(6-8)
- cyclohexane and o-xylene in MW-4(4-6)

Due to presence in the associated method blank, the following detections are considered external contamination and edited to reflect non-detection:

- methylene chloride in the samples reported in SDGs 480-4809, 480-5348, and 480-5725
- toluene in TP-27(7-10), SED-3, SED-4, and TP-25(4-8.5)
- acetone in SED-2, SED-3, and SED-4

The undiluted analyses of Blind Up #2 and MW-1 (6-8) show elevated surrogate recoveries. Results of detected analytes that are derived from that analysis have been qualified as estimated.

The matrix spikes of TP-18(6-9.5), TP-46(5-5.5), MW-4, and SW-4 show recoveries and duplicate correlations that are within validation guidelines for the thirteen evaluated analytes.

The result for 1,2-dichloroethane in SED#3 is qualified as estimated, with a slight low bias, due to low recoveries (76% and 72%) in the matrix spikes of that sample.

Calibration standards showed acceptable responses, with the following exceptions, results for which are to be qualified as estimated in the indicated samples:

- 1,2-dibromo-3-chloropropane (low RRF in the lowest concentration calibration standard) in TP-2(7-9), TP-3(4-6.5), TP-13(6-8), TP-16(4.5-7.0), TP-18(6-9.5), TP-20(5-8), TP-21(4-6), TP-46 (5-5.5), MW-7 (2-4), MW-6 (4-8)
- bromoform (22%D) in TP-22 (4-5) and TP-32 (3-7)
- 1,1,2-trichloro-1,2,2-trifluoroethane and carbon disulfide (25%D and 23%D) in TP-28 (0-2), TP-31 (9-11), TP-33 (4-9), TP-36 (5-7), TP-37 (4.5-6.5), TP-39 (0-3), TP-41 (0-5) and TP-42 (1.5-4.5)
- carbon disulfide (23%D) in TP-46 (5-5.5)
- 1,1,2-trichloro-1,2,2-trifluoroethane, cyclohexane , methylcyclohexane and carbon disulfide (24%D to 39%D) in MW-7 (2-4) and MW-6 (4-8)
- dichlorodifluoromethane, chloroethane and bromomethane (22%D to 35%D) in MW-1 (6-8), MW-2 (4-6), MW-3 (4-6) and MW-4 (4-6)
- chloromethane, chloroethane and bromomethane (24%D to 31%D) in MW-5 (4-6), SED-2, SED-1 and BLIND DUP #4
- 1,2-dibromo-3-chloropropane (21%D and 23%D) in SW-1, SW-2, SW-3, SW-4, BLIND DUP #5, BLIND DUP #6, MW-2, MW-3, MW-4, MW-5, MW-7, MW-8 and the trip blanks
- bromomethane, 1,1,2-trichloro-1,2,2-trifluoroethane, carbon disulfide, cis-1,3-dichloropropene and chloroethane (22%D to 29%D) in MW-1 and MW-6

Some of the samples were processed only at dilution due to elevated target or non-target analyte concentrations. Reporting limits for undetected analytes are therefore proportionally elevated in those samples.

TCL Semivolatiles by EPA 8270C

The sample detections of naphthalene in MW-4(4-6), and of all detections (low level PAHs) flagged as "B" in MW-5 and MW-7 are considered external contamination due to presence in the associated method blanks. They have been edited to reflect non-detection.

The following results are to be qualified as tentative in identification and estimated in value due to spectral matrix interferences:

- 2-methylnaphthalene and fluorene in TP-36(5-7)
- chrysene and benzo(k)fluoranthene in TP-4(6.5-9.0)
- naphthalene in TP-13(6-8)
- 2-methylnaphthalene in TP-39(0-3) and TP-42 (1.5-4.5)
- acenaphthene in TP-25(4-8.5)
- naphthalene and fluorene in MW-1(6-8)
- carbazole in MW-3(4-6)
- 2-methylnaphthalene in MW-8(2-4)
- chrysene and dibenzofuran in MW-5(4-6)
- phenol in SED-2
- chrysene in TP-48(3-9)
- indeno(1,2,3-cd)pyrene in TP-46(5-5.5)

The following results are edited to non-detection due to incorrect identification or very poor mass spectral quality:

- all detections of benzo(a)anthracene except those in TP-2(7-9) and TP-36(5-7)
- chrysene in TP-5(8.5-11), MW-7(2-4), SS-6, SS-8, SS-15, and BLIND DUP#3
- fluorene in TP-8(4-6)
- acetophenone and n-nitrosodi-n-propylamine in TP-32(3-7)
- 2-methylnaphthalene in TP-16(4.5-7.0)
- phenanthracene and fluorene in TP-28(0-2)
- isophorone in TP-31(9-11)
- naphthalene in MW-4(4-6)
- benzo(g,h,i)perylene in SED-3
- anthracene and indeno(1,2,3-cd)pyrene in SED-2
- benzo(k)fluoranthene in SED-1, SW-3, SS-5, SS-7, and SS-9
- anthracene in BLIND DUP#2
- 4-nitroaniline in BLIND DUP#5
- benzo(g,h,i)perylene in SS-5

Matrix spikes of TP-18(6-9.5), TP-28(0-2), SED-3, SS-7, TP-46(5-5.5), SW-4, and MW-4 show acceptable recoveries and duplicate correlations for the twelve analytes evaluated, with consideration of the dilutions at which they were analyzed. Many of the duplicate correlations for MW-4 were reported as outlying, but did not reflect the precision of the spikes, since they were generated using concentration instead of recovery. Evaluation using the reported concentrations is not applicable due to the variance in parent sample volumes, and therefore the spike added concentration.

Laboratory Control Samples (LCSs) show analyte recoveries within the laboratory acceptance ranges.

Calibrations standards showed acceptable responses, with the following exceptions, results for which are to be qualified as estimated in the indicated samples:

- bis (2-chloroisopropyl) ether (26%D) in TP-27 (7-10), TP-25 (4-8.5) and BLIND DUP#1
- 2,4-dinitrophenol (21%D) in TP-28 (0-2), TP-31 (9-11), TP-32 (3-7) and TP-33 (4-9)
- n-nitrosodi-n-propylamine (22%D) in BLIND DUP #4
- bis (2-chloroisopropyl) ether and n-nitrosodi-n-propylamine (23%D and 26%D) in MW-5 (4-6), SED-2 and SED-1

Internal standard responses meet validation guidelines.

Some of the samples were analyzed at dilution due to either target or non-target analyte responses. Reporting limits for undetected analytes in those samples are elevated in proportion to the dilution factor. Chromatograms of several of the diluted samples indicate that they may be excessively diluted.

TCL Pesticide, PCB, and Herbicide Analyses by EPA 8081, EPA 8082, and EPA 8151

The herbicide surrogates failed to recover in TP-46(5-5.5) and BLIND DUP#2, and results for herbicides in those two samples are therefore to be rejected and are not usable.

The matrix interferences in the MW-7(2-4) pesticide analysis are too large to allow for usable pesticide target analtye results. Those results are therefore to be rejected and are not usable.

Results for pesticide analytes in MW-6(4-8) are to be qualified as estimated due to matrix interferences.

The result for 4,4'-DDT in TP-25(4-8.5) has been qualified as estimated in value due to elevated dual column quantitative correlation.

The following results have been qualified as estimated in value and tentative in identification due to elevated dual column quantitative correlations:

- 4,4'-DDE in TP-25(4-8.5) and BLIND DUP#1
- 4,4'-DDT in BLIND DUP#3

Matrix spikes of Aroclors 1016 and 1260 in SW-4, TP-18(6-9.5), and SED#3 show acceptable recoveries and duplicate correlations. One PCB matrix spike each in TP-46(5-5.5) and SS-7 shows acceptable recoveries, but the spiked duplicates show low recoveries and therefore elevated duplicate correlations. The surrogate standard recoveriess in those spikes show similar variance, indicating an extract-specific effects. No qualification to the results of those two parent samples is indicated.

Matrix spikes of herbicides TP-18(6-9.5) show acceptable recoveries and duplicate correlations.

As with the parent sample, the herbicide matrix spikes of TP-46(5-5.5) show no recovery of surrogate standards, and they show no recovery of the spiked analytes. Results for the parent sample are not usable, as noted above.

The herbicide matrix spike of SS-7 shows no recoveries of target analytes or surrogate standards. The spiked duplicate of the sample shows recoveries of the surrogates and the target analytes that are below the recommended limit. However, the parent sample surrogate standard recoveries are within the recommended limits, and therefore, the results of the herbicides in the parent sample are not qualified.

The pesticide matrix spikes of TP-18(6-9.5), SS-7, and TP-46(5-5.5) were processed at dilution and cannot be properly evaluated.

Holding times and surrogate recoveries (when not diluted) meet validation protocol guidelines.

2,4-D and 2,4,5-TP showed low responses greater than 15%D in the calibration standards associated with the samples reported in 480-5163. Therefore, results for these analytes in the samples reported in that data group have been qualified as estimated (unless otherwise rejected).

4,4-DDT and methoxychlor showed low responses greater than 15%D in the calibration standards associated with the samples reported in 480-5348. Therefore, results for these analytes in the samples reported in that data group have been qualified as estimated (unless otherwise rejected).

Not all of the results for pesticide and herbicide analytes reporting no detection can by verified from the raw data provided. Retention times and areas for responses in samples with matrix interfere-ences were not provided unless determined by the analyst to be a detected analyte. This is compounded by the fact that some of the chromatograms were not scaled to NYSDEC ASP Category B requirements.

Some of the samples were analyzed at dilution, at times for reasons not apparent in the raw data. This results in unnecessarily elevated reporting limits. Responses were observed in some of the pesticide analyses that indicate sulfur interference. It is not evident in raw data that the copper clean-up for sulfur was performed. Those sulfur interferences were not observed in the PCB analyses of the same samples.

TAL Metals Analyses by EPA 6010B and 7470/7471

All results for the filtered fractions of the aqueous samples are qualified as estimated, with a possible low bias, due to the fact that they were not preserved until received at the laboratory.

The following matrix spikes for TAL metals show outlying recoveries in both spikes or correlations for the following elements, and results for the affected elements are qualified as estimated in the affected samples:

Parent Sample	Element	%Recoveries	Affected Samples
TP-7 (2.5-4.0)	antimony	59 and 58	Those reported in SDG 480-4809
	aluminum	497 and 526	"
	barium	182 and 207	"
	iron	410 and 519	"
	lead	178 and 192	"
	magnesium	156 and 167	"
	manganese	374 and 599	"
	potassium	144 and 155	"
	zinc	276 and 416	"

Parent Sample	Element	%Recoveries	Affected Samples
TP-18 (6-9.5)	antimony	63 and 64	"
	magnesium	127 and 134	"
TP-33 (4-9)	antimony	54 and 55	"
SS-7	antimony	53 and 54	SS's reported in SDG 480-5183
	chromium	63 and -23	"
	copper	137 and 148	"
TP-46 (5-5.5)	aluminum	26 and 54	TP's reported in SDG 480-5183
	magnesium	71 and 64	"
	manganese	-31 and -42	"
	zinc	19 and 39	"
	mercury	25 and 58	"
	lead	%RPD = 75	"
MW-2 (4-6)	barium	136 and 131	MW's reported in SDG 480-5348
	antimony	52 and 55	"
SED#3	antimony	62 and 64	SED's reported in SDG 480-5348
	potassium	126 and 133	"

The mercury result for TP-48(3-9) is slightly below the SCO, but the recovery for that element in the associated project matrix spike is low, and the actual value for mercury in the sample may be above the SCO. The result is qualified as estimated, and highlighted to indicate that it should be considered as a value above the objective.

Matrix spikes of the total and dissolved fractions of SW-4 and MW-4, and of mercury in TP-25(4-8.5), show acceptable accuracy and precision.

The ICP serial dilution correlations for the following elements are above the recommended limit, and detected results for the affected elements are qualified as estimated in the indicated associated samples:

Parent Sample	Element	%D	Associated Samples
TP-7(2.5-4)	aluminum	32	Those reported in SDG 480-4809
	barium	36	"
	calcium	33	"
	cobalt	28	"
	copper	32	"
	iron	33	"
	lead	30	"
	magnesium	33	"
	manganese	33	"
	nickel	26	"
	vanadium	32	"
	zinc	33	"
TP-18(6-9.5)	lead	13	"
TP-33(4-9)	barium	11	"
SS-7	iron	11	Those reported in SDG 480-5183

Parent Sample	Element	%Recoveries	Affected Samples
SW-4-Total	barium	150	SW's reported in 480-5725
	calcium	40	"
MW-4-total	aluminum	22	MW's reported in 480-5725

The ICP serial dilution evaluations for MW-1(6-8), MW-2(4-6), and the dissolved fraction of MW-4 show acceptable correlations.

Instrument performance was compliant with sample processing. The summary forms 2B for the low level standard recoveries do not show quantitative values below the RL (reporting "ND" instead of the actual concentrations). The recovery values on the forms are correct.

Total and dissolved fraction concentrations correlate well.

DRO/GRO by USEPA Method 8015

Due to presence in the associated trip blank, the detections of GRO up to concentration of 60 ug/L in the aqueous samples collected 06/03/11 are considered external contamination have been edited to reflect non-detection.

Due to presence in the associated method blanks, the result for GRO in MW-2(4-6) is considered contamination and edited to reflect non-dctection.

The result for GRO in SED-1 is qualified as estimated due to low recovery (42%) of the surrogate compound in that sample.

Matrix spikes of GRO on TP-4(6.5-9), DRO on SED-3, and GRO and DRO on MW-4 and SW-4 fall with recommended limits.

The matrix spikes of GRO in MW-2(4-6) and SED-3 show low recoveries (35% to 56%). The results for that analyte in those parent samples are therefore qualified as estimated in value.

Parent sample concentrations of DRO and GRO in TP-18(6-9.5) and TP-46(5-5.5) are above levels for which the matrix spike evaluations are possible.

Please do not hesitate to contact me if you have comments or questions regarding this report.

Very truly yours,

Judy Harry

Judy Harry

VALIDATION DATA QUALIFIER DEFINITIONS

U	The analyte was analyzed for, but was not detected above the level of the associated reported quantitation limit.
J	The analyte was positively identified; the associated numerical value is an approximate concentration of the analyte in the sample.
UJ	The analyte was not detected. The associated reported quantitation limit is an estimate and may be inaccurate or imprecise.
NJ	The detection is tentative in identification and estimated in value. Although there is presumptive evidence of the analyte, the result should be used with caution as a potential false positive and/or elevated quantitative value.
R	The data are unusable. The analyte may or may not be present.
EMPC	The results do not meet all criteria for a confirmed identification. The quantitative value represents the Estimated Maximum Possible Concentration of the analyte in the sample.

CLIENT and LABORATORY SAMPLE IDs and CASE NARRATIVES

SAMPLE SUMMARY

Client: Turnkey Environmental Restoration, LLC

Job Number: 480-4809-1

Lab Sample ID	Client Sample ID	Client Matrix	Date/Time Sampled	Date/Time Received
480-4809-1	TP-5 (8.5-11.0)	Solid	05/10/2011 0930	05/11/2011 1315
480-4809-2	TP-8 (4-6)	Solid	05/10/2011 1245	05/11/2011 1315
480-4809-3	TP-7 (2.5-4.0)	Solid	05/10/2011 1110	05/11/2011 1315
480-4819-1	TP-2 (7-9)	Solid	05/09/2011 1245	05/11/2011 1530
480-4819-2	TP-3 (4-6.5)	Solid	05/09/2011 1324	05/11/2011 1530
480-4819-3	TP-4 (6.5-9.0)	Solid	05/09/2011 1410	05/11/2011 1530
480-4912-1	TP-13 (6-8)	Solid	05/11/2011 1115	05/13/2011 1240
480-4912-2	TP-16 (4.5-7.0)	Solid	05/11/2011 1441	05/13/2011 1240
480-4912-3	TP-18 (6-9.5)	Solid	05/12/2011 1030	05/13/2011 1240
480-4912-3MS	TP-18 (6-9.5)	Solid	05/12/2011 1030	05/13/2011 1240
480-4912-3MSD	TP-18 (6-9.5)	Solid	05/12/2011 1030	05/13/2011 1240
480-4912-4	TP-20 (5-8)	Solid	05/12/2011 1300	05/13/2011 1240
480-4912-5	TP-21 (4-6)	Solid	05/12/2011 1430	05/13/2011 1240
480-4970-1	TP-27 (7-10)	Solid	05/13/2011 1444	05/16/2011 1330
480-4970-2	TP-25 (4-8.5)	Solid	05/13/2011 1245	05/16/2011 1330
480-4970-3	TP-22 (4-5)	Solid	05/13/2011 0921	05/16/2011 1330
480-4970-4	BLIND DUP#1	Solid	05/13/2011 1300	05/16/2011 1330
480-5067-1	TP-28 (0-2)	Solid	05/16/2011 0920	05/18/2011 1255
480-5067-2	TP-31 (9-11)	Solid	05/16/2011 1055	05/18/2011 1255
480-5067-3	TP-32 (3-7)	Solid	05/16/2011 1130	05/18/2011 1255
480-5067-4	TP-33 (4-9)	Solid	05/16/2011 1300	05/18/2011 1255
480-5067-5	TP-36 (5-7)	Solid	05/17/2011 0920	05/18/2011 1255
480-5067-6	TP-37 (4.5-6.5)	Solid	05/17/2011 1030	05/18/2011 1255
480-5067-7	TP-39 (0-3)	Solid	05/17/2011 1200	05/18/2011 1255
480-5067-8	TP-41 (0-5)	Solid	05/17/2011 1245	05/18/2011 1255
480-5067-9	TP-42 (1.5-4.5)	Solid	05/17/2011 1300	05/18/2011 1255

SAMPLE SUMMARY

Client: Benchmark Env. Eng. & Science, PLLC

Job Number: 480-5183-1

Lab Sample ID	Client Sample ID	Client Matrix	Date/Time Sampled	Date/Time Received
480-5183-1	SS-1	Solid	05/18/2011 1351	05/20/2011 1203
480-5183-2	SS-2	Solid	05/18/2011 1357	05/20/2011 1203
480-5183-3	SS-3	Solid	05/18/2011 1423	05/20/2011 1203
480-5183-4	SS-4	Solid	05/18/2011 1431	05/20/2011 1203
480-5183-5	SS-5	Solid	05/18/2011 1434	05/20/2011 1203
480-5183-6	SS-6	Solid	05/18/2011 1451	05/20/2011 1203
480-5183-7	SS-7	Solid	05/18/2011 1457	05/20/2011 1203
480-5183-7MS	SS-7	Solid	05/18/2011 1457	05/20/2011 1203
480-5183-7MSD	SS-7	Solid	05/18/2011 1457	05/20/2011 1203
480-5183-8FD	BLIND DUP#3	Solid	05/18/2011 1100	05/20/2011 1203
480-5183-9	SS-8	Solid	05/18/2011 1503	05/20/2011 1203
480-5183-10	SS-9	Solid	05/18/2011 1508	05/20/2011 1203
480-5183-11	SS-10	Solid	05/18/2011 1513	05/20/2011 1203
480-5183-12	SS-11	Solid	05/18/2011 1517	05/20/2011 1203
480-5183-13	TP-46 (5-5.5)	Solid	05/18/2011 1030	05/20/2011 1203
480-5183-13MS	TP-46 (5-5.5)	Solid	05/18/2011 1030	05/20/2011 1203
480-5183-13MSD	TP-46 (5-5.5)	Solid	05/18/2011 1030	05/20/2011 1203
480-5183-14FD	BLIND DUP#2	Solid	05/18/2011 1200	05/20/2011 1203
480-5183-15	TP-48 (3-9)	Solid	05/18/2011 1130	05/20/2011 1203
480-5183-16	SS-12	Solid	05/19/2011 0923	05/20/2011 1203
480-5183-17	SS-13	Solid	05/19/2011 0935	05/20/2011 1203
480-5183-18	SS-14	Solid	05/19/2011 0939	05/20/2011 1203
480-5183-19	SS-15	Solid	05/19/2011 0945	05/20/2011 1203

SAMPLE SUMMARY

Client: Benchmark Env. Eng. & Science, PLLC

Job Number: 480-5348-1

Lab Sample ID	Client Sample ID	Client Matrix	Date/Time Sampled	Date/Time Received
480-5348-1	MW-1 (6-8)	Solid	05/25/2011 1120	05/26/2011 1245
480-5348-2	MW-2 (4-6)	Solid	05/25/2011 1530	05/26/2011 1245
480-5429-1	MW-3 (4-6)	Solid	05/26/2011 1345	05/27/2011 1155
480-5429-2	MW-4 (4-6)	Solid	05/26/2011 1600	05/27/2011 1155
480-5475-1	MW-5 (4-6)	Solid	05/27/2011 1500	05/31/2011 1430
480-5475-2	SED-2	Solid	05/27/2011 1245	05/31/2011 1430
480-5475-3	SED-1	Solid	05/27/2011 1214	05/31/2011 1430
480-5475-4	BLIND DUP #4	Solid	05/27/2011 1200	05/31/2011 1430
480-5530-1	MW-7 (2-4)	Solid	05/31/2011 1610	06/01/2011 1315
480-5530-2	MW-6 (4-8)	Solid	05/31/2011 1215	06/01/2011 1315
480-5580-1	MW-8 (2-4)	Solid	06/01/2011 1500	06/02/2011 1215
480-5580-2	SED#3	Solid	06/01/2011 1540	06/02/2011 1215
480-5580-2MS	SED#3	Solid	06/01/2011 1540	06/02/2011 1215
480-5580-2MSD	SED#3	Solid	06/01/2011 1540	06/02/2011 1215
480-5580-3	SED#4	Solid	06/01/2011 1515	06/02/2011 1215

SAMPLE SUMMARY

Client: Benchmark Env. Eng. & Science, PLLC

Job Number: 480-5725-1

Lab Sample ID	Client Sample ID	Client Matrix	Date/Time Sampled	Date/Time Received
480-5725-1	SW-1	Water	06/03/2011 1520	06/06/2011 1135
480-5725-2	SW-2	Water	06/03/2011 1510	06/06/2011 1135
480-5725-3	BLIND DUP #5	Water	06/03/2011 1200	06/06/2011 1135
480-5725-4	SW-3	Water	06/03/2011 1600	06/06/2011 1135
480-5725-5	SW-4	Water	06/03/2011 1418	06/06/2011 1135
480-5725-5MS	SW-4	Water	06/03/2011 1418	06/06/2011 1135
480-5725-5MSD	SW-4	Water	06/03/2011 1418	06/06/2011 1135
480-5725-6	TRIP BLANK	Water	06/03/2011 0000	06/06/2011 1135
480-5894-1	MW-1	Water	06/06/2011 1445	06/08/2011 1320
480-5894-2	BLIND DUP #6	Water	06/06/2011 1200	06/08/2011 1320
480-5894-3	MW-2	Water	06/06/2011 1104	06/08/2011 1320
480-5894-4	MW-3	Water	06/07/2011 1252	06/08/2011 1320
480-5894-5	MW-4	Water	06/06/2011 1225	06/08/2011 1320
480-5894-5MS	MW-4	Water	06/06/2011 1225	06/08/2011 1320
480-5894-5MSD	MW-4	Water	06/06/2011 1225	06/08/2011 1320
480-5894-6	MW-5	Water	06/07/2011 1351	06/08/2011 1320
480-5894-7	MW-6	Water	06/07/2011 1140	06/08/2011 1320
480-5894-8	MW-7	Water	06/07/2011 1047	06/08/2011 1320
480-5894-9	MW-8	Water	06/06/2011 1337	06/08/2011 1320
480-5894-10TB	TRIP BLANK	Water	06/07/2011 0000	06/08/2011 1320
480-6614-1	MW-5	Water	06/27/2011 1227	06/28/2011 1400
480-6614-2	MW-7	Water	06/27/2011 1044	06/28/2011 1400

Job Narrative
480-5183-1

Comments
No additional comments.

Receipt
All samples were received in good condition within temperature requirements.

GC/MS VOA
Method(s) 8260B: The following sample(s) was diluted due to the abundance of target analytes: TP-46 (5-5.5) (480-5183-13), TP-46 (5-5.5) (480-5183-13 MS), TP-46 (5-5.5) (480-5183-13 MSD). Elevated reporting limits (RLs) are provided.

Method(s) 8260B: The following sample(s) was diluted due to the abundance of target analytes: BLIND DUP#2 (480-5183-14). Elevated reporting limits (RLs) are provided.

Method(s) 8260B: The following sample(s) was diluted due to the abundance of target analytes: BLIND DUP#2 (480-5183-14). Elevated reporting limits (RLs) are provided.

Method(s) 8260B: Surrogate recovery for the following sample(s) was outside control limits: BLIND DUP#2 (480-5183-14). Dilution was performed with acceptable results.

Method(s) 8260B: The following sample(s) was diluted due to the abundance of non-target analytes: TP-48 (3-9) (480-5183-15). Elevated reporting limits (RLs) are provided.

No other analytical or quality issues were noted.

GC/MS Semi VOA
Method(s) 8270C: The following samples were diluted due to the nature of the sample matrix : BLIND DUP#2 (480-5183-14), BLIND DUP#3 (480-5183-8), SS-13 (480-5183-17), SS-2 (480-5183-2), SS-4 (480-5183-4), SS-6 (480-5183-6), SS-7 (480-5183-7), SS-7 (480-5183-7 MS), SS-7 (480-5183-7 MSD), SS-8 (480-5183-9), TP-46 (5-5.5) (480-5183-13), TP-46 (5-5.5) (480-5183-13 MS), TP-46 (5-5.5) (480-5183-13 MSD), TP-48 (3-9) (480-5183-15). The surrogate recoveries were diluted to where they do not provide useful information. As such, surrogate recoveries are not reported, and elevated reporting limits (RLs) are provided.

Method(s) 8270C: The following sample was diluted due to the nature of the sample matrix: SS-1 (480-5183-1), SS-12 (480-5183-16), SS-14 (480-5183-18), SS-15 (480-5183-19). Elevated reporting limits (RLs) are provided.

Method(s) 8270C: The following compound was outside control limits in the continuing calibration verification (CCV) associated with batch 18070: 2,4-Dinitrophenol. This compound is not classified as Calibration Check Compounds (CCC) in the reference method. Due to the large number of analytes contained in the CCV, the laboratory's SOP allows for four analytes to be outside limits; therefore, the data have been reported.

Method(s) 8270C: The matrix spike / matrix spike duplicate (MS/MSD) recoveries for preparation batch 17069 were outside control limits. The associated laboratory control sample (LCS) recovery met acceptance criteria.

Method(s) 8270C: The matrix spike / matrix spike duplicate (MS/MSD) precision for batch 203368 was outside control limits, for Bis (2-ethylhexyl) phthalate and Fluorene. The associated laboratory control sample / laboratory control sample duplicate (LCS/LCSD) precision met acceptance criteria.

No other analytical or quality issues were noted.

GC VOA
The form VII continuing calibration data, incorrectly flags the surrogate a,a,a-Triflourotoluene based upon +/- 15%, though the response is within the method surrogate recovery limits for this compound.

Method(s) 8015B: The following samples were diluted due to abundance of target analytes and abundance of non-target analytes: BLIND DUP#2 (480-5183-14), TP-46 (5-5.5) (480-5183-13), TP-46 (5-5.5) (480-5183-13 MS), TP-46 (5-5.5) (480-5183-13 MSD). As such, surrogate recoveries are not reported, and elevated reporting limits (RLs) are provided.

Method(s) 8015B: Matrix spikes,TP-46 (5-5.5) (480-5183-13 MS), TP-46 (5-5.5) (480-5183-13 MSD) could not be recovered due to sample matrix interferences which required sample dilution. The associated laboratory control sample (LCS) met acceptance criteria.

Method(s) 8015B: The following samples were diluted due to abundance of target analytes and abundance of non-target analytes: TP-48 (3-9) (480-5183-15). As such, surrogate recoveries are not reported, and elevated reporting limits (RLs) are provided.

No other analytical or quality issues were noted.

GC Semi VOA
The continuing calibration verification (CCV) 480-17839/30 for Toxaphene was decreased and exceeded control criteria of 15%D, though all associated samples did not show any potential pattern. The data has been reported.

Method 8082: The continuing calibration verification (CCV 480-17485/55) for Aroclor 1260 recovered above the upper control limit. The samples associated with this CCV were non-detects for the affected analytes; therefore, the data have been reported.

The continuing calibration verification (CCV 480-17522/26 for 2,4 D recovered above the upper control limit. The samples associated with this CCV were non-detects for the affected analytes; therefore, the data have been reported.

Method(s) 8015B: The following samples were diluted due to the abundance of target analytes: BLIND DUP#2 (480-5183-14), TP-46 (5-5.5) (480-5183-13), TP-46 (5-5.5) (480-5183-13 MS), TP-46 (5-5.5) (480-5183-13 MSD), TP-48 (3-9) (480-5183-15). As such, surrogate recoveries are reduced to a level where the recovery calculation does not provide useful information. Elevated reporting limits (RLs) are provided.

Method(s) 8015B, 8081A: The following samples were diluted due to the nature of the sample matrix : BLIND DUP#2 (480-5183-14), BLIND DUP#3 (480-5183-8), SS-15 (480-5183-19), SS-4 (480-5183-4), SS-7 (480-5183-7), SS-7 (480-5183-7 MS), SS-7 (480-5183-7 MSD), TP-46 (5-5.5) (480-5183-13), TP-46 (5-5.5) (480-5183-13 MS), TP-46 (5-5.5) (480-5183-13 MSD). As such, surrogate recoveries are not reported, and elevated reporting limits (RLs) are provided.

Method(s) 8081A: All sample primary data is reported from RTX-CLPI column.
For samples;BLIND DUP#2 (480-5183-14), TP-46 (5-5.5) (480-5183-13), TP-46 (5-5.5) (480-5183-13 MS), TP-46 (5-5.5) (480-5183-13 MSD), the closing CCV 480-17839/31 was decreased on the RTX-CLPI column for alpha chlordane and 4,4'-DDT, but was compliant on the RTX-CLPII column. These samples are all non-detect on both column for these analytes, therefore the data is unaffected.

Method(s) 8151A: The matrix spike and matrix spike duplicate (MS/MSD) recoveries for batch 17260 were outside control limits. The associated laboratory control sample (LCS) recovery met acceptance criteria.

Method(s) 8151A: The matrix spike and matrix spike duplicate (MS/MSD) recoveries for batch 17260 were outside control limits. The associated laboratory control sample (LCS) recovery met acceptance criteria.

Method(s) 8151A: Surrogate recovery for the following samples were outside control limits: BLIND DUP#2 (480-5183-14), SS-7 (480-5183-7 MS), TP-46 (5-5.5) (480-5183-13), TP-46 (5-5.5) (480-5183-13 MS), TP-46 (5-5.5) (480-5183-13 MSD). Evidence of matrix interference is present; therefore, re-extraction and/or re-analysis was not performed.

No other analytical or quality issues were noted.

Metals
Method(s) 6010B: The Serial Dilution and Post Digestion Spike (480-5183-7 PDS), (480-5183-7 SD) exceeded the quality control limits for total iron. Sample matrix is suspected, therefore, no corrective action was necessary.

Method(s) 6010B: The recovery of Post Digestion Spike, (480-5183-7 PDS), in batch 480-17478 exhibited results below the quality control limts for total aluminum, magnesium, and manganese. However, the Serial Dilution of this sample was compliant. Therefore, no corrective action was necessary.

Method(s) 6010B: The Matrix Spike/ Matrix Spike Duplicate (MS/MSD) SS-7 (480-5183-7 MS), SS-7 (480-5183-7 MSD) recoveries for total chromium, copper, and antimony, in batch 480-17478 were outside control limits. The MSD recoveries for total barium and zinc were also outside control limits. The associated Laboratory Control Sample (LCS SRM) recovery met acceptance criteria, therefore no corrective action was necessary.

Method(s) 6010B: The Matrix Spike / Matrix Spike Duplicate (MS/MSD) SS-7 (480-5183-7 MS), SS-7 (480-5183-7 MSD) precision for batch 480-17478 was outside control limits for total chromium. Non-homogeneity of the sample matrix is suspected.

Method(s) 6010B: The Matrix Spike/ Matrix Spike Duplicate (MS/MSD) TP-46 (5-5.5) (480-5183-13 MS), TP-46 (5-5.5) (480-5183-13 MSD) recoveries for total aluminum, magnesium, manganese and zinc in batch 480-17478, were outside control limits. The Matrix Spike recovery for total barium was also outside control limits. The associated Laboratory Control Sample (LCS SRM) recovery met acceptance criteria, therefore no corrective action was necessary.

Method(s) 6010B: The Matrix Spike / Matrix Spike Duplicate (MS/MSD) TP-46 (5-5.5) (480-5183-13 MS), TP-46 (5-5.5) (480-5183-13 MSD) precision for batch 480-17478 was outside control limits for total calcium and zinc. Non-homogeneity of the sample matrix is suspected.

Method(s) 6010B: The following sample was diluted due to the abundance of target analyte total iron: TP-48 (3-9) (480-5183-15). Elevated reporting limits (RLs) are provided.

Method(s) 7471A: The Matrix Spike/ Matrix Spike Duplicate (MS/MSD) recoveries for mercury in batch 480-17319 were outside control limits. The associated Laboratory Control Sample (LCS) recovery and an additional MS/MSD met acceptance criteria, therefore no corrective action was necessary.

Method(s) 7471A: The following sample(s) were diluted due to the abundance of target analyte mercury: BLIND DUP#3 (480-5183-8), SS-7 (480-5183-7 MS), SS-7 (480-5183-7 MSD), TP-48 (3-9) (480-5183-15). Elevated reporting limits (RLs) are provided.

No other analytical or quality issues were noted.

Organic Prep

Method(s) 3550B: Due to the matrix, the following samples could not be concentrated to the final method required volume: TP-46 (5-5.5) (480-5183-13 MS), TP-46 (5-5.5) (480-5183-13 MSD). The reporting limits (RLs) are elevated proportionately.

Method(s) 3550B: Due to the matrix, the following samples could not be concentrated to the final method required volume: BLIND DUP#2 (480-5183-14), TP-46 (5-5.5) (480-5183-13), TP-48 (3-9) (480-5183-15). The reporting limits (RLs) are elevated proportionately.

Method(s) 3550B: Due to the matrix, the following samples could not be concentrated to the final method required volume: BLIND DUP#2 (480-5183-14), SS-6 (480-5183-6), TP-46 (5-5.5) (480-5183-13), TP-48 (3-9) (480-5183-15). The reporting limits (RLs) are elevated proportionately.

Method(s) 3550B: The following samples required a Florisil clean-up to reduce matrix interferences: BLIND DUP#2 (480-5183-14), BLIND DUP#3 (480-5183-8), SS-15 (480-5183-19), SS-4 (480-5183-4), SS-7 (480-5183-7), SS-7 (480-5183-7 MS), SS-7 (480-5183-7 MSD), TP-46 (5-5.5) (480-5183-13), TP-46 (5-5.5) (480-5183-13 MS), TP-46 (5-5.5) (480-5183-13 MSD).

Method(s) 3550B: Due to the matrix, the following samples could not be concentrated to the final method required volume: SS-15 (480-5183-19), TP-46 (5-5.5) (480-5183-13 MS), TP-46 (5-5.5) (480-5183-13 MSD). The reporting limits (RLs) are elevated proportionately.

No other analytical or quality issues were noted.

Job Narrative
480-4809-1

Comments
No additional comments.

Receipt
All samples were received in good condition within temperature requirements.

GC/MS VOA
Method(s) 8260B: The following samples were diluted due to the abundance of target analytes: TP-2 (7-9) (480-4819-1), TP-3 (4-6.5) (480-4819-2). Elevated reporting limits (RLs) are provided.

Method(s) 8260B: The following sample(s) was analyzed at 0.5 grams due to the abundance of target analytes: TP-5 (8.5-11.0) (480-4809-1), TP-8 (4-6) (480-4809-2). Elevated reporting limits (RLs) are provided.

Method(s) 8260B: The following sample(s) was diluted due to the abundance of target analytes: TP-13 (6-8) (480-4912-1),TP-21 (4-6) (480-4912-5). Elevated reporting limits (RLs) are provided.

Method(s) 8260B: The method blank for batch 16710 contained Methylene Chloride and Toluene above the method detection limit. This target analyte concentration was less than the reporting limit (RL); therefore, re-extraction and/or re-analysis of samples was not performed.

Method(s) 8260B: The following sample was diluted due to the nature of the sample matrix: TP-22 (4-5) (480-4970-3). Elevated reporting limits (RLs) are provided.

Method(s) 8260B: The following samples were diluted due to the abundance of non-target analytes: TP-41 (0-5) (480-5067-8). Elevated reporting limits (RLs) are provided.

Method(s) 8260B: The following sample(s) was diluted due to the abundance of non-target analytes: TP-32 (3-7) (480-5067-3). Elevated reporting limits (RLs) are provided.

No other analytical or quality issues were noted.

GC/MS Semi VOA
Method(s) 8270C: The following sample was diluted due to the abundance of target analytes: TP-2 (7-9) (480-4819-1). Elevated reporting limits (RLs) are provided.

Method(s) 8270C: The following samples were diluted due to the nature of the sample matrix: TP-13 (6-8) (480-4912-1), TP-18 (6-9.5) (480-4912-3), TP-18 (6-9.5) (480-4912-3 MS), TP-18 (6-9.5) (480-4912-3 MSD), TP-7 (2.5-4.0) (480-4809-3), TP-8 (4-6) (480-4809-2). Elevated reporting limits (RLs) are provided.

Method(s) 8270C: The following samples were diluted due to sample viscosity: TP-16 (4.5-7.0) (480-4912-2), TP-20 (5-8) (480-4912-4), TP-21 (4-6) (480-4912-5). Elevated reporting limits (RL) are provided.

Method(s) 8270C: Due to the level of dilution necessary for the following samples, surrogate recoveries are reduced to a level where the recovery calculation does not provide useful information:TP-16 (4.5-7.0) (480-4912-2), TP-20 (5-8) (480-4912-4), TP-21 (4-6) (480-4912-5), TP-7 (2.5-4.0) (480-4809-3).

Method(s) 8270C: The following compounds were outside control limits in the continuing calibration verification (CCV) associated with analytical batch 480-17063: 2,2'-oxybis[1-chloropropane] and 4-Nitrophenol. These compounds are not classified as Calibration Check Compounds (CCCs) in the reference method, and the laboratory defaults to in-house and/or project-specific criteria for evaluation. Due to the large number of analytes contained in the CCV, the laboratory's SOP allows for four analytes to be outside limits; therefore, the data have been reported.

Method(s) 8270C: The following samples were diluted due to sample viscosity: BLIND DUP#1 (480-4970-4), TP-25 (4-8.5) (480-4970-2). Elevated reporting limits (RL) are provided.

Method(s) 8270C: Due to the dilutions necessary for the following samples, surrogate recoveries are reduced to a level where the recovery calculation does not provide useful information: BLIND DUP#1 (480-4970-4), TP-25 (4-8.5) (480-4970-2).

Method(s) 8270C: The following sample contained base surrogate 2-Fluorobiphenyl outside acceptance limits: TP-27 (7-10) (480-4970-1). The laboratory's SOP allows one acid surrogate and/or one base surrogate to be outside acceptance limits; therefore, re-extraction/re-analysis was not performed. These results have been reported and qualified.

Method(s) 8270C: The following samples were diluted due to the nature of the sample matrix: (480-5067-1 MS), (480-5067-1 MSD), TP-28 (0-2) (480-5067-1), TP-32 (3-7) (480-5067-3), TP-33 (4-9) (480-5067-4), TP-36 (5-7) (480-5067-5), TP-37 (4.5-6.5) (480-5067-6). As such, surrogate recoveries were reduced to a level where the recovery calculation does not provide useful information. Elevated reporting limits (RLs) are provided.

Method(s) 8270C: Samples (480-5067-1 MS), (480-5067-1 MSD) were diluted due to the nature of the sample matrix. As such, spike recoveries were diluted to a level where the recovery calculation does not provide useful information. Also the %RPD for 4-Chloro-3-methylphenol exceeded quality control limits. The data has been qualified and reported.

Method(s) 8270C: The following samples were diluted due to viscosity: TP-39 (0-3) (480-5067-7), TP-41 (0-5) (480-5067-8), TP-42 (1.5-4.5) (480-5067-9). As such, surrogate recoveries were reduced to a level where the recovery calculation does not provide useful information. Elevated reporting limits (RLs) are provided.

No other analytical or quality issues were noted.

GC VOA

The form VII continuing calibration data, incorrectly flags the surrogate a,a,a-Triflourotoluene based upon +/- 15%, though the response is within the method surrogate recovery limits for this compound.

Method(s) 8015B: The following samples were diluted due to an abundance of target analytes: TP-13 (6-8) (480-4912-1), TP-16 (4.5-7.0) (480-4912-2), TP-18 (6-9.5) (480-4912-3), TP-20 (5-8) (480-4912-4), TP-21 (4-6) (480-4912-5), TP-22 (4-5) (480-4970-3). As such, surrogate recoveries are not reported, and elevated reporting limits (RLs) are provided.

Method(s) 8015B: The following samples were diluted due to an abundance of target analytes BLIND DUP#1 (480-4970-4), TP-25 (4-8.5) (480-4970-2), TP-27 (7-10) (480-4970-1). As such, surrogate recoveries are not reported, and elevated reporting limits (RLs) are provided.

Method(s) 8015B: The following samples were diluted due to an abundance of target analytes : TP-2 (7-9) (480-4819-1), TP-3 (4-6.5) (480-4819-2), TP-5 (8.5-11.0) (480-4809-1), TP-8 (4-6) (480-4809-2) As such, surrogate recoveries are not reported, and elevated reporting limits (RLs) are provided.

Method(s) 8015B: The following samples were diluted due to abundance of target analytes and abundance of non-target analytes: TP-28 (0-2) (480-5067-1), TP-31 (9-11) (480-5067-2), TP-32 (3-7) (480-5067-3), TP-33 (4-9) (480-5067-4), TP-36 (5-7) (480-5067-5), TP-46 (5-5.5) (480-5183-13), TP-46 (5-5.5) (480-5183-13 MS), TP-46 (5-5.5) (480-5183-13 MSD). As such, surrogate recoveries are not reported, and elevated reporting limits (RLs) are provided.

Method(s) 8015B: The following samples were diluted due to abundance of target analytes and abundance of non-target analytes: TP-31 (9-11) (480-5067-2), TP-37 (4.5-6.5) (480-5067-6), TP-42 (1.5-4.5) (480-5067-9). TP-39 (0-3) (480-5067-7) and TP-41 (0-5) (480-5067-8). As such, surrogate recoveries are not reported, and elevated reporting limits (RLs) are provided.

Method(s) 8015B: The matrix spike / matrix spike duplicate (MS/MSD) recoveries for TP-18 (6-9.5) (480-4912-3 MS), TP-18 (6-9.5) (480-4912-3 MSD) were outside control limits. The associated laboratory control sample (LCS) recovery met acceptance criteria.

No other analytical or quality issues were noted.

GC Semi VOA

Method(s) 8015B: The following samples were diluted due to an abundance of target analytes analytes:TP-2 (7-9) (480-4819-1), TP-3 (4-6.5) (480-4819-2), TP-8 (4-6) (480-4809-2) TP-5 (8.5-11.0) (480-4809-1) and TP-7 (2.5-4.0) (480-4809-3) . As such, surrogate recoveries are not reported, and elevated reporting limits (RLs) are provided.

Method(s) 8015B: Due to the level of dilution required for the following sample, surrogate recoveries are not reported: BLIND DUP#1 (480-4970-4), TP-13 (6-8) (480-4912-1), TP-16 (4.5-7.0) (480-4912-2), TP-20 (5-8) (480-4912-4), TP-21 (4-6) (480-4912-5), TP-22 (4-5) (480-4970-3), TP-25 (4-8.5) (480-4970-2), TP-27 (7-10) (480-4970-1).

Method(s) 8015B: The following sample were diluted due to the abundance of target analytes: BLIND DUP#1 (480-4970-4), TP-13 (6-8) (480-4912-1), TP-16 (4.5-7.0) (480-4912-2), TP-18 (6-9.5) (480-4912-3), TP-18 (6-9.5) (480-4912-3 MS), TP-18 (6-9.5) (480-4912-3 MSD), TP-20 (5-8) (480-4912-4), TP-21 (4-6) (480-4912-5), TP-22 (4-5) (480-4970-3), TP-25 (4-8.5) (480-4970-2), TP-27 (7-10) (480-4970-1). Elevated reporting limits (RLs) are provided.

Method(s) 8015B: Surrogate recovery for the following samples were outside control limits: TP-18 (6-9.5) (480-4912-3), TP-18 (6-9.5) (480-4912-3 MSD). Evidence of matrix interference is present; therefore, re-extraction and/or re-analysis was not performed.

Method(s) 8015B: The matrix spike / matrix spike duplicate (MS/MSD) precision for preparation batch 480-16544 was outside control limits for C10-C28. No further corrective action was taken. Data have been qualified and reported.

Method(s) 8015B: The following samples were diluted due to the abundance of target analytes: TP-28 (0-2) (480-5067-1), TP-31 (9-11) (480-5067-2), TP-32 (3-7) (480-5067-3), TP-33 (4-9) (480-5067-4), TP-36 (5-7) (480-5067-5), TP-37 (4.5-6.5) (480-5067-6), TP-39 (0-3) (480-5067-7), TP-41 (0-5) (480-5067-8). As such, surrogate recoveries are reduced to a level where the recovery calculation does not provide useful information. Elevated reporting limits (RLs) are provided.

Method(s) 8015B: The following sample had an adjusted final volume which reduced surrogate recovery to a level where the recovery calculation does not provide useful information.

Method(s) 8081A: All primary data is reported from the RTX-CLP-I column.

Method 8081: The matrix spike / matrix spike duplicate (MS/MSD) recoveries for batch 16553 were outside control limits. The associated laboratory control sample (LCS) recovery met acceptance criteria.

Method 8081: The laboratory control sample (LCSD) for batch 16076 exceeded control limits for the following analytes: alpha chlordane though the LCS is compliant.

Method 8081:The continuing calibration verification (CCV) CCV5-480-16296 for Toxaphene was decreased and exceeded control criteria of 15%D, though all associated samples did not show any potential pattern. The data has been reported.

Method(s) 8081A: The continuing calibration verification (CCV) (CCV 480-17839/23) was decreased and slightly exceeded control criteria for alpha chlordane due to sample matrix effects from sample 480-5067-B-9-D. This sample is non-detect for this compound and the confirmatory column continuing calibration verification (CCV) was compliant for allpha chlordane. The data is uneffected.

Method(s) 8081A: The following samples were diluted due to matrix effects: TP-2 (7-9) (480-4819-1) TP-18 (6-9.5) (480-4912-3), TP-25 (4-8.5) (480-4970-2), BLIND DUP#1 (480-4970-4) and TP-42 (1.5-4.5) (480-5067-9) . As such surrogate recoveries are reduced to a level where recovery calculation does not provide useful information. Elevated reporting limits (RL) are provided.

Method 8082: The percent difference in a PCB continuing calibration verification is assessed on the basis of the PCB total amount, individual peak calculations are only listed for completeness.

Method 8082: All primary data for samples: TP-2 (7-9) (480-4819-1) and TP-42 (1.5-4.5) (480-5067-9) is reported from the ZB-35 column.

Method 8082: All primary data for samples: TP-18 (6-9.5) (480-4912-3), (480-4912-3MS), (480-4912-3MSD), TP-25 (4-8.5) (480-4970-2) and BLIND DUP#1 (480-4970-4) is reported from the ZB-5 column.

Method 8082: The capping continuing calibration verification (CCV) exceeded control limits for Tetrachloro-m-xylene and Decachlorobiphenyl. Sample matrix is suspected to have contributed to this failure. CCV 480-16744/40.

Method(s) 8082: The following sample was diluted due to color : As such surrogate recoveries are reduced to a level where recovery calculation does not provide useful information. Elevated reporting limits (RL) are provided.

Method(s) 8082: The percent difference in the continuing calibration verifications exceeded 15% for several individual Aroclor peaks, though the total amount is compliant. (CCV 480-16212/13), (CCVRT 480-16212/2)

Method(s) 8082: The surrogate percent difference in the associated continuing calibration verifications (CCV) for Tetrachloro-m-xylene exceeded 15% on the ZB-5 column, indicating a high bias. (CCV 480-16744/31)

Method(s) 8082: The surrogate percent difference in the associated continuing calibration verifications (CCV) for Tetrachloro-m-xylene exceeded 15% on the ZB-35 column, indicating a high bias. (CCV 480-16212/13)

Method(s) 8082: surrogate recovery for tetrachloro-m-xylene for sample TP-42 (1.5-4.5) (480-5067-9) exceeded quality control limits due to the sample matrix . The recovery of the secondary surrogate is within quality control criteria; no corrective action is required

Method(s) 8082: The percent difference in the continuing calibration verification exceeded 15% on the ZB-5 for several individual Aroclor peaks, though the total amount is compliant. (CCVRT 480-16744/7)

Method 8082: The continuing calibration verification (CCV) for Aroclor 1016 recovered above the upper control limit. The samples associated with this CCV were non-detects for the affected analytes; therefore, the data have been reported. (CCV 480-16744/40)

Method 8082 :The following samples were diluted due to matrix effects: TP-250(4-8.5) (480-4970-2) and BLIND DUP#1 (480-4970-4). As such surrogate recoveries are reduced to a level where recovery calculation does not provide useful information. Elevated reporting limits (RL) are provided.

Method(s) 8151 : All primary data is reported from the RTX-CLP-I column for samples: TP-250(4-8.5) (480-4970-2), BLIND DUP#1

(480-4970-4) and TP-42 (1.5-4.5) (480-5067-9)

Method(s) 8151 : All primary data is reported from the RTX-CLP-II column for samples: TP-18 (6-9.5) (480-4912-3) and TP-2 (7-9) (480-4819-1).

Method(s) 8151A: The surrogate recovery for the following sample : TP-2 (7-9) (480- 4819-1) was outside acceptance limits (high biased) on the primary column due to matrix interference. The recovery is within acceptance limits on the confrimatory column, indicating that the extraction process was in control.

Method(s) 8151A: The surrogate recovery for the following samples TP-250(4-8.5) (480-4970-2) and BLIND DUP#1 (480-4970-4), was outside acceptance limits on the confirmatory column which produced uncalculatable results, listed as NaN (Not a Number) on the Form II Surrogate Summary

No other analytical or quality issues were noted.

Metals

Method(s) 6010B: The Serial Dilution (480-4809-3 SD) in batch 480-15807, exhibited results outside the quality control limits for total calcium, cobalt, copper, magnesium, nickel, and vanadium. However, the Post Digestion Spike was compliant so no corrective action was necessary

Method(s) 6010B: The Serial Dilution and Post Spike (480-4809-3 PDS), (480-4809-3 SD) exceeded the quality control limits for total aluminum, barium, iron, manganese, lead, and zinc. Sample matrix is suspected, therefore, no corrective action was necessary.

Method(s) 6010B: The Matrix Spike / Matrix Spike Duplicate, (480-4809-3 MS), (480-4809-3 MSD), recoveries associated with batch 480-15807 were outside control limits for total aluminum, barium, iron, potassium, magnesium, manganese, lead, antimony, and zinc. The Matrix Spike Duplicate was also outside quality control limits for total calcium, copper, nickel, and vanadium. Matrix interference is suspected. The Laboratory Control Sample (LCSSRM) was compliant, therefore no corrective action was necessary

Method(s) 6010B: The Matrix Spike / Matrix Spike Duplicate, (480-4809-3 MS), (480-4809-3 MSD), precision for batch 480-15807 was outside control limits for total manganese and zinc. Non-homogeneity of the sample matrix is suspected. The associated Laboratory Control Sample (LCSSRM) met acceptance criteria, therefore no corrective action was necessary.

Method(s) 6010B: The Serial Dilution, (480-4912-3 SD) in batch 480-16422, exhibited a result outside the quality control limits for total lead. However, the Post Digestion Spike was compliant so no corrective action was necessary.

Method(s) 6010B: The recoveries of Post Digestion Spike (480-4912-3 PDS), in batch 480-16422 exhibited results below the quality control limits for total aluminum, iron, and manganese. However, the Serial Dilution of this sample was compliant. Therefore, no corrective action was necessary.

Method(s) 6010B: The Matrix Spike/ Matrix Spike Duplicate (MS/MSD) recoveries for total magnesium and antimony in batch 480-16422 were outside control limits. The associated Laboratory Control Sample (LCSSRM) recovery met acceptance criteria, therefore no corrective action was necessary.

Method(s) 6010B: The Serial Dilution, (480-5067-4 SD), in batch 480-16713, exhibited a result outside the quality control limits for total barium. However, the Post digestion Spike was compliant so no corrective action was necessary.

Method(s) 6010B: The recovery for Post Digestion Spike, (480-5067-4 PDS), in batch 480-16713, exhibited results below the quality control limits for total aluminum, calcium, iron, and magnesium. However, the Serial Dilution of this sample was compliant. Therefore, no corrective action was necessary.

Method(s) 6010B: The Matrix Spike/ Matrix Spike Duplicate (480-5067-4 MS), (480-5067-4 MSD) recoveries for total antimony in batch 480-16713 were outside control limits. The associated Laboratory Control Sample (LCS SRM) met acceptance criteria, therefore no corrective action was necessary.

Method(s) 6010B: The following sample was diluted due to the abundance of target analyte total calcium: TP-32 (3-7) (480-5067-3). Elevated reporting limits (RLs) are provided.

Method(s) 7471A: The following sample(s) were diluted due to the abundance of target analyte mercury: (480-4970-2 MS), (480-4970-2 MSD), (480-4970-2 SD), BLIND DUP#1 (480-4970-4), TP-25 (4-8.5) (480-4970-2). Elevated reporting limits (RLs) are provided.

No other analytical or quality issues were noted.

Organic Prep

Method(s) 3550B: Due to the matrix, the following samples could not be concentrated to the final method required volume: TP-7 (2.5-4.0) (480-4809-3). The reporting limits (RLs) are elevated proportionately.

Method(s) 3550B: The following samples required a Florisil clean-up to reduce matrix interferences: TP-2 (7-9) (480-4819-1).

Method(s) 3550B: The following samples required a Florisil clean-up to reduce matrix interferences: BLIND DUP#1 (480-4970-4), TP-18 (6-9.5) (480-4912-3), TP-18 (6-9.5) (480-4912-3 MS), TP-18 (6-9.5) (480-4912-3 MSD), TP-25 (4-8.5) (480-4970-2).

Method(s) 3550B: Due to the matrix, the following samples could not be concentrated to the final method required volume: BLIND DUP#1 (480-4970-4), TP-13 (6-8) (480-4912-1), TP-16 (4.5-7.0) (480-4912-2), TP-20 (5-8) (480-4912-4), TP-21 (4-6) (480-4912-5), TP-22 (4-5) (480-4970-3), TP-25 (4-8.5) (480-4970-2). The reporting limits (RLs) are elevated proportionately.

Method(s) 3550B: Due to the matrix, the following samples could not be concentrated to the final method required volume: BLIND DUP#1 (480-4970-4), TP-16 (4.5-7.0) (480-4912-2), TP-2 (7-9) (480-4819-1), TP-20 (5-8) (480-4912-4), TP-21 (4-6) (480-4912-5), TP-25 (4-8.5) (480-4970-2), TP-27 (7-10) (480-4970-1), TP-7 (2.5-4.0) (480-4809-3). The reporting limits (RLs) are elevated proportionately.

Method(s) 3550B: Due to the matrix, the following samples could not be concentrated to the final method required volume: TP-32 (3-7) (480-5067-3), TP-33 (4-9) (480-5067-4), TP-36 (5-7) (480-5067-5). The reporting limits (RLs) are elevated proportionately.

Method(s) 3550B: Due to the matrix, the following samples could not be concentrated to the final method required volume: TP-39 (0-3) (480-5067-7), TP-41 (0-5) (480-5067-8), TP-42 (1.5-4.5) (480-5067-9). The reporting limits (RLs) are elevated proportionately.

Method(s) 3550B: Due to the matrix, the following samples could not be concentrated to the final method required volume: (480-5067-1 MS), (480-5067-1 MSD), TP-28 (0-2) (480-5067-1), TP-32 (3-7) (480-5067-3), TP-33 (4-9) (480-5067-4), TP-39 (0-3) (480-5067-7), TP-41 (0-5) (480-5067-8). The reporting limits (RLs) are elevated proportionately.

Method(s) 3550B: The following samples required a Florisil clean-up to reduce matrix interferences: BLIND DUP#1 (480-4970-4), TP-18 (6-9.5) (480-4912-3), TP-18 (6-9.5) (480-4912-3 MS), TP-18 (6-9.5) (480-4912-3 MSD), TP-25 (4-8.5) (480-4970-2), TP-42 (1.5-4.5) (480-5067-9).

No other analytical or quality issues were noted.

Job Narrative
480-5348-1

Comments
No additional comments.

Receipt
All samples were received in good condition within temperature requirements.

GC/MS VOA
Method(s) 8260B: Surrogate recovery for the following sample was outside control limits: MW-1 (6-8) (480-5348-1). Evidence of matrix interference is present. The associated sample is being re-extracted and re-run medium level for target compounds over low level soil calibration range.

Method(s) 8260B: The following samples were analyzed at 1 gram due to the abundance of target analytes: SED-1 (480-5475-3). Elevated reporting limits (RLs) are provided.

Method(s) 8260B: The following samples were diluted due to the abundance of target analytes: MW-1 (6-8) (480-5348-1). Elevated reporting limits (RLs) are provided.

Method(s) 8260B: The following sample was diluted due to the abundance of non-target analytes: MW-6 (4-8) (480-5530-2). Elevated reporting limits (RLs) are provided.

Method(s) 8260B: The method blank for batch 18123 contained 1,2,4-Trichlorobenzene above the method detection limit. This target analyte concentration was less than the reporting limit (RL); therefore, re-extraction and/or re-analysis of samples was not performed.

Method(s) 8260B: The following sample(s) was diluted due to the abundance of target analytes: MW-5 (4-6) (480-5475-1). Elevated reporting limits (RLs) are provided.

Method(s) 8260B: The matrix spike / matrix spike duplicate (MS/MSD) recoveries for batch 18571 were outside control limits. The associated laboratory control sample (LCS) recovery met acceptance criteria.

Method(s) 8260B: The matrix spike / matrix spike duplicate (MS/MSD) precision for batch 18571 was outside control limits for 1,2 Dichlorobenzene.

Method(s) 8260B: The method blank for batch 18571 contained Methylene Chloride and Toluene above the method detection limit. This target analyte concentration was less than the reporting limit (RL); therefore, re-extraction and/or re-analysis of samples was not performed.

Method(s) 8260B: The method blank for batch 18179 contained several analytes above the method detection limit. This target analyte concentration was less than the reporting limit (RL); therefore, re-extraction and/or re-analysis of samples was not performed.

No other analytical or quality issues were noted.

GC/MS Semi VOA
Method(s) 8270C: The following samples were diluted due to the nature of the sample matrix: MW-3 (4-6) (480-5429-1), MW-4 (4-6) (480-5429-2). Elevated reporting limits (RLs) are provided.

Method(s) 8270C: The following sample was diluted due to the nature of the sample matrix: MW-5 (4-6) (480-5475-1). As such, surrogate concentrations were reduced to a level where they do not provide useful information, elevated reporting limits (RLs) are provided.

Method(s) 8270C: The following compounds were outside control limits in the continuing calibration verification (CCV) associated with batch 18523: 2,2'-Oxybis[1-Chloropropane] and 2,4-Dinitrophenol. These compounds are not classified as Calibration Check Compounds (CCCs) in the reference method. Due to the large number of analytes contained in the CCV, the laboratory's SOP allows for four analytes to be outside limits; therefore, the data have been reported.

Method(s) 8270C: The following compounds were outside control limits in the continuing calibration verification (CCV) associated with batch 18386: 4,6-Dinitro-2-methylphenol, 2,2'-Oxybis[1-Chloropropane] and 2,4-Dinitrophenol. These compounds are not classified as Calibration Check Compounds (CCCs) in the reference method. Due to the large number of analytes contained in the CCV, the laboratory's SOP allows for four analytes to be outside limits; therefore, the data have been reported.

Method(s) 8270C: The following samples were diluted due to the nature of the sample matrix: MW-6 (4-8) (480-5530-2), MW-7 (2-4) (480-5530-1), SED#3 (480-5580-2), SED#3 (480-5580-2 MS), SED#3 (480-5580-2 MSD), SED#4 (480-5580-3). Elevated reporting limits (RLs) are provided.

Method(s) 8270C: The following compound was outside control limits in the continuing calibration verification internal standard (CCVIS) associated with analytical batches 19194 and 19891:2,4-Dinitrophenol. This compound is not classified as Calibration Check Compound (CCC) in the reference method, and the laboratory defaults to in-house and/or project-specific criteria for evaluation. Due to the large number of analytes contained in the CCVIS, the laboratory's SOP allows for four analytes to be outside limits; therefore, the data have been reported.

Method(s) 8270C: the following compound was outside control limits in the continuing calibration verification internal standard (CCVIS) associated with analytical batch 480-18006: Atrazine. This compound is not classified as Calibration Check Compound (CCC) in the reference method, and the laboratory defaults to in-house and/or project-specific criteria for evaluation. Due to the large number of analytes contained in the CCVIS, the laboratory's SOP allows for four analytes to be outside limits; therefore, the data have been reported.

Method(s) 8270C: The method blank for batch 18027contained Napthalene above the method detection limit. This target analyte concentration was less than the reporting limit (RL); therefore, re-extraction and/or re-analysis of samples was not performed.

Method(s) 8270C: The following sample was diluted due to viscosity: MW-8 (2-4) (480-5580-1). As such, surrogate recoveries are not reported, and elevated reporting limits (RLs) are provided.

Method(s) 8270C: Internal standard (ISTD) response for the following sample(s) was outside of acceptance limits for retention time only: (CCVIS 480-18336/2). The sample(s) was not re-analyzed, there is no impact on the data.

No other analytical or quality issues were noted.

GC VOA

Method(s) 8015B: The following sample was diluted due to an abundance of target analytes: MW-5 (4-6) (480-5475-1). As such, surrogate recoveries are not reported, and elevated reporting limits (RLs) are provided.

Method(s) 8015B: The matrix spike duplicate (MS/MSD) recoveries for batch18781 was outside control limits. The associated laboratory control sample (LCS) recovery met acceptance criteria.

Method(s) 8015B: The matrix spike and matrix spike duplicate (MS/MSD) recoveries for batch 18368 were outside control limits. The associated laboratory control sample (LCS) recovery met acceptance criteria.

Method(s) 8015B: The following sample was diluted due to an abundance of target analytes: MW-4 (4-6) (480-5429-2). As such, surrogate recoveries are not reported, and elevated reporting limits (RLs) are provided.

Method(s) 8015B: The following sample was diluted due to the abundance of target analytes: MW-6 (4-8) (480-5530-2). Elevated reporting limits (RLs) are provided.

Method(s) 8015B: The form VII continuing calibration data, incorrectly flags the surrogate a,a,a-Triflourotoluene based upon +/- 15%, though the response is within the method surrogate recovery limits for this compound.

Method 8015B :The method blank (MB) for batches 480-18368 and 480-18787 contained GRO (C6-C10) above the method detection limit. This target analyte concentration was less than the reporting limit (RL); therefore, re-extraction and/or re-analysis of samples was not performed.

Method(s) 8015B: The matrix spike / matrix spike duplicate (MS/MSD) recoveries for batch 19504 were outside control limits. The associated laboratory control sample (LCS) recovery met acceptance criteria.

Method(s) 8015B: The following sample was diluted due to an abundance of target analytes : MW-8 (2-4) (480-5580-1). As such, surrogate recoveries are not reported, and elevated reporting limits (RLs) are provided.

Method(s) 8015B: Surrogate recovery for the following sample was outside control limits: SED-1 (480-5475-3).

No other analytical or quality issues were noted.

GC Semi VOA

Method(s) 8015B: The following samples were diluted due to the abundance of target analytes: MW-5 (4-6) (480-5475-1), MW-7 (2-4) (480-5530-1). As such, surrogate recoveries are not reported, and elevated reporting limits (RLs) are provided.

Method(s) 8015B: The following samples were diluted due to the abundance of target analytes : MW-1 (6-8) (480-5348-1), MW-4 (4-6) (480-5429-2), MW-6 (4-8) (480-5530-2). As such, surrogate recoveries are not reported, and elevated reporting limits (RLs) are provided.

Method 8081:All primary data is reported from the RTX-CLP-II column.

Method(s) 8081A: Method 8081: Due to the level of dilution required for the following sample(s), surrogate recoveries are not reported: MW-1 (6-8) (480-5348-1), MW-6 (4-8) (480-5530-2), MW-7 (2-4) (480-5530-1).

Method(s) 8081A: The percent difference in the continuing calibration verifications exceeded 15% for 4,4-DDTand Methoxychlor due to the decreased instrument response following field samples that had heavy matrix effects; (CCV 480-19663/23).

Method(s) 8081A: The percent difference in the continuing calibration verifications exceeded 15% for 4,4-DDT due to the decreased instrument response following field samples that had heavy matrix effects; (CCV 480-19663/16).

Method 8082: All primary data is reported from the ZB-5

Method 8082:The percent difference in a PCB continuing calibration verification is assessed on the basis of the PCB total amount, individual peak calculations are only listed for completeness.

Method 8082: The following CCV's: CCV 480-18654/8, CCV 480-18654/20, CCV 480-18654/28 have one Surrogate outside recovery limits, though the secondary surrogate is within limits.

Method(s) 8082: The laboratory control sample (LCS) for batch 480-18075 exceeded control limits for the surrogates, Tetrachloro-m-xylene and Decachlorobiphenyl, indicating a high bias.

Method 8151:All sample primary data is reported from RTX-CLPI column

No other analytical or quality issues were noted.

Metals

Method(s) 6010B: The Serial Dilution (480-5580-2 SD) in batch 480-18812, exhibited results outside the quality control limits for total barium, calcium, cobalt, chromium, copper, potassium, magnesium, manganese, nickel, lead, vanadium, and zinc. However, the Post Digestion Spike was compliant so no corrective action was necessary.

Method(s) 6010B: The Serial Dilution and Post Digestion Spike (480-5580-2 PDS), (480-5580-2 SD) exceeded the quality control limits for total aluminum and iron. Sample matrix is suspected, therefore, no corrective action was necessary.

Method(s) 6010B: The Matrix Spike/ Matrix Spike Duplicate (MS/MSD) SED#3 (480-5580-2 MS), SED#3 (480-5580-2 MSD) recoveries in batch 480-18812 were outside control limits for total potassium and antimony. The Matrix Spike Duplicate was also outside control limits for total aluminum. The associated Laboratory Control Sample (LCS SRM) recovery met acceptance criteria, therefore no corrective action was necessary.

Method(s) 6010B: The Matrix Spike / Matrix Spike Duplicate (MS/MSD) precision for batch 480-18812, samples SED#3 (480-5580-2 MS), SED#3 (480-5580-2 MSD), was outside control limits for total antimony. Non-homogeneity of the sample matrix is suspected.

Method(s) 6010B: The recovery of Post Spike, (480-5348-2 PDS), in batch 480-18078, exhibited results below the quality control limits for total aluminum and manganese. However, the Serial Dilution of this sample was compliant. Therefore, no corrective action was necessary.

Method(s) 6010B: The Matrix Spike/ Matrix Spike Duplicate (MS/MSD) (480-5348-2 MS), (480-5348-2 MSD) recoveries for batch 480-18078 were outside control limits for total barium and antimony. The associated Laboratory Control Sample (LCS SRM) recovery met acceptance criteria, therefore no corrective action was necessary.

Method(s) 6010B: The Matrix Spike / Matrix Spike Duplicate (MS/MSD) (480-5348-2 MS), (480-5348-2 MSD) precision for batch 480-18078 was outside control limits for total manganese. Non-homogeneity of the sample matrix is suspected.

Method(s) 7471A: The following samples was diluted due to the abundance of target analyte mercury: MW-5 (4-6) (480-5475-1). Elevated reporting limits (RLs) are provided.

Method(s) 7471A: The following sample(s) were diluted due to the abundance of target analyte mercury: MW-8 (2-4) (480-5580-1). Elevated reporting limits (RLs) are provided.

No other analytical or quality issues were noted.

Organic Prep

Method(s) 3550B: Due to the matrix, the following samples could not be concentrated to the final method required volume: BLIND DUP #4 (480-5475-4), MW-5 (4-6) (480-5475-1), SED-1 (480-5475-3). The reporting limits (RLs) are elevated proportionately.

Method(s) 3550B: Due to the matrix, the following sample could not be concentrated to the final method required volume: MW-5 (4-6) (480-5475-1). The reporting limits (RLs) are elevated proportionately.

Method(s) 3550B: The following samples required a Florisil clean-up to reduce matrix interferences: MW-1 (6-8) (480-5348-1), MW-2 (4-6) (480-5348-2), MW-6 (4-8) (480-5530-2), MW-7 (2-4) (480-5530-1).

Method(s) 3550B: The following samples required a Florisil clean-up to reduce matrix interferences: MW-1 (6-8) (480-5348-1), MW-2 (4-6) (480-5348-2), MW-6 (4-8) (480-5530-2), MW-7 (2-4) (480-5530-1).

Method(s) 3550B: A significant amount of liquid was present in the following samples: SED#3 (480-5580-2), SED#3 (480-5580-2 MS), SED#3 (480-5580-2 MSD). The samples were decanted prior to preparation.

No other analytical or quality issues were noted.

Job Narrative
480-5725-1

Comments
No additional comments.

Receipt
All samples were received in good condition within temperature requirements.

GC/MS VOA
The method blank for batch MB 480-19614 contained Methylene Chloride above the method detection limit. This target analyte concentration was less than the reporting limit (RL); therefore, re-extraction and/or re-analysis of samples was not performed.

Method(s) 8260B: The following compounds were outside control limits in the continuing calibration verification (CCV) associated with batches 19469 and 19614: Acrolien. These compounds are not classified as Calibration Check Compounds (CCCs) in the reference method, and the laboratory defaults to in-house and/or project-specific criteria for evaluation. Due to the large number of analytes contained in the CCV, the laboratory's SOP allows for six analytes to be outside limits; therefore, the data have been reported.

Method(s) 8260B: The following volatiles samples were diluted due to foaming at the time of purging during the original sample analysis: MW-5 (480-5894-6), MW-8 (480-5894-9). Elevated reporting limits (RLs) are provided.

Method(s) 8260B: The following samples were diluted due to the abundance of target analytes: BLIND DUP #6 (480-5894-2), MW-1 (480-5894-1). Elevated reporting limits (RLs) are provided.

Method(s) 8260B: The following volatiles sample was diluted due to foaming at the time of purging during the original sample analysis: MW-6 (480-5894-7). Elevated reporting limits (RLs) are provided.

Method(s) 8260B: The following volatiles sample(s) was diluted due to foaming at the time of purging during the original sample analysis: (480-5894-7 MS), (480-5894-7 MSD). Elevated reporting limits (RLs) are provided.

No other analytical or quality issues were noted.

GC/MS Semi VOA
Method(s) 8270C: The following compounds were outside control limits in the continuing calibration verification (CCV) associated with batch 19914: Bis(2-Ethylhexyl) phthalate and Butyl Benzyl phthalate. These compounds are not classified as Calibration Check Compounds (CCCs) in the reference method. Due to the large number of analytes contained in the CCV, the laboratory's SOP allows for four analytes to be outside limits; therefore, the data have been reported.

Method(s) 8270C: The laboratory control sample (LCS) for preparation batch 19568 exceeded control limits for the following analyte: Bis(2-Ethylhexyl) phthalate. This analyte was biased high in the LCS and was not detected in the associated samples; therefore, the data have been reported.

Method(s) 8270C: The matrix spike (MS) recovery for preparation batch 480-19612 was outside control limits for Bis(2-ethylhexyl) phthalate. The associated laboratory control sample (LCS) recovery met acceptance criteria. All data has been reported and qualified.

Method(s) 8270C: The matrix spike / matrix spike duplicate (MS/MSD) precision for preparation batch 480-19612 was outside control limits for several analytes. The associated laboratory control sample (LCS) precision met acceptance criteria.

Method(s) 8270C: The method blank for preparation batch 480-22033 contained Benzo[a]anthracene, Benzo[a]pyrene, Benzo[b]fluoranthene, Benzo[g,h,i]perylene, Benzo[k]fluoranthene, Chrysene, Dibenz[a,h]anthracene and Indeno[1,2,3-cd]pyrene above the method detection limit. These target analyte concentrations were less than the reporting limit (RL); therefore, re-extraction and/or re-analysis of samples was not performed.

Method(s) 8270C: The %RPD of the laboratory control sample (LCS) and laboratory control standard duplicate (LCSD) for preparation batch 480-22033 exceeded control limits for the following analytes: 2-Methylnaphthalene and Hexachlorobutadiene. No corrective action is required. The data have been qualified and reported.

Method(s) 8270C: The following sample was diluted due to the nature of the sample matrix: MW-5 (480-6614-1). Elevated reporting limits (RLs) are provided.

Method(s) 8270C: Internal standard (ISTD) response for the following sample(s) was outside of acceptance limits for retention time only.: (CCVIS 480-22114/2) and (CCVIS 480-22294/2). The sample(s) was not re-analyzed, there is no impact on the data.

No other analytical or quality issues were noted.

GC VOA
No analytical or quality issues were noted.

GC Semi VOA
Method 8082: All primary data is reported from the ZB-5 column.

Method 8082: The percent difference in a PCB continuing calibration verification is assessed on the basis of the PCB total amount, individual peak calculations are only listed for completeness

Method 8082: The surrogate percent difference in the associated continuing calibration verifications (CCV) for Decachlorobiphenyl exceeded 15% on the ZB-5 column, indicating a high bias. (CCV 480-20024)

Method(s) 8015B: The following sample was diluted due to the abundance of target analytes: MW-5 (480-5894-6). Elevated reporting limits (RLs) are provided.

No other analytical or quality issues were noted.

Metals
Method(s) 6010B: The Serial Dilution (480-5725-5 SD), in batch 480-18926 exhibited results outside the quality control limits for total barium and calcium. However, the Post Digestion Spike was compliant so no corrective action was necessary.

Method(s) 6010B: The Serial Dilution (480-5894-5 SD) in batch 480-19644, exhibited a result outside the quality control limits for total aluminium. However, the Post Digestion Spike was compliant so no corrective action was necessary

Method(s) 6010B: The following sample was diluted due to the abundance of target analyte total and dissolved manganese: MW-5 (480-5894-6). Elevated reporting limits (RLs) are provided.

Method(s) 6010B: The Continuing Calibration Blank CCB 480-20760/13, for batch 480-20760, contained dissolved potassium above the reporting limit (RL). The associated Laboratory Control Sample (LCS), (LCS 480-20142/2-C), contained a detect for dissolved potassium at a concentration greater than 10X the value found in the Continuing Calibration Blank; therefore, re-analysis of the LCS was not performed.

No other analytical or quality issues were noted.

Organic Prep
No analytical or quality issues were noted.classified as Calibration Check Compounds (CCCs) in the reference method, and the laboratory defaults to in-house and/or project-specific criteria for evaluation. Due to the large number of analytes contained in the CCV, the laboratory's SOP allows for six analytes to be outside limits; therefore, the data have been reported.

Method(s) 8260B: The following volatiles samples were diluted due to foaming at the time of purging during the original sample analysis: MW-5 (480-5894-6), MW-8 (480-5894-9). Elevated reporting limits (RLs) are provided.

Method(s) 8260B: The following samples were diluted due to the abundance of target analytes: BLIND DUP #6 (480-5894-2), MW-1 (480-5894-1). Elevated reporting limits (RLs) are provided.

Method(s) 8260B: The following volatiles sample was diluted due to foaming at the time of purging during the original sample analysis: MW-6 (480-5894-7). Elevated reporting limits (RLs) are provided.

Method(s) 8260B: The following volatiles sample(s) was diluted due to foaming at the time of purging during the original sample analysis: (480-5894-7 MS), (480-5894-7 MSD). Elevated reporting limits (RLs) are provided.

No other analytical or quality issues were noted.

QUALIFIED CLIENT RESULTS TABLES

TurnKey Environmental Restoration, LLC

TABLE 1

SURFACE SOIL ANALYTICAL RESULTS

251 HOMER STREET REDEVELOPMENT SITE
OLEAN, NEW YORK

Parameter [1]	Commercial SCOs[2] (mg/kg)	SAMPLE LOCATI							
		SS-1	SS-2	SS-3	SS-4	SS-5	SS-6	SS-7	SS-8
TCL Semi-Volatile Organic Compounds (SVOCs) - mg/kg[3]									
Anthracene	**500**	0.045 J	ND	ND	ND	ND	ND	ND	ND
Benzo(a)anthracene	**5.6**	ND ~~0.22 J~~ U	ND ~~0.42 DJ~~ U	ND ~~0.009 J~~ U	ND ~~1.4 DJ~~ U	ND ~~0.017 DJ~~ U	ND ~~1.4 DJ~~ U	ND	ND ~~0.22 DJ~~ U
Benzo(b)fluoranthene	**5.6**	0.23 J	ND	ND	ND	0.012 DJ	ND	0.43 DJ	ND
Benzo(k)fluoranthene	**56**	0.14 J	ND	ND	ND	ND ~~0.0081 DJ~~ U	ND	ND ~~0.19 DJ~~ U	ND
Benzo(g,h,i)perylene	**500**	0.22 J	1.1 DJ	ND	2.1 DJ	ND ~~0.0097 DJ~~ U	ND	0.59 DJ	ND
Benzo(a)pyrene	**1**	0.19 J	ND	ND	ND	0.011 DJ	ND	0.6 DJ	ND
Carbozole	--	ND	ND	ND	ND	ND	ND	ND	ND
Chrysene	**56**	0.29 J	0.43 DJ	0.0076 J	0.93 DJ	0.012 DJ	ND ~~1.3 DJ~~ U	ND	ND ~~0.15 DJ~~ U
Dibenzofuran	**350**	ND	ND	ND	ND	ND	ND	ND	ND
Dibenzo(a,h)anthracene	**0.56**	ND	ND	ND	ND	ND	ND	ND	ND
Fluoranthene	**500**	0.37 J	ND	ND	1.7 DJ	0.02 DJ	ND	ND	ND
Fluorene	**500**	ND	ND	ND	ND	ND	ND	ND	ND
Indeno(1,2,3-cd)pyrene	**5.6**	0.11 J	ND	ND	ND	0.0067 DJ	ND	0.27 DJ	ND
2-Methylnaphthalene	--	0.23 J	1 DJ	ND	ND	ND	ND	ND	ND
Naphthalene	**500**	ND	ND	ND	ND	ND	ND	ND	ND
Phenanthrene	**500**	0.4 J	0.86 DJ	0.0094 J	2 DJ	0.011 DJ	ND	ND	ND
Pyrene	**500**	0.43 J	ND	ND	1.8 DJ	ND	ND	1.2 DJ	0.19 DJ
Total SVOCs	--	***2.88***	***3.81***	***0.03***	***9.93***	***0.108***	***2.70***	***3.28***	***0.560***
TAL Metals - mg/kg									
Aluminum	--	13400	15500	15500	10100	15600	14400	23800	17300
Arsenic	**16**	14.8	**16**	**16.5**	**27**	15.9	**20**	**42.1**	**19.5**
Barium	**400**	139	145	218	135	103	180	144	200
Beryllium	**590**	0.73	0.77	0.88	0.7	0.88	0.83	1.1	1
Cadmium	**9.3**	0.34	ND	ND	0.69	ND	ND	0.95	ND
Calcium	--	3860	3360	2420	7970	1860	3620	10100	2480
Chromium	**400**	19.2 J	19.5 J	18.2 J	16.8 J	18.2 J	22.1 J	199 J	22 J

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TABLE 1

SURFACE SOIL ANALYTICAL RESULTS

251 HOMER STREET REDEVELOPMENT SITE
OLEAN, NEW YORK

Parameter [1]	Commercial SCOs[2] (mg/kg)	SAMPLE LOCATI							
		SS-1	SS-2	SS-3	SS-4	SS-5	SS-6	SS-7	SS-8
Cobalt	--	10.4	12	15.7	7.3	16	15.6	7.8	16.7
Copper	**270**	43.2 J	33.9 J	23.2 J	64.2 J	21.2 J	49.6 J	217 J	33.3 J
Iron	--	27000 J	26600 J	31900 J	20000 J	34300 J	31700 J	27500 J	35400 J
Lead	**1,000**	135	129	45.8	338	20	635	852	96.3
Magnesium	--	3250	5220	4490	5190	5130	3850	18600	5380
Manganese	**10,000**	826	620	888	467	812	1020	358	846
Nickel	**310**	21.6	24.6	29.8	20.9	31.4	28.6	22.7	33.1
Potassium	--	1610	2110	2320	1240	2330	2030	3100	2540
Sodium	--	ND	ND	ND	ND	ND	ND	875	ND
Vanadium	--	20.2	22.5	21.2	21.3	20.7	20.3	49.5	25.1
Zinc	**10,000**	88.9 J	72.3 J	72.4 J	85.3 J	76 J	83.3 J	178 ~~J~~	92.6 J
Mercury	**2.8**	0.11	0.76	0.055	0.73	ND	0.16	1.2	0.08

Parameter [1]	Commercial SCOs[2] (mg/kg)	ON						
		SS-9	SS-10	SS-11	SS-12	SS-13	SS-14	SS-15
TCL Semi-Volatile Organic Compounds (SVOC								
Anthracene	**500**	0.0072	0.098	0.027	0.055 DJ	ND	0.072 DJ	ND
Benzo(a)anthracene	**5.6**	ND ~~0.05 DJ~~ U	ND ~~0.13 DJ~~ U	ND ~~0.1 DJ~~ U	ND ~~0.16 DJ~~ U	ND ~~0.85 DJ~~ U	ND ~~0.17 DJ~~ U	ND ~~0.68 DJ~~ U
Benzo(b)fluoranthene	**5.6**	0.058 DJ	0.12 DJ	0.1 DJ	0.16 DJ	ND	0.14 DJ	ND
Benzo(k)fluoranthene	**56**	ND ~~0.026 DJ~~ U	0.046 DJ	0.047 DJ	0.049 DJ	ND	0.056 DJ	ND
Benzo(g,h,i)perylene	**500**	0.066 DJ	0.061 DJ	0.07 DJ	0.19 DJ	1.8 DJ	0.35 DJ	7 DJ
Benzo(a)pyrene	**1**	0.055 DJ	0.097 DJ	0.093 DJ	0.16 DJ	**1.1 DJ**	0.19 DJ	**1.6 DJ**
Carbozole	**--**	ND	0.049 DJ	0.0091 DJ	ND	ND	ND	ND
Chrysene	**56**	0.06 DJ	0.12 DJ	0.1 DJ	0.17 DJ	0.88 DJ	0.22 DJ	ND ~~1.2 DJ~~ U
Dibenzofuran	**350**	ND	0.04 DJ	ND	ND	ND	ND	ND
Dibenzo(a,h)anthracene	**0.56**	ND	ND	ND	ND	ND	ND	**2.9 DJ**
Fluoranthene	**500**	0.08 DJ	0.28 D	0.19 DJ	0.25 DJ	ND	0.19 DJ	ND
Fluorene	**500**	ND	0.05	ND	ND	ND	ND	ND
Indeno(1,2,3-cd)pyrene	**5.6**	0.03 DJ	0.047 DJ	0.047 DJ	0.079 DJ	0.41 DJ	0.1 DJ	2.7 DJ
2-Methylnaphthalene	**--**	0.0059 DJ	0.019 DJ	0.012 DJ	0.17 DJ	3 DJ	0.48 DJ	0.55 DJ
Naphthalene	**500**	ND	0.024	ND	ND	ND	ND	ND
Phenanthrene	**500**	0.051 DJ	0.35 D	0.11 DJ	0.28 DJ	3.6 DJ	0.63 DJ	1.1 DJ
Pyrene	**500**	0.079 DJ	0.22 DJ	0.17 DJ	0.28 DJ	2.2 DJ	0.45 DJ	ND
Total SVOCs	**--**	***0.568***	***1.75***	***1.08***	***2.00***	***13.8***	***3.05***	***17.7***
TAL Metals - mg/kg								
Aluminum	**--**	16000	14400	16300	13200	12500	13300	12300
Arsenic	**16**	15.1	13.3	**17.9**	**16.1**	**30.3**	**20.2**	**19.9**
Barium	**400**	105	162	111	97	168	134	159
Beryllium	**590**	0.91	0.79	0.95	0.82	0.79	0.81	0.68
Cadmium	**9.3**	ND	ND	ND	0.3	0.33	0.32	0.24
Calcium	**--**	2650	2320	2520	3880	3400	4070	1120
Chromium	**400**	19 J	17.3 J	20.1 J	17.1 J	16.4 J	17.9 J	14.7 J

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Parameter [1]	Commercial SCOs[2] (mg/kg)	ON						
		SS-9	SS-10	SS-11	SS-12	SS-13	SS-14	SS-15
Cobalt	--	14.7	10.7	17.2	13.3	11	14.1	9.1
Copper	**270**	29.6 J	26.1 J	32.4 J	53.9 J	51.7 J	50 J	50.4 J
Iron	--	29100 J	27100 J	36400 J	28800 J	26500 J	30000 J	28000 J
Lead	**1,000**	59.4	37.6	45.9	121	319	148	155
Magnesium	--	4250	4090	5770	5010	3460	4340	2640
Manganese	**10,000**	451	484	806	727	581	783	211
Nickel	**310**	26.8	25.4	34.6	28.6	27.4	28.6	22.3
Potassium	--	2220	1970	2730	1970	1960	1900	1310
Sodium	--	512	ND	ND	ND	ND	ND	ND
Vanadium	--	24.1	21.1	22.2	19.4	21.8	19.9	20.3
Zinc	**10,000**	95.1	73	94.1	86.9	97.6	96.6	75.6
Mercury	**2.8**	0.076	0.051	0.081	0.12	0.12	0.11	0.085

08/08/2011

TurnKey Environmental Restoration, LLC

Parameter [1]	Commercial SCOs[2] (mg/kg)	TP-2 (7-9)	TP-3 (4-6.5)	TP-4 (6.5-9.0)	TP-5 (8.5-11)	TP-7 (2.5-4.0)	TP-8 (4-6)	TP-13 (6-8)	TP-16 (4.5-7.0)	TP-18 (6-9.5)
TCL ~~plus STARS~~ Volatile Organic Compounds (VOCs) - mg/kg[3]										
1,2-Dibromo-3-Chloropropane	--	ND UJ	ND UJ	ND	ND	ND	ND	ND UJ	ND ~~0.13~~ U	ND UJ
1,2-Dichlorobenzene	**500**	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-Butanone (MEK)	**500**	ND	ND	0.0099 J	0.036 J	0.032 J	0.0053 J	ND	ND	ND
4-Methyl-2-pentanone (MIBK)	--	ND	ND	ND	ND	ND	ND	ND	ND	ND
Acetone	**500**	ND	ND	0.12	0.21	0.15	0.061	ND	ND	ND
Benzene	**44**	ND	ND	ND	ND	ND	ND	ND	ND	ND
Carbon disulfide	--	ND	ND	ND	ND	ND	ND	ND	ND	ND
Cyclohexane	--	10	12 NJ	ND	0.12	ND	0.037 NJ	ND	ND	ND
Ethylbenzene	**390**	ND	ND	ND	ND	ND	ND	ND	0.11 J	ND
2-Hexanone	--	ND	ND	ND	ND	ND	ND	ND	ND	ND
Isopropylbenzene (Cumene)	--	ND	0.12	ND	0.0049 J NJ	ND	0.0064 NJ	1.3 NJ	ND ~~0.096 J~~ U	ND
Methyl Acetate	--	ND	ND	ND	ND	ND	ND	ND	ND	ND
Methylcyclohexane	--	38	49	0.0049 J	0.49	0.0034 J	0.26	94	3.2	3.8
Methylene chloride	**500**	ND	ND	ND ~~0.01~~ U	ND ~~0.0045 J~~ U	ND ~~0.0081 J~~ U	ND ~~0.004 J~~ U	ND	ND	ND
~~tert-Butylbenzene~~	**500**	~~ND~~	~~ND~~	~~ND~~	~~ND~~	~~ND~~	~~ND~~	~~ND~~	~~ND~~	~~ND~~
Toluene	**500**	ND	ND	ND	ND	0.0008 J	ND	ND	ND	ND
Xylenes, Total	**500**	ND	ND	ND	ND	ND	0.0013 J NJ	2.2 J NJ	0.19 J NJ	ND
Gasoline Range Organics [C6-C10]	--	550	460	1 J	510.0	5.7	200	940.0	62	130.0
Total VOCs	--	***598***	***521***	***1.14***	***511***	***5.89***	***200***	***1038***	***65.7***	***134***

TurnKey Environmental Restoration LLC

Parameter [1]	Commercial SCOs[2] (mg/kg)	TP-2 (7-9)	TP-3 (4-6.5)	TP-4 (6.5-9.0)	TP-5 (8.5-11)	TP-7 (2.5-4.0)	TP-8 (4-6)	TP-13 (6-8)	TP-16 (4.5-7.0)	TP-18 (6-9.5)
TCLSemi-Volatile Organic Compounds (SVOCs) - mg/kg[3]										
2-Methylnaphthalene	--	4.7 J	ND	ND	0.18 J	4.6 J	5	3.5	ND ~~1.4 J~~ U	ND
Acenaphthene	**500**	11	ND	ND	ND	ND	ND	ND	ND	ND
Acetophenone	--	ND	ND	ND	ND	ND	ND	ND	ND	ND
Anthracene	**500**	30	ND	ND	ND	ND	0.46 J	ND	ND	ND
Benzo(a)anthracene	**5.6**	**30**	ND	ND ~~0.015 J~~ U	ND ~~0.017 J~~ U	ND	ND ~~0.12 J~~ U	ND	ND	ND
Benzo(a)pyrene	**1**	**23**	ND	0.012 J	ND	ND	0.13 J	ND	ND	ND
Benzo(b)fluoranthene	**5.6**	**23**	ND	0.018 J	ND	**8.6 J**	ND	ND	**13 J**	0.27 J
Benzo(g,h,i)perylene	**500**	4.9 J	ND	ND	ND	ND	0.39 J	ND	ND	ND
Benzo(k)fluoranthene	**56**	14	ND	0.026 J NJ	ND	ND	ND	ND	ND	ND
Biphenyl	--	ND	ND	ND	ND	ND	ND	ND	ND	ND
Bis(2-ethylhexyl) phthalate	--	ND	ND	ND	ND	ND	ND	ND	ND	ND
Cabazole	--	9.4 J	ND	ND	ND	ND	ND	ND	ND	ND
Chrysene	**56**	27	ND	0.015 J NJ	ND ~~0.029 J~~ U	ND	0.42 J	ND	ND	ND
Dibenzo(a,h)anthracene	**0.56**	**4 J**	ND	ND	ND	ND	ND	ND	ND	ND
Dibenzofuran	**350**	8.8 J	ND	ND	ND	ND	ND	ND	ND	ND
Fluoranthene	**500**	69	ND	0.018 J	0.028 J	ND	0.043 J	ND	ND	ND
Fluorene	**500**	16	ND	ND	ND	ND	ND ~~0.42 J~~ U	ND	ND	ND
Indeno(1,2,3-cd)pyrene	**5.6**	**11**	ND	0.01 J	ND	ND	ND	ND	ND	ND
Isophorone	--	ND	ND	ND	ND	ND	ND	ND	ND	ND
N-Nitrosodi-n-propylamine	--	ND	ND	ND	ND	ND	ND	ND	ND	ND
Naphthalene	**500**	6.7 J	ND	ND	ND	ND	0.39 J	0.76 J NJ	ND	ND

Parameter [1]	Commercial SCOs[2] (mg/kg)	TP-2 (7-9)	TP-3 (4-6.5)	TP-4 (6.5-9.0)	TP-5 (8.5-11)	TP-7 (2.5-4.0)	TP-8 (4-6)	TP-13 (6-8)	TP-16 (4.5-7.0)	TP-18 (6-9.5)
Phenanthrene	**500**	90	ND	ND	ND	ND	5.1	0.32 J	ND	ND
Pyrene	**500**	48	ND	0.018 J	0.018 J	ND	2.4	ND	ND	ND
Diesel Range Organics [C10-C28]	--	3900	370	75	380	5100	2800	12000	1300	1200
Total SVOCs	--	***4331***	***370***	***75.1***	***380***	***5113***	***2815***	***12005***	***1314***	***1200***

TurnKey Environmental Restoration, LLC

TABLE 3

SUMMARY OF SUBSURFACE SOIL ANALYTICAL DATA

251 HOMER STREET REDEVELOPMENT SITE
OLEAN, NEW YORK

Parameter [1]	Commercial SCOs[2] (mg/kg)	SAMPLE LOCATION									
		TP-20 (5-8)	TP-21 (4-6)	TP-22 (4-5)	TP-25 (4-8.5)	TP-27 (7-10)	TP-28 (0-2)	TP-31 (9-11)	TP-32 (3-7)	TP-33 (4-9)	TP-36 (5-7)
TCL ~~plus STARS~~ Volatile Organic Compounds (VOCs) - mg/l											
1,2-Dibromo-3-Chloropropane	--	ND UJ	ND ~~10~~ UJ	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dichlorobenzene	**500**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-Butanone (MEK)	**500**	ND	ND	ND	0.16 J	ND	ND	ND	ND	ND	ND
4-Methyl-2-pentanone (MIBK)	--	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Acetone	**500**	ND	ND	ND	0.76	0.25 J	ND	ND	ND	ND	ND
Benzene	**44**	ND	0.44 NJ	0.68 ~~J~~ NJ	ND	0.023 J	ND	ND	0.4 ~~J~~ NJ	ND	0.21 NJ
Carbon disulfide	--	ND	ND	ND	ND	ND	0.11 ~~J~~ J	0.1 ~~J~~ J	ND	ND UJ	ND UJ
Cyclohexane	--	0.7	5.9	9.2	ND	0.42 NJ	0.93	ND	3.3	ND	2.4 NJ
Ethylbenzene	**390**	0.18	2.0	3.0	ND	0.12	0.25	ND	1.2 J	ND	0.17
2-Hexanone	--	ND	ND ~~7.0~~ U	ND	ND	ND	ND	ND	ND	ND	ND
Isopropylbenzene (Cumene)	--	0.089 ~~J~~ NJ	1.0 NJ	1.4 NJ	ND	0.047 ~~J~~ NJ	0.23 NJ	ND	0.74 NJ	ND	0.43 NJ
Methyl Acetate	--	ND	ND	ND	ND	ND	0.83	ND	ND	ND	ND
Methylcyclohexane	--	2.2	18	27	0.13	0.96	4.0	ND	11.0	1.7	3.8
Methylene chloride	**500**	ND	ND	ND	ND ~~0.14 B~~ U	ND ~~0.12 B~~ U	ND	ND	ND	ND	ND
~~tert-Butylbenzene~~	**500**	~~ND~~	~~ND~~	~~2.6~~	~~ND~~	~~ND~~	~~ND~~	~~ND~~	~~ND~~	~~ND~~	~~ND~~
Toluene	**500**	ND	0.72 NJ	~~ND~~ 2.6	ND ~~0.012 BJ~~ U	ND ~~0.036 BJ~~ U	ND	ND	2.6	ND	ND
Xylenes, Total	**500**	1.0	11.0 NJ	28	0.13	1.3	1.5	ND	16.0	0.13 J	1.1
Gasoline Range Organics [C6-C10]	--	210.0	620.0	490.0	43.0	250.0	190.0	50.0	360.0	44	170.0
Total VOCs	--	***214***	***676***	***562***	***44.3***	***253***	***198***	***50.1***	***395***	***45.8***	***178***

TurnKey Environmental Restoration, LLC

TABLE 3

SUMMARY OF SUBSURFACE SOIL ANALYTICAL DATA

251 HOMER STREET REDEVELOPMENT SITE
OLEAN, NEW YORK

Parameter [1]	Commercial SCOs[2] (mg/kg)	SAMPLE LOCATION									
		TP-20 (5-8)	TP-21 (4-6)	TP-22 (4-5)	TP-25 (4-8.5)	TP-27 (7-10)	TP-28 (0-2)	TP-31 (9-11)	TP-32 (3-7)	TP-33 (4-9)	TP-36 (5-7)
TCLSemi-Volatile Organic Compounds (SVOCs) - mg/kg [3]											
2-Methylnaphthalene	--	28 J	40	ND	1.7 J	1.4 J	ND	ND	230	ND	0.5 J NJ
Acenaphthene	**500**	ND	ND	0.0092 J	0.77 J NJ	ND	ND	ND	ND	ND	0.67 J
Acetophenone	--	ND	ND	ND	ND	ND	ND	ND	ND ~~20 J~~ U	ND	ND
Anthracene	**500**	ND	ND	ND	ND	ND	4 J	ND	ND	0.95 J	1 J
Benzo(a)anthracene	**5.6**	ND	ND	ND	ND	ND	ND	ND ~~0.087 J~~ U	ND	ND ~~2 J~~ U	**13**
Benzo(a)pyrene	**1**	ND	ND	ND	ND	ND	ND	0.064 J	ND	**1.7 J**	**17**
Benzo(b)fluoranthene	**5.6**	ND	ND	0.056 J	4.1 J	ND	ND	0.045 J	ND	1.8 J	**7.5 J**
Benzo(g,h,i)perylene	**500**	ND	ND	ND	ND	ND	3.9 J	0.07 J	ND	2 J	12
Benzo(k)fluoranthene	**56**	ND	ND	ND	ND	ND	ND	0.0054 J	ND		1.4 J
Biphenyl	--	ND	4.6 J	ND	ND	ND	3.2 J	ND	21 J	ND	ND
Bis(2-ethylhexyl) phthalate	--	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Cabazole	--	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chrysene	**56**	ND	ND	ND	1.3 J	ND	ND	0.13 J	ND	2.6 J	13
Dibenzo(a,h)anthracene	**0.56**	ND	ND	ND	ND	ND	ND	0.023 J	ND	ND	**7.4 J**
Dibenzofuran	**350**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Fluoranthene	**500**	ND	ND	ND	1.2 J	ND	4.9 J	0.15 J	ND	3.2 J	2 J
Fluorene	**500**	ND	ND	ND	ND	ND	ND ~~5.5 J~~ U	ND	ND	ND	0.92 ~~J~~ NJ
Indeno(1,2,3-cd)pyrene	**5.6**	ND	ND	ND	ND	ND	ND	0.034 J	ND	1.1 J	5.2 J
Isophorone	--	ND	ND	ND	ND	ND	ND	ND ~~1.1 J~~ U	ND	ND	ND
N-Nitrosodi-n-propylamine	--	ND	ND	ND	ND	ND	ND	ND	ND ~~79 J~~ U	ND	ND
Naphthalene	**500**	ND	ND	0.099 J	ND	ND	ND	ND	ND	ND	0.4 J

TurnKey Environmental Restoration, LLC

TABLE 3

SUMMARY OF SUBSURFACE SOIL ANALYTICAL DATA

251 HOMER STREET REDEVELOPMENT SITE
OLEAN, NEW YORK

Parameter [1]	Commercial SCOs[2] (mg/kg)	SAMPLE LOCATION									
		TP-20 (5-8)	TP-21 (4-6)	TP-22 (4-5)	TP-25 (4-8.5)	TP-27 (7-10)	TP-28 (0-2)	TP-31 (9-11)	TP-32 (3-7)	TP-33 (4-9)	TP-36 (5-7)
Phenanthrene	**500**	ND	18 J	ND	11	0.2 J	ND ~~34 J~~ U	ND	62	2.8 J	2.7 J
Pyrene	**500**	ND	2 J	ND	8.4 J	ND	22 J	0.31	ND	4.8 J	6.2 J
Diesel Range Organics [C10-C28]	--	42000	34000	5700	8900	2600	22000	3300	250000	7900	9900
Total SVOCs	--	***42028***	***34065***	***5700***	***8928***	***2602***	***22078***	***3302***	***250412***	***7923***	***9991***

TurnKey Environmental Restoration, LLC

Parameter [1]	Commercial SCOs[2] (mg/kg)	TP-37 (4.5-6.5)	TP-39 (0-3)	TP-41 (0-5)	TP-42 (1.5-4.5)	TP-46 (5-5.5)	TP-48 (3-9)	MW-1 (6-8)	MW-2 (4-6)	MW-3 (4-6)
TCL ~~plus STARS~~ Volatile Organic Compounds (VOCs) - mg/l										
1,2-Dibromo-3-Chloropropane	--	ND	ND	ND	ND	ND UJ	ND	ND	ND	ND
1,2-Dichlorobenzene	**500**	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-Butanone (MEK)	**500**	ND	ND	ND	ND	ND	ND	ND	ND	0.011 J
4-Methyl-2-pentanone (MIBK)	--	ND	ND	ND	ND	ND	ND	ND	ND	ND
Acetone	**500**	ND	ND	ND	ND	ND	ND	0.11 J	0.0056 J	0.051
Benzene	**44**	ND	ND ~~0.2~~ U	ND ~~0.16 J~~ U	ND	1 J NJ	ND	ND	ND	ND
Carbon disulfide	--	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND	ND	ND	ND
Cyclohexane	--	1.0	3.6	8	ND	21	3.5	5.8	ND	ND
Ethylbenzene	**390**	0.13 J	1.1	0.22 J	ND	4.3	1.2	ND	0.001 J	ND
2-Hexanone	--	ND	ND	ND	ND	ND	ND	ND	ND	ND
Isopropylbenzene (Cumene)	--	ND ~~0.073 J~~ U	0.57 NJ	0.53	ND	1.8 NJ	0.86 NJ	ND	ND	ND
Methyl Acetate	--	ND	ND	ND	ND	ND	ND	ND ~~0.064~~ U	ND	ND
Methylcyclohexane	--	1.6	11	23	0.18	51	16	29	0.0022 J	ND
Methylene chloride	**500**	ND	ND	ND	ND	ND	ND	ND ~~0.0038 J~~ U	ND ~~0.0038 J~~ U	ND ~~0.0034 J~~ U
~~tert-Butylbenzene~~	**500**	~~ND~~	~~ND~~	~~ND~~	~~ND~~	~~ND~~	~~ND~~	~~ND~~	~~ND~~	~~ND~~
Toluene	**500**	0.33	0.57	0.36	ND	5.9	ND	ND	ND	ND
Xylenes, Total	**500**	ND ~~2.4~~ U	5.2 NJ	1.8	0.16 J	36 J	4.1	0.0055 J	0.0033 J	0.0028 J
Gasoline Range Organics [C6-C10]	--	62.0	97	170	17.0	270.0	59.0	190 B	ND ~~0.46 BJ~~ UJ	2.1 B
Total VOCs	--	***67.5***	***119***	***204***	***17.3***	***391***	***84.7***	***225***	***0.476***	***2.17***

TurnKey Environmental Restoration, LLC

Parameter [1]	Commercial SCOs[2] (mg/kg)	TP-37 (4.5-6.5)	TP-39 (0-3)	TP-41 (0-5)	TP-42 (1.5-4.5)	TP-46 (5-5.5)	TP-48 (3-9)	MW-1 (6-8)	MW-2 (4-6)	MW-3 (4-6)
TCLSemi-Volatile Organic Compounds (SVOCs) - mg/kg [3]										
2-Methylnaphthalene	--	ND	2.4 J NJ	ND	0.21 J NJ	21 J	ND	ND	ND	0.058 J
Acenaphthene	**500**	ND	ND	ND	ND	ND	ND	ND	ND	0.034 J
Acetophenone	--	ND	ND	ND	ND	ND	ND	ND	ND	ND
Anthracene	**500**	ND	ND	ND	ND	ND	ND	ND	ND	ND
Benzo(a)anthracene	**5.6**	ND ~~1.2 J~~ U	ND ~~7.1 J~~ U	ND ~~1.5 J~~ U	ND	ND ~~17 J~~ U	ND ~~18 J~~ U	ND	ND	ND ~~0.11 J~~ U
Benzo(a)pyrene	**1**	**1.6 J**	**19 J**	**2.3 J**	**1.2 J**	**16 J**	**10 J**	ND	ND	ND
Benzo(b)fluoranthene	**5.6**	ND	ND	ND	ND	**6.1 J**	ND	ND	ND	ND
Benzo(g,h,i)perylene	**500**	1.6 J	30 J	4.9 J	2.2 J	28 J	ND	ND	ND	0.31 J
Benzo(k)fluoranthene	**56**	ND	ND	ND	ND	ND	ND	ND	ND	ND
Biphenyl	--	ND	ND	ND	ND	ND	ND	ND	ND	ND
Bis(2-ethylhexyl) phthalate	--	ND	ND	ND	ND	ND	ND	0.28	0.07 J	0.7 J
Cabazole	--	ND	ND	ND	ND	ND	ND	ND	ND	0.021 J NJ
Chrysene	**56**	1.3 J	6.6 J	2.5 J	ND	20 J	13 J NJ	ND	ND	0.12 J
Dibenzo(a,h)anthracene	**0.56**	**1 J**	**10 J**	**1.7 J**	**1.1 J**	ND	ND	ND	ND	ND
Dibenzofuran	**350**	ND	ND	ND	ND	ND	ND	ND	ND	ND
Fluoranthene	**500**	ND	ND	ND	ND	8.2 J	10 J	ND	ND	0.18 J
Fluorene	**500**	ND	ND	ND	ND	ND	ND	0.053 J NJ	ND	ND
Indeno(1,2,3-cd)pyrene	**5.6**	0.58 J	**8 J**	1.5 J	0.78 J	**7.4 J** NJ	ND	ND	ND	0.082 J
Isophorone	--	ND	ND	ND	ND	ND	ND	ND	ND	ND
N-Nitrosodi-n-propylamine	--	ND	ND	ND	ND	ND	ND	ND	ND	ND
Naphthalene	**500**	ND	ND	ND	ND	ND	ND	0.081 J NJ	ND	ND

Parameter [1]	Commercial SCOs[2] (mg/kg)	TP-37 (4.5-6.5)	TP-39 (0-3)	TP-41 (0-5)	TP-42 (1.5-4.5)	TP-46 (5-5.5)	TP-48 (3-9)	MW-1 (6-8)	MW-2 (4-6)	MW-3 (4-6)
Phenanthrene	**500**	0.91 J	2.5 J	4.5 J	0.35 J	41 J	19 J	0.13 J	ND	0.17 J
Pyrene	**500**	0.9 J	ND	2.3 J	0.54 J	47 J	13 J	ND	ND	0.15 J
Diesel Range Organics [C10-C28]	--	5500	14000	12000	3400	47000	37000	2000	ND	88
Total SVOCs	--	***5509***	***14086***	***12021***	***3406***	***47212***	***37083***	***2001***	***0.07***	***89.9***

TurnKey Environmental Restoration, LLC

Parameter [1]	Commercial SCOs[2] (mg/kg)	MW-4 (4-6)	MW-5 (4-6)	MW-6 (4-8)	MW-7 (2-4)	MW-8 (4-6)
TCL ~~plus STARS~~ Volatile Organic Compounds (VOCs) - mg/l						
1,2-Dibromo-3-Chloropropane	--	ND	ND	ND UJ	ND UJ	ND
1,2-Dichlorobenzene	**500**	ND	0.025 J	ND	ND	ND
2-Butanone (MEK)	**500**	0.019 J	0.033 J	ND	ND	0.12 J
4-Methyl-2-pentanone (MIBK)	--	ND	ND ~~0.038 J~~ U	ND	ND	ND
Acetone	**500**	0.092	1.2 B	ND	ND	0.36
Benzene	**44**	ND	0.1	ND	ND	0.065
Carbon disulfide	--	ND	ND	ND UJ	ND UJ	ND
Cyclohexane	--	ND ~~0.0057~~ U	11	ND UJ	ND UJ	0.43
Ethylbenzene	**390**	0.0025 J	5.6 J	ND	ND	0.13 NJ
2-Hexanone	--	ND	ND	ND	ND	ND
Isopropylbenzene (Cumene)	--	0.0072	3.1	ND	ND	0.069
Methyl Acetate	--	ND	ND	ND	ND	ND
Methylcyclohexane	--	0.024	66	ND UJ	ND UJ	1.6
Methylene chloride	**500**	ND ~~0.0027 J~~ U	ND ~~0.061 B~~ U	ND	ND	ND ~~0.13 B~~ U
~~tert-Butylbenzene~~	**500**	~~ND~~	~~ND~~	~~ND~~	~~ND~~	~~ND~~
Toluene	**500**	ND	0.15 B	ND	ND	ND
Xylenes, Total	**500**	0.0025 ~~0.0044~~ J	29	ND	ND	0.68 NJ
Gasoline Range Organics [C6-C10]	--	190 B	380 B	130 B	3.1 B	200 B
Total VOCs	--	***190***	***496***	***130***	***3.10***	***204***

TurnKey Environmental Restoration, LLC

Parameter [1]	Commercial SCOs[2] (mg/kg)	MW-4 (4-6)	MW-5 (4-6)	MW-6 (4-8)	MW-7 (2-4)	MW-8 (4-6)
TCLSemi-Volatile Organic Compounds (SVOCs) - mg/kg[3]						
2-Methylnaphthalene	--	ND	ND	ND	ND	22 J NJ
Acenaphthene	**500**	ND	3.4 J	ND	ND	ND
Acetophenone	--	ND	ND	ND	ND	ND
Anthracene	**500**	ND	6.9 J	ND	ND	ND
Benzo(a)anthracene	**5.6**	ND	ND ~~5.1 J~~ U	ND ~~0.45 J~~ U	ND ~~0.41 J~~ U	ND
Benzo(a)pyrene	**1**	ND	**2.6 J**	0.82 J	0.83 J	ND
Benzo(b)fluoranthene	**5.6**	ND	ND	ND	ND	ND
Benzo(g,h,i)perylene	**500**	0.31 J	3.7 J	1.1 J	2.5	ND
Benzo(k)fluoranthene	**56**	ND	ND	ND	ND	ND
Biphenyl	--	ND	2.8 J	ND	ND	ND
Bis(2-ethylhexyl) phthalate	--	ND	ND	1.4 J	ND	ND
Cabazole	--	ND	ND	ND	ND	ND
Chrysene	**56**	ND	9.1 J NJ	0.72 J	ND ~~0.83 J~~ U	ND
Dibenzo(a,h)anthracene	**0.56**	ND	ND	0.46 J	**0.84 J**	ND
Dibenzofuran	**350**	ND	4.1 J NJ	ND	ND	ND
Fluoranthene	**500**	0.16 J	8.4 J	ND	0.56 J	ND
Fluorene	**500**	ND	6.7 J	ND	ND	ND
Indeno(1,2,3-cd)pyrene	**5.6**	ND	ND	0.32 J	0.77 J	ND
Isophorone	--	ND	ND	ND	ND	ND
N-Nitrosodi-n-propylamine	--	0.65 J	ND UJ	ND	ND	ND
Naphthalene	**500**	ND ~~0.12 BJ~~ U	4.6 J	ND	ND	ND

Parameter [1]	Commercial SCOs[2] (mg/kg)	MW-4 (4-6)	MW-5 (4-6)	MW-6 (4-8)	MW-7 (2-4)	MW-8 (4-6)
Phenanthrene	**500**	0.44 J	37 J	ND	0.61 J	19 J
Pyrene	**500**	0.31 J	23 J	0.5 J	0.57 J	14 J
Diesel Range Organics [C10-C28]	--	1800	14000	1700	4900	96000
Total SVOCs	--	***1802***	***14117***	***1706***	***4908***	***96055***

TurnKey Environmental Restoration, LLC

TABLE 3

SUMMARY OF SUBSURFACE SOIL ANALYTICAL DATA

251 HOMER STREET REDEVELOPMENT SITE
OLEAN, NEW YORK

Parameter [1]	Commercial SCOs[2] (mg/kg)	SAMPLE LOCATION																			
		TP-2 (7-9)	TP-3 (4-6.5)	TP-4 (6.5-9.0)	TP-5 (8.5-11)	TP-7 (2.5-4.0)	TP-8 (4-6)	TP-13 (6-8)	TP-16 (4.5-7.0)	TP-18 (6-9.5)	TP-20 (5-8)	TP-21 (4-6)	TP-22 (4-5)	TP-25 (4-8.5)	TP-27 (7-10)	TP-28 (0-2)	TP-31 (9-11)	TP-32 (3-7)	TP-33 (4-9)	TP-36 (5-7)	TP-37 (4.5-6.5)
TAL Metals - mg/kg																					
Aluminum	--	10800 J	7160 J	20200 J	20400 J	5690 J	9980 J	14600 J	12200 J	12300 J	10700 J	12800 J	6610 J	16800 J	13100 J	13800 J	16100 J	413 J	20600 J	11900 J	6370 J
Arsenic	**16**	**24.1**	8.9	8.7	2.7	15.3	11.3	6.1	**24.7**	4.4	15.5	15.8	15.9	**47.9**	11.5	**17.8**	6.3	ND	**17.9**	**55.7**	**17**
Barium	**400**	118 J	58 J	218 J	314 J	79.4 J	113 J	72.9 J	89.6 J	56 J	113 J	182 J	93.4 J	~~[illegible]~~ 1030	178 J	168 J	55.1 J	2.4 J	71.1 J	126 J	111 J
Beryllium	**590**	0.63	0.44	1.0	0.71	0.45	0.6	0.72	0.83	0.56	0.68	0.76	0.39	0.71	0.69	0.76	0.66	ND	1.1	1.1	0.68
Cadmium	**9.3**	0.37	ND	ND	ND	0.47	ND	ND	0.68	ND	0.26	ND	0.31	1.1	ND	0.51	ND	ND	0.87	0.32	ND
Calcium	--	53300 J	810 J	3040 J	2330 J	2790 J	1170 J	1130 J	20600 J	442 J	8010 J	12100 J	70700 J	32300 J	1950 J	6180 J	1480 J	189000 J	19100 J	8930 J	1700 J
Chromium	**400**	13.0	8.6	22.3	22.1	8.0	12.8	14.1	27.5	13.8	18.0	21.7	38.3	54.1	16.6	20.7	15.3	4.4	51.5	11.4	6.8
Cobalt	--	10.7 J	7.9 J	7.5 J	6.0 J	5.0 J	12.7 J	10.6 J	5.9 J	11.3 J	14 J	14.2 J	6.9 J	5.8 J	12 J	12.2 J	7.7 J	ND J	6.2 J	7.5 J	5.6 J
Copper	**270**	37.7 J	14.7 J	9.6 J	14.6 J	32.7 J	20.9 J	12.8 J	46.5 J	11.6 J	69.9 J	36.6 J	111 J	208 J	27.8 J	**390** J	14.6 J	10.4 J	30.8 J	103 J	32.9 J
Iron	--	38100 J	14800 J	31800 J	14700 J	11600 J	24700 J	20900 J	23200 J	19800 J	58700 J	31100 J	15600 J	27100 J	28900 J	27700 J	24700 J	1180 J	16800 J	36600 J	13900 J
Lead	**1000**	**1240** J	18.1 J	20.3 J	20.6 J	90.6 J	17 J	13.3 J	363 J	13.4 J	245 J	752 J	**5150** J	**1190** J	61 J	834 J	14.8 J	**1330** J	386 J	191 J	11.7 J
Magnesium	--	4130 J	1850 J	3510 J	2820 J	1540 J	3130 J	2430 J	9830 J	3060 J	4770 J	4420 J	3220 J	11100 J	3710 J	4900 J	2590 J	2040 J	22700 J	2000 J	720 J
Manganese	**10,000**	2010 J	386 J	448 J	331 J	168 J	922 J	295 J	326 J	251 J	826 J	621 J	383 J	394 J	792 J	640 J	275 J	16.6 J	291 J	570 J	57.9 J
Nickel	**310**	17.0 J	14.5 J	20.8 J	17.4 J	13.7 J	24 J	16 J	16 J	18.1 J	29.6 J	26.9 J	14.2 J	20.8 J	24.1 J	24.7 J	14.9 J	ND J	16.8 J	36.5 J	13.4 J
Potassium	--	926 J	795 J	1380 J	1490 J	508 J	1060 J	590 J	1340 J	856 J	1690 J	1610 J	1110 J	1670 J	1270 J	1550 J	747 J	ND J	2700 J	1190 J	692 J
Sodium	--	ND	ND	ND	ND	ND	ND	ND	328	ND	ND	ND	ND	596	ND	ND	322	ND	488	233	ND
Vanadium	--	17.8 J	9.1 J	24 J	16.8 J	12.4 J	15.2 J	16.6 J	30.3 J	15.6 J	16.7 J	17.7 J	10.9 J	34 J	18.7 J	22.4 J	20.4 J	3.2 J	50.5 J	26.5 J	18.8 J
Zinc	**10,000**	77.9 J	43.7 J	73.6 J	68.2 J	70.3 J	57.3 J	55.5 J	121 J	60.1 J	81.3 J	76.6 J	78.4 J	504 J	70.5 J	157 J	57.9 J	14.5 J	75.8 J	60.4 J	18.3 J
Mercury	**2.8**	0.08	ND	0.051	0.076	0.23	ND	0.058	0.74	0.025	0.41	0.19	0.4	**4.4**	0.042	0.89	0.031	0.044	0.14	0.048	0.053
Organochlorine Pesticides mg/kg[3]																					
4,4'-DDD	**92**	ND	NA	NA	NA	NA	NA	NA	NA	ND	NA	NA	NA	0.16 J	NA	NA	NA	NA	NA	NA	NA
4,4'-DDE	**62**	0.034 J	NA	NA	NA	NA	NA	NA	NA	ND	NA	NA	NA	0.073 J NJ	NA	NA	NA	NA	NA	NA	NA
4,4'-DDT	**47**	ND	NA	NA	NA	NA	NA	NA	NA	ND	NA	NA	NA	0.1 J J	NA	NA	NA	NA	NA	NA	NA
alpha-BHC	**3.4**	ND	NA	NA	NA	NA	NA	NA	NA	ND	NA	NA	NA	0.2 J	NA	NA	NA	NA	NA	NA	NA

TurnKey Environmental Restoration, LLC

Parameter [1]	Commercial SCOs[2] (mg/kg)	TP-39 (0-3)	TP-41 (0-5)	TP-42 (1.5-4.5)	TP-46 (5-5.5)	TP-48 (3-9)	MW-1 (6-8)	MW-2 (4-6)	MW-3 (4-6)	MW-4 (4-6)
TAL Metals - mg/kg										
Aluminum	--	3400 J	12000 J	6470 J	8290 J	4990 J	10600	13600	12200	8030
Arsenic	**16**	**42.2**	**31**	**97.7**	**30.1**	**57.1**	**17.1**	9.4	9.1	10.9
Barium	**400**	55.2 J	120 J	174 J	113	140	107 J	166 J	89.1 J	50.5 J
Beryllium	**590**	0.26	1.1	0.71	0.58	0.55	0.78	0.66	0.53	0.39
Cadmium	**9.3**	ND	0.63	ND	1.2	1.2	ND	ND	0.25	ND
Calcium	--	3040 J	8840 J	3440 J	41200 J	19300	1320	1890	1150	17000
Chromium	**400**	8.4	14.3	10.7	18.2	17.1	12.4	16.3	12.5	9.5
Cobalt	--	5.2 J	15.9 J	10.3 J	4.2	9.8	10.5	8	8.9	5.3
Copper	**270**	30.2	83.3	120	50.2 J	130 J	19.3	14.1	16.6	22.9
Iron	--	17800	21700	32600	18600	90500	31100	27700	20200	15600
Lead	**1000**	79.5	335	66.2	**1030**	**1100** J	17.7	10.4	19.5	84.4
Magnesium	--	541	4120	467	2900	2560	2830	4010	3110	2360
Manganese	**10,000**	77.7	281	189	160	343	744	472	321	464
Nickel	**310**	12.7	43.7	23.7	28.9	25.4	23.7	24.1	15.5	12.9
Potassium	--	534	1150	779	984	552	947	1160	869	7.3

TurnKey Environmental Restoration, LLC

Parameter [1]	Commercial SCOs[2] (mg/kg)	TP-39 (0-3)	TP-41 (0-5)	TP-42 (1.5-4.5)	TP-46 (5-5.5)	TP-48 (3-9)	MW-1 (6-8)	MW-2 (4-6)	MW-3 (4-6)	MW-4 (4-6)
Sodium	--	ND	786	280	227	330	ND	ND	ND	ND
Vanadium	--	7.7 J	24.1 J	23.1 J	28.3	41.8	16.1	18.5	16	12.4
Zinc	**10,000**	31.6 J	131 J	43.7 J	119 J	65 J	51.5	61.1	64	49.9
Mercury	**2.8**	0.061	0.12	0.023	0.64 J	2.4 J	ND	ND	0.027	0.097
Organochlorine Pesticides mg/kg[3]										
4,4'-DDD	**92**	NA	NA	ND	~~NA~~ ND	NA	~~NA~~ ND	~~NA~~ ND	NA	NA
4,4'-DDE	**62**	NA	NA	ND	~~NA~~	NA	~~NA~~	~~NA~~	NA	NA
4,4'-DDT	**47**	NA	NA	ND	~~NA~~	NA	~~NA~~	~~NA~~	NA	NA
alpha-BHC	**3.4**	NA	NA	ND	~~NA~~	NA	~~NA~~	~~NA~~	NA	NA

TurnKey Environmental Restoration, LLC

Parameter [1]	Commercial SCOs[2] (mg/kg)	MW-5 (4-6)	MW-6 (4-8)	MW-7 (2-4)	MW-8 (4-6)
TAL Metals - mg/kg					
Aluminum	--	12800	10300	5660	5660
Arsenic	**16**	**44.3**	**17.2**	**126**	**17.2**
Barium	**400**	140 J	118 J	74.4 J	139 J
Beryllium	**590**	0.54	0.72	0.61	0.29
Cadmium	**9.3**	0.77	ND	0.28	ND
Calcium	--	55900	4210	10800	25200
Chromium	**400**	38.3	12.1	7.7	12.1
Cobalt	--	4.6	12.6	12.6	2.2
Copper	**270**	147	45.5	101	52.6
Iron	--	35200	21800	51100	9830
Lead	**1000**	**2100**	141	89	**1200**
Magnesium	--	7250	2260	1250	4510
Manganese	**10,000**	828	461	128	77.5
Nickel	**310**	14.2	22.1	30.9	11.6
Potassium	--	1210	1040	535	549

Parameter [1]	Commercial SCOs[2] (mg/kg)				
		MW-5 (4-6)	MW-6 (4-8)	MW-7 (2-4)	MW-8 (4-6)
Sodium	--	746	295	265	ND
Vanadium	--	24.9	17.3	18.3	25.6
Zinc	**10,000**	150	62.2	82.3	30.3
Mercury	**2.8**	**3.9**	0.12	0.054	2
Organochlorine Pesticides mg/kg [3]					
4,4'-DDD	**92**	NA	NA J	~~NA~~ R	NA
4,4'-DDE	**62**	NA	NA	NA	NA
4,4'-DDT	**47**	NA	NA	NA	NA
alpha-BHC	**3.4**	NA	NA	NA	NA

TurnKey Environmental Restoration, LLC

TABLE 4

SUMMARY OF GROUNDWATER ANALYTICAL RESULTS

251 HOMER STREET REDEVELOPMENT SITE
OLEAN, NEW YORK

Parameter [1]	NYSDEC Class GA GWQS[2]	Sample Locations (6/7/11)							
		MW-1	MW-2	MW-3	MW-4	MW-5	MW-6	MW-7	MW-8
TCL plus STARS Volatile Organic Compounds (VC									
Acetone	**50**	ND	ND	5 J	ND	ND	ND	ND	ND
2-Butanone (MEK)	**50**	ND	ND	ND	ND	ND	ND	ND	ND
Carbon disulfide	**60**	ND UJ	ND	ND	ND	ND	ND	ND UJ	ND
Cyclohexane	--	98	ND	ND	ND	35	ND	ND	ND
1,2-Dichlorobenzene	**3**	ND	ND	ND	ND	ND	ND	ND	ND
Methylcyclohexane	--	150	ND	ND	750 J	52	ND	ND	ND
Methylene Chloride	**5**	ND	ND	ND	ND	~~12 BJ~~ U	ND	ND	ND
sec-Butylbenzene	**5**	ND	ND	ND	ND	ND	ND	ND	ND
tert-Butylbenzene	**100**	ND	ND	ND	ND	ND	ND	ND	ND
Gasoline Range Organics [C6-C10]	--	580	6.7 J	58	40	600	140	ND ~~17 J~~ U	100
TICs[3]	--	ND	ND	ND	ND	ND	ND	ND	ND
Total VOCs	--	***828***	***6.7***	***63***	***790***	***700***	***140***	***17***	***100***
STARS Semi-Volatile Organic Compounds (SVOCs) - ug/L									
Acenaphthene	**20**	ND	ND	ND	ND	ND	ND	ND	0.37 J
Benzo(k)fluoranthene	--	ND	ND	ND	ND	ND	ND	ND	ND
Bis(2-ethylhexyl) phthalate	--	ND	2.9 J	ND	ND	ND	2.5 J	ND	ND
Di-n-butyl phthalate	**50**	0.3 J	ND	ND	ND	ND	ND	ND	0.34 J
Fluorene	**50**	ND	ND	ND	ND	ND	ND	ND	ND
Phenanthrene	**50**	ND	ND	ND	ND	ND	ND	ND	ND
Diesel Range Organics [C10-C28]	--	1,000	320 J	960	1,100	22,000	2000	950	550 J
TICs[3]	--	ND	ND	ND	ND	ND	ND	ND	ND
Total SVOCs	--	***1000***	***323***	***960***	***1100***	***22000***	***2003***	***950***	***551***

See attached for mw-5 + mw-7 SVOC results

08/08/2011

Analytical Data

Client: Benchmark Env. Eng. & Science, PLLC

Job Number: 480-5725-1

Client Sample ID: **MW-7**

Lab Sample ID: 480-6614-2
Client Matrix: Water

Date Sampled: 06/27/2011 1044
Date Received: 06/28/2011 1400

8270C Semivolatile Organic Compounds (GC/MS)

Analysis Method:	8270C	Analysis Batch:	480-22294	Instrument ID:	HP5973X
Prep Method:	3510C	Prep Batch:	480-22033	Lab File ID:	X4933.D
Dilution:	1.0			Initial Weight/Volume:	1060 mL
Analysis Date:	07/01/2011 1031			Final Weight/Volume:	1 mL
Prep Date:	06/29/2011 1537			Injection Volume:	1 uL

Analyte	Result (ug/L)	Qualifier	MDL	RL
Biphenyl	ND		0.62	4.7
bis (2-chloroisopropyl) ether	ND		0.49	4.7
2,4,5-Trichlorophenol	ND		0.45	4.7
2,4,6-Trichlorophenol	ND		0.58	4.7
2,4-Dichlorophenol	ND		0.48	4.7
2,4-Dimethylphenol	ND		0.47	4.7
2,4-Dinitrophenol	ND		2.1	9.4
2,4-Dinitrotoluene	ND		0.42	4.7
2,6-Dinitrotoluene	ND		0.38	4.7
2-Chloronaphthalene	ND		0.43	4.7
2-Chlorophenol	ND		0.50	4.7
2-Methylnaphthalene	ND	*	0.57	4.7
2-Methylphenol	ND		0.38	4.7
2-Nitroaniline	ND		0.40	9.4
2-Nitrophenol	ND		0.45	4.7
3,3'-Dichlorobenzidine	ND		0.38	4.7
3-Nitroaniline	ND		0.45	9.4
4,6-Dinitro-2-methylphenol	ND		2.1	9.4
4-Bromophenyl phenyl ether	ND		0.42	4.7
4-Chloro-3-methylphenol	ND		0.42	4.7
4-Chloroaniline	ND		0.56	4.7
4-Chlorophenyl phenyl ether	ND		0.33	4.7
4-Methylphenol	ND		0.34	9.4
4-Nitroaniline	ND		0.24	9.4
4-Nitrophenol	ND		1.4	9.4
Acenaphthene	ND		0.39	4.7
Acenaphthylene	ND		0.36	4.7
Acetophenone	ND		0.51	4.7
Anthracene	ND		0.26	4.7
Atrazine	ND		0.43	4.7
Benzaldehyde	ND		0.25	4.7
Benzo(a)anthracene	ND		0.34	4.7
Benzo(a)pyrene	ND		0.44	4.7
Benzo(b)fluoranthene	ND ~~0.38~~ U	J B	0.32	4.7
Benzo(g,h,i)perylene	ND ~~0.36~~ U	J B	0.33	4.7
Benzo(k)fluoranthene	ND		0.69	4.7
Bis(2-chloroethoxy)methane	ND		0.33	4.7
Bis(2-chloroethyl)ether	ND		0.38	4.7
Bis(2-ethylhexyl) phthalate	ND		1.7	4.7
Butyl benzyl phthalate	ND		0.40	4.7
Caprolactam	ND		2.1	4.7
Carbazole	ND		0.28	4.7
Chrysene	ND		0.31	4.7
Di-n-butyl phthalate	0.37	J	0.29	4.7
Di-n-octyl phthalate	ND		0.44	4.7
Dibenz(a,h)anthracene	ND ~~0.42~~ U	J B	0.40	4.7

Analytical Data

Client: Benchmark Env. Eng. & Science, PLLC

Job Number: 480-5725-1

Client Sample ID: **MW-7**

Lab Sample ID: 480-6614-2

Client Matrix: Water

Date Sampled: 06/27/2011 1044

Date Received: 06/28/2011 1400

8270C Semivolatile Organic Compounds (GC/MS)

Analysis Method:	8270C	Analysis Batch:	480-22294	Instrument ID:	HP5973X
Prep Method:	3510C	Prep Batch:	480-22033	Lab File ID:	X4933.D
Dilution:	1.0			Initial Weight/Volume:	1060 mL
Analysis Date:	07/01/2011 1031			Final Weight/Volume:	1 mL
Prep Date:	06/29/2011 1537			Injection Volume:	1 uL

Analyte	Result (ug/L)	Qualifier	MDL	RL
Dibenzofuran	ND		0.48	9.4
Diethyl phthalate	ND		0.21	4.7
Dimethyl phthalate	ND		0.34	4.7
Fluoranthene	ND		0.38	4.7
Fluorene	ND		0.34	4.7
Hexachlorobenzene	ND		0.48	4.7
Hexachlorobutadiene	ND	*	0.64	4.7
Hexachlorocyclopentadiene	ND		0.56	4.7
Hexachloroethane	ND		0.56	4.7
Indeno(1,2,3-cd)pyrene	ND		0.44	4.7
Isophorone	ND		0.41	4.7
N-Nitrosodi-n-propylamine	ND		0.51	4.7
N-Nitrosodiphenylamine	ND		0.48	4.7
Naphthalene	ND		0.72	4.7
Nitrobenzene	ND		0.27	4.7
Pentachlorophenol	ND		2.1	9.4
Phenanthrene	ND		0.42	4.7
Phenol	ND		0.37	4.7
Pyrene	ND		0.32	4.7

Surrogate	%Rec	Qualifier	Acceptance Limits
2,4,6-Tribromophenol	119		52 - 132
2-Fluorobiphenyl	92		48 - 120
2-Fluorophenol	42		20 - 120
Nitrobenzene-d5	78		46 - 120
p-Terphenyl-d14	76		24 - 136
Phenol-d5	32		16 - 120

Analytical Data

Client: Benchmark Env. Eng. & Science, PLLC

Job Number: 480-5725-1

Client Sample ID: **MW-5**

Lab Sample ID: 480-6614-1

Client Matrix: Water

Date Sampled: 06/27/2011 1227

Date Received: 06/28/2011 1400

8270C Semivolatile Organic Compounds (GC/MS)

Analysis Method:	8270C	Analysis Batch:	480-22294	Instrument ID:	HP5973X
Prep Method:	3510C	Prep Batch:	480-22033	Lab File ID:	X4931.D
Dilution:	5.0			Initial Weight/Volume:	1050 mL
Analysis Date:	07/01/2011 0945			Final Weight/Volume:	1 mL
Prep Date:	06/29/2011 1537			Injection Volume:	1 uL

Analyte	Result (ug/L)	Qualifier	MDL	RL
Biphenyl	ND		3.1	24
bis (2-chloroisopropyl) ether	ND		2.5	24
2,4,5-Trichlorophenol	ND		2.3	24
2,4,6-Trichlorophenol	ND		2.9	24
2,4-Dichlorophenol	ND		2.4	24
2,4-Dimethylphenol	ND		2.4	24
2,4-Dinitrophenol	ND		11	48
2,4-Dinitrotoluene	ND		2.1	24
2,6-Dinitrotoluene	ND		1.9	24
2-Chloronaphthalene	ND		2.2	24
2-Chlorophenol	ND		2.5	24
2-Methylnaphthalene	ND	*	2.9	24
2-Methylphenol	ND		1.9	24
2-Nitroaniline	ND		2.0	48
2-Nitrophenol	ND		2.3	24
3,3'-Dichlorobenzidine	ND		1.9	24
3-Nitroaniline	ND		2.3	48
4,6-Dinitro-2-methylphenol	ND		10	48
4-Bromophenyl phenyl ether	ND		2.1	24
4-Chloro-3-methylphenol	ND		2.1	24
4-Chloroaniline	ND		2.8	24
4-Chlorophenyl phenyl ether	ND		1.7	24
4-Methylphenol	ND		1.7	48
4-Nitroaniline	ND		1.2	48
4-Nitrophenol	ND		7.2	48
Acenaphthene	ND		2.0	24
Acenaphthylene	ND		1.8	24
Acetophenone	ND		2.6	24
Anthracene	ND		1.3	24
Atrazine	ND		2.2	24
Benzaldehyde	ND		1.3	24
Benzo(a)anthracene	ND ~~1.8~~ U	J B	1.7	24
Benzo(a)pyrene	ND		2.2	24
Benzo(b)fluoranthene	ND ~~1.9~~ U	J B	1.6	24
Benzo(g,h,i)perylene	ND ~~1.8~~ U	J B	1.7	24
Benzo(k)fluoranthene	ND		3.5	24
Bis(2-chloroethoxy)methane	ND		1.7	24
Bis(2-chloroethyl)ether	ND		1.9	24
Bis(2-ethylhexyl) phthalate	ND		8.6	24
Butyl benzyl phthalate	ND		2.0	24
Caprolactam	ND		10	24
Carbazole	ND		1.4	24
Chrysene	ND ~~1.8~~ U	J B	1.6	24
Di-n-butyl phthalate	ND		1.5	24
Di-n-octyl phthalate	11	J	2.2	24
Dibenz(a,h)anthracene	ND ~~2.0~~ U	J B	2.0	24

Analytical Data

Client: Benchmark Env. Eng. & Science, PLLC

Job Number: 480-5725-1

Client Sample ID: **MW-5**

Lab Sample ID: 480-6614-1
Client Matrix: Water

Date Sampled: 06/27/2011 1227
Date Received: 06/28/2011 1400

8270C Semivolatile Organic Compounds (GC/MS)

Analysis Method:	8270C	Analysis Batch:	480-22294	Instrument ID:	HP5973X
Prep Method:	3510C	Prep Batch:	480-22033	Lab File ID:	X4931.D
Dilution:	5.0			Initial Weight/Volume:	1050 mL
Analysis Date:	07/01/2011 0945			Final Weight/Volume:	1 mL
Prep Date:	06/29/2011 1537			Injection Volume:	1 uL

Analyte	Result (ug/L)	Qualifier	MDL	RL
Dibenzofuran	ND		2.4	48
Diethyl phthalate	ND		1.0	24
Dimethyl phthalate	ND		1.7	24
Fluoranthene	ND		1.9	24
Fluorene	ND		1.7	24
Hexachlorobenzene	ND		2.4	24
Hexachlorobutadiene	ND	*	3.2	24
Hexachlorocyclopentadiene	ND		2.8	24
Hexachloroethane	ND		2.8	24
Indeno(1,2,3-cd)pyrene	ND ~~2.2~~ U	J B	2.2	24
Isophorone	ND		2.0	24
N-Nitrosodi-n-propylamine	ND		2.6	24
N-Nitrosodiphenylamine	ND		2.4	24
Naphthalene	ND		3.6	24
Nitrobenzene	ND		1.4	24
Pentachlorophenol	ND		10	48
Phenanthrene	ND		2.1	24
Phenol	ND		1.9	24
Pyrene	ND		1.6	24

Surrogate	%Rec	Qualifier	Acceptance Limits
2,4,6-Tribromophenol	106		52 - 132
2-Fluorobiphenyl	89		48 - 120
2-Fluorophenol	43		20 - 120
Nitrobenzene-d5	79		46 - 120
p-Terphenyl-d14	57		24 - 136
Phenol-d5	33		16 - 120

Parameter [1]	NYSDEC Class GA GWQS[2]	Sample Locations (6/7/11)							
		MW-1	MW-2	MW-3	MW-4	MW-5	MW-6	MW-7	MW-8
TAL Metals - ug/L (Total)									
Aluminum	--	6,600 J	6,800 J	ND UJ	3,500 J	ND UJ	5500 J	780 J	760 J
Arsenic	**25**	**38**	ND	13	ND	**25**	19	ND	ND
Barium	**1000**	86	200	130	410	410	410	140	27
Calcium	--	105000	83100	36800	117000	150000	213000	158000	296000
Chromium	**50**	4	6.4	ND	ND	ND	5	ND	ND
Cobalt	--	ND	5.1	ND	ND	ND	ND	ND	58
Copper	**200**	25	16.0	ND	ND	ND	19	ND	ND
Iron	**300**	**64200**	**14800**	**28400**	**64700**	**100000**	**23400**	**29900**	**112000**
Lead	**25**	15	13.0	ND	8.30	ND	22	ND	ND
Magnesium	**35000**	22800	25100	19900	27200	**83100**	**37600**	12300	**36600**
Manganese	**300**	**5500**	**7800**	**6100**	**9100**	**23100**	**3100**	**1800**	**12100**
Nickel	**100**	ND	ND	ND	ND	ND	ND	ND	49
Potassium	--	7400	5200	ND	4300	9300	11200	ND	3800
Sodium	**20000**	**34000**	**33500**	3700	15500	**39400**	**162000**	**52900**	**86600**
Vanadium	--	16	18	7.2	14	20	12	ND	14
Zinc	**5000**	50	32	ND	19	ND	39	ND	31
Dissolved Metals - ug/L									
Arsenic	**25**	ND UJ	ND UJ	ND UJ	ND UJ	11 J	ND UJ	ND UJ	ND UJ
Barium	**1000**	520 J	130 J	79 J	220 J	180 J	260 J	98 J	17 J
Calcium	--	90700 J	74300 J	60100 J	105000 J	144000 J	195000 J	149000 J	288000 J
Cobalt	--	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	52 J
Iron	**300**	ND UJ	ND UJ	170 J	ND UJ	ND UJ	ND UJ	ND UJ	**8900** J
Magnesium	**35000**	19800 J	21700 J	19300 J	24700 J	**82300** J	34400 J	11700 J	**35300** J
Manganese	**300**	**5200** J	**8600** J	**5700** J	**8300** J	**23900** J	**2700** J	**1600** J	**11500** J
Nickel	**100**	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	40 J
Potassium	--	5500 J	3000 J	2900 J	3500 J	9400 J	9500 J	2000.00 J	3600 J
Sodium	**20000**	**32000** J	**27700** J	3700 J	14400 J	**41600** J	**148000** J	**49300** J	**80500** J
Vanadium	--	5 J	7.3 J	5.2 J	6.9 J	14 J	ND J	ND J	8.7 J
Zinc	**5000**	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	ND UJ	12 J

Notes:

1. Only those parameters detected at a minimum of one sample location are presented in this table; all other compounds were reported as non-detect.
2. Values per NYSDEC TOGS 1.1.1 Class GA Groundwater Quality Standards (GWQS).
3. Tentatively identified compounds

Definitions:

ND = Parameter not detected above laboratory detection limit.

08/08/2011

TABLE 6

SUMMARY OF SURFACE WATER ANALYTICAL RESULTS

251 HOMER STREET REDEVELOPMENT SITE
OLEAN, NEW YORK

Parameter [1]	NYSDEC Class C SWQS[2, 3]	Sample Location (6/3/11)			
		SW-1	SW-2	SW-3	SW-4
TCL ~~plus STARS~~ Volatile Organic Compounds (VOCs) - ug					
Acetone	--	3.3 J	ND	ND	ND
Gasoline Range Organics [C6-C10]	--	ND ~~8.9 J~~ U	ND ~~4.5 J~~ U	ND	ND
Total VOCs	--	***12***	***4.5***	***ND***	***ND***
~~STARS~~ Semi-Volatile Organic Compounds (SVOCs) - ug/L					
Benzo(k)fluoranthene	--	ND	ND	ND ~~1.4 J~~ U	ND
Total SVOCs	--	***ND***	***ND***	~~***1.4***~~ ND	***ND***
TAL Metals - ug/L					
Aluminum	--	ND	280	340	310
Barium	--	120 J	22 J	29 J	25 J
Calcium	--	46800 J	13200 J	17200 J	12800 J
Cobalt	**5**	ND	ND	ND	**58**
Iron	**300**	**2200**	**380**	**580**	**410**
Magnesium	--	5600	3200	4100	3200
Manganese	--	1000	190	160	190
Nickel [4]	**3.3**	ND	ND	**49**	**49**
Potassium	--	2400	840	990	800
Sodium	--	16400	6600	8100	5900

Notes:

1. Only those parameters detected at a minimum of one sample location are presented in this table; all other compounds were reported as non-detect.
2. Values per NYSDEC TOGS 1.1.1 Class C Surface Water Quality Standards (SWQS).
3. Two- Mile Creek is listed as a class C water body according to NYSDEC Environmental Resource Mapper.
4. SWQS calculated based upon an assumed hardness of 4.0 on the Mohs Hardness Scale.

Definitions:

ND = Parameter not detected above laboratory detection limit.

"--" = No SCO available.

J = Estimated value; result is less than the sample quantitation limit but greater than zero.

BOLD = Sample result exceeds NYSDEC Surface Water Quality Standards.

08/08/2011

TurnKey

TABLE 7

SEDIMENT ANALYTICAL RESULTS

251 HOMER STREET REDEVELOPMENT SITE
OLEAN, NEW YORK

Parameter [1]	Commercial SCOs[2] (mg/kg)	SAMPLE LOCATION			
		SED-1	SED-2	SED-3	SED-4
TCL ~~plus STARS~~ Volatile Organic Compounds (VOCs) - mg/kg [3]					
Acetone	**500**	ND 0.22 B	ND ~~0.04 BJ~~ U	ND ~~0.012 J~~ U	ND ~~0.019 J~~ U
2-Butanone (MEK)	**500**	0.077 J	0.0099 J	ND	0.0048 J
Methylene chloride	**500**	ND ~~0.01 BJ~~ U	ND	ND ~~0.013 B~~ U	ND ~~0.0064 BJ~~ U
Methyl tert butyl ether (MTBE)	**500**	ND	ND	ND	0.00083 J
Toluene	**500**	2.3 J	0.16 B	ND ~~0.00078 BJ~~ U	ND ~~0.00072 BJ~~ U
Total Xylene	**500**	ND	ND	ND	0.0011 J
Gasoline Range Organics [C6-C10]	--	4.5 J	2.4 B	1.3 J J	1.2 J
Total VOCs	--	***7.1***	***2.6***	***1.3***	***1.2***
TCL Semi-Volatile Organic Compounds (SVOCs) - mg/kg [3]					
Acenaphthylene	**500**	ND	0.015	ND	ND
Anthracene	**500**	0.045 J	ND ~~0.026 J~~ U	ND	ND
Benzo(a)anthracene	**5.6**	ND ~~0.77 J~~ U	ND ~~0.15 J~~ U	ND ~~0.15 J~~ U	ND
Benzo(b)fluoranthene	**5.6**	1.3 J	0.23 J	ND	ND
Benzo(k)fluoranthene	**56**	ND ~~0.83 J~~ U	0.11 J	ND	ND
Benzo(g,h,i)perylene	**500**	1.4 J	0.14 J	ND ~~0.075~~ U	0.42 J
Benzo(a)pyrene	**1**	0.89 J	0.16 J	0.11 J	ND
Carbozole	--	ND	0.027 J	ND	ND
Chrysene	**56**	0.83 J	0.19 J	0.12 J	ND
Dibenzo(a,h)anthracene	**0.56**	ND	ND	ND	0.09 J
Fluoranthene	**500**	1.1 J	0.33 J	0.21 J	ND
Indeno(1,2,3-cd)pyrene	**5.6**	0.86 J	ND ~~0.12 J~~ U	ND	0.11 J
4-Methylhenol	--	3.4 J	0.71	ND	ND
2-Methylnaphthalene	--	ND	ND	ND	0.17 J
Phenanthrene	**500**	0.47 J	0.15 J	ND	0.24 J
Phenol	**500**	ND	0.046 J NJ	ND	ND
Pyrene	**500**	1 J	0.27 J	ND	0.36 J
Diesel Range Organics [C10-C28]	--	190 J	81	50	340 DJ
Total SVOCs	--	***202.9***	***83.7***	***50.7***	***341.4***

TABLE 7

SEDIMENT ANALYTICAL RESULTS

251 HOMER STREET REDEVELOPMENT SITE
OLEAN, NEW YORK

Parameter [1]	Commercial SCOs^2 (mg/kg)	SAMPLE LOCATION			
		SED-1	SED-2	SED-3	SED-4
TAL Metals - mg/kg					
Aluminum	--	22400 J	11800	11100	11900
Arsenic	**16**	**22.5**	9.5	10.6	9.9
Barium	**400**	253	119	116	124
Beryllium	**590**	1.3	0.59	0.59	0.65
Cadmium	**9.3**	1	ND	ND	0.25
Calcium	--	5110 J	1690	1800	1630
Chromium	**400**	28.1 J	14.1	12.2	15.9
Cobalt	--	20	10.4	11.2	11.6
Copper	**270**	66.5 J	17.8	16.4	33.4
Iron	--	46200	23200	22900	22300
Lead	**1,000**	96.7 J	20.6	24	110
Magnesium	--	5750 J	3110	2850	3660
Manganese	**10,000**	1400 J	824	1030	220
Nickel	**310**	40.5 J	20.5	20.2	24.1
Potassium	--	2710 J	1290 J	1020 J	1470 J
Vanadium	--	35.2 J	16.9	16.7	17.6
Zinc	**10,000**	236	78.7	70.8	124 J
Mercury	**2.8**	0.2	0.044	0.032	0.089

Notes:

1. Only those parameters detected at a minimum of one sample location are presented in this table; all other compounds were reported as non-detect.
2. Values per NYSDEC Part 375 Restricted-Commercial Soil Cleanup Objectives (SCOs).
3. Sample results reported by the laboratory in ug/kg were converted to mg/kg for comparison to SCOs.

Definitions:

mg/kg = milligrams per kilogram
ug/kg = micrograms per kilogram
ND = Parameter not detected above laboratory detection limit.
"--" = No SCO available.
B = Analyte was detected in the associated blank as well as in the sample.
D = All compounds were identified in an analysis at the secondary dilution factor.
J = Estimated value; result is less than the sample quantitation limit but greater than zero.
BOLD = Sample concentration exceeds Commercial SCO.

Data Validation Services

120 Cobble Creek Road   P.O. Box 208
North Creek, NY 12853

Phone 518-251-4429
Facsimile 518-251-4428

July 27, 2012

Michael Lesakowski
Benchmark Env. Engineers
2558 Hamburg Turnpike Suite 300
Buffalo, NY 14218

RE: **Data Usability Summary Report** for the 251 Homer Street Site
TAL SDG Nos. 480-19484-1 and 480-20349-1

Dear Mr. Lesakowski:

Review has been completed for the data packages noted above, generated by Test America Laboratories that pertain to samples collected between 04/30/12 and 05/22/12 at the 251 Homer Street site. Eleven soil samples and a soil field duplicate were processed for TCL volatiles, TCL semivolatiles, TAL metals, Gasoline Range Organics (GRO), and Diesel Range Organics (DRO). Two of those soil samples were also processed for Total Organic Carbon (TOC). Four other soil samples were processed for TCL semivolatiles, TCL PCBs, and TAL metals. Thirteen aqueous samples and an aqueous field duplicate were processed for TCL volatiles, TCL semivolatiles, GRO, and DRO. The analytical methods utilized are those of the USEPA SW846 6000/7000/8000.

The data packages submitted contain full deliverables for validation, but this usability report is generated from review of the summary form information, with review of sample raw data, and limited review of associated QC raw data. Full validation has not been performed. However, the reported summary forms have been reviewed for application of validation qualifiers, using guidance from the USEPA Region 2 validation SOPs, the USEPA National Functional Guidelines for Data Review, the specific laboratory methodologies, and professional judgment, as affects the usability of the data. The following items were reviewed:

* Laboratory Narrative Discussion
* Custody Documentation
* Holding Times
* Surrogate and Internal Standard Recoveries
* Matrix Spike Recoveries/Duplicate Correlations
* Field Duplicate Correlations
* Preparation/Calibration Blanks
* Control Spike/Laboratory Control Samples
* Instrumental Tunes
* Calibration/Low Level Standards

* ICP Serial Dilution
* Instrument IDLs
* Sample Result Verification

Those items listed above which show deficiencies are discussed within the text of this narrative. All of the other items were determined to be acceptable for the DUSR level review.

In summary, sample analyses were primarily conducted in compliance with the required analytical protocols. Sample results are usable either as reported or with minor qualification/edit.

Copies of the sample identification summaries and the laboratory case narratives are attached to this text, and should be reviewed in conjunction with this report. Also included with the report are client results tables annotated to reflect the qualifications recommended within this report.

The following text discusses quality issues of concern.

Chains-of-Custody

Intervals of three and four days occurred between sample collection and laboratory receipt for three of the soil samples, beyond the two day timeframe allowed by NYS. Memorandums should be make to the file documenting the condition and custody of the samples during the time between collection and shipment.

For samples collected 04/30/12, the interim receipt time was later than the time noted for that same individual's relinquish entry. The date and time were not present on the initial relinquish entries associated with samples collected 05/22/12. The signature and time were not present on the initial relinquish entries associated with samples collected 05/21/12.

Blind Duplicate Evaluations

The blind field duplicate evaluations were performed on MW-10(2-4) and MW-14. The correlations are within validation guidelines, with the exception of that for DRO (77%RPD) in MW-10(2-4). The results for that analyte in the parent sample and its duplicate are qualified as estimated in value.

General

The laboratory has created their own flags and definitions, some of which are not consistent with those of the NYSDEC ASP, utilizing the ASP flags with alternate definitions.

TCL Volatile Analyses by EPA 8260B

SED-5 and SED-6 had solids contents below 50%, and their reported results have therefore been qualified as estimated, with an unknown direction of bias.

The result for chlorobenzene in MW-12(4-6) is edited to reflect non-detection due to very poor mass spectral quality.

The results for isopropylbenzene in MW-14(6-8) and MW-11, and for m,p-xylenes in MW-13(6-8) and MW-14(6-8) are qualified as tentative in identification and estimated in value due to poor spectral quality.

Results for analytes that are initially reported with the "E" laboratory flagged are to be derived from the dilution analyses of those samples.

The aqueous matrix spikes of MW-7 and MW-9 show recoveries and duplicate correlations of the thirteen analytes that were evaluated are within validation guidelines. The analytical protocol requires evaluation of all target analytes.

The soil matrix spikes of TP-60 (8-10) and TP-61 (6-8) show anomalies that indicate likely errors in laboratory spiking procedure. The spikes of TP-60 (8-10) show consistently low recoveries for the spike compounds (including toluene and 1,2-dichloroethane at 30% to 43%), but acceptable recoveries for the surrogate standards (including d8-toluene and d4-1,2-dichloroethane at 90% to 101%). Similarly, the spikes of TP-61 (6-8) show consistently high recoveries for the spike compounds (including toluene and 1,2-dichloroethane at 156% to 189%), but acceptable recoveries for the surrogate standards (including d8-toluene and d4-1,2-dichloroethane at 86% to 91%). Those spike compounds and their deuterated analog surrogate compounds should recover identically. No qualification is made.

Due to presence in the associated method blank, the result for toluene in MW-14(6-8) is considered external contamination and edited to reflect non-detection.

Calibration standards showed acceptable responses, with the following exceptions, results for which are to be qualified as estimated in the indicated samples:

- dichlorodifluoromethane (26%D and 31%D) in MW-4, MW-6, MW-7, MW-11, MW-12, MW-14, Blind Duplicate, Trip Blank, MW-9, MW-10, MW-9 2-4, MW-11 4-6, MW-12 4-6, MW-13(6-8), and MW-14(6-8)
- methyl acetate, 2-butanone (MEK), 4-methyl-2-pentanone (MIBK) and 2-hexanone (22%D to 26%D) in MW-1, MW-2, MW-3 MW-8, and MW-13
- methylcyclohexane (26%D) in TP-59(10-12) and TP-60(8-10)
- cyclohexane and carbon disulfide (21% and 22%) in TP-61(6-8)

Surrogate recoveries and internal standard responses are within required limits. LCS recoveries meet validation guidelines.

Tentatively Identified Compounds (TICs) reported as naphthalene are to be disregarded as volatile sample components. This TIC was also present in at least one method blank. Other Target Compound List analytes are also to be disregarded as TICs.

The TIC identified as methylcyclohexane in MW-1 and that identified as 1,1-dimethylcyclopentane in MW-4 are not good spectral matches, are to be edited to unknown.

Not all of the mass spectral library best matches were provided for the TICs reported as unknowns.

Some of the samples were processed only at dilution due to either elevated target analyte concentrations or matrix effect (such as foaming). This results in elevated reporting limits for analytes not detected in those affected samples.

<u>TCL Semivolatiles by EPA 8270C</u>

Samples SED-5 and SED-6 show very low solids content (85% and 48%, respectively). They were therefore decanted prior to sample preparation. However, the laboratory did not perform the solids determination on the decanted product, and used the determination that included the water. Because that solids value is included in the dry weight results for the soil samples, falsely elevated detected values and reporting limits were reported for those two samples. Results for those two samples have been qualified as estimated, and may have a high bias by unknown factors, the degree of which is not likely to exceed an order of magnitude for SED-5 and two-fold for SED-6.

The detections of acenaphthylene and fluorene in MW-10 are qualified as tentatively identified and estimated in value due to poor mass spectral quality.

The detections of benzo(a)anthracene in MW-10 and benzo(k)fluoranthene in MW-10 2-4 are edited to non-detection due to very poor mass spectral quality.

The method blank associated with SED-6 was contaminated with low levels of twenty-three of the target analytes. The detections of PAHs reported in that sample are at concentrations that are within the limits for consideration as external contamination, and have been edited to reflect non-detection.

Matrix spikes of MW-7 and TP-61 (6-8) show acceptable recoveries and duplicate correlations for the twelve analytes that were evaluated. The analytical protocol requires evaluation of all target analytes.

Surrogate recoveries and internal standard responses are within required limits. LCS recoveries meet validation guidelines.

Calibration standards showed acceptable responses, with the exception of that for 4-nitrophenol (28%D) in that associated with MW-9 2-4, MW-11 4-6, MW-12 4-6, MW-13 (6-8) and MW-14 (6-8). , Results for that compound in those samples are qualified as estimated.

Some of the samples were processed only at dilution due to either elevated target analyte concentrations or matrix effect (such as extract viscosity). This results in elevated reporting limits for analytes not detected in those affected samples.

TICs in MW-10(2-4) reported as unknowns appear to be alkanes. Not all of the library mass spectral best matches were provided for the TICs reported as unknowns. Target Compound List analytes are to be disregarded as TICs.

<u>TCL PCBs by EPA 8082</u>

Surrogate recoveries were acceptable. No project matrix spikes were analyzed; LCSs show recoveries and duplicate correlations for Aroclors 1016 and 1260 that are within laboratory acceptance ranges. Blanks show no contamination.

Instrument performance was compliant, with the exception of elevated baselines in the some of the calibration standards.

GRO and DRO by EPA 8015

SED-5 was decanted prior to sample preparation for the DRO analysis. Please see the discussion in the semivolatile section above. That result has been qualified as estimated, with a probable high bias.

The results for SED-6 are qualified as estimated due to the sample solids content below 50%.

Due to low surrogate recoveries, results for GRO in SED-5 and MW-12 4-6 are qualified as estimated. The detected results for DRO are qualified as estimated in MW-9 and MW-11 due to elevated surrogate recoveries

Matrix spike recoveries of GRO and DRO in MW-7 and TP-61(6-8), for GRO in MW-9 2-4, and for DRO in MW-13(6-8) show acceptable recoveries and correlations, with the exception of that for DRO in TP-61(6-8) (26% and 17%). The result for DRO in that parent has been qualified as estimated in value.

The GRO method blanks show low level responses. Therefore results for that analyte in the following samples are considered external contamination, and edited to reflect non-detection:
TP-60(8-10), SED-5, MW-10 2-4, BLIND DUP, MW-4, MW-7, MW-13, and MW-8

TAL Metals Analyses by EPA 6010B, 7470, and 7471

SED-5 and SED-6 had solids contents below 50%, and their reported results have therefore been qualified as estimated, with an unknown direction of bias.

Matrix spikes (MS/MSD) for TAL metals on TP-61(6-8), and for mercury on SS-16, MW-10(2-4), and MW-9 2-4 show acceptable recoveries and duplicate correlations, with the exception of the outying recoveries below. The results for the listed elements are qualified as estimated in the indicated soil samples.

Parent Sample	Element	% Recovery	Affected Samples
TP-60 (8-10)	antimony	44 and 45	Those w/ TP prefix
MW-13(6-8)	antimony	60 and 60	Those w/MW and SS prefixes
	calcium	48 and 64	

The ICP serial dilution evaluation for TP-61(6-8) shows outlying correlations for potassium and zinc (16%D and 13%D). Detected results for those elements in the samples with the "TP" prefix are therefore qualified as estimated in value.

The ICP serial dilution evaluation for MW-13(6-8) shows outlying correlations between 17%D and 30%D for 13 of the elements. Therefore, detected results for the following analytes are qualified as estimated, with a possible low bias, in the soil samples with the "MW" and "SS" prefixes: aluminum, barium, calcium, chromium, cobalt, copper, iron, lead, magnesium, manganese, potassium, vanadium, and zinc.

Instrument performance was compliant with analytical protocols. The results for low-level standards are entered on the summary Forms 2B as being ND, when they were not. Recoveries on those forms are correct. Method blank summary Forms 3 should show the units.

TOC by Lloyd Kahn

SED-5 and SED-6 had solids contents below 50%, and their reported results have therefore been qualified as estimated in value.

Calibration standard and LCS recoveries are acceptable. Blanks show no contamination.

Please do not hesitate to contact me if you have comments or questions regarding this report.

Very truly yours,

Judy Harry

Judy Harry

VALIDATION DATA QUALIFIER DEFINITIONS

U	The analyte was analyzed for, but was not detected above the level of the associated reported quantitation limit.
J	The analyte was positively identified; the associated numerical value is an approximate concentration of the analyte in the sample.
UJ	The analyte was not detected. The associated reported quantitation limit is an estimate and may be inaccurate or imprecise.
NJ	The detection is tentative in identification and estimated in value. Although there is presumptive evidence of the analyte, the result should be used with caution as a potential false positive and/or elevated quantitative value.
R	The data are unusable. The analyte may or may not be present.
EMPC	The results do not meet all criteria for a confirmed identification. The quantitative value represents the Estimated Maximum Possible Concentration of the analyte in the sample.

CLIENT and LABORATORY SAMPLE IDs and CASE NARRATIVES

SAMPLE SUMMARY

Client: Benchmark Env. Eng. & Science, PLLC

Job Number: 480-19484-1

Lab Sample ID	Client Sample ID	Client Matrix	Date/Time Sampled	Date/Time Received
480-19484-1	SS-16	Solid	04/30/2012 1455	05/02/2012 1806
480-19484-2	SS-17	Solid	04/30/2012 1502	05/02/2012 1806
480-19484-3	SS-18	Solid	04/30/2012 1440	05/02/2012 1806
480-19484-4	SS-19	Solid	04/30/2012 1447	05/02/2012 1806
480-19484-5	TP-59 (10-12)	Solid	04/30/2012 1550	05/02/2012 1806
480-19484-6	TP-60 (8-10)	Solid	04/30/2012 1558	05/02/2012 1806
480-19562-1	TP-61 (6-8)	Solid	05/02/2012 1006	05/03/2012 1500
480-19562-1MS	TP-61 (6-8)	Solid	05/02/2012 1006	05/03/2012 1500
480-19562-1MSD	TP-61 (6-8)	Solid	05/02/2012 1006	05/03/2012 1500
480-19749-1	SED-5	Solid	05/07/2012 1515	05/08/2012 1315
480-19946-1	MW-10 (2-4)	Solid	05/10/2012 1516	05/11/2012 1300
480-19946-2	BLIND DUP	Solid	05/10/2012 1200	05/11/2012 1300
480-20010-1	MW-9 2-4	Solid	05/10/2012 1100	05/14/2012 1240
480-20010-2	MW-11 4-6	Solid	05/11/2012 1550	05/14/2012 1240
480-20010-3	MW-12 4-6	Solid	05/11/2012 1600	05/14/2012 1240
480-20045-1	MW-13 (6-8)	Solid	05/14/2012 1150	05/15/2012 1235
480-20045-2	MW-14 (6-8)	Solid	05/14/2012 1544	05/15/2012 1235
480-20255-1	SED-6	Solid	05/17/2012 1215	05/18/2012 1400

SAMPLE SUMMARY

Client: Benchmark Env. Eng. & Science, PLLC

Job Number: 480-20349-1

Lab Sample ID	Client Sample ID	Client Matrix	Date/Time Sampled	Date/Time Received
480-20349-1	MW-4	Water	05/21/2012 1542	05/22/2012 1400
480-20349-2	MW-6	Water	05/21/2012 1200	05/22/2012 1400
480-20349-3	BLIND DUPLICATE	Water	05/21/2012 1230	05/22/2012 1400
480-20349-4	MW-7	Water	05/21/2012 1112	05/22/2012 1400
480-20349-4MS	MW-7	Water	05/21/2012 1112	05/22/2012 1400
480-20349-4MSD	MW-7	Water	05/21/2012 1112	05/22/2012 1400
480-20349-5	MW-11	Water	05/21/2012 1458	05/22/2012 1400
480-20349-6	MW-12	Water	05/21/2012 1430	05/22/2012 1400
480-20349-7	MW-13	Water	05/21/2012 1318	05/22/2012 1400
480-20349-8	MW-14	Water	05/21/2012 1245	05/22/2012 1400
480-20349-9	TRIP BLANK	Water	05/21/2012 0000	05/22/2012 1400
480-20398-1	MW-1	Water	05/22/2012 1105	05/23/2012 1152
480-20398-2	MW-2	Water	05/22/2012 1143	05/23/2012 1152
480-20398-3	MW-3	Water	05/22/2012 1308	05/23/2012 1152
480-20398-4	MW-8	Water	05/22/2012 1429	05/23/2012 1152
480-20398-5	MW-9	Water	05/22/2012 1230	05/23/2012 1152
480-20398-6	MW-10	Water	05/22/2012 1345	05/23/2012 1152

Job Narrative
480-19484-1

Comments
No additional comments.

Receipt
The samples were received on 5/2/2012 2:00 PM, 5/3/2012 3:00 PM, 5/8/2012 1:15 PM, 5/11/2012 1:00 PM, 5/14/2012 12:40 PM, 5/15/2012 12:35 PM and 5/18/2012 2:00 PM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperatures of the 7 coolers at receipt time were 2.6° C, 2.6° C, 3.6° C, 3.6° C, 3.8° C, 4.1° C and 4.2° C.

GC/MS VOA
Method(s) 8260B: The matrix spike / matrix spike duplicate (MS/MSD) recoveries for batch 62796 were outside control limits. The associated laboratory control sample (LCS) recovery met acceptance criteria.

Method(s) 8260B: The matrix spike / matrix spike duplicate (MS/MSD) recoveries for batch 63165 were outside control limits. The associated laboratory control sample (LCS) recovery met acceptance criteria.

Method(s) 8260B: The following compound was outside control limits in the continuing calibration verification (CCV) associated with batch 63801: Pentachloroethane. This compound is not classified as Calibration Check Compounds (CCCs) in the reference method, and the laboratory defaults to in-house and/or project-specific criteria for evaluation. Due to the large number of analytes contained in the CCV, the laboratory's SOP allows for six analytes to be outside limits; therefore, the data have been reported.

Method(s) 8260B: The method blank for batch 64624 contained Toluene above the method detection limit. This target analyte concentration was less than the reporting limit (RL); therefore, re-extraction and/or re-analysis of samples was not performed.

No other analytical or quality issues were noted.

GC/MS Semi VOA
Method(s) 8270C: The laboratory control sample (LCS) and laboratory control sample duplicate (LCSD) for preparation batch 62869 exceeded control limits for the following analyte: N-Nitrosodiphenylamine. This analyte was biased high in the LCS and was not detected in the associated samples; therefore, the data has been reported.

Method(s) 8270C: The following sample was diluted due to the nature of the sample matrix: SS-18 (480-19484-3). As such, surrogate recoveries were reduced to a level in which they do not provide useful information. Elevated reporting limits (RLs) are provided.

Method(s) 8270C: The continuing calibration verification (CCV) for multiple analytes associated with batch 64159 recovered above the upper control limit. The samples associated with this CCV were non-detects for the affected analytes; therefore, the data have been reported.

Method(s) 8270C: The following compound was outside control limits in the continuing calibration verification (CCV) associated with batch 64159: Benzidine. This compound is not classified as a Calibration Check Compound (CCC) in the reference method. Due to the large number of analytes contained in the CCV, the laboratory's SOP allows for four analytes to be outside limits; therefore, the data have been reported.

Method(s) 8270C: The continuing calibration verification (CCV) for multiple analytes associated with batch 63846 recovered above the upper control limit. The samples associated with this CCV were non-detects for the affected analytes; therefore, the data have been reported.

Method(s) 8270C: The laboratory control sample (LCS) for preparation batch 63035 exceeded control limits for multiple analytes. These analytes were biased high in the LCS and were not detected in the associated samples; therefore, the data have been reported.

Method(s) 8270C: The continuing calibration verification (CCV) for multiple analytes associated with batch 64500 recovered above the upper control limit. The samples associated with this CCV were non-detects for the affected analytes; therefore, the data have been reported.

Method(s) 8270C: The following sample was diluted due to the nature of the sample matrix: SED-5 (480-19749-1). Elevated reporting limits (RLs) are provided.

Method(s) 8270C: The continuing calibration verification (CCV) for multiple analytes associated with batch 64845 recovered above the upper control limit. The samples associated with this CCV were non-detects for the affected analytes; therefore, the data have been reported.

Method(s) 8270C: The following samples were diluted due to the nature of the sample matrix : BLIND DUP (480-19946-2), MW-10 (2-4) (480-19946-1). As such, surrogate recoveries were reduced to a level in which they do not provide useful information. Elevated reporting limits (RLs) are provided.

Method(s) 8270C: The continuing calibration verification (CCV) for multiple analytes associated with batch 64707 recovered above the upper control limit. The samples associated with this CCV were non-detects for the affected analytes; therefore, the data have been reported.

Method(s) 8270C: The laboratory control sample (LCS) for preparation batch 64322 exceeded control limits for multiple analytes. These analytes were biased high in the LCS and were not detected in the associated samples; therefore, the data have been reported.

Method(s) 8270C: The following samples were diluted due to the nature of the sample matrix and viscosity: MW-11 4-6 (480-20010-2), MW-12 4-6 (480-20010-3), MW-13 (6-8) (480-20045-1), MW-14 (6-8) (480-20045-2), MW-9 2-4 (480-20010-1). As such, surrogate recoveries were reduced to a level in which they don not provide useful information. Elevated reporting limits (RLs) are provided.

Method(s) 8270C: The following compounds were outside control limits in the continuing calibration verification (CCV) associated with batch 65019: 4-Nitrophenol and Atrazine. These compounds are not classified as Calibration Check Compounds (CCCs) in the reference method. Due to the large number of analytes contained in the CCV, the laboratory's SOP allows for four analytes to be outside limits; therefore, the data have been reported.

Method(s) 8270C: The continuing calibration verification (CCV) for multiple analytes associated with batch 64845 recovered above the upper control limit. The samples associated with this CCV were non-detects for the affected analytes; therefore, the data have been reported.

Method(s) 8270C: The laboratory control sample (LCS) and laboratory control sample duplicate (LCSD) for preparation batch 64623 exceeded control limits for the multiple analytes. These analytes were biased high in the LCS and were not detected in the associated samples; therefore, the data have been reported.

Method(s) 8270C: The %RPD of the laboratory control sample (LCS) and laboratory control standard duplicate (LCSD) for preparation batch 64623 exceeded control limits for the following analyte: Hexachlorobenzene. The recoveries were within quality control acceptance limits, therefore the data has been qualified and reported.

Method(s) 8270C: The laboratory control sample (LCS) for preparation batch 480-65304 exceeded control limits for 1,1-Biphenyl. This analyte was biased in the LCS and was not requested in the client spike list ; therefore, the data have been reported.

Method(s) 8270C: The following compound was outside control limits in the continuing calibration verification (CCV) associated with analytical batch 480-65659: Benzidine. This compound is not classified as Calibration Check Compounds (CCCs) in the reference method, and the laboratory defaults to in-house and/or project-specific criteria for evaluation. Due to the large number of analytes contained in the CCV, the laboratory's SOP allows for four analytes to be outside limits; therefore, the data have been reported.

Method(s) 8270C: The method blank for preparation batch 480-65304 contained several analytes above the method detection limit. These target analyte concentrations were less than the reporting limit (RL); therefore, re-extraction and/or re-analysis of samples was not performed.

Method(s) 8270C: The following sample was diluted due to viscosity: SED-6 (480-20255-1). Elevated reporting limits (RL) are provided.

No other analytical or quality issues were noted.

GC VOA

Method(s) 8015B GRO: Surrogate recovery for the following sample was outside control limits: SED-5 (480-19749-1). Evidence of matrix interferences is present due to the moisture content of the sample. This sample was re-extracted and re-analyzed with similar results obtained. Both sets of data is reported.

Method(s) 8015B GRO: Surrogate recovery for the following sample was outside control limits: MW-12 4-6 (480-20010-3). Evidence of high moisture content is present; therefore, re-extraction and/or re-analysis was not performed.

Method(s) 8015B GRO: The following sample was diluted due to the abundance of target analytes: MW-14 (6-8) (480-20045-2). Surrogate recoveries are not reported or not representative, and elevated reporting limits (RLs) are provided.

Method(s) 8015B GRO: The following sample was diluted due to the abundance of target analytes: MW-11 (4-6) (480-20010-2). Elevated reporting limits (RLs) are provided.

Method(s) 8015B GRO: The method blanks (MB 480-63055/1-A), (MB 480-63623/1-A), (MB 480-64294/1-A), (MB 480-64510/1-A), (MB 480-64996/1-A) and (MB 480-65188/1-A) contained Gasoline Range Organics above the method detection limit. This target analyte concentration was less than the reporting limit (RL); therefore, re-extraction and/or re-analysis of samples was not performed.

No other analytical or quality issues were noted.

GC Semi VOA

Method(s) 8015B DRO: Surrogate recovery for the following sample was outside control limits: SS-18 (480-19484-3). Evidence of matrix interference is present; therefore, re-extraction and/or re-analysis was not performed. The sample extract was very dark and very viscous.

Method(s) 8015B DRO: The matrix spike / matrix spike duplicate (MS/MSD) recoveries for batch 63036 were outside control limits. The associated laboratory control sample (LCS) recovery met acceptance criteria.

Method(s) 8015B DRO: The following samples were diluted due to the abundance of target analytes: BLIND DUP (480-19946-2), MW-10 (2-4) (480-19946-1). As such, surrogate recoveries are not reported or not representative, and elevated reporting limits (RLs) are provided.

Method(s) 8015B DRO: The following samples were diluted due to the abundance of target analytes: MW-11 4-6 (480-20010-2), MW-12 4-6 (480-20010-3), MW-9 2-4 (480-20010-1). Surrogate recoveries are not reported or not representative, and elevated reporting limits (RLs) are provided.

Method(s) 8015B DRO: The following samples were diluted due to the abundance of target analytes: (480-20045-1 MS), (480-20045-1 MSD), MW-13 (6-8) (480-20045-1), MW-14 (6-8) (480-20045-2). As such, surrogate recoveries are not reported or not representative, and elevated reporting limits (RLs) are provided.

Method(s) 8082: All primary data is reported from the ZB-35 column.

No other analytical or quality issues were noted.

Metals

Method(s) 6010B: The Serial Dilution (480-19562-1 SD) in batch 480-63220, exhibited a result outside the quality control limits for total potassium. However, the Post Digestion Spike was compliant so no corrective action was necessary

Method(s) 6010B: The recoveries of Post Spike, (480-19562-1 PDS), in batch 480-63220 exhibited results outside the quality control limits for total aluminum, barium, and iron. However, the Serial Dilution of this sample was compliant. Therefore, no corrective action was necessary

Method(s) 6010B: The Matrix Spike/ Matrix Spike Duplicate (TP-61 (6-8) (480-19562-1 MS), TP-61 (6-8) (480-19562-1 MSD)) recoveries for total antimony in batch 480-63220 were outside control limits. The Matrix Spike Duplicate was also outside the quality control limits for total lead. Non-homogeneity of the sample matrix is suspected The associated Laboratory Control Sample (LCS) met acceptance criteria, therefore no corrective action was necessary.

Method(s) 6010B: The Matrix Spike / Matrix Spike Duplicate (TP-61 (6-8) (480-19562-1 MS), TP-61 (6-8) (480-19562-1 MSD)) precision for batch 480-63220 was outside control limits for total lead. Non-homogeneity of the sample matrix is suspected. The associated Laboratory Control Sample met acceptance criteria, therefore, no corrective action was necessary.

Method(s) 6010B: The Method Blank for batch 480-63220 contained total potassium above the client detection limit. This target analyte concentration was less than the laboratory's standard reporting limit (RL); therefore, re-extraction and/or re-analysis of sample TP-61 (6-8) (480-19562-1) was not performed.

Method(s) 6010B: The Serial Dilution (480-19562-1 SD) in batch 480-63220, exhibited a result outside the quality control limits for total zinc. However, the Post Digestion Spike was compliant so no corrective action was necessary

Method(s) 6010B: The Matrix Spike Duplicate (MSD) recovery for total zinc in batch 480-63220 was outside control limits. Non-homogeneity of the sample matrix is suspected The associated Laboratory Control Sample (LCS) met acceptance criteria, therefore no corrective action was necessary.

Method(s) 6010B: The Serial Dilution (480-20045-1 SD) in batch 64637, exhibited results outside the quality control limits for total calcium, cobalt, chromium, copper, iron, potassium, magnesium, manganese, nickel, lead, vanadium, and zinc. However, the Post Spike was compliant, therefore, no corrective action was necessary.

Method(s) 6010B: The Serial Dilution and Post Spike (480-20045-1 PDS), (480-20045-1 SD) exceeded the quality control limits for total aluminum and barium. Sample matrix is suspected, therefore no corrective action was necessary.

Method(s) 6010B: The Matrix Spike and Matrix Spike Duplicate ((480-20045-1 MS), (480-20045-1 MSD)) recoveries for total calcium and antimony in batch 480-64637 were outside quality control limits. The Matrix Spike Duplicate was also outside the quality control limits for total potassium. The associated Laboratory Control Sample (LCSSRM) was compliant, therefore no corrective action was necessary.

Method(s) 6010B: The Method Blank for soil batch 480-65190 contained total manganese above the client detection limit. This target analyte concentration was less than the laboratory reporting limit (RL); therefore, re-extraction and/or re-analysis of sample SED-6 (480-20255-1) was not performed.

Method(s) 7471A: The following samples were diluted due to the abundance of target analyte total mercury: MW-11 4-6 (480-20010-2). Elevated reporting limits (RLs) are provided.

Method(s) 7471A: The Serial Dilution (480-19946-1 SD) exceeded the quality control limits for total mercury in batch 480-64531. The Laboratory Control Sample (LCSSRM) was compliant, therefore no corrective action was necessary.

Method(s) 7471A: The Matrix Spike Duplicate (MSD) recovery for total mercury in batch 480-64532 was outside control limits. Non-homogeneity of the sample matrix is suspected. The associated Laboratory Control Sample (LCS) recovery met acceptance criteria, therefore no corrective action was necessary.

No other analytical or quality issues were noted.

General Chemistry
Method(s) Lloyd Kahn: Please note that the reporting limit for Lloyd Kahn TOC analysis is a nominal value and does not reflect adjustments in sample mass processed on an individual basis.

Method(s) Lloyd Kahn: The following sample(s) was received outside of holding time: SED-5 (480-19749-1).

No other analytical or quality issues were noted.

Organic Prep
Method(s) 3550B: A significant amount of liquid was present in the following sample: SED-5 (480-19749-1). This sample was decanted prior to preparation.

Method(s) 3550B: A significant amount of liquid was present in the following sample: SED-5 (480-19749-1). This sample was decanted prior to preparation.

Method(s) 3550B: Due to the matrix, the following samples could not be concentrated to the final method required volume: MW-13 (6-8) (480-20045-1), MW-14 (6-8) (480-20045-2), MW-9 2-4 (480-20010-1). The reporting limits (RLs) are elevated proportionately.

Method(s) 3550B: Due to the matrix of the samples, a matrix spike/matrix spike duplicate (MS/MSD) was not prepared with batch 64623. The laboratory control sample (LCS) was performed in duplicate to provide precision data for this batch.

Method(s) 3550B: Due to the matrix, the following samples could not be concentrated to the final method required volume: MW-14 (6-8) (480-20045-2), MW-9 2-4 (480-20010-1). The reporting limits (RLs) are elevated proportionately.

Method(s) 3550B: A significant amount of liquid was present in the following samples: SED-6 (480-20255-1). These samples were decanted prior to preparation.

No other analytical or quality issues were noted.

Job Narrative
480-20349-1

Comments
No additional comments.

Receipt
The samples were received on 5/22/2012 2:00 PM and 5/23/2012 11:52 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperatures of the 5 coolers at receipt time were 1.9° C, 2.9° C, 3.6° C, 3.9° C and 4.2° C.

GC/MS VOA
Method(s) 8260B: The matrix spike / matrix spike duplicate (MS/MSD) recoveries for batch 65836 were outside control limits. The associated laboratory control sample (LCS) recovery met acceptance criteria.

Method(s) 8260B: The matrix spike / matrix spike duplicate (MS/MSD) precision for batch 65836 was outside control limits.

Method(s) 8260B: The following samples were diluted due to the abundance of target analytes: MW-11 (480-20349-5DL), MW-12 (480-20349-6DL). Elevated reporting limits (RLs) are provided.

Method(s) 8260B: The following volatiles sample(s) was diluted due to foaming at the time of purging during the original sample analysis: MW-1 (480-20398-1), MW-3 (480-20398-3), MW-8 (480-20398-4). Elevated reporting limits (RLs) are provided.

Method(s) 8260B: The following sample(s) was diluted due to the abundance of target analytes: MW-9 (480-20398-5). Elevated reporting limits (RLs) are provided.

Method(s) 8260B: The following sample(s) was diluted due to the abundance of target analytes: MW-9 (480-20398-5DL). Elevated reporting limits (RLs) are provided.

No other analytical or quality issues were noted.

GC/MS Semi VOA
Method(s) 8270C: The following sample was diluted due to the nature of the sample matrix and viscosity: MW-6 (480-20349-2), MW-11 (480-20349-5), MW-12 (480-20349-6). As such, surrogate recoveries were reduced to a level in which they do not provide useful information. Elevated reporting limits (RLs) are provided.

Method(s) 8270C: The following samples contained one acid and/or one base surrogate outside acceptance limits: BLIND DUPLICATE (480-20349-3). The laboratory's SOP allows one acid surrogate and/or one base surrogate to be outside acceptance limits; therefore, re-extraction/re-analysis was not performed. These results have been reported and qualified.

Method(s) 8270C: The following compound was outside control limits in the continuing calibration verification (CCV) associated with batch 66240: Atrazine. This compound is not classified as Calibration Check Compound (CCC) in the reference method. Due to the large number of analytes contained in the CCV, the laboratory's SOP allows for four analytes to be outside limits; therefore, the data have been reported.

Method(s) 8270C: The following compound was outside control limits in the continuing calibration verification (CCV) associated with batch 66053: Atrazine. This compound is not classified as Calibration Check Compound (CCC) in the reference method. Due to the large number of analytes contained in the CCV, the laboratory's SOP allows for four analytes to be outside limits; therefore, the data have been reported.

Method(s) 8270C: The laboratory control sample (LCS) for preparation batch 65773 exceeded control limits for multiple analytes. These analytes were biased high in the LCS and were not detected in the associated samples; therefore, the data have been reported.

Method(s) 8270C: The matrix spike / matrix spike duplicate (MS/MSD) recoveries for preparation batch 65773 were outside control limits. The associated laboratory control sample (LCS) recovery met acceptance criteria.

Method(s) 8270C: The following sample(s) contained one acid and/or one base surrogate outside acceptance limits: MW-7 (480-20349-4). The laboratory's SOP allows one acid surrogate and/or one base surrogate to be outside acceptance limits; therefore, re-extraction/re-analysis was not performed. These results have been reported and qualified.

Method(s) 8270C: The following sample(s) contained one acid and/or one base surrogate outside acceptance limits: MW-11 (480-20349-5). The laboratory's SOP allows one acid surrogate and/or one base surrogate to be outside acceptance limits; therefore, re-extraction/re-analysis was not performed. These results have been reported and qualified.

Method(s) 8270C: The following sample(s) contained one acid and/or one base surrogate outside acceptance limits: MW-12 (480-20349-6). The laboratory's SOP allows one acid surrogate and/or one base surrogate to be outside acceptance limits; therefore, re-extraction/re-analysis was not performed. These results have been reported and qualified.

Method(s) 8270C: The following sample(s) contained one acid and/or one base surrogate outside acceptance limits: MW-13 (480-20349-7). The laboratory's SOP allows one acid surrogate and/or one base surrogate to be outside acceptance limits; therefore, re-extraction/re-analysis was not performed. These results have been reported and qualified.

Method(s) 8270C: The following sample(s) contained one acid and/or one base surrogate outside acceptance limits: MW-14 (480-20349-8). The laboratory's SOP allows one acid surrogate and/or one base surrogate to be outside acceptance limits; therefore, re-extraction/re-analysis was not performed. These results have been reported and qualified.

Method(s) 8270C: The matrix spike / matrix spike duplicate (MS/MSD) recoveries for batch 65773 were outside control limits. The associated laboratory control sample (LCS) recovery met acceptance criteria.

Method(s) 8270C: The following sample was diluted due to the nature of the sample matrix: MW-9 (480-20398-5). As such, surrogate recoveries were reduced to a level in which they do not provide useful information. Elevated reporting limits (RLs) are provided.

Method(s) 8270C: The following samples contained one acid and/or one base surrogate outside acceptance limits: MW-1 (480-20398-1), MW-10 (480-20398-6), MW-2 (480-20398-2), MW-3 (480-20398-3), MW-8 (480-20398-4). The laboratory's SOP allows one acid surrogate and/or one base surrogate to be outside acceptance limits; therefore, re-extraction/re-analysis was not performed. These results have been reported and qualified.

Method(s) 8270C: The following compound was outside control limits in the continuing calibration verification (CCV) associated with batch 66305: Atrazine. This compound is not classified as Calibration Check Compounds (CCCs) in the reference method. Due to the large number of analytes contained in the CCV, the laboratory's SOP allows for four analytes to be outside limits; therefore, the data have been reported.

Method(s) 8270C: The laboratory control sample (LCS) and laboratory control sample duplicate (LCSD) for preparation batch 65901 exceeded control limits for multiple analytes. These analytes were biased high in the LCS and were not detected in the associated samples; therefore, the data have been reported.

No other analytical or quality issues were noted.

GC VOA

Method(s) 8015B: The following samples were diluted due to the abundance of target analytes: MW-11 (480-20349-5) and MW-12 (480-20349-6). Elevated reporting limits (RLs) are provided.

Method(s) 8015B: The following sample was diluted due to the abundance of target analytes: MW-9 (480-20398-5). Elevated reporting limits (RLs) are provided.

Method(s) 8015B: The method blanks (MB 480-65831/10) and (MB 480-65988/3) contained Gasoline Range organics above the method detection limit. This target analyte concentration was less than the reporting limit (RL); therefore, re-analysis of samples was not performed.

No other analytical or quality issues were noted.

GC Semi VOA

Method(s) 8015B: The following samples were diluted due to the abundance of target analytes: MW-11 (480-20349-5), MW-12 (480-20349-6). As such, surrogate recoveries are not reported or not representative, and elevated reporting limits (RLs) are provided.

Method(s) 8015B: The following sample was diluted due to the abundance of target analytes: MW-6 (480-20349-2). Elevated reporting limits (RLs) are provided.

Method(s) 8015B: The following sample was diluted due to the abundance of target analytes: MW-9 (480-20398-5). As such, surrogate recoveries are not reported or not representative, and elevated reporting limits (RLs) are provided.

No other analytical or quality issues were noted.

Organic Prep

Method(s) 3510C: The following samples formed emulsions during the extraction procedure: BLIND DUPLICATE (480-20349-3), MW-11 (480-20349-5), MW-12 (480-20349-6), MW-13 (480-20349-7), MW-14 (480-20349-8), MW-4 (480-20349-1), MW-6 (480-20349-2), MW-7 (480-20349-4). The emulsions were broken up using pour backs.

Method(s) 3510C: Sample concentrated down to 0.5mL. Brought up to final volume of 1.0mL with MeCl2 before vialing.

Method(s) 3510C: The following samples formed emulsions during the extraction procedure: MW-9 (480-20398-5). The emulsions were broken up using a centrifuge.

Method(s) 3510C: Insufficient sample volume was available to perform batch matrix spike/matrix spike duplicate (MS/MSD) associated with batch 65901. The laboratory control sample (LCS) was performed in duplicate to provide precision data for this batch.

No other analytical or quality issues were noted.

Data Validation Services

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July 21, 2015

Lori Riker
Benchmark Environmental
2558 Hamburg Turnpike
Suite 300
Buffalo, NY 14218

RE: **D**ata **U**sability **S**ummary **R**eport (DUSR) for the 251 Homer Street Analytical Data
TAL SDG Nos. 490-62683, 490-62797, 490-63066, 490-63077, 490-63772, 490-64084, 490-64527, 490-64886, 490-65153, 490-66020, 490-66726, 490-67718, 490-68278, 490-68849, 490-69113, 490-69269, 490-69427, 490-69918, 490-70110, 490-70394, 490-70487, 490-70555, 490-70803, 490-72373, and 490-73667

Dear Ms. Riker:

Review has been completed for the analytical data packages noted above, generated by TestAmerica Laboratories, that pertain to samples collected between 10/01/14 and 03/06/15 at the 251 Homer Street site. Eighty two soil samples and three field duplicates were processed for TCL and CP51 volatile analytes, polynuclear aromatic hydrocarbons (PAHs), and total lead. Eleven additional soil samples were processed for total arsenic. Sample matrix spikes were also processed. The analytical methods utilized are those of the USEPA SW846 8260C, 8270D, and 6010C.

The data packages submitted contain full deliverables for validation, but this DUSR is generated from review of the summary form information, with full validation review of sample raw data, and limited review of associated QC raw data. The reported summary forms have been reviewed for application of validation qualifiers, using guidance from the USEPA Region 2 validation SOPs, the USEPA National Functional Guidelines for Data Review, the specific laboratory methodologies, and professional judgment. The following items were reviewed:

* Laboratory Narrative Discussion
* Custody Documentation
* Holding Times
* Surrogate and Internal Standard Recoveries
* Matrix Spike Recoveries/Duplicate Correlations
* Field Duplicate Correlations
* Preparation/Calibration/Trip Blanks
* Laboratory Control Samples (LCSs)
* Instrumental Tunes
* Calibration/Low Level Standards
* ICP Serial Dilution
* Instrument IDLs
* Sample Result Verification

The data review includes evaluation of the specific items noted in The NYS DER-10 Appendix B section 2.0 (c). The items listed above that show deficiencies are discussed within the text of this narrative. The laboratory QC forms illustrating the excursions can be found within the laboratory data packages.

In summary, analyses were conducted in compliance with the required analytical protocols. Most results are usable either as reported or with qualification/edit. The following items involve rejected data; details are found in the report below:

- twenty four volatile analytes in one sample; that location was further excavated, so the lack of usable data for this sample is not of major concern
- between one and three volatile analytes in each of four samples
- 1,4-dioxane in all samples

Many of the samples have large matrix interferences that made evaluation for organic target analytes difficult. In some instances, in order to avoid rejection of data points, certain of the volatile compounds were reported from a medium level analysis, with the resulting elevated reporting limits. Several of the samples were processed for semivolatile anaytes at dilution due to the matrix. Poor or no recovery of specific volatile analytes in matrix spikes indicated rejection of those data in the parent sample.

Accuracy and precision of the PAH and lead values are good, but show a significant number of outliers for the volatile analytes. Those evaluations were not available for arsenic. Data completeness, representiveness, and comparability are acceptable. Sensitivity is optimal for the matrix of the samples.

Copies of the sample identification summaries are attached to this text. Also included with the report are validation qualifier definitions and client results tables that are manually annotated to reflect the qualifications recommended within this report.

The following text discusses quality issues of concern.

Chains-of-Custody/Sample Receipt

Due to elevated temperature at sample receipt, the results for the volatile analytes in the samples collected 10/30/14 are qualified as estimated, with a possible low bias.

Scratchovers and writeovers on the custody forms should have been dated and initialed.

Samples collected 10/03/14 were not received by the laboratory until four days after collection due to delay prior to shipment. A memorandum to the file should be made documenting the condition/temperature and custody of the samples during the interim.

No collection date or time was present on the custody for samples reported in SDG 490-62797.

The depth entries on the custody forms were not used in the laboratory identifications.

The custody did not show the entries for the designated analysis on VSW-37

Blind Duplicate Evaluations

The blind field duplicates were collected at locations VFL-17, VFL-34, and VFL-41. Correlations are within validation guidelines, with the exceptions of those for the following, results for which are qualified as estimated in the indicated parent samples and their duplicates:

- isopropyltoluene, mp-xylene, methylene chloride, n-butybenzene, toluene, and all detected PAHs in VFL-14
- anthracene, pyrene, and all detected volatile analytes in VFL-34
- carbon disulfide and methylene chloride in VFL-41

VFL-34 shows very poor correlations to its field duplicate, where the duplicate is significantly higher than the parent sample. A nonhomogeneous sample matrix is suspected. The conservative approach is that the field duplicate data be used to characterize the location. Two additional field duplicates should have been collected.

TCL and CP-51 Volatile Analyses by EPA 8260C

The following samples exhibited outlying responses for the internal standards and/or surrogate standards added at analysis. The results for the specific target analytes associated with the outlying internal standards are therefore derived from dilution analyses of the samples. Reporting limits are therefore elevated. Analyte detected results that are derived from analyses wherein elevated surrogate recoveries were observed are qualified as estimated, with a possible high bias. The affected samples are: VSW-03, VSW-04, VFL-01, VFL-07, VSW-09, VSW-11, VSW-02, VSW-08, VSW-09, VFL-17, VFL-18, VSW-10, VFL-19, VFL-20, VFL-23, VFL-27, VFL-29, VFL-30, VSW-12, and VSW-14

Sample matrix spikes (MS/MSD) were performed on VFL-11, VFL-13, VFL05, VFL-02 (medium level), A1-VFL-02, VSW-03, VSW-06 (spiked at the RL), VSW-07, VSW-09, VFL-20, VFL-22, VFL-34, VFL-21, VFL-40, and VSW-07R. The following analytes are rejected in the parent samples due to recoveries below 10% in one or both spikes:

- 1,2,3-trichlorobenzene and 1,2,4-trichlorobenzene in A1-VFL-02 and VFL-20
- 24 analytes show recoveries below 10% in VSW-07 (10/30/14). Results for the affected compounds are rejected (where reported on the client tables), with the exception of the result for m,p-xylene, a detection, which was qualified as estimated. Although matrix may be an issue with the sample, discrepancies were observed between the recoveries of analytes 1,2-dichloroethane, toluene, 1,4-dichlorobenzene, chlorobenzene, and their corresponding deuterated surrogated/internal standards. Laboratory spike error is suspected.
- 1,1,2-trichloroethane in VSW-09
- naphthalene, 1,2,3-trichlorobenzene, and 1,2,4-trichlorobenzene in VSW-07R

Other of the matrix spike evaluations show acceptable accuracy and precision, with the exceptions of the following, results for which are qualified as estimated in the indicated parent sample:

Parent Sample	Analyte	Outlying % Recoveries	Outlying %RPD
VFL-02	methylcyclohexane	367	105
VSW-03	isopropylbenzene	11, 21	
	n-butybenzene	-20, -18	
	tetrachloroethene	23, 27	
A1-VFL-02	tert-butylbenzene	18,18	

Parent Sample	Analyte	Outlying % Recoveries	Outlying %RPD
VSW-09	1,1,1-trichloroethane	29,28	
	1,1,2-trichloro-1,2,2-trifluoroethane	33,29	
	1,1-dichloroethene	40,34	
	bromochloromethane	27,25	
	carbon disulfide	25,18	
	carbon tetrachloride	23, 22	
	chlorobenzene	22,16	
	cis-1-2-dichloroethene	30,25	
	tetrachloroethene	17,17	
	trichloroethene	20,16	
	trans-1,2-dichoroethene	21,16	
VSW-20	1,2-dichlorobenzene	-9, 37	
	1,3,5-trimethylbenzene	-162, -108	
	1,4-dichlorobenzene	-6, 3	
	chlorobenzene	22, 20	
	cyclohexane	-73,-84	
	ethylbenzene	3,-5	
	isopropylbenzene	8,5	
	naphthalene	-97-20	
	n-butylbenzene	-19,-5	
	n-propylbenzene	-14,-9	
	p-isopropyltoluene	-10,-5	
	sec-butylbenzene	-1,2	
	tetrachloroethene	25,20	
	toluene	25,21	
	m,p-xylene	-21,-18	
	o-xylene	-27-36	
VFL-22	n-butylbenzene	7,3	
	tert-butylbenzene	19,14	
VSW-07R	1,2,4-trimethylbenzene	13,26	

Additionally, the laboratory integrated an incorrect response for n-butylbenzene in the MS of VFL-02 (reporting 1% recovery). The MSD was acceptable. Because the actual recovery for that compound is not known, the result for that analyte in the parent sample is qualified as estimated. No action is taken for outlying recoveries of VSW-08, as the spikes were performed at the reporting limit concentrations.

The following detections are edited to non-detection due to very poor mass spectral identification:

- toluene in VSW-05
- 1,1,2,2-tetrachloroethane, 1,2-dichlorobenzene, and 1,4-dichlroobenzene in VFL-19
- 1,2-dichlorobenzene and 1,4-dichlroobenzene in VFL-20
- 1,1,2,2-tetrachloroethane, toluene, and 1,4-dichlroobenzene in VFL-27

- 1,4-dichorobenzene in VFL-22
- trans-1,3-dichoropropene, 1,4-dichorobenzene, and toluene in VFL-23
- n-butylbenzene in VFL-39

Most of the reported n-butyl benzene detections in the samples show matrix significant interferences in the mass spectra, making identification difficult. This is also true for other conjugated aromatics, but to a lesser extent. The conservative approach of retaining the reported detections has been made.

The detected value for acetone in VSW-9 is qualified as estimated with a high bias due to interference from hydrocarbons in the sample.

Results for 1,4-dioxane in the samples are rejected due to low responses (RRFs) in the calibration standards. Other calibration standards showed acceptable responses, with the following exceptions, results for which are to be qualified as estimated in the indicated samples:

- naphthalene (26%D) in VSW-01, VSW-02, VFL-01,
- chloromethane and bromomethane (36%D and 47%D) in samples reported in SDG 490-66020-1
- 1,1,2,2-tetrachloroethane (27%D) in VSW-08
- bromomethane (23%D) in samples reported in 490-67726-1 and 490-68278-1
- dichlorodifluoromethane, bromomethane, methyl acetate, and tetrachloroethene (22%D to 59%D) in samples reported in 490-69260-1
- 1,2,4-trichlorobenzene and n-butylbenzene in VSW-07R

Blanks show no contamination. Holding times were met.

The data packages do not clarify sample medium level preparation methods and volumes. The only documentation to indicate the medium level analysis is found in a reference for the methanol lot number in the raw data preparation logs.

QC summary forms for the matrix spikes are not accurate in that they do not show concentrations below the reporting limits.

TCL Semivolatiles by EPA 8270D

The matrix spikes of VFL-13, VFL-14, A1-ASW-01, VFL-22, VFL-34, and VFL-40 show acceptable recoveries and correlations.

Several samples exhibited low surrogate recoveries as a result of dilution. No qualification is made.

Blanks show no contamination. Calibration standards showed acceptable responses. Holding times were met.

Total Lead and Arsenic by EPA 6010C

Matrix spike/duplicate and serial dilution evaluations were performed for total lead on VFL-07, VFL-08, VFL-11, VFL-14, VSW-03, VSW-09, VFL-18, VFL-34, and VFL-40. They show acceptable recoveries and correlations, with the exceptions of one of the recoveries for lead (133%) in VFL-08 and both recoveries in VSW-09 (355% and 473%). Those results have been qualified as estimated in the parent samples.

No matrix spike/duplicate evaluations were performed for arsenic.

Low level and calibration standards show acceptable responses. Blanks show no contamination affecting sample reporting results.

Please do not hesitate to contact me if you have comments or questions regarding this report.

Very truly yours,

Judy Harry

VALIDATION DATA QUALIFIER DEFINITIONS

U	The analyte was analyzed for, but was not detected above the level of the associated reported quantitation limit.
J	The analyte was positively identified; the associated numerical value is an approximate concentration of the analyte in the sample.
J-	The analyte was positively identified; the associated numerical value is an estimated quantity that may be biased low.
J+	The analyte was positively identified; the associated numerical value is an estimated quantity that may be biased high.
UJ	The analyte was analyzed for, but was not detected. The associated reported quantitation limit is approximate and may be inaccurate or imprecise.
NJ	The detection is tentative in identification and estimated in value. Although there is presumptive evidence of the analyte, the result should be used with caution as a potential false positive and/or elevated quantitative value.
R	The data are unusable. The sample results are rejected due to serious deficiencies in meeting Quality Control limits. The analyte may or may not be present.
EMPC	The results do not meet all criteria for a confirmed identification. The quantitative value represents the Estimated Maximum Possible Concentration of the analyte in the sample.

CLIENT and LABORATORY SAMPLE IDs

SAMPLE SUMMARY

Client: Homer Street Redevelopment LLC

Job Number: 490-62683-1

Lab Sample ID	Client Sample ID	Client Matrix	Date/Time Sampled	Date/Time Received
490-62683-1	VSW-01	Soil	10/01/2014 1200	10/02/2014 0850
490-62683-2	VSW-02	Soil	10/01/2014 1210	10/02/2014 0850
490-62683-3	VSW-03	Soil	10/01/2014 1220	10/02/2014 0850
490-62683-4	VSW-04	Soil	10/01/2014 1230	10/02/2014 0850
490-62683-5	VFL-01	Soil	10/01/2014 1240	10/02/2014 0850
490-62683-6	VFL-02	Soil	10/01/2014 1250	10/02/2014 0850

SAMPLE SUMMARY

Client: Homer Street Redevelopment LLC

Job Number: 490-62797-1

Lab Sample ID	Client Sample ID	Client Matrix	Date/Time Sampled	Date/Time Received
490-62797-1	VFL-03	Solid	10/02/2014 0845	10/03/2014 0830
490-62797-2	VFL-04	Solid	10/02/2014 0900	10/03/2014 0830
490-62797-3	VFL-05	Solid	10/02/2014 0920	10/03/2014 0830
490-62797-4	VFL-06	Solid	10/02/2014 0930	10/03/2014 0830

SAMPLE SUMMARY

Client: Homer Street Redevelopment LLC

Job Number: 490-63066-1

Lab Sample ID	Client Sample ID	Client Matrix	Date/Time Sampled	Date/Time Received
490-63066-1	VFL-07	Soil	10/02/2014 1500	10/07/2014 0830
490-63066-2	VFL-08	Soil	10/03/2014 0900	10/07/2014 0830
490-63066-3	VSW-05	Soil	10/03/2014 0930	10/07/2014 0830
490-63066-4	VSW-06	Soil	10/03/2014 1000	10/07/2014 0830
490-63066-5	VSW-07	Soil	10/03/2014 1015	10/07/2014 0830
490-63066-6	VSW-08	Soil	10/03/2014 1030	10/07/2014 0830
490-63066-7	VFL-09	Soil	10/03/2014 1300	10/07/2014 0830
490-63066-8	VFL-10	Soil	10/03/2014 1330	10/07/2014 0830
490-63066-9	VFL-11	Soil	10/03/2014 1400	10/07/2014 0830

SAMPLE SUMMARY

Client: Homer Street Redevelopment LLC

Job Number: 490-63077-1

Lab Sample ID	Client Sample ID	Client Matrix	Date/Time Sampled	Date/Time Received
490-63077-1	VSW-09	Soil	10/06/2014 1100	10/07/2014 0830
490-63077-2	VSW-10	Soil	10/06/2014 1400	10/07/2014 0830
490-63077-3	VSW-11	Soil	10/06/2014 1430	10/07/2014 0830
490-63077-4	VFL-12	Soil	10/06/2014 1000	10/07/2014 0830
490-63077-5	VFL-13	Soil	10/06/2014 1030	10/07/2014 0830

SAMPLE SUMMARY

Client: Homer Street Redevelopment LLC

Job Number: 490-63772-1

Lab Sample ID	Client Sample ID	Client Matrix	Date/Time Sampled	Date/Time Received
490-63772-1	A1-VSW-01	Solid	10/14/2014 0900	10/15/2014 0820
490-63772-2	A1-VFL-01	Solid	10/14/2014 0910	10/15/2014 0820
490-63772-3	A1-VSW-02	Solid	10/14/2014 0900	10/15/2014 0820
490-63772-4	A1-VFL-02	Solid	10/14/2014 0910	10/15/2014 0820

SAMPLE SUMMARY

Client: Homer Street Redevelopment LLC

Job Number: 490-64084-1

Lab Sample ID	Client Sample ID	Client Matrix	Date/Time Sampled	Date/Time Received
490-64084-1	VSW-03	Solid	10/17/2014 0800	10/18/2014 0840
490-64084-2	VFL-03	Solid	10/17/2014 0810	10/18/2014 0840
490-64084-3	VFL-04	Solid	10/17/2014 0820	10/18/2014 0840

SAMPLE SUMMARY

Client: Homer Street Redevelopment LLC

Job Number: 490-64527-1
Sdg Number: Site 1

Lab Sample ID	Client Sample ID	Client Matrix	Date/Time Sampled	Date/Time Received
490-64527-1	VFL-05	Solid	10/23/2014 0800	10/24/2014 0815
490-64527-2	VFL-06	Solid	10/23/2014 0820	10/24/2014 0815
490-64527-3	VFL-07	Solid	10/23/2014 0900	10/24/2014 0815
490-64527-4	VSW-04	Solid	10/23/2014 0910	10/24/2014 0815

SAMPLE SUMMARY

Client: Homer Street Redevelopment LLC

Job Number: 490-64886-1

Lab Sample ID	Client Sample ID	Client Matrix	Date/Time Sampled	Date/Time Received
490-64886-1	VFL-08	Soil	10/28/2014 0900	10/29/2014 0830
490-64886-2	VFL-09	Soil	10/28/2014 0910	10/29/2014 0830
490-64886-3	VFL-10	Soil	10/28/2014 0920	10/29/2014 0830
490-64886-4	VSW-05	Soil	10/28/2014 0950	10/29/2014 0830
490-64886-5	VSW-06	Soil	10/28/2014 1000	10/29/2014 0830

SAMPLE SUMMARY

Client: Homer Street Redevelopment LLC

Job Number: 490-65153-1

Lab Sample ID	Client Sample ID	Client Matrix	Date/Time Sampled	Date/Time Received
490-65153-1	VFL-11	Soil	10/30/2014 0900	10/31/2014 0830
490-65153-2	VFL-12	Soil	10/30/2014 0915	10/31/2014 0830
490-65153-3	VFL-13	Soil	10/30/2014 0930	10/31/2014 0830
490-65153-4	VSW-07	Soil	10/30/2014 0945	10/31/2014 0830

SAMPLE SUMMARY

Client: Homer Street Redevelopment LLC

Job Number: 490-66020-1

Lab Sample ID	Client Sample ID	Client Matrix	Date/Time Sampled	Date/Time Received
490-66020-1	VFL-14	Solid	11/11/2014 0800	11/12/2014 0820
490-66020-2	VFL-15	Solid	11/11/2014 0810	11/12/2014 0820
490-66020-3	VFL-16	Solid	11/11/2014 0820	11/12/2014 0820
490-66020-4	VSW-08	Solid	11/11/2014 0830	11/12/2014 0820

SAMPLE SUMMARY

Client: Homer Street Redevelopment LLC

Job Number: 490-66726-1

Lab Sample ID	Client Sample ID	Client Matrix	Date/Time Sampled	Date/Time Received
490-66726-1	VSW-09	Solid	11/19/2014 0900	11/20/2014 0900
490-66726-1MS	VSW-09	Solid	11/19/2014 0900	11/20/2014 0900
490-66726-1MSD	VSW-09	Solid	11/19/2014 0900	11/20/2014 0900
490-66726-1DU	VSW-09	Solid	11/19/2014 0900	11/20/2014 0900
490-66726-2	VFL-17	Solid	11/19/2014 0900	11/20/2014 0900
490-66726-3	VFL-711	Solid	11/19/2014 0915	11/20/2014 0900

SAMPLE SUMMARY

Client: Homer Street Redevelopment LLC

Job Number: 490-67718-1

Lab Sample ID	Client Sample ID	Client Matrix	Date/Time Sampled	Date/Time Received
490-67718-1	VFL-18	Solid	12/03/2014 0830	12/04/2014 0830
490-67718-2	VSW-10	Solid	12/03/2014 0830	12/04/2014 0830

SAMPLE SUMMARY

Client: Homer Street Redevelopment LLC

Job Number: 490-68278-1

Lab Sample ID	Client Sample ID	Client Matrix	Date/Time Sampled	Date/Time Received
490-68278-1	VFL-19	Solid	12/09/2014 1135	12/10/2014 0830
490-68278-2	VFL-20	Solid	12/09/2014 1135	12/10/2014 0830

SAMPLE SUMMARY

Client: Homer Street Redevelopment LLC

Job Number: 490-68849-1

Lab Sample ID	Client Sample ID	Client Matrix	Date/Time Sampled	Date/Time Received
490-68849-1	VFL-22	Soil	12/16/2014 0930	12/17/2014 0900
490-68849-2	VFL-23	Soil	12/16/2014 0935	12/17/2014 0900

SAMPLE SUMMARY

Client: Homer Street Redevelopment LLC

Job Number: 490-69113-1

Lab Sample ID	Client Sample ID	Client Matrix	Date/Time Sampled	Date/Time Received
490-69113-1	VFL-24	Soil	12/18/2014 0930	12/19/2014 0850
490-69113-2	VFL-25	Soil	12/18/2014 0930	12/19/2014 0850
490-69113-3	VFL-26	Soil	12/18/2014 0930	12/19/2014 0850

SAMPLE SUMMARY

Client: Homer Street Redevelopment LLC

Job Number: 490-69260-1

Lab Sample ID	Client Sample ID	Client Matrix	Date/Time Sampled	Date/Time Received
490-69260-1	VFL-27	Soil	12/19/2014 0900	12/20/2014 0900
490-69260-2	VFL-28	Soil	12/19/2014 0900	12/20/2014 0900

SAMPLE SUMMARY

Client: Homer Street Redevelopment LLC

Job Number: 490-69427-1

Lab Sample ID	Client Sample ID	Client Matrix	Date/Time Sampled	Date/Time Received
490-69427-1	VFL-29	Solid	12/22/2014 0800	12/23/2014 0915
490-69427-2	VFL-30	Solid	12/22/2014 0815	12/23/2014 0915
490-69427-3	VFL-31	Solid	12/22/2014 0830	12/23/2014 0915
490-69427-4	VFL-32	Solid	12/22/2014 0845	12/23/2014 0915
490-69427-5	VFL-33	Solid	12/22/2014 1200	12/23/2014 0915

SAMPLE SUMMARY

Client: Homer Street Redevelopment LLC

Job Number: 490-69918-1

Lab Sample ID	Client Sample ID	Client Matrix	Date/Time Sampled	Date/Time Received
490-69918-1	VFL-34	Solid	01/06/2015 0900	01/07/2015 0830
490-69918-1MS	VFL-34	Solid	01/06/2015 0900	01/07/2015 0830
490-69918-1MSD	VFL-34	Solid	01/06/2015 0900	01/07/2015 0830
490-69918-1DU	VFL-34	Solid	01/06/2015 0900	01/07/2015 0830
490-69918-2	VFL-35	Solid	01/06/2015 0915	01/07/2015 0830
490-69918-3	VFL-36	Solid	01/06/2015 0930	01/07/2015 0830
490-69918-4	VFL-431	Solid	01/06/2015 0945	01/07/2015 0830
490-69918-5	VSW-12	Solid	01/06/2015 1000	01/07/2015 0830

SAMPLE SUMMARY

Client: Homer Street Redevelopment LLC

Job Number: 490-70110-1

Lab Sample ID	Client Sample ID	Client Matrix	Date/Time Sampled	Date/Time Received
490-70110-1	VSW-11	Solid	01/08/2015 0915	01/09/2015 0845
490-70110-2	VFL-21	Solid	01/08/2015 0900	01/09/2015 0845

SAMPLE SUMMARY

Client: Homer Street Redevelopment LLC

Job Number: 490-70394-1

Lab Sample ID	Client Sample ID	Client Matrix	Date/Time Sampled	Date/Time Received
490-70394-1	VFL-37	Solid	01/13/2015 0900	01/14/2015 0835
490-70394-2	VFL-38	Solid	01/13/2015 0930	01/14/2015 0835
490-70394-3	VSW-13	Solid	01/13/2015 1000	01/14/2015 0835

SAMPLE SUMMARY

Client: Homer Street Redevelopment LLC

Job Number: 490-70487-1

Lab Sample ID	Client Sample ID	Client Matrix	Date/Time Sampled	Date/Time Received
490-70487-1	VFL-39	Soil	01/14/2015 0900	01/15/2015 0830
490-70487-2	VSW-14	Soil	01/14/2015 0900	01/15/2015 0830

SAMPLE SUMMARY

Client: Homer Street Redevelopment LLC

Job Number: 490-70555-1

Lab Sample ID	Client Sample ID	Client Matrix	Date/Time Sampled	Date/Time Received
490-70555-1	VFL-40	Soil	01/15/2015 0930	01/16/2015 0820
490-70555-1MS	VFL-40	Soil	01/15/2015 0930	01/16/2015 0820
490-70555-1MSD	VFL-40	Soil	01/15/2015 0930	01/16/2015 0820
490-70555-1DU	VFL-40	Soil	01/15/2015 0930	01/16/2015 0820
490-70555-2	VFL-41	Soil	01/15/2015 0945	01/16/2015 0820
490-70555-3	VFL-114	Soil	01/15/2015 1000	01/16/2015 0820

SAMPLE SUMMARY

Client: Homer Street Redevelopment LLC

Job Number: 490-70803-1

Lab Sample ID	Client Sample ID	Client Matrix	Date/Time Sampled	Date/Time Received
490-70803-1	VSW-07R	Solid	01/20/2015 0900	01/21/2015 0815

SAMPLE SUMMARY

Client: Homer Street Redevelopment LLC

Job Number: 490-72373-1

Lab Sample ID	Client Sample ID	Client Matrix	Date/Time Sampled	Date/Time Received
490-72373-1	VSW-S2-21	Solid	02/11/2015 1000	02/12/2015 0830
490-72373-2	VSW-S2-22	Solid	02/11/2015 1100	02/12/2015 0830

SAMPLE SUMMARY

Client: Homer Street Redevelopment LLC

Job Number: 490-73667-1
Sdg Number: Site 1 (Arsenic EX)

Lab Sample ID	Client Sample ID	Client Matrix	Date/Time Sampled	Date/Time Received
490-73667-1	VSW-AR-01	Soil	03/06/2015 0800	03/07/2015 1050
490-73667-2	VSW-AR-02	Soil	03/06/2015 0830	03/07/2015 1050
490-73667-3	VSW-AR-03	Soil	03/06/2015 0900	03/07/2015 1050
490-73667-4	VSW-AR-04	Soil	03/06/2015 1115	03/07/2015 1050
490-73667-5	VSW-AR-05	Soil	03/06/2015 1200	03/07/2015 1050
490-73667-6	VFL-AR-01	Soil	03/06/2015 0930	03/07/2015 1050
490-73667-7	VFL-AR-02	Soil	03/06/2015 1000	03/07/2015 1050
490-73667-8	VFL-AR-03	Soil	03/06/2015 1030	03/07/2015 1050
490-73667-9	VFL-AR-04	Soil	03/06/2015 1100	03/07/2015 1050
490-73667-10	VFL-AR-05	Soil	03/06/2015 1230	03/07/2015 1050
490-73667-11	VFL-AR-06	Soil	03/06/2015 1300	03/07/2015 1050

APPENDIX H

FISH AND WILDLIFE RESOURCE IMPACT ANALYSIS

Appendix 3C Fish and Wildlife Resources Impact Analysis Decision Key	If YES Go to:	If NO Go to:
1. Is the site or area of concern a discharge or spill event?	13	2
2. Is the site or area of concern a point source of contamination to the groundwater which will be prevented from discharging to surface water? Soil contamination is not widespread, or if widespread, is confined under buildings and paved areas.	13	3
3. Is the site and all adjacent property a developed area with buildings, paved surfaces and little or no vegetation?	4	9
4. Does the site contain habitat of an endangered, threatened or special concern species?	Section 3.10.1	5
5. Has the contamination gone off-site?	6	14
6. Is there any discharge or erosion of contamination to surface water or the potential for discharge or erosion of contamination?	7	14
7. Are the site contaminants PCBs, pesticides or other persistent, bioaccumulable substances?	Section 3.10.1	8
8. Does contamination exist at concentrations that could exceed ecological impact SCGs or be toxic to aquatic life if discharged to surface water?	Section 3.10.1	14
9. Does the site or any adjacent or downgradient property contain any of the following resources? i. Any endangered, threatened or special concern species or rare plants or their habitat ii. Any DEC designated significant habitats or rare NYS Ecological Communities iii. Tidal or freshwater wetlands iv. Stream, creek or river v. Pond, lake, lagoon vi. Drainage ditch or channel vii. Other surface water feature viii. Other marine or freshwater habitat ix. Forest x. Grassland or grassy field xi. Parkland or woodland xii. Shrubby area xiii. Urban wildlife habitat xiv. Other terrestrial habitat	11	10
10. Is the lack of resources due to the contamination?	3.10.1	14
11. Is the contamination a localized source which has not migrated and will not migrate from the source to impact any on-site or off-site resources?	14	12
12. Does the site have widespread surface soil contamination that is not confined under and around buildings or paved areas?	Section 3.10.1	12
13. Does the contamination at the site or area of concern have the potential to migrate to, erode into or otherwise impact any on-site or off-site habitat of endangered, threatened or special concern species or other fish and wildlife resource? (See #9 for list of potential resources. Contact DEC for information regarding endangered species.)	Section 3.10.1	14
14. No Fish and Wildlife Resources Impact Analysis needed.		